

# Part E: Reference & Utilities

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Part E is a general reference of EasyIO functions and utilities.

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## Section 1: Easyadm operation (Unix)

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If you are not familiar with easyadm operation, you should familiarize yourself with:

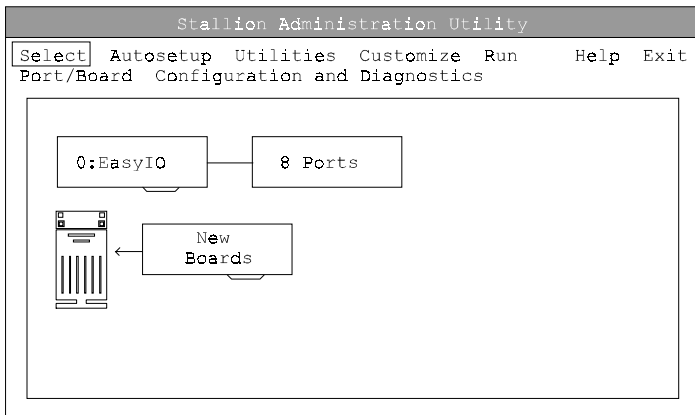
- What you will see on the screen.
- How you will execute the various options.

The following section covers these two aspects of using **easyadm**, the administration tool used to configure EasyIO

### Menus

**Menu Diagram** A menu screen consists of four regions; Title Line, Menu Line, Dialogue Window and Status Line

The figure below shows the Configuration Menu screen which is displayed after entering the command, **easyadm**, at the root prompt:



**Note:** If Stallion Technologies Easy, Easyreach or EasyConnection is installed on the same system, this main screen will also display these products.

**Title Line.** The top line of the screen is the Menu Title Line.

**Menu Line.** Menu Options appear in the Menu Line under the Menu Title Line.

**Active and Inactive Menu Options.** Depending on the type of terminal you have, active and inactive options are displayed in different ways:

- **Color Monitor** - Active options are in blue, with the first letter in upper case. They are intense when highlighted. Inactive menus are in lower case, and grey.
- **Monochrome Monitor** - Active options not underlined, inactive options underlined.

Familiarize yourself with the way your monitor displays active options (currently available) and inactive options (not available for use).

**Menu Option Selection.** Menu options are easy to select. You can use either of these methods:

- Use arrow keys to highlight the menu option and <Enter> to select the highlighted option.
- Type the first letter of the option to select the option.

## Keystrokes

You will use keystrokes to activate some of the EasyIO functions. The most frequently used keystrokes and key operated functions are outlined here:

**Arrow Keys.** Use arrow keys during all phases of operation. Some examples are:

- Highlighting an option.
- Accessing a field within a menu.

Use the arrow keys in the same way for all menus.

<Enter> The <Enter> key is used for the following:

- To accept options on the Menu Line.
- To move forward one field within a window.
- To accept the selections or options entered into a window.

<ESC> is used frequently during operation of the easyadm software:

- To de-highlight a selected option.
- To escape from a function.

- To revert to the previous menu.
- To abort the current operation.

<TAB> moves cursor to next field in a window. <TAB> also moves from port to port on the Port Configuration diagram.

<F1> **Help.** Activate on-line help at any time with <F1>.

A help screen is displayed, providing field specific help for the highlighted option or current situation.

<F3> **Windows.** During input of data to a field, <F3> windows provide a list of options available for that field. With some exceptions relating to printers, you can select an option from the <F3> window:

1. Move the cursor to the field.
2. Press <F3> to display the options for that field.
3. Highlight the required option with cursor keys.

Select the highlighted option with <Enter>.

**Control Characters** Control characters are shown in this manual as, for example <CTRL><L>. Execution is by holding down <CTRL> and pressing <L> or the appropriate character key.

**Note:** <CAPS LOCK> can be 'ON' or 'OFF' when control characters are entered.

## Other Operations

**Selecting an EasyIO Adapter Cable.** There are two ways to select an adapter cable from the easyadm front screen:

- Use the cursor arrow to move the highlight bar to the required EasyIO adapter cable.
- Type the cable's label.

**Selecting a Port.** There are two ways to select a port from the EasyIO Adapter Cable diagram:

- Type the port id number (eg. 3) to highlight the port.
- Use arrow keys to move the cursor to the required port.

**Accepting Default Options.** Use <Enter> to accept default options.

**Changing a Default.** Type the new information into a field and <Enter> or select an item from the <F3> window and <Enter>.

**Field Entry.** During entry of information to fields, all standard functions to highlight options, move around a window or request help are available - eg. arrow keys, <F3> window, <Enter> key. Field entry can be achieved in several ways:

- <Enter> to accept the default option as it is.
- Type different information into the field and <Enter>.
- Activate the <F3> window, highlight an option and <Enter>.

**Changes to System.** When changes to the system are being accepted, the top right corner of the screen displays 'Working' with a spinning slash ' / '. Wait until this stops spinning before proceeding.

**Re-draw Screen.** If you want to re-draw or refresh the screen, use <CTRL><L>.

**Screens With Indicator Lights.** Some screens display a bank of Indicator Lights. These screens are part of the Single Port and All Port Diagnostics and the Loopback tests.

When these screens are active you can display the pop-up legend describing the name and position of signals in the indicator bank:

1. Press <F3>. Each Indicator Light bank has two states: Asserted (true) which is green or +, and Not Asserted (false) which is red or -. Note that with Monochrome screens, the two states are indicated by: Asserted (true) which is +, and Not Asserted (false) which is - or \*.
2. Press <ESC> to exit the display.

**On-Line Help.** Two methods of help are available:

1. Highlight Help on the menu line and <Enter>.
2. Highlight an option and press <F1>.

If help information does not exist for a particular function or option, the Status Line displays a message to that effect. <ESC> removes the help screen.

**Prompts and Beeps.** The Status Line at the bottom of the screen provides prompts at various times during operation of the system. Some prompts require a <y> or <n> answer. Others inform you what action to take next.

**Exit and Save Changes.** When you exit the configuration utility (called **easyadm** in this manual), you are prompted about saving changes you have made only if the changes affect the Unix/System Driver configuration.

1. Highlight Exit on the Main Menu and <Enter>.
2. If changes have been effected to the Unix/System Driver configuration, a window displays two options: Commit changes and rebuild kernel or Exit and lose changes. Or you can quit out of the operation and go back to the main menu by pressing <ESC>.
3. Highlight Commit Changes and <Enter>.

**User Modes.** Two user modes are available under Unix:

1. Multi User Mode
2. Single User Mode

**Multi User Mode.** Multi User Mode is the most frequently used mode of operation for the **easyadm** program. Many users can access the system when Multi User Mode is active.

The normal boot process takes the system up into Multi User Mode. To enter Multi User Mode from Single User Mode: Type `/etc/init 2`

Some diagnostic tests cannot run in Multi User Mode. A prompt appears on the status line if this situation arises. Unless you are using SVR4, it is also recommended to perform Board Configuration in Single User Mode.

Shutdown causes all Multi User logins to be terminated so you should alert users that the system is to be shut down.

**Single User Mode.** Single User Mode is system maintenance mode. During system boot, a root password provides access to Single User Mode. One user only (the System Administrator) can access the system in Single User Mode.

To enter Single User Mode from Multi User Mode, type `init S` at the root prompt.

Single User Mode allows certain Diagnostic Tests to be performed. Unless you are using SVR4, it is recommended to perform Board Configuration in Single User Mode.

**Using EasyIO.** All instructions for EasyIO functions are outlined in the following Sections and depend on the following events:

- EasyIO software has been installed.

- You are logged on as 'root'.
- The **easyadm** program is running.

## Shared Interrupts on EISA Bus Machines

Multiple EasyIO boards may share the same interrupt in an EISA machine only if the EISA configuration is updated. A configuration file for EasyIO boards, called !STL0200.CFG, will be generated automatically on installation and each time the board configuration is changed.

It is only necessary to update your system's configuration diskette with this file when configuring multiple EasyIO boards to share the same interrupt. It is also possible to share interrupts between Stallion Technologies EasyIO boards and EasyConnection boards.

## Board modification options

### Modify Board

The configuration setup parameters (I/O addresses and interrupt) for an installed EasyIO board can be modified within **easyadm**.

1. Highlight **Select** on the Main Menu.
2. Highlight the board to be modified and press <Enter>.
3. The Board Diagram is displayed.
4. Highlight **Modify** and press <Enter>.
5. Enter the new settings or select them from the <F3> windows for each field.
6. Type press <Enter> to accept the changes. Any board changes must be recorded in the system:
7. <ESC> back to the main menu.
8. Highlight **Exit** and press <Enter>.
9. Highlight the '**Commit changes and rebuild kernel**' option and press <Enter>.

The new settings are committed and the Unix system is rebuilt to reflect the changes.

## Remove Board

You can remove a board from the system if this becomes necessary:

1. Highlight **Select** on the Main Menu.
2. Highlight the board to be removed and press <Enter>.
3. Highlight **Remove** and press <Enter>.
4. Answer “y” at the “Remove this board and all its ports now? (y/n)” prompt. Any board changes must be recorded in the system:
5. <ESC> back to the main menu.
6. Highlight **Exit** and press <Enter>.
7. Highlight the ‘**Commit changes and rebuild kernel**’ option and press <Enter>.

Removal of the board is recorded and the Unix system is re- built to reflect the changes.

## Layout

The Layout option allows you to change the displayed circuit board diagram to suit your particular hardware type.

**Note:** If there is only one board layout for your board, this option is not active.

1. Highlight **Select** on the Main Menu.
2. Highlight the board to be changed and press <Enter>.
3. Highlight **Layout** and press <Enter>.
4. Select the appropriate board layout from the list of available board layouts.
5. Check the EasyIO board switch settings.

## Diagnose

The Diagnose option on the Board Modification menu allows you to perform hardware diagnostic tests on EasyIO boards. You must be in single user mode to use this option.

## Port configuration options

The Panel Configuration and Port Configuration menus provide access to port configuration options.

To access the Panel Configuration Menu:

1. Highlight Select on the Main Menu.
2. Highlight the EasyIO adapter cable to be modified and press <Enter>.
3. The configuration options are displayed: Select, View, Utilities, Analyse, Adapter cable.

To access the Port Configuration Menu:

1. Highlight Select on the Panel Configuration Menu.
2. Use arrow keys to select a port.
3. The Port Configuration options are displayed: Configure, Modify, Remove, Wiring, Options, Analyse.

### View Port Setup

The View option on the Panel Configuration Menu lets you view the devices attached to each port:

- Physical Devices (Terminals, Printers, Modems, UUCP Links)
- Labels
- Sessions
- Attached Printers
- Port Status
- Input
- Output

To activate the View option:

1. Highlight View on the Adapter cable Configuration Menu & press <Enter>.
2. Select the device type to be viewed and press <Enter>.
3. The adapter cable diagram displays the requested information.

## Modify Device Parameters

Use these steps to Modify a Device:

1. Select the port supporting the device to be modified.
2. Highlight Modify on the Port Configuration Menu & press <Enter>.
3. Select the device to be modified and press <Enter>.
4. Make the changes to the parameters.
5. <Enter> after the last field to accept the modifications.

## Remove an Attached Device

The Remove option allows you to remove a device from a port:

1. Select a single port supporting the device(s) to be removed.
2. Highlight Remove on the Port Configuration Menu and press <Enter>.
3. Select the device to be removed from the device table.
4. Answer “y” at the “Remove this Device? (y/n):” prompt to remove the device from the port.

If you wish to remove multiple ports, use the Adapter cable Configuration menu Utilities Remove option. See Remove Port Configurations.

## Options

Options on the Port Configuration Menu provides two alternatives for changing various device parameters: Port and Device.

You will not usually change the default settings. To change the default settings:

1. Highlight Select on the Main Menu, highlight the EasyIO adapter cable containing the relevant port and press <Enter>.
2. Highlight Select on the Adapter cable Configuration Menu and the port supporting the Device and press <Enter>.
3. Highlight Options on the Port Configuration Menu and press <Enter>.
4. Highlight the Port or Device option (as required) and the Device Type in the Device Table and press <Enter>.
5. Change the necessary parameter(s) and press <Enter> to activate.

See Section 3, Unix technical reference for more information.

## Port Operations with Sessions/Attached Printers

On all Unix operating systems, **easyadm** takes control of the settings of any port using sessions or attached printers. When sessions or attached printers are configured, any attempt to change the port settings (e.g. autobaud, stty) will not affect the settings as defined in **easyadm**. For ports not using attached printers or sessions, this does not apply.

## Port Monitors (SVR4)

To configure a port to use Port Monitors, use the default **ttymon** option on the port configuration screen. The **getty** option is also provided if required. For details on port monitors and services, consult your SVR4 system manuals.

## Hangup on DCD Drop (SVR4 only)

If this option is set when configuring terminals, all processes on the port are killed when DCD drops. This is the same behaviour as a modem port and is achieved through setting HUPCL and -CLOCAL on the port.

## The Map CTS port flag (EasyIO8-M only)

The Map CTS flag enables modem control on the EasyIO8-M by utilising the pins normally used for hardware flow control.

Turning the Map CTS flag 'ON' maps the functions of DTR and DCD onto pins 1 and 6, which are normally used for RTS and CTS respectively. Hardware flow control is therefore unavailable when Map CTS is enabled.

Under UNIX, when a device is configured to be a modem through **easyadm**, the Map CTS flag is automatically set to 'ON' (for the port in question). For every other device type, the default is 'OFF'. Auto CTS must be turned 'OFF' when Map CTS is turned 'ON'.

To modify the Map CTS flag in **easyadm**:

1. Select the port.
2. From the Port Configuration Menu, select **Option**.
3. Select **Port**.
4. Turn the Map CTS flag 'ON' or 'OFF'.

**SVR4 and UnixWare.** SVR4 Unix operating systems require the DCD signal to be asserted before a port may be opened. This may be achieved in the driver by inserting the following line for each port at the end of the file */etc/rc2.d/S30easy*:

```
/usr/lib/easyio/bin/bccstty -d [device] fakedcd
```

where [device] is */dev/ttybbpp* eg. */dev/tty1a00*

Only the main device on a port should be included ( ie. do NOT include sessions and attached printer devices).

## Autosetup

Autosetup provides the facility to create a diskette or file containing a customized setup for boards and ports. This setup can be used at a later date to restore the setup on an existing system or duplicate them on a new system. Time is saved and settings will always be correct.

The diskette or file also provides a backup of your configuration. The two options under Autosetup are:

- Create
- Install

### Creating an Autosetup Diskette

1. If you are saving to diskette, have a spare diskette ready for this procedure. It can be formatted during the creation phase.
2. Highlight the Autosetup option on the Main Menu and press <Enter>.
3. Highlight Create and press <Enter>.
4. Highlight Diskette in the Destination field.
5. Highlight the Required Diskette Drive (Drive0 or Drive1).
6. Highlight the Required Diskette Size (1.2Mb or 1.44Mb).
7. If you wish to Format the Diskette first, highlight "Yes" and press <Enter>.
8. Answer "y" to the question, 'Create an Autosetup using this setup (y/n)'.
9. Insert the diskette and press <Enter>.

The Working '/' appears as the Autoseup diskette is created.

## Creating an Autoseup File

1. Highlight the Autoseup option on the Main Menu and press <Enter>.
2. Highlight Create and press <Enter>.
3. Highlight File in the Destination field and press <Enter>.
4. Type the required filename, including the full path.
5. Answer "y" to the question, "Create an Autoseup using this setup (y/n)".

The Working '/' appears as the Autoseup file is created.

## Restoring from an Autoseup Diskette

To install an autoseup configuration from Diskette:

1. Highlight the Autoseup option on the main menu and press <Enter>.
2. Highlight Install and press <Enter>.
3. Highlight Diskette and press <Enter>.
4. Highlight the required Diskette Drive and press <Enter>.
5. Highlight the required Diskette Size and press <Enter>.
6. Insert the previously saved Autoseup diskette into the selected diskette drive and press <Enter>.
7. If saved adapter cable configurations are the only requirements from the autoseup diskette - i.e. saved board configurations are not required - answer "n" to "Do you wish to install the saved Board configuration? (y/n)" prompt.
8. An "Autoseup diskette" icon appears on the front screen, with any saved EasyIO adapter cables chained to it.
9. If 'n' was chosen above, proceed to step 13.
10. Select the Main Screen Exit option and press <Enter>.
11. Select the "Commit changes and rebuild kernel" option.
12. Connect any adapter cables, reboot the machine and run **easyadm**. The "Autoseup diskette" icon again appears.
13. Select the Utilities option on the front screen and press <Enter>.
14. Highlight the Copy option of the Utilities menu and press <Enter>.

15. Select the adapter cable in the Autoseup list to be copied and press <Enter>.
16. Select the adapter cables to be set up identical to the selected Autoseup list adapter cable. You can copy the setup to multiple adapter cables by selecting cables using the arrow keys and tagging them for copying with the <Space>. When all destination cables have been tagged for copying, type press <Enter> to start the configuration copy process.
17. Exit and re-run easyadm. The “Autoseup Diskette' icon now no longer appears. The Autoseup restore is complete.

### **Restoring from an Autoseup File**

The procedure for restoring from an Autoseup file is similar to restoring from an Autoseup diskette, except a filename is supplied to the above rather than details of the source diskette drive.

## **Utilities**

The Utilities option on the Main Menu allows operations to be performed on adapter cables.

### **Label an adapter cable**

The default label given to an adapter cable depends on the number and type of ports provided by your hardware. This label may be changed to aid in identifying the ownership of ports on the adapter cable, eg. “Admin' or “Accounts'.

To Label an adapter cable:

1. Select Utilities on the front screen menu bar.
2. Select Label from the pop-up menu screen.
3. Choose the EasyIO adapter cable you wish to label. You can do this by
  - using the arrow keys to move the highlight bar to the required EasyIO adapter cable.
  - entering the label, eg Accounts.
4. Accept the chosen adapter cable by pressing press <Enter>.
5. Enter the new label on the line provided.

## Copy Adapter cable Configurations

An EasyIO adapter cable's configuration can be copied to another adapter cable. After the copy, all ports on the newly configured adapter cable will be identical to the original. Any copied printers will have a digit appended to the name to avoid printer name clashes. To copy one EasyIO adapter cable's configuration to another:

1. Select Utilities on the front screen menu bar.
2. Select Copy from the pop-up menu screen.
3. Select the adapter cable you wish to copy. (See the Label an adapter cable procedure above for details on doing this.)
4. Select each adapter cable designated to receive the new configuration. This is done by typing <Space> to tag each adapter cable required.
5. Type press <Enter> after selecting all destination adapter cables.

A progress bar is displayed at the base of the screen to reflect the progression of the device copying operation on each of the adapter cables. In addition, the 'Working /' spins, and the highlight is removed from each adapter cable in turn as each receives its new configuration.

## Customize

The Customize option on the Main Menu provides the facility to customize Terminal Escape Sequences.

## Terminal Escape Sequences

Each different terminal type uses escape sequences (special characters that the terminal interprets as commands instead of data for display). There are special escape sequences to:

- Position the cursor.
- Clear the screen.
- Select a different page.
- Make data go to the attached printer and not to the screen.
- and so on....

**Syntax for Entering Escape Sequences.** These guidelines relate to entering Escape Sequences for Session Hotkeys and Terminal Escape Sequences:

- **Tilde (~)** has a special meaning. When it precedes a character it means <ALT><character>. (Eg. ~A means <ALT><A>.)
- **Carat (^)** has a special meaning. When it precedes a character it means <CTRL>. (Eg. ^A means <CTRL><A>.) Instead of typing ^J (or Enter), enter the carat (^) followed by <J>. The carat character (^) can be entered as \^, \d094, \x5e or \136.
- **Escape (^D)** can also be entered as \x1b, \d027 or \033 for the <ESC> character.
- **Octal Numbers** are prefixed by \. (eg. enter octal 20 as \020) - Octal Numbers must contain three (3) digits.
- **Decimal Numbers** are three digit sequences prefixed by \d. (Eg. enter decimal 20 as \d020).
- **Hexadecimal Numbers.** Enter hexadecimal numbers in 2 hex digit sequences prefixed by \x.(Eg. enter hex 0xBF as \xbf).

**Customize Terminal Escape Sequence Options.** If you need to make changes to the Terminal Escape Sequences for the terminals connected to your system, three options are available for this process:

- Create
- Modify
- Remove

**Create an Entry for a Terminal Type.** Create allows you to enter Escape Sequences to support Sessions and Attached Printers on a new terminal type. Most users will not need to use this function.

1. Highlight Customize on the Main Menu and press <Enter>.
2. Highlight Terminal Escape Sequences and press <Enter>.
3. The Terminal Escape Sequences Table and Menu display.
4. Highlight Create and press <Enter>.
5. Enter a name for this terminal's entry and press <Enter>.
6. Enter the terminfo or termcap type (eg. wy60) to use. The logon TERM type will be set to this value.
7. Enter the Printer, Terminal and Session Escape Sequence and press <Enter> after each entry. Also enter the preferred hot-keys to select each session.

**Note:** The port sends down an escape sequence whenever it needs to switch to a new session or send output to an attached printer. If you have an attached printer, you will need to know the “Enable Transparent Print Mode’ and “Disable Transparent Print Mode’ escape sequences. If the terminal has an attached printer, the sequences are:

```
Attached Printer: <Enable Transparent Print>
Terminal:        <Disable Transparent Print> <Select Page 0>
Session 0:      <Disable Transparent Print> <Select Page 1>
Session 1:      <Disable Transparent Print> <Select Page 2>
```

**Note:** EasyIO supports SCO permanent scan code operation by offering additional terminal types (wy60-pc and ansi-pc) when configuring terminals on ports. For example, on a Wyse 60, set TERM=wy60-pc and use terminal setup to change the emulation to PC-TERM.

The following is an example set up for a Wyse 60 terminal, which uses function keys <F1>,<F2>,<F3> to select the Terminal and two extra sessions. To use this entry when creating a new terminal, enter wy60fk as the terminal type.

```
Name for this Terminfo's Entry:  wy60fk
Terminfo/Termcap type to use:    wy60
Target      Escape Sequence      Preferred Hotkey
Printer:    ^[d#
Terminal:   ^T^[w0                  ^A@^M
Session 0:  ^T^[w1                  ^AA^M
Session 1:  ^T^[w2                  ^AB^M
```

For a Wyse 60 terminal, ^[d# and ^T turn Transparent Print mode on and off respectively, ^[w0 selects the first terminal display page, and the terminal sends ^A@^M whenever <F1> is pressed.

**Modify an Entry** You can modify Terminal Escape Sequences if this becomes necessary:

1. Highlight Customize on the Main Menu and press <Enter>.
2. Highlight the Terminal Escape Sequences option and press <Enter>.
3. Highlight Modify and press <Enter>.
4. Use the down arrow to highlight the terminal type to be modified.
5. Press <Enter> and answer “y’ at the “Update This Entry?’ prompt.
6. Enter the changes and preferred session hotkeys and the Terminal, Session and Attached Printer Escape Sequences.

**Remove an Entry.** You can remove an entry from the Terminal Escape Sequences table:

1. Highlight **Customize** on the Main Menu and press <Enter>.
2. <Enter> to accept the Terminal Escape Sequences option.
3. Highlight **Remove** and press <Enter>.
4. Highlight the entry to be removed and press <Enter>.
5. Answer “y” to the “Remove this terminal entry?” prompt.

### **EISA Configuration diskette generation**

To generate an EISA Configuration Diskette:

1. Highlight **Customize** on the Main Menu.
2. Highlight 'Generate EISA/MCA Config'.
3. Highlight the diskette drive required.
4. Highlight the diskette size required.
5. Insert a DOS-formatted diskette into the required drive.
6. Answer 'y' to the prompt, 'Update configuration using the setup above?'
7. The configuration diskette file !STL0200.CFG is written.

## **Run**

The Run option provides access to other Stallion products which may be installed on your system. If you do not have these products, a demonstration runs when the option is selected. Note that these products are now discontinued.

### **Crocodile**

Crocodile is Stallion’s disk performance enhancement product. To activate Crocodile:

1. Highlight **Run** on the Main Menu and press <Enter>.
2. Highlight **Crocodile** and press <Enter>.

## **Monitor**

Monitor is Stallion's system performance monitoring product. It highlights performance problems on your system. To activate Monitor:

1. Highlight Run on the Main Menu and press <Enter>.
2. Highlight Monitor and press <Enter>.

## Section 2: Port monitoring using Easyadm (Unix)

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### Port monitoring

Port Monitoring provides two levels of diagnostic tests:

- All Ports Display.
- Single Port Display.

All Ports Display provides diagnostic information about all the ports on a selected EasyIO adapter cable.

Single Port Display displays more detailed information on a selected single port on an EasyIO adapter cable. The State and Device options provide device information, communication parameters, throughput statistics and status information for individual port devices. The Admin option provides device manipulation functions, such as Flush, Reset, Enable and Disable, while Tips and Report assist with reporting faults.

#### Access to All Ports Display

To access the All Ports Display:

1. Highlight Analyse on the Adapter cable Configuration Menu & press <Enter>.
2. Highlight Monitor and press <Enter>. The screen displays the All Ports Display. This display provides useful diagnostic information about all the ports on the selected EasyIO adapter cable.
3. Use the down arrow to scroll through the display.
4. To access the Single Port Display for a particular port, highlight the port for further investigation and press <Enter>.
5. Activate any of the Single Port Display options if necessary. See explanations of individual options, in this Section.
6. <ESC> returns you to the All Ports Display.

#### Access to Single Port Display

The Single Port Display can be accessed through the All Ports Display as outlined above, or by selecting Analyse from the Port Configuration Menu:

1. Highlight Select on the Adapter cable Configuration Menu.
2. Highlight the port to analyse and press <Enter>.
3. Highlight Analyse on the Port Configuration Menu and press <Enter>.
4. Highlight Monitor and press <Enter>.

The Single Port Display for the selected port is shown on the screen displaying:

- Port Configuration Parameters.
- Percentage Throughput.
- Status of RS-232 Signals.

## Port Status

You can use the next level of diagnostics to further examine the port setup. The options available for reporting and device manipulation are: State, Device, Admin, Report, Tips

## Single Port Display Field Descriptions

**Device Type** identifies which of the port's devices is currently being displayed.

**Device** identifies the /dev device file which corresponds to the displayed device.

**Comms** summarizes the port's communications setup. This comprises five communication parameters, each beginning with a word describing the parameter, followed by the parameter's currently configured value:

- Baud - the baud rate setting (bits/second).
- Data - the number of data bits per character.
- Stop - the number of stop bits per character.
- Par - the parity setting.
- Hndshk - the handshaking setting.

These parameters are identical for all of the port's devices.

**Description** describes the various attributes of the current device (eg. terminal types, printer names, etc.).

**Percentage Throughput** shows receive and transmit throughput as a percentage of the port's capacity at its Baud Rate.

**Total Chars** the total number of characters, including flow control characters, exchanged on the current device.

**Status** displays the current device's line status and whether the device is Open (Operating) or Closed (Not currently operating).

## State

You can use the State option on the Single Port Display to acquire detailed technical port information for the selected device. This display records statistics on character exchange, hardware and software flow control and error conditions:

1. Highlight **State** and press <Enter>.
2. The Technical Port Display for the selected port shows on the screen. The information relates to Software and Hardware Flow Control and character transmission data. See Technical Port Display Field Descriptions in this Section for field specific information.
3. Press <Enter> at the **Display** option if you need to toggle between the two statistics screens.

**Note:** The Host State/Slave State statistics screen is offered as diagnostic information for Stallion support use only. The user is not required to interpret the data displayed.

4. Press <Enter> at the **View** option if you wish to display more advanced technical information.

**View** is accessed through State on the Single Port Display:

1. With the Technical Port Display on the screen, press <Enter> to activate the View option.
2. Port State information displays:
  - EasyIO Port State.
  - Port Control Flags.
  - Port Input Flags.
  - Port Output Flags.

## Device

Several devices may be configured on one port (eg. the physical device, several sessions and an attached printer).

The Device option allows you to select a port and display information about the devices attached to that port.

1. Highlight **Select** on the Main Menu and press <Enter>.
2. Select the required EasyIO adapter cable and press <Enter>.
3. Highlight **Select** on the Adapter cable Configuration Menu & press <Enter>
4. Highlight the port for investigation and press <Enter>.
5. Highlight **Analyse** on the Port Configuration Menu, press <Enter>.
6. Press <Enter> to select the **Monitor** option.
7. Highlight **Device** on the Single Port Display Menu, press <Enter>.
8. Highlight the device type you wish to display and press <Enter>.
9. Select another **Single Port Display** option or <ESC> back to the previous menu.

## Admin

Admin allows you to perform various port administration tasks. Four options are available for device manipulation:

**Flush device.** The **Tips** option may provide information about why the device is having problems communicating. Always activate **Tips** before using the **Flush** option. Alternatively, further diagnostic tests may be required. The **Flush** option may clear minor communications problems in the data buffers. If this procedure does not work, try **Reset**.

**Reset device.** Using **Reset** may get a device working again if flushing the port does not fix the problem. **Reset** will flush the data buffers and kill any processes on the device selected. Further diagnostic tests may be required.

**Enable device.** A login will not appear on a terminal or session or a Unix printer will not print unless it is enabled.

**Disable device.** If you need to disable a device, use this function. Remember to re-enable it after you have attended to the matters at hand.

To activate any of the Admin functions:

1. Highlight **Select** on the Adapter cable Configuration Menu, highlight the port for investigation and press <Enter>.
2. Highlight **Analyse** on the Port Configuration Menu & press <Enter>.
3. <Enter> to accept the Monitor option.
4. Highlight **Admin** on the Single Port Display Menu and press <Enter>.
5. Highlight the device function to be activated and press <Enter>.
6. <ESC> takes you back to the Port Configuration Menu.

## Report

The Report option generates a support report containing all relevant information about a selected port. The information is placed in a file which you name, and should be included in a fax or email to your Support Centre.

To produce a Support Report:

1. Highlight **Select** on the Adapter cable Configuration Menu, highlight the port for investigation and press <Enter>.
2. Highlight **Analyse** on the Port Configuration Menu & press <Enter>.
3. <Enter> to accept the Monitor option.
4. Highlight **Report** on the Single Port Display and press <Enter>.
5. Type a *file name* and press <Enter>.
6. <ESC> takes you back to the Port Configuration Menu.
7. Print the file using the Unix lp command - eg.  
`lp -d <printer name> <file>`

## Tips

The Tips option performs a port analysis in an attempt to diagnose common port configuration errors. An explanation of the problem and the action you should take to correct the error situation displays on the status line.

To activate the Tips option:

1. Highlight **Select** on the Adapter cable Configuration Menu, highlight the port for investigation and press <Enter>.

2. Highlight **Analyse** on the Port Configuration Menu & press <Enter>.
3. Press <Enter> to accept the **Monitor** option.
4. Highlight **Tips** on the Single Port Display Menu & press <Enter>.
5. The error explanation displays or 'Cannot detect any serious problems on this port' 'appears on the status line.
6. Press <Enter> removes the message.

## Technical Port Display Fields

Selecting the State option displays detailed technical port information for the selected device. This display records statistics on character exchange, hardware and software flow control and error conditions.

The port number, board number and device name are shown in the top line of the display window. The following summary provides information about the technical port display fields:

**Transmitted.** The total number of characters transmitted on the selected device since the last system reboot.

**Received.** The total number of characters received on the selected device since the last system reboot.

**Transmitted/second.** The number of chars transmitted on the device in the last sec.

**Received/second.** The number of chars received by the device in the last second.

**DUART Transmit Buffer.** The number of characters buffered in the EasyIO ring queue.

**DUART Receive Buffer.** The number of characters in the EasyIO receive ring queue.

**Slave Transmit Buffer.** The number of characters in the transmit buffer.

**Slave Receive Buffer.** The number of characters in the receive buffer.

**Lost.** The number of receive characters lost to date, due to flow control problems. Characters arrived when the ring queue was full and had to be flushed.

**Overruns.** The number of receive character overruns to date.

**Receive Errors.** The total number of receive errors to date.

**Parity Errors.** The number of receive parity errors to date.

**Software Xon Transmitted.** The number of Xon characters transmitted by the board sw.

**Software Xon Received.** The number of Xon characters received by the board software.

**Software Xoff Transmitted.** The number of Xoff characters transmitted by the board sw.

**Software Xoff Received.** The number of Xoff characters received by the board sw.

**RTS Off.** The number of times the port has de-asserted RTS.

**RTS On.** The number of times the port has asserted RTS.

**Breaks.** The number of breaks received to date.

**Receive Delay.** The configured software receive delay (in 100ths of a second).

**Transmit Priority.** The number of chars on the priority transmission queue.

**Framing Errors.** The number of receive framing errors to date.

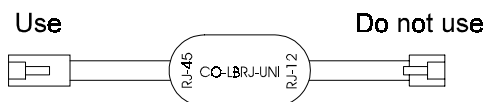
## Loopback Tests

Loopback tests validate the internal wiring of each port, and the port RS-232 circuitry. There are two Loopback Tests:

- All Ports Loopback
- Single Port Loopback

While Single Port Loopback Tests can be performed in Multi User Mode, the All Ports Loopback Test must be done in Single User Mode.

Loopback Tests require the use of the RS-232 Loopback Connector Plug (the RJ45 loopback plug shown below) which is part of the EasyIO kit.



The Loopback Test displays the current line status of all ports on the EasyIO adapter cable. When you plug the Loopback Connector Plug into a port, the status of every signal on that port should change. This indicates a successful Loopback Test for that port. If some signals do not change, or a diagnostic error message displays for the port, the Loopback Test has failed for that port.

**Note:** Indicator Lights which are “asserted” are green or display as +.  
Indicator Lights which are “not asserted” are red or display as -.

## All Ports Loopback Test

To activate the All Ports Loopback Test:

1. Boot the system in Single User Mode.
2. Highlight Select on the Main Menu.
3. Highlight the EasyIO adapter cable to be tested and press <Enter>.
4. Highlight Analyse on the adapter cable Configuration Menu and press <Enter>.
5. Highlight Loopback and press <Enter>.
6. Plug the Loopback Connector Plug into a port on the EasyIO adapter cable. If all Indicator Lights (RS-232 signals) are “asserted” the test on that port is successful.
7. Repeat step (6) on all ports on the EasyIO adapter cable.
8. If any test is unsuccessful, that port may be faulty.

**Note:** This test sends characters out all ports on the adapter cable under test, and should be used with no devices connected.

## Single Port Loopback Test

To activate the Single Port Loopback Test:

1. Highlight Select on the Main Menu.
2. Highlight the EasyIO adapter cable containing the port for testing and press <Enter>.
3. Select the port to be tested and press <Enter>.
4. Highlight Analyse on the Port Configuration Menu, press <Enter>.

5. Highlight Loopback and press <Enter>.
6. 'Working /' appears in the top right corner of the screen until the Single Port Loopback test diagram displays.
7. Plug the Loopback Connector Plug into the port being tested. A successful test shows all Indicator Lights (RS-232 signals) "asserted".
8. If the test is unsuccessful, the port may be faulty.

## Section 3: Unix technical reference

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This section contains technical information suitable for Developers and System Administrators.

### Unix Device Naming Conventions

EasyIO Device Names:

`ttybbppx` for devices where:

`bb` = [1-9][a-z] Non-modem device.

[1-9][A-Z] Modem device.

`pp` = [0-9] [0-9] Port number.

`x` = [] No characters (No multiple sessions on this port).

[0-9] Session number.

`prnbbpp` for Attached Printers:

`bb` = [1-9] [a-z] Non-modem device.

[1-9] [A-Z] Modem device.

`pp` = [0-9] [0-9] Port number.

### Port configurable parameter

**AutoCTS - Locked Hardware Handshaking.** Easyadm provides the facility for the ports to always obey RTS/CTS transmit flow control, overriding system commands to turn hardware flow control off. This feature is particularly useful for protocols which turn all flow control off, such as UUCP. By default the AutoCTS flag is OFF. A hardware handshake cable is required on a port if AutoCTS is turned ON. To change the AutoCTS flag setting from "Off" to "On" or vice versa:

1. Select a port.
2. Highlight **Options** on the Port Configuration Menu.
3. Highlight **Port** and press <Enter>.
4. Change the **AutoCTS** parameter and press <Enter> to execute.

## Device configurable parameters

Each Device on a port has a configurable Onboard Device Flag, whilst any device on a port configured with multiple devices has the following extended list of configurable parameters:

- Onboard
- Block
- Maximum CPS
- Quantum
- Escape Wait
- Flow Control Characters

### Onboard Device Flag

The Onboard device flag applies to all devices configured on a port. It should be turned off only when absolutely necessary. System performance is affected by turning the Onboard flag off. If the Onboard device flag is turned on for a device, Stallion Technologies enhanced character processing is enabled, significantly reducing the load on the host CPU. If a program doesn't work on an EasyIO port, but does on a standard serial port, then turning the Onboard device flag off may help.

To change the Onboard device flag setting:

1. Select a port.
2. Highlight Options on the Port Configuration Menu.
3. Highlight Device and press <Enter>.
4. Select the Port Device.
5. Change the Onboard device parameter and press <Enter> to execute.

### Block Device Flag

The Block Device Flag applies to Multiple Session Devices. This flag should be turned "Off" only if your terminal supports multiple windows.

Multiple Sessions are handled differently by different terminals. Some terminals, such as the Wyse-60, use a separate page for each terminal session. Others support multiple tiled windows. All windows appear to be updated simultaneously.

When the Block Device Flag is turned “On”, the driver blocks output to all except the current session. The Block Device Flag defaults to “On” when a terminal session is enabled. If this flag is turned “Off”, output to sessions proceeds simultaneously.

To change the Device Flag:

1. Select a Port Device.
2. Highlight **Options** on the Port Configuration Menu.
3. Highlight **Device** and press <Enter>.
4. Select the port device type to be configured and press <Enter>.
5. The Device Flags display with their respective status highlighted.
6. Change the **Block** Device Flag and press <Enter> to execute.

### **Maximum CPS (CHARS/SEC) Parameters**

If output to your terminal pauses intermittently when the attached printer is printing, modifying the CPS may solve the problem.

As printers may be slower output devices than terminals, attached printers will often signal the terminal to pause output. Most terminals then relay this signal to the serial port. This results in all transfers between the port and the terminal being temporarily suspended (flow controlled). Output to the terminal’s screen will also stop.

To solve this problem, lower the maximum CPS value on the Attached Printer Device. This places an upper limit on the number of characters sent to the attached printer per second. Set this value slightly less than the printer’s minimum printing rate. This will prevent the printer from requesting flow control.

The default CPS value for Attached Printers is 960 characters per second. It is zero for other devices.

To modify the CPS value for an Attached Printer:

1. Highlight **Select** on the Main Menu, highlight the adapter cable containing the relevant port and press <Enter>.
2. Highlight **Select** on the Configuration Menu and then the port supporting the Attached Printer and press <Enter>.
3. Highlight **Options** on the Port Configuration Menu & press <Enter>.

4. Highlight **Device**, highlight **Attached Printer** in the Device Table and press <Enter>.
5. Change the **Maximum CPS** parameter & press <Enter> to execute.

### Quantum Device Parameter

Session and Attached Printer devices are cyclical, giving all Sessions and the Attached Printer a turn to use the line. A quantum is the maximum burst of characters the port sends to a session if other non-blocked sessions or attached printers are also waiting for a turn to use the line for output.

You can increase the proportion of an output cycle given to a session or attached printer by increasing that device's quantum value. On your attached printer session, always set the Quantum to be less than your printer's buffer size. Suggested values are baud/20 for sessions up to 9600 baud or 480 for higher baud rates, and 32 for printers at all baud rates. If the quantum value is too large, output to the terminal sessions and the Attached Printer will be bursty.

To modify the quantum value:

1. Highlight **Select** on the Main Menu, highlight the EasyIO adapter cable containing the relevant port and press <Enter>.
2. Highlight **Select** on the Configuration Menu and then the port supporting the Device and press <Enter>.
3. Highlight **Options** on the Port Configuration Menu and press <Enter>.
4. Highlight the **Device** option and the **Device Type** in the Device Table and press <Enter>.
5. Change the **Quantum** parameter and press <Enter> to execute.

### ESCAPE\_WAIT Device Parameter

If your terminal:

- Suffers from output corruptions when using an Attached Printer and/or Multiple Sessions, or
- Displays data to the wrong device (eg. data for the Attached Printer appears on the terminal),

then modifying the **escape\_wait** parameter may solve your problem.

Many terminals and printers use multi-character escape sequences to control the cursor position and enhancement of data (eg. bold, inverse). When both a Terminal and its Attached Printer are operating simultaneously, the board software transparently inserts escape sequences to direct output to the appropriate device.

Often an escape sequence will only be partially output when it is time to switch output to the other device. When this happens, most terminals get confused, the desired switch is not performed and the corruption described results.

To solve this problem, a timer (set to the value of the ESCAPE\_WAIT period) is started whenever a port sends an escape character. Switching to the alternate device will be inhibited until the ESCAPE\_WAIT period has elapsed. The timer is restarted if another escape character is sent within the ESCAPE\_WAIT period.

The default value of the ESCAPE\_WAIT period for all devices is 80 clock ticks (i.e.. 80/100ths of a second). To modify the Escape\_Wait parameter:

1. Highlight **Select** on the Main Menu, highlight the adapter cable containing the relevant port and press <Enter>.
2. Highlight **Select** on the Configuration Menu and then the port supporting the Device and press <Enter>.
3. Highlight **Options** on the Port Configuration Menu and press <Enter>.
4. Highlight the **Device** option and the **Device Type** in the Device Table and press <Enter>.
5. Change the **ESCAPE\_WAIT** parameter and press <Enter> to execute.

## Device Flow Control Characters

This section is relevant only if your system uses software flow control characters other than ^S and ^Q.

If a device is receiving characters faster than it can process them, the device will request the port to stop sending characters. When it is ready to receive again, it will request the character flow be restarted. The board software uses two characters, Vstop (usually ^S) to pause the flow, and Vstart (usually ^Q) to restart the flow.

To modify Vstop and Vstart:

1. Highlight **Select** on the Main Menu, highlight the adapter cable containing the relevant port and press <Enter>.
2. Highlight **Select** on the Configuration Menu and then the port supporting the Device and press <Enter>.
3. Highlight **Options** on the Port Configuration Menu, press <Enter>.
4. Highlight the **Device** option and the **Device Type** in the Device Table and press <Enter>.
5. Change the Vstart and Vstop values and press <Enter> to execute.

## Section 4: Windows NT technical reference

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### Easyadmw

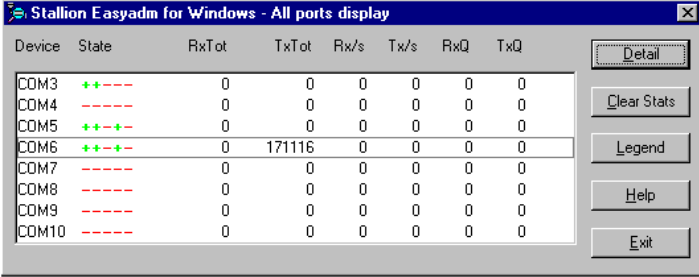
**Easyadmw** is a port monitoring utility that is installed along with the drivers. It is a convenient way for the system administrator to monitor current modem control signals and statistics for Stallion serial ports.

### Running easyadmw

Select the easyadm icon from the Control Panel.

### All Ports Display

After selecting the easyadmw icon from Control Panel, the 'All Ports Display' screen is displayed, as shown below:



Device	State	RxTot	TxTot	Rx/s	Tx/s	RxQ	TxQ
COM3	++----	0	0	0	0	0	0
COM4	-----	0	0	0	0	0	0
COM5	++-+-	0	0	0	0	0	0
COM6	++-+-	0	171116	0	0	0	0
COM7	-----	0	0	0	0	0	0
COM8	-----	0	0	0	0	0	0
COM9	-----	0	0	0	0	0	0
COM10	-----	0	0	0	0	0	0

The window contains an entry for each port with the following details:

**Device.** The System name for the port.

**State.** There are five indicators showing the current state of (from left to right): State of the Port: Open (a green plus sign) or Closed (a red minus sign). State of RTS, CTS, DTR, DCD: a red minus sign indicates that the signal is inactive and a green plus sign indicates that the signal is active.

**RxTot.** The total number of characters received by the port since the system was started, or the statistics were last cleared.

**TxTot.** The total number of characters transmitted by the port since the system was started, or the statistics were last cleared.

**Rx/s.** The rate at which characters are being received in characters per second.

**Tx/s.** The rate at which characters are being transmitted in characters per second.

**RxQ.** The number of characters currently in the internal receive queue.

**TxQ.** The number of characters currently in the internal transmit queue.

Stallion ports found on the system but not mapped onto system ports are displayed as COMXXX. On Windows NT un-mapped ports can be mapped via **Control panel > Network > Configure**.

Doubleclicking on a list box item displays details about the selected port.

Other functions available from this screen are:

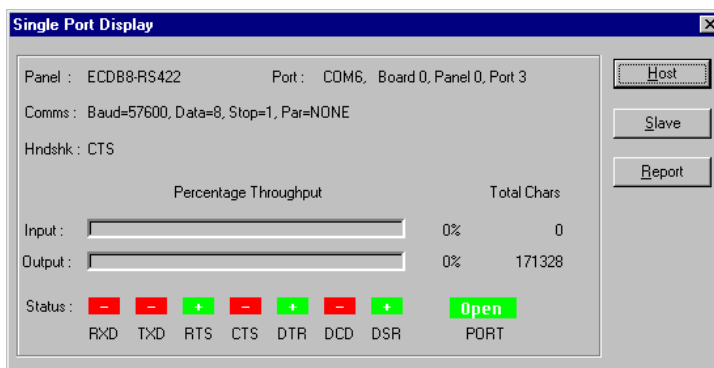
**Clear Stats.** Resets the slave statistics for the selected port to 0 (the slave statistics include the counters displayed on this screen. If you have not selected a port yet you will get a warning message. To select a port just click on the associated row in the “All ports display” listbox.

**Legend.** Displays the meaning of the state indicators

**Detail.** Displays further details of the selected port via the Single Port Display.

## Single Port Display

The ‘Detail’ option on the ‘All Ports Display’ screen displays the ‘Single Port Display’ screen in which more details about the selected port is shown. If you have not selected a port yet you will get a warning message. To select a port, click on the associated row in the ‘All ports display’ listbox. The ‘Single Port Display’ screen is displayed:



**Panel.** Panel type as detected by the Stallion driver.

**Port.** Windows COM port name and Stallion driver port identification.

**Comms.** Current values for baud rate, number of bits per char (Data), number of stop bits (Stop) and parity.

**Hndshk.** Handshake or flow controls settings.

**Input.** Shows a percentage of the effective transmitted throughput, considering the baud rate and the total number of characters transmitted since start-up or last Clear Stats.

**Output.** Shows a percentage of the effective received throughput considering the baud rate and the total number of characters received since start-up or last ‘Clear Stats’.

**Status.** Current values for RXD, TXD, RTS, CTS, DTR, DCD, DSR and port state. A red minus sign indicates that the signal is inactive and a green plus sign indicates that the signal is active.

Other functions available from this screen are:

**Host State.** Shows per port information from the top-most part of the Stallion driver, the part of the driver that interfaces directly with the host Operating System. It displays information relevant to that specific environment. For example, with Windows NT, it displays IRP's related statistics. The information shown on the 'Host State' screen is useful for support. It displays names and codes that relate to the interface between the Stallion driver and the kernel. These will not be intelligible to the user.

**Slave State.** The 'Slave State' screen shows per port information from the bottom-most part of the Stallion driver. This is the part of the driver that is closest to the serial hardware. The information presented on the 'Slave State' screen relates to the functioning of the Stallion driver, and may be useful for support

**Report.** Generates a support report for forwarding to your distributor or Stallion Technologies. It should be used when you have encountered a problem which cannot be solved. The report contains all necessary information about the port. It is placed in a file that can be faxed or emailed to support. Send the complete report using the following command:

**Administrative Tools > Windows NT Diagnostics > File > Save Report**

to your distributor, or in the event that the distributor cannot be reached, to Stallion Technologies at the address shown at the front of this manual.

## Special control signal utilities

Two utilities are shipped on the driver diskette to modify control signal behaviour under very special circumstances.

The **set\_dsrhigh.exe** utility may be used to force the driver to always report the DSR signal as high if the signal is present on the Stallion port.

**set\_hwflow.exe** forces the driver to enable RTS/CTS flow control under DOS.

## Special configuration flags

Special per port configuration flags can be created in the Registry to instruct the Stallion driver to operate in a different than default behaviour for the specified ports.

The per port configuration flags are defined as a mask of bits. Their values and the procedures to create them are described below.

### Configuration flags and their values

- **DSR\_ALWAYS\_HIGH - value 1 hex.** Older models of EasyIO included the DSR input signal. The driver would normally report the actual state of the signal.
- **FLOW\_CONTROL\_ALWAYS\_HW - value 2 hex.** Set this bit to do HW flow control (RTS/CTS based) from DOS applications. This makes the driver do the RTS/CTS toggling.

The application should *not* need to be changed.

### Instructions to create and modify the config flags for Stallion ports.

You can set some special configuration flags on a per port basis using the Registry Editor (see Option 2 below) - OR, for an easier and safer procedure, you can do the same thing using `set_dsrhigh.exe` or `set_hwflow.exe` (utilities provided on the directory \I386 of the driver floppy) (see Option 1 below).

**Note:** If you re-install the Stallion driver you may have to repeat the flag configuration described above

#### Option 1.

1. The `set_dsrhigh.exe` utility could be used to set the `DSR_ALWAYS_HIGH` bit on the config flags bit mask.
2. The `set_hwflow.exe` utility could be used to set the `FLOW_CONTROL_ALWAYS_HW` bit on the config flags bit mask.
3. Both utilities can be found in the I386 directory in compressed form - run `%SystemRoot%\system32\expand` to uncompress the desired utility.
4. Type the name of the utility without parameters and check the 'Usage' message for more information on how to use it.

#### Option 2.

1. Start the Registry Editor.
2. Focus on 'HKEY\_LOCAL\_MACHINE' window.
3. Double click 'SYSTEM' branch.
4. Double click '**CurrentControlSet**' branch.

5. Double click '**Services**' branch.
6. Double click '**StlnATAn**' branch (or branches if you have more than one Stallion card that you want to act on). The '**n**' numbers from '**StlnATAn**' are also displayed in '**Control Panel / Network**', in front of the adapter name. Use this information to ensure that you are acting on the desired board.
7. To create the special config flags, double click '**Parameters**'. Press the '**Panel**' you are interested in and press menu option 'Edit'.
8. Press sub-menu option '**Add Value**' and '**Value Name**' control should be ConfigFlagsPortN if you want to create a special config flag on port number N (N=0,1,2,...). '**Data Type**' control should be REG\_DWORD press '**OK**'. '**Data**' control should be a mask of bits:  
DSR\_ALWAYS\_HIGH - value 1 hex, and  
FLOW\_CONTROL\_ALWAYS\_HW - value 2 hex. Press '**OK**'.
9. To modify existing special config flags double press the value named '**ConfigFlagsPortN**' and modify the 'Data' control as described above.

## Additional NT Driver Notes

If a Stallion port is allocated to COM1..COM4, you will be able to invoke the **Control Adapter cable > Ports > Advanced Settings** dialog for it. We recommend that you do not modify any of these settings.

Under some circumstances RAS may generate warning messages in the system log such as: *The serial driver could not allocate adequate I/O queues. This may result in an unreliable connection.* This message can be disregarded.

The correspondence between PCI slots and the device numbers used internally by Windows NT varies from system to system. When installing multiple PCI boards it may be easiest to add them one at a time so that it is obvious which board is which.

## Section 5: DOS technical reference

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This section contains technical information suitable for Developers and System Administrators.

### Configuring ISA boards in EISA machines

When installing ISA boards in an EISA machine it is recommended to use the system's EISA Configuration Utility. Hardware conflicts can easily be detected and resolved using this method.

If ISA boards only are being installed, and they are not being configured, proceed to step 5.

The Driver diskette contains configuration files required by EISA machines to configure EISA and ISA boards.

Configure your EISA machine to recognise the installed board(s) using the respective system configuration utility. Consult your computer system installation manual for instructions on using the system configuration utility.

Follow these steps to reconfigure your EISA machine:

1. Power-on and boot-up your machine using the diskette containing the system configuration utility supplied with your machine.
2. If you are not using a working copy of this reference diskette, then make a working copy using the system configuration utility. Restart the machine from the working copy.
3. Use the system configuration utility to copy the appropriate configuration file from the root directory of the distribution diskette. The configuration file is !STL0200.CFG - EISA configuration file for EasyIO (ISA).
4. Save the new configuration and exit the utility.
5. Upon reboot to the system configuration utility, the configuration file information will be updated and a valid I/O address will be selected automatically from the choices available.
6. Save the new configuration, exit the system configuration utility, and reboot your system.

## Interfaces to the Multiport Board

There are three interfaces by which applications can access the serial ports on Stallion multiport boards: the Command-line, DOS INT21h and BIOS INT14h interfaces. All of the interfaces are standard interfaces to devices in the DOS world. It should be noted, however, that not all DOS applications abide by these interfaces and, for reasons of their own, use direct hardware access to the native serial ports. These applications cannot be used in conjunction with Stallion I/O boards.

Additionally, some models of EasyIO process DSR signals. To be compatible with DOS interfaces, no data is allowed to be transmitted unless DSR is asserted.

## Command-line Interface

Stallion ports are extensions to the standard DOS file system and so follow on consecutively from existing native ports in the device name hierarchy. That is, the ports on an EasyIO4 in a DOS machine with COM1: and COM2: installed will be numbered as COM3: TO COM6: (unless alternate port naming convention is used).

From the DOS command-line Stallion ports can be accessed as you would access any other file. For example you may use pipes with these devices to redirect input and output from them, eg. `type \autoexec.bat > com5:` Or you may use the COPY command to do the same thing, eg. `copy \autoexec.bat com5:`

You can also switch your standard input and output from the console to any Stallion Technologies port with a terminal configured. The terminal should be configured to match the line settings of the Stallion port to be used. The following command will switch the standard input/output to the terminal on COM3:

```
ctty com3:
```

This allows you to type commands and receive their output on the terminal device. This command (typed at the terminal's keyboard) will return standard input/output to the system console.

```
ctty con:
```

Note, however, that not all applications abide by the DOS device interface and so, even though you may enter input at the terminal's keyboard, the results may still be displayed on the system console. In this case the application uses direct hardware access to display its output. Stallion port users should avoid the DOS MODE command. The DOS MODE command is not compatible with Stallion ports. The serial device configuration functions of this command are replaced for Stallion Technologies ports with those of the program ATAMODE.EXE.

## Modifying Port Signals

**The DSR signal.** If DSR is not asserted, then data will be prevented from being transmitted on a port.

The ATAMODE.EXE program, using the '-d' option allows you to report the DSR signal as always high, on any or all ports if required. This is required if you do not wish to wire the cable to assert DSR.

To set DSR to report high always on com5, use: `atamode -d com5:1`

To set DSR reporting back to normal on com5: `atamode -d com5:0`

Warning: DSR signals should not be enabled on board types that do not support it as it may adversely affect the performance of the driver.

**DTR and RTS signals.** The DOS native serial device driver asserts DTR and RTS before each character is sent. For Stallion ports the DTR and RTS lines are asserted in the driver initialization routine and will remain asserted unless they are deliberately cleared. If you wish, you may use the ATAMODE.EXE program to raise or lower DTR and/or RTS for any port. The format of the command required is: `atamode -h COM#:rts,dtr`

For example to raise DTR and lower RTS on Stallion port COM3: you would execute the following command: `atamode -h COM3:0,1`

## INT21h Interface

The INT21h interface presented by the DOS Driver conforms to that specified by the IBM 'Disk Operating System Technical Reference'. The DOS INT21h interface permits filesystem operations such as open(), close(), read() and write() upon ports as they appear just as files under DOS. For the application programmer it is simply a matter of using these routines with Stallion Technologies serial devices as you would to manage native serial devices such as COM1:. Stallion serial devices can be used with any application that communicates with serial devices via the DOS filesystem interface.

Applications programmers should note that the standard INT21h interface does not provide a means to configure ports for operation, and whereas BIOS INT14h does allow you to configure ports, the upper limits for the parameters are restrictive eg. a maximum baud rate of 9600. To bypass these limitations, the utility ATAMODE.EXE can be used to modify the coms parameters of selected ports.

## INT14h Interface

The BIOS INT14h interface conforms to that specified in the IBM 'Personal Computer Hardware Reference Library'. The INT14h vector is intercepted by the DOS Driver and the request processed according to the targeted port. If the targeted port is not one of the Stallion ports then the driver relinquishes the request to the next driver in the INT14h interrupt chain.

The most common interfaces used by comms applications are the Fossil and Digiboard INT14h interfaces, which are both supported by the Stallion DOS driver.

## Modifying the BIOS Hardware Configuration

Some DOS programs use the BIOS hardware configuration to determine the number of serial ports in your machine. As a result, the program may not allow you to use a Stallion port as it recognises the last COM port to be COM2 (or COM1, depending on the number of native serial ports you have installed).

A work-around for this problem has been provided using the ATAMODE.EXE program. This allows you to set the number of RS232 ports found by BIOS to be any number between 1 and 7. Note that this number should include native serial ports that are already installed. For example, if you have a machine with 2 native serial ports and wish to have BIOS recognize up to 4 Stallion ports (ie. COM3 to COM6) you would call ATAMODE.EXE with the '-p' option as follows: `atamode -d 6`

The upper limit of 7 serial devices is a restriction of the BIOS data area as the space set aside for serial ports is only 3 bits. Of course, reinstating the original BIOS value can be accomplished using ATAMODE.EXE. Regardless of whether you reset the value yourself, the BIOS will reset this value itself when the machine is next restarted. If you wish to permanently run your system with this modification, you should place the appropriate ATAMODE.EXE in your AUTOEXEC.BAT file.

**Warning:** The BIOS data area is accessible to, and employed by, many varying DOS applications to determine the serial hardware configured in the system. Users who wish to modify the data area should be aware that some applications communicate directly with the serial device hardware and these applications fail when attempting to access the hardware of Stallion ports. It is not possible to access Stallion ports under DOS other than through the interfaces provided by the DOS Driver product. If you wish to use the ports with a particular application, please ensure that the application conforms to either the DOS INT21h or BIOS INT14h interfaces.

## Section 6: OS/2 technical reference

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### Programming

The interface provided by Stallion Technologies serial ports is almost a complete implementation of the OS/2 ASYNC Driver specification. A few exceptions occur in the Category 1 ASYNC IOCTLS. These won't affect the average serial port application.

#### **Function: Description**

##### **43: Extended Set Bit Rate**

Ignores 'Fraction' parameter. The 'Fraction' value represents the fraction of the bit rate to set. It is used for setting a very precise bit rate. In most cases, this field is set to zero.

##### **44: Transmit Byte Immediate**

Byte is not sent ahead of characters already in the driver buffers. This is generally used to manually send XON and XOFF characters. Byte is flushed due to a TX flush request.

Normally the Byte should not be considered a part of the normal transmit Queue, and is not flushed due to a flush request.

##### **47: Behave as if XOFF Received**

Ignored. This function should behave as if XOFF was received.

##### **53: Set DCB Parameters**

DSR output handshaking is ignored. Flags1, Bit 4 set enables output handshaking using DSR.

DCD output handshaking is ignored. Flags1, Bit 5 set enables output handshaking using DCD.

DSR input sensitivity is ignored. Flags1, Bit 5 set enables input sensitivity using DSR. Input is ignored when DSR is low.

Automatic Receive Flow Control is always set to Full Duplex. Flags 2, Bit 5 clear set Normal Control, which stops the transmitter if the receiver has asked for a XOFF to be sent. This allows for machines that use Unix IXANY like flow control.

RTS Control Mode, Toggling on transmit is ignored. Flags2, Bits 6-7, set to '1 1' enables RTS to toggle high when sending data, and low when idle.

#### **64: Query COM Status**

Status - Tx Waiting for CTS not reported. Bit 0, set to 1 when Tx is flow control by CTS being LOW.

Status - Tx Waiting for DSR not reported. Bit 1, set to 1 when Tx is flow control by DSR being LOW.

Status - Tx Waiting for DCD not reported. Bit 2, set to 1 when Tx is flow control by DCD being LOW.

Status - Tx Waiting because XOFF received not reported. Bit 3, set to 1 when Tx is flow control by XOFF char being received.

Status - Tx Waiting because XOFF transmitted not reported. Bit 3, set to 1 when Rx is flow controlled by issuing XOFF char and rx flow control mode is set to 'Normal'.

Status - Character waiting to transmit immediately not reported.

Status - Receive waiting for DSR not reported

#### **65: Query Transmit Data Status**

Status - Character Waiting to be tx'ed immediately not reported. Bit 3, set to 1 while waiting to send character immediately.

Status - Waiting to automatically tx an XON not reported. Bit 4, set to 1 while waiting to send XON automatically.

Status - Waiting to automatically tx an XOFF not reported. Bit 5, set to 1 while waiting to send XOFF automatically

### **The CONFIG.SYS Entry**

```
DEVICE=<path>EASY.SYS [/b {Type=<type> | Slot=<slot> | PCI=<brd number>},
                    [<config item> [, <config item> ...]] [/b ...]
```

Items within '['s are optional.

At least one of the '|' seperated items within '{ }'s must selected.

/b : starts configuration of each adapter (maximum of four adapters)

<config item> is one of:

T[ype]=<type>

P[ort]=<port>

R[am]=<ram>

I[rq]=<irq>

F[irst]=<first>

TX[buf]=<txbufsize>

RX[buf]=<rxbufsize>

PC[i]

MAPR[ts]

MAPC[ts]

Where:

**Type=<type>** is easyio. Type of board in ISA/EISA machine. No default.

**Port=<port> : <hex number>** eg 2A0 Primary I/O Port address of board.  
Used by all adapters. Defaults to factory setting.

**Irq=<irq> : <dec number>** eg 15 Interrupt request number of adapter.  
Used by EasyIO Adapters. Default is 15.

The following options are not normally required:

**First=<first> : <dec number>** eg 99 Number component of name of first port of the adapter. Thus F=99 would produce COM99, COM100, ....  
Used by all adapters. Default for first adapter identified is the number of native ports + 1. Default for following boards is the next contiguous number after the previously identified adapter.

**TXbuf=<txbufsize> : <dec number>** eg 128 Size of transmit buffers  
Used by all adapters. Default is adapter specific. Note: all EasyIO adapters must use the one common size.

**RXbuf=<rxbufsize> : <dec number>** eg 1024 Size of receive buffers  
Used by all adapters. Default is adapter specific. Note: all EasyIO's must use the one size.

**PCi=<board number>: <dec number>** eg 2 To change default attributes of adapters automatically detected by PCI BIOS's, the board number can be specified and attributes changed. The only other attributes that can be changed in conjunction with 'PCi' are 'First', 'TXbuf', 'RXbuf', 'MAPRts', and 'MAPCts'. This has no default.

**MAPRts** Enables the mapping of RTS to DTR. The driver will report the value of DTR to be the same as RTS. Used by all adapters. Default is to disable this.

**MAPCts** Enables the mapping of CTS to DCD. The driver will report the value of DCD to be the same as CTS. Used by all adapters. Default is to disable this.

Example:

EasyIO 8M. The user needs all the ports to MAP RTS to DTR and MAP CTS to DCD for modem applications.

```
DEVICE=C:\OS2\EASY.SYS /b
type=EasyIO,port=2a0,irq=15,mapcts,maprts
```

## Requirements and Limitations

1. DOS and Windows applications cannot directly access the Stallion COM ports as a Virtual COM driver is not supplied.
2. The Application Server can not use a Stallion COM port to connect a mouse as a Mouse COM driver is not supplied.
3. Some Stallion Ports do not provide DSR input signal, and in these cases, always report it as asserted.
4. DSR and DCD flow control are not supported in this release.

## Citrix WinView

### Introduction

This document describes how to install the Stallion OS/2 Drivers in the Citrix WinView server.

## Installation

When the installation prompts you to select the type of multi-port adapter installed in your WinView server computer, select the 'No multi-port adapter installed.'

You are required to manually install the Stallion driver after the application server installation.

## Manual Installation

1. Log into the application server as a System Administrator.
2. Start an OS/2 Command Prompt
3. Insert the Stallion Driver diskette into Drive A
4. Run the command

```
C:\OS2\INSTALL\RSPDDI
```

This will copy the Stallion device drivers from the Diskette and place them into the directory C:\OS2 on the application server. The following files are copied

```
A:\OS2\EASY.SYS -> C:\OS2\EASY.SYS
```

```
A:\OS2\EMODE.EXE -> C:\OS2\EMODE.EXE
```

```
A:\OS2\EDIAG.EXE -> C:\OS2\EDIAG.EXE
```

```
A:\OS2\ETEST.EXE -> C:\OS2\ETEST.EXE
```

In addition C:\CONFIG.SYS will have an entry placed into it for the Stallion Driver. DEVICE=C:\OS2\EASY.SYS

5. If your application server computer uses an ISA bus then you will need to use the system editor to modify the entry in CONFIG.SYS for each Stallion Multiport Adapter installed. The following example uses the Factory supplied settings.

```
EasyIO Port=2A0, Irq=15:
```

```
DEVICE=C:\OS2\EASY.SYS /btype=easyio
```

6. The system should be shutdown, Stallion Multiport Adapters inserted and restarted. The Stallion COM ports will now be available to the application server, and will be named consecutively after the last built-in asynch COM ports.

## Description of Initialization Errors

Error 0001:board Type not supported. Driver Internal Error, report to Stallion support.

Error 0002:GSI BRD\_CONFIG failed [%d]! Invalid Configuration settings were passed to the driver. Internal error number '%d'.

Error 0003:Board not found. Using the Configuration settings provided on the command line the driver was unable to initialise and locate the board.

Error 0004:No adapter cables found! No adapter cables are connected to the Easy Connection board.

Error 0005:Maximum of %d adapter cables per board has been exceeded. Too many adapter cables are connected to the Easy Connection board. At most '%d' adapter cables are allowed per board.

Error 0006:No ports found! No Functioning ports were located.

Error 0007:Too many ports (%d) on adapter cable %d Driver Internal Error, report toStallion support.

Error 0008:Unable to Download board, error %d! Driver was unable to program the EC 8/64 processor. Possible hardware failure.Error number '%d'.

Error 0009:Adapter signature not found. Driver was unable to locate the EC 8/64 Adapter RAM signature. Possible hardware failure, or RAM address incorrect.

Error 0010:GSI BRD\_SEEK to %lx failed.

Error 0011:GSI board write fail %d != %d

Error 0012:GSI BRD\_SEEK to %lx failed.

Error 0013:GSI board read fail, %d != %d Driver was unable to program the EC 8/64 processor. Possible hardware failure.

Error 0014:Too many boards, Maximum = %u

Error 0015:Too many boards, Maximum = %u The Driver only supports a maximum of '%u' Stallion boards.

Error 0016:MCA get identity failed %d

Error 0017:MCA abioscall(GET\_LID\_...) failed %d

Error 0018:MCA abioscall(READ\_POS) failed %d Driver was unable to access MCA EBIOS to automatically locate Stallion boards.Internal error number '%d'.

Error 0019:Unable to set timer for polling.

Error 0020:Unable to register interrupt IRQ=%d

Error 0021:Unable to register stack usage IRQ=%d Driver was unable to gain an OS/2 resource it requires. It is possible they have all been consumed. For IRQ's it is possible that another device has claimed it first.

Error 0022:'%S' too big for '%S'

Error 0023:'%S=%S' contains invalid character '%c'

Error 0024:'%S' too big for '%S'

Error 0025:'%S' too big for '%S'

Error 0026:'%S=%S' contains invalid character '%c'

Error 0027:'%S' too big for '%S' Invalid number '%S' has been provided for a configuration item '%S'

Error 0028:Invalid board type '%S=%S' Invalid board type name '%s' was used.Valid board types are EC8-64, EC8-32, EasyIO.

Error 0029:Parameter syntax error '%S=%S'

Error 0030:Invalid parameter '%S=%S'

Error 0031:Parameter '%S' must%s have a value. A syntax error has been detected.The particular parameter '%S'has an invalid argmnt '%S'.

Error 0032:Either 'Type' or 'Slot' must be specified. For each /b, either a Type= or Slot= must be provided.

Error 0033:Slot cannot be used with Type, Port, Ram, OPort or Irq. You cannot override the EISA or MCA configured settings for Type, Port, Ram, OPort or Irq.

Error 0034:'First' value of %u is to large Maximum value is 1000

Error 0035:'TXbuf' value of %u out of range

Error 0036:'RXbuf' value of %u out of range. The buffer override value '%u' is out of range. Maximum value is 4096, minimum value is 32

Error 0037:'Slot' value of %u out of range. Maximum value is 16.

Error 0038:Board not found in 'Slot=%u'. A Stallion board was not found in the Slot that is being updated.

Error 0039:Invalid parameters specified for 'Type=%s'. A configuration item specified was not needed for the board type specified. For example, Ram=d0000 is not valid for Type=easyio as it does not have and on-board RAM.

Error 0040:'Mem=%lx' invalid for 'Type=%s'

Error 0041:'Port=%x' invalid for 'Type=%s'

Error 0042:'Port=%x' for 'Type=%s' clashes

Error 0043:Default 'Port' clashes for 'Type=%s'

Error 0044:'OPort=%x' invalid for 'Type=%s'

Error 0045:'Irq=%u' invalid for 'Type=%s'

Error 0046:'Irq=%u' for 'Type=%s' clashes

Error 0047:Default 'Irq' clashes. Either the configuration item value is not legal for the board type or was not specified, and the default value has already been taken by another adapter and thus clashes. For example:/btype=EC8-64,Ram=ff000000 would fail with error "Ram=ff000000' invalid for "Type=ec8-64".

This is because EC8-64's can not place their Ram at that location. The example:/Btype=easyio,port=2a0 /Btype=easyio,port=2b0 Would fail with error 'Default Irq clashes'.This is because the two EasyIO boards would be assigned the default interrupt of 15, and EasyIO's are unable to share interrupts in ISA machines. Refer to the Hardware Technical Reference for valid settings.

Error 0048:Too many boards, Maximum = %u The Driver only supports a maximum of '%u' Stallion boards in one machine.

Error 0049:Unable to locate '%s' in arguments. The Driver may have been renamed from '%s'.

Error 0050:Syntax error '%S'

Error 0051:Invalid argument '%c'. The driver was unable to locate a valid /b in the line or there was some incorrect characters before the /b

Error 0052:Unable to allocate memory. The driver was unable to allocate memory from OS/2. Possibly it has all been consumed.

Warning 0053:First port clash, corrected. The First port specified is less than the last boards end port the driver will automatically increase it to just above the last board's end port.

Error 0054:Unable to AllocGDTSelector, %d. Driver was unable to gain an OS/2 resource it requires. Possibly they have all been consumed.

Error 0055:Parameter '%S' repeated. The configuration item was specified twice for the same board. Remove one of them.

Error 0056:Unable to read PCI first port

Error 0057:Unable to read PCI second port

Error 0058:Unable to read PCI interrupt. The driver was unable to read the PCI adapter settings.Either the machine's PCI BIOS is incompatable with the driver or the board is faulty.

Error 0059:PCI board %u not found. The board specified by Pci=board number could not be found.

Error 0060:'PCI' can not be used with Type, Port, Ram, Oport, Irq or Slot. PCI settings are automatically detected, so these parameters are not required.

## Section 7: NetWare technical reference

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During the installation and use of the Novell NetWare Driver, error messages or warnings may be displayed to notify of unsatisfactory conditions. This Section lists these error messages and gives a brief explanation of the causative state.

### Error Conditions

ERROR 0001: Previously loaded driver using same device type <N>. Another driver is using this driver's unique device type number. Don't load the other AIO driver. <N> is the conflicting device type number.

ERROR 0002: Unable to register driver with AIO. Probably out of resources <N>. AIO refused to register this driver. AIO is probably out of resources. Shutdown and restart the server. <N> is the error code returned from AIORegisterDriver().

ERROR 0003: Unable to allocate IORegistration resource tags. The server is probably low on resources. Reduce the number of applications running on the server, or increase the server's resources. If the problem persists, try rebooting the server.

ERROR 0004: Unable to Alloc <N> bytes of memory. The server is probably low on free memory. Reduce the number of applications running on the server, or increase the server's resources. If the problem persist, try rebooting the server. <N> is the number of bytes requested by the driver from the server.

ERROR 0005: Unable to read <N> bytes of driver custom file. The driver was unable to read the custom file data (attached to the driver's .NLM executable file). Possibly the AIOEASY.NLM file is corrupted. <N> is the number of bytes attempted to be read from the custom file.

ERROR 0006: Invalid parameter <S>. An invalid parameter was placed on the LOAD AIOEASY line. <S> is the parameter in error.

ERROR 0007: Parameter <S> should not have argument. Parameter was given an argument when one is not required. <S> is the parameter in error.

ERROR 0008: Parameter <S> must have argument. Parameter was not supplied an argument, when one was required. <S> is the parameter in error.

ERROR 0009: Parameter <S1> has invalid argument <S2>. The argument to parameter is not in range, or is not of the expected type. <S1> is the parameter, <S2> is the invalid argument.

ERROR 0010: Duplicate parameter <S>. Parameter was specified on the LOAD AIOEASY line more than once. <S> is the parameter in error.

ERROR 0011: Unable to allocate Alloc resource tags. The server is probably low on resources. Reduce the number of applications running on the server, or increase the server's resources. If the problem persists, try rebooting the server.

ERROR 0012: No need to specify PORT, MEM, BTYPE, SLOTSIZE or INT with SLOT. The driver automatically interrogates non-volatile RAM for these parameters. Only the SLOT is necessary.

ERROR 0013: Do not specify SLOT in non-EISA machines. ISA machines do not have the concept of a SLOT number. The configuration of the board must be explicitly specified using PORT and MEM parameters.

ERROR 0014: Do not specify CACHE in non-ISA machines. Non-ISA machines (EISA and MCA) automatically handle caching issues. The CACHE parameter is not valid for them.

ERROR 0015: Do not specify non-MCA adapters in MCA machine. It is not possible to put non-MCA adapters in MCA machines. Do not specify non-MCA adapters in an MCA machine.

ERROR 0016: Do not specify MCA adapters in non-MCA machine. It is not possible to place MCA adapters in non-MCA machine. Do not specify MCA adapters in a non-MCA machine.

ERROR 0017: Do not specify EISA adapters in an ISA machine. It is not possible to place EISA adapters in a non-EISA machine. Do not specify EISA adapters in a non-EISA machine.

ERROR 0018: Unable to register hardware options. The driver was not able to register the adapter's hardware settings to the server. Try alternative PORT or MEM settings. This often occurs when trying to LOAD an adapter that is already loaded. Unload the driver and try loading it again.

ERROR 0019: A maximum of <N> boards can be installed. The driver only supports <N> adapters. An attempt to configure more than <N> adapters was made. <N> is the maximum number of adapters.

ERROR 0020: Unable to register board. Board number <N> already registered. An adapter is using the same NODE number. Try using a different node address using the NODE= parameter. <N> is the board/NODE number in error.

ERROR 0021: Duplicate NAME=<S> for adapter, NODE=<N>. An existing adapter has already been given the name <S>. Change the name using the NAME= parameter. Can also occur when a NAME is generated automatically when one is not specified. The name is based on the NODE number, so specifying a different NODE may also overcome the problem. Another cause can be an attempt to reload the driver for the same board.

ERROR 0022: Unable to read configuration for adapter in slot <N>. The information for the adapter in the SLOT could not be obtained. Check that:

- . the SLOT number is correct
- . the adapter in the SLOT is an EasyIO
- . the adapter in the SLOT has been configured with the EISA Configuration Utility.

<N> is the slot in error.

ERROR 0023: Unable to de-register board <S>. Error = <N>. The adapter could not be de-registered from AIO. Try giving each adapter

a sequential NODE number starting from 0 for the first board loaded. <S> is the name of the board. <N> is the error number returned from AIODeRegisterBoard().

ERROR 0024: Unable to register board. No driver for the hardware type registered. A driver internal error has occurred. Contact support.

ERROR 0025: Unable to register board. Unknown error <N>. AIO refused to register the adapter. Try reducing the number of applications running on the server, or increase the server's resources.

ERROR 0026: Unable to locate any boards in slots <N1> to <N2>. Unable to autodetect any Stallion boards in the default slot range of <N1> to <N2>.

ERROR 0027: Unable to de-register driver <N>. Error = <E>. A driver internal error has occurred. Contact support.

ERROR 0028: Adapter not found. The PORT or MEM values may be incorrect, the adapter may be faulty, or caching may need to be specified.

ERROR 0029: CACHE type conflicts with previous board's CACHE setting. Only one type of CACHE control may be specified for all boards loaded.

ERROR 0030: Too many ports (<N>) for this driver to handle. The total number of ports found (<N>) is greater than the maximum supported by this driver.

ERROR 0031: Brd type <S> not supported. The board type <S> is not supported in this version of the driver. Contact Stallion Technologies for information on the board driver you require.

ERROR 0032: GSI returned error <N>. AIO driver internal error. If there are no other errors accompanying this one, then contact Stallion Technologies support department for more information concerning this error. If other errors accompany this one then refer to those as a means of fixing this error.

ERROR 0033: Bad interrupt selection <I> for slot size <N>. The interrupt <I> is not usable in a slot size of <N>. (eg. Interrupt 0x10 can not be used in an 8 bit slot since the largest IRQ that can be selected is 7.)

ERROR 0034: Bad slot size [<N>] for board type [<S>]. Expected [<N>]. The slot size specified, <N>, does not match the hardware board type, <S>. Slot size <N> was expected.

ERROR 0035: Cannot alloc port structures for board <N>. The system call to allocate memory has failed. Your system is running too low on memory to properly initialize the driver.

ERROR 0036: GSI device close failed for port <P> on board <N>. The Stallion AIO driver has failed to close this port.

ERROR 0037: GSI device init failed for port <P> on board <N>. The Stallion AIO driver has failed to initialize this port.

ERROR 0038: GSI device open failed for port <P> on board <N>. The Stallion AIO driver has failed to open this port.

ERROR 0039: GSI found no ports on <S> #<N>! No ports were found on board number <N> which is board type <S>. Power down and ensure that the EasyIO modules are attached to the board correctly, then restart the server and reload the driver.

ERROR 0040: GSI open/close returned error <N>. The Stallion AIO driver has failed to either open or close this port.

ERROR 0041: GSI read fail, board <N>. The Stallion AIO driver has failed to read a block of data from the adapter board numbered <N>.

ERROR 0042: GSI returned unknown board type! The driver does not recognize the board type found at the given I/O address or in the supplied slot.

ERROR 0043: GSI seek fail, board <N>. The Stallion AIO driver has failed to seek into the adapter's onboard RAM.

ERROR 0044: Unknown notification, type=<N>. An unknown/unexpected event has being detected by the board. It is non-fatal error that should be reported to Stallion Technologies support department if it occurs frequently.

ERROR 0045: GSI write fail, board <N>. The Stallion AIO driver has failed to read a block of data from the adapter board numbered <N>.

ERROR 0046: Lower GSI module <N> missing essential GSI API. AIO driver fatal error. This error should not occur. Reinstall the driver files from the installation floppy using the procedures described in the manual. If the error still occurs, contact the Stallion Technologies support department.

ERROR 0047: ONboard/BRUMBY are not supported. These boards are not supported in this version of the AIO driver. Contact Stallion Technologies for information on the board driver you require.

ERROR 0048: The <S> board operates in polled mode only. The board type <S> does not require an IRQ line for operation as it is polled by the AIO driver. Remove any reference to the INT parameter from the driver command line.

ERROR 0049: Unable to allocate callback signature tags. The system call to allocate a callback tag has failed. Your system may be running too low on memory to properly initialize the driver. If problems persist, try rebooting the server.

ERROR 0050: Unknown open/close request [<N>]. An unrecognized open/close request of type <N> was received internally to the driver. If the error persists, try restarting the server. If the error message still persists, contact Stallion Technologies support department.

ERROR 0051: Unrecognized board type [<N>]. The board type <N> is unrecognized by the AIO driver. Please supply a board type from those listed in the manual.

ERROR 0052: Mem\_read - NULL buf or count param. AIO internal error. If the error persists, try restarting the server. If the error message still persists, contact Stallion Technologies support department.

ERROR 0053: Mem\_write - NULL buf or count param. AIO internal error. If the error persists, try restarting the server. If the error message still persists, contact Stallion Technologies support department.

ERROR 0054: Unexpected notification, type=<N>. An unknown/unexpected event has been detected by the board. It is a non-fatal error that should be reported to Stallion Technologies support department if it occurs frequently.

ERROR 0055: BRD-ICONFIG failed [<N>]! AIOEASY Internal error. Unload the driver and try again. If the problem persists contact Stallion Technologies support department.

ERROR 0056: No modules found on <S> #<N>! No modules were found on the board number <N> which is of type <S>. Power down the machine, ensure that the modules are connected correctly to the board, restart the machine and reload the driver.

ERROR 0057: Maximum of <X> modules per board has been exceeded on board #<N>. There are an excessive number of modules on board <N>. Please redistribute the modules across all installed boards with a maximum of <X> modules per board.

ERROR 0059: Download routine failed with error <N>! The slave could not be downloaded to the board. Ensure that the I/O address, the slot used, and the Dual port RAM address is correct. If the error persists, unload the driver and try reloading it.

ERROR 0070 PCI specified in non-PCI machine! Either the driver could not detect that the machine has PCI slots or the machine does not have PCI slots.

ERROR 0071 PCI adapter number invalid (1 -> 8)! A value from 1 to 8 can only be specified for the PCI= option

ERROR 0072 PCI adapter not found! The adapter specified by the PCI= option was not found.

ERROR 0073 PCI adapter not found! The adapter specified by the PCI= option was not found.

ERROR 0074 PCI Unable to read PCI PORT0 setting! The driver was unable to read the PCI port setting for the PCI card. The PCI BIOS or machine is incompatible with the driver or the adapter is faulty.

ERROR 0075 PCI Unable to read PCI PORT1 setting! The driver was unable to read the PCI port setting for the PCI card. The PCI BIOS or machine is incompatible with the driver or the adapter is faulty.

ERROR 0076 PCI Unable to read PCI INT setting! The driver was unable to read the PCI interrupt setting for the PCI card. The PCI BIOS or machine is incompatible with the driver or the adapter is faulty.

## Warnings

AIOEASY WARNING 1001: The following ports are still acquired: <L>. While unloading, the driver detected that the listed ports, <L>, were still acquired, and not yet released. To avoid this message, ensure all ports are released prior to unloading the driver. This warning message is non-fatal and will not affect driver operation.

AIOEASY WARNING 1002: block returned by NON-blocking ioctl [<N>]. AIO internal warning. If the warning persists, try restarting the server. If the warning message still persists, contact Stallion Technologies support department. This message is non-fatal and will not affect driver operation.

AIOEASY WARNING 1003: Unknown command [<N>] ignored. AIO internal warning. If the warning persists, try restarting the server. If the warning message still persists, contact Stallion Technologies support department. This message is non-fatal and will not affect driver operation.

## Section 8: DOS diagnostics

---

Diagnostic software, DIAG.EXE, is supplied to test the state of the Stallion adapter(s). This software tests the hardware functionality of the board and includes memory and loopback diagnostics tests. DIAG can be found (along with the DOS drivers) on the following diskettes:

- Microsoft Drivers (Part No. 710088)
- EasyUtilities (Part No. 710031)

**Note:** The system must be booted to DOS as correct operation of the diagnostics is not guaranteed in a DOS window under Windows NT.

To use the diagnostic facility, perform the following:

1. Boot the machine to DOS.
2. Insert the distribution diskette into the chosen floppy drive.
3. To select the DIAGS directory, enter the following command at the DOS prompt of the chosen drive: `CD \DIAGS`
4. To start the board diagnostics, type: `DIAG`
5. Select the board type from the menu.
6. The default settings for the board are displayed on the screen. If these values do not reflect available settings in your system change the configuration by entering the appropriate number for that value.
7. Press `<ESC>` to start the diagnostic program.
8. Run the required tests using diagnostic options 1 - 4.
9. If the board fails the presence test, there may be an I/O address clash. Check that the addresses chosen are available for use.
10. If the board still fails diagnostic tests, contact your supplier.

Complete Checkout enables the board and confirms the presence of the board in the system. This is indicated by the presence test result. The number of ports on the board is calculated. This test can be run repetitively by selecting option 2.

Ports Loopback test allows the testing of the communications ports by looping transmit signals back to receive signals using the loopback plug supplied with the board. An internal data loopback test is also performed to verify the RS232 driver operation. This tests all of the electronic circuits on the board including the line drivers and the interrupt on the host bus. If required this test can be run on an individual port.

**Note:** It is possible for a Stallion port to sustain damage to the driver chips and *still pass* the loopback diagnostic test. A port may have been damaged to the point where it cannot sustain sufficient voltage under a given load or over a long cable length.

**“Complete Checkout’** verifies board functions except the communications interface and bus interrupt. This is tested by the Cable Loopback tests.

**“Board Present ...OK’** indicates that the specified board has been found at the selected I/O address, and that the board has powered up correctly. If this should fail check the I/O address is correctly selected and does not clash with other adapters.

**“Number of ASYNC Ports...’** is the number of standard asynchronous ports found to be alive on the board. If this is not equal to the number of ports actually on the board there may be a problem with the hardware.

**“Firmware Revision...’** is the firmware revision of the RISC UARTs on the EasyIO board. This is provided for information only and indicates that the UARTs are functional.

**Note:** To avoid static damage, avoid excessive board handling.

## Section 9: EasyIO Point of Sale

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Stallion Technologies produces a number host-based multiport cards ideally suited to Point of Sale (POS) applications. These cards have the ability to source power for POS peripherals and supply it via an unused pin on the RS-232 cable.

There are both 8 and 4 port varieties available.

The **8 port** cards have a DB78 connector on the rear of the card for the RS-232 and power signals. See Part D: Section 4 for DB78 pinout diagram.

The **4 port** card has a DB37 connector on the rear of the card for RS-232 & power signals. See Part D: Section 4 for DB37 pinout diagram.

Contact your local Stallion office for further details.

## Section 10: Hardware troubleshooting

---

The information in this Section is designed to help you identify the cause of error situations and to correct them quickly.

All Stallion Technologies' products are supplied with comprehensive Diagnostic software which also pin-points problems. See Section 8 - Diagnostics - for instructions on how to use the Diagnostic software.

In this Section, trouble shooting tips and solutions are covered in the following sections:

- Booting Problems.
- Terminal Problems.
- Printer Problems.
- Attached Printer (APS) Problems.
- Multiple Sessions (MSS) Problems.
- Modem Problems.
- General Errors.

If you encounter a problem or error during installation, these points should assist you to get the system going:

### Booting Problems

#### **System does not boot and console remains blank**

1. Check system power supply by listening for fan and disk motor or observing indicator lights.
2. Does system boot without EasyIO board? If yes, system works without EasyIO board:
  - Check that EasyIO board is not shorting on an adjacent card.
  - Visually check board for burnt-out components
3. If no, system does not boot without EasyIO board the problem is in System Hardware. - Refer to system manuals for troubleshooting procedure. - Check nothing was disturbed when EasyIO board was plugged in.

### **System begins to boot but stops before operating system starts to load**

1. Check there is no diskette in diskette drive.
2. Is the disk controller card OK?
  - Check controller card is seated properly.
  - Check cables haven't been dislodged.
  - Check controller isn't shorting with other boards.
3. For upgrade or new installations, can you boot from an old kernel (eg. unix.old)? If yes - contact your dealer for support.

### **System boots, begins to load, but stops in the Unix configuration banner. (SCO Unix/XENIX only)**

1. Check at what point in the boot banner it stops and refer to the system manual.
2. Does the system boot if the EasyIO board is removed?
3. If so, is there a message similar to "EasyIO Not Found: nr=1 type=21 io=000003A0 irq=0"?
4. If you can boot off a pre-EasyIO kernel, the board configuration is probably in conflict with another peripheral.

### **New or upgrade installation - board boots to Unix, but banner reports message similar to "EasyIO Not Found: nr=1 type=21 io=00000204 mem=000D0000 irq=0"**

Possible Causes:

1. Check that switches are set correctly to match software installation.
2. Conflict of I/O address or with another device's configuration.

### **System has been operating for some time, when system boots, banner reports message similar to "EasyIO Not Found: nr=1 type=21 io=00000204 mem=000D0000 irq=0"**

1. Isolate software causes: Check on other changes made to the system. Check if new kernels have been built. Try booting an older kernel.

2. If no software causes are found: Board may be damaged or dislodged. Try re-seating the board or call your Support Center.

### **Problems adding extra boards**

1. Treat the problem as for a problem with a single board.
2. Check that each board functions separately in the system.
3. Check if the power supply has the capacity to run a number of boards.

### **Other peripherals stop functioning or function incorrectly after board installation**

Most likely the EasyIO board configuration uses some settings already used by another installed device (ie. a configuration conflict).

1. Check that the switches are correct.
2. Does the peripheral still work on a pre-EasyIO board installation kernel?
3. Check that other controllers have not been physically disturbed.
4. Check that all cables are intact.
5. Remove the board. Do the other peripherals work?
6. Try configuring the board to use a different interrupt.
7. Try configuring the board to use a different I/O address.

## **Terminal Problems**

### **System boots correctly but there are no login messages on the terminals**

1. Check the port is configured and enabled in the software driver.
2. Check the port and terminal communication parameters are the same:
  - Baud Rate.
  - Bits/Character.
  - Parity (Odd, Even, None).
  - Stop Bits (1 or 2).
  - Handshaking (Software, Hardware, Both, None) .
  - Verify the terminal is OK on a known working port.

3. On new installations check adapter cables are fully plugged into the board.
4. Check the cable is connected as per required wiring diagram.
5. Check that CTS is enabled for the port.
6. Do a single port loopback on the port to check for open circuits in the cable and to confirm the port is working.
7. Use an indicator lamp box to check data is being transmitted on the Tx pin, and received on the Rx at the other end. Do this at both adapter cable and terminal ends.
8. Alternatively, use the **easyadm** single port monitoring function to check the state of port signals.
9. Check the port is not flow controlled. Type ^Q.
10. If the port fails the loopback test, move the terminal to an unused working port.

If the port has been working for some time and then fails, and single port loopback fails with the loopback plug plugged at the adapter cable, the board may be faulty. Call your Support Center.

### **Characters output to terminals are corrupted/missing**

1. Check that both the port and the terminal are set up with the same communications parameters:
  - Baud Rate.
  - Bits/Character.
  - Parity (Odd, Even, None).
  - Stop Bits (1 or 2).
  - Handshaking (Software, Hardware, Both, None).
2. Does the corruption happen with some applications and files and not others? If so, the problem is most likely to be with flow control.
3. Is the port set up for software flow control?
4. If so, list a large file (eg. /etc/termcap), and type ^S. The output should stop. ^Q should restart the output.
5. If using software flow control, use **easyadm** port monitoring screens to check Xoff and Xon characters are being sent to the port.
6. If you are using hw handshaking, is the cabling correct?
7. Swap the cable with a known working cable.

8. If using hardware flow control, use the **easyadm** port monitoring screens to check the state of the CTS pin on the single port monitoring screen.
9. Try enabling AutoCTS. This will require a hardware handshake cable.

### **Keyboard Input does not function**

1. Check that port and terminal communication parameters agree.
2. Monitor the received characters using **easyadm** to see if characters are being received by the board.
3. If using software flow control, check the port is not flow controlled. Type ^Q on the terminal.
4. Check if the problem always occurs or only when running a certain application.
5. Type `cat < /dev/ttybbppx` on the console, where `/dev/ttybbppx` is the offending port device. Try to type some characters on the offending port. Characters should appear on the console.
6. Check cabling. Swap the cable with a known working port.
7. Try using **easyadm**'s Single Port Monitor Admin menu option "Flush" to flush the port.
8. If flushing the port does not work, try using **easyadm** to reset the port.

### **Output to a terminal has stopped when it should not have**

1. If using software flow control, type ^Q on the terminal to check if the port is flow controlled.
2. Use **easyadm** to see if output is blocked by flow control.
3. Type `echo 1234567890 > /dev/ttybbppx`, where `/dev/ttybbppx` is the offending port. Use **easyadm** to check that the transmit character queue increases.
4. Use **easyadm** to flush the port. If this does not work, try using **easyadm** to reset the port.

### **Screen painting applications cause the layout on the screen to be corrupted**

1. Check terminal flow control is set up to match software configuration.
2. Check TERM variable agrees with terminal type.
3. Check that the terminal is set up for the correct number of lines (normally 24 or 25).
4. Check the terminal's terminfo or /etc/termcap entries for correctness.
5. Check if the application runs on the standard serial port.

### **Some keys on a terminal do not function correctly for a particular application**

1. This is almost certainly a terminal type problem.
2. Check the TERM variable is correct.
3. Check that the **terminfo** or **/etc/termcap** entry is correct for this terminal.
4. Does the application require the terminal to be in 'scan-code mode'? - If not, ensure the application cannot put the terminal into scan-code mode.
5. Is the terminal in scan-code mode?
6. Does the application reprogram the keyboard?

### **Flow control problems for some applications only**

1. Run the application on the standard serial port.
2. Try using hardware flow control only.
3. Try enabling AutoCTS. This will require a hardware handshake cable.

### **Some keys cause terminal to hang**

- Some applications switch the terminal into PC/TERM mode. In this mode different keys may generate hotkey sequences.
- Is the terminal in scan-code (PC/TERM) mode?
- If so, set the terminal back to native mode, enter the hotkey to get back to the PC/TERM mode session, set the terminal back to PC/TERM.
- It is not recommended to use sessions on terminals running PC/TERM mode applications.

## Printer problems

### No printers are working

Check line printer scheduler is working: - Type `lpstat -t` and look for a "scheduler is running" message. If not, use the system administration shell to enable the lp scheduler.

### Individual Printers not working

1. If individual printers are not working, use the system administration shell to check printers are: - Enabled. - Accepting requests.
2. Check the cable is working correctly by swapping it with a known working cable if necessary.
3. Check the communications parameters of the port while printing: -  
At the console type:  

```
stty -a < /dev/ttybbpp
```

where `/dev/ttybbpp` is the device for the printer port.
4. Check the printer communications parameters.
5. Try printing something to the port by typing:  

```
echo 0123456789 > /dev/ttybbpp
```

### Printers enabled, accepting requests, but no output

1. Check the port and terminal communication parameters are the same: - Baud Rate. - Bits/Character. - Parity (Odd, Even, None). - Stop Bits (1 or 2). - Flow Control (Software, Hardware, Both, None).
2. Send a large job to the printer. Monitor its progress with **easyadm's** single port display screen. When the port is open, type (from another terminal or console screen): `stty -a < /dev/ttybbpp` where `/dev/ttybbpp` is the device of the printer port device.
3. Check these are as expected. If not, check: - Interface script for stty commands. - System administration shell for port configuration parameters.
4. Follow the procedure for fixing terminal problems (described earlier in this Section).

**Note:** If you suspect the port is flow controlled, use **easyadm's** single port monitor screen Admin option to flush the port.

## Characters output to printer are corrupted or missing

1. Check the port and printer communication parameters are the same:
  - Baud Rate
  - Bits/Character
  - Parity (Odd, Even, None)
  - Stop Bits (1 or 2)
  - Flow Control (Software, Hardware, Both, None)
2. Send a large job to the printer. Monitor its progress with **easyadm**'s single port display screen. When the port is open, (from another terminal or console screen): `Typetty -a < /dev/ttybbpp` where `/dev/ttybbpp` is the device name of the printer port. Check these are as expected. If not, check:
  - Interface script for stty commands.
  - System adm shell for port configuration parameters.
3. Does corruption happen with some files and not others? If so, the problem is most likely to be with flow control.
4. If using Software Flow Control: Connect a terminal to the port, and print a large file (eg. `/etc/termcap`), and type `^S`. The output should stop. `^Q` should restart the output.
5. Use **easyadm** single port monitoring screen to check `Xoff` and `Xon` characters are being sent to the port.
6. If using Hardware Flow Control:
  - Check the cable against the hardware flow control cable wiring diagrams in this manual.
  - Check the CTS line is being de-asserted when printer flow controls.
  - If possible, swap cable with a known working cable.

## Printer output stopped when it should not have

- Use single port monitor screens to check port not flow controlled.
- Try flushing port from Admin option Single port monitor screen.
- Check cables have not worked loose.

## Printers connected to a port do not line feed and carriage return properly

1. This is most likely a problem with the stty setting used by the interface script.
2. Try a different interface script.

3. Check the stty settings of the port while it is printing.
4. Check the onlcr and ocrnl values are set as expected.
5. Check the printer switches against the printer manual.

## **Attached printer problems (Unix only)**

### **No output to attached printer but terminal is OK**

1. Check the terminal auxiliary port parameters match the printer's:
  - Baud Rate.
  - Bits/Character.
  - Parity (Odd, Even, None).
  - Stop Bits (1 or 2).
  - Flow Control (Software, Hardware, Both, None).
2. Check printer is connected to terminal auxiliary serial port, not the parallel auxiliary port.
3. Check the terminal setup uses the serial port for the auxiliary device.
4. Consult your terminal manual. Check the cable matches the wiring diagram for the attached printer cable.
5. Check Escape Sequence for Auxiliary Port.

### **Attached Printer prints corrupted characters**

1. Check setup of auxiliary port agrees with printer setup.
2. Run **easyadm** and set the Characters Per Second printed (CPS) parameter to be less than the printer's slowest printing rate.

### **Attached Printer Output always displayed on terminal**

1. Is the Escape Sequence to Select Transparent Print mode correct?
2. The ESCAPE\_WAIT parameter may be set too low. O

### **Terminal Output Appears on Printer.**

The Escape Sequence to disable Transparent Print mode is not correct, or it has not been specified in the Escape Sequences to switch between sessions.

### **No output to terminal with Attached Printer while printer is operating.**

Run **easyadm** and set the Characters Per Second printed (CPS) parameter to be less than the printer's slowest printing rate.

### **Attached Printers connected to a terminal do not line feed and carriage return properly**

1. This is most likely a problem with the stty setting used by the printer interface script:
2. Try a different interface script.
3. Check the stty settings of the port while the attached printer is printing.
4. Check the onlcr and ocrnl values are set as it should be.
5. Check the printer switches against the printer manual.

### **Output to terminal is bursty when printer is operating**

Run **easyadm** and modify the Quantum Parameter for the Attached Printer and Sessions devices.

## **Multiple Session (MSS) Problems (Unix only)**

### **Terminal on a port configured for Multiple Sessions does not switch between sessions correctly**

1. Check Escape Sequences are correct.
2. Check Escape Sequences Received with Terminal in Monitor mode.
3. Check Hotkey is correct.
4. If unusual characters are left on the screen, increase ESCAPE\_WAIT parameter value.

## **Terminal on a port configured for multiple sessions loses screen data switching between sessions**

1. Does the terminal have sufficient memory for the number of sessions supported?
2. Check if the terminal has a special mode to allow more memory for sessions. If you have a Wyse 60 terminal, select ECON-80 mode.

## **Modem Problems**

### **Modem Overruns**

Some modems are unable to respond quickly enough at high speed to a drop in the RTS handshaking line. This usually results in data overruns (visible in the **easyadm** port monitor screens). This release of the driver allows the RTS threshold to be adjusted on a per port basis via the `bccstty` utility. To reduce the threshold from the default of 8 down to say, 6 on port `tty1a00`, try:

```
bccstty rxthold 6 -d /dev/tty1a00
```

To turn this off:

```
bccstty -rxthold -d /dev/tty1a00
```

To display the `bccstty` current settings:

```
bccstty -d /dev/tty1a00
```

Note that the `bccstty` utility is in the `/usr/lib/easyio/bin` directory while the `bccstty` documentation is in `/usr/lib/easyio/man` directory.

### **Modem does not go off hook to dial out**

1. Check the cable against a modem cable wiring diagram.
2. Check port communications parameters agree with modem.
3. Check status of modem indicator lights, especially DTR, TXD and RXD.
4. Check using a terminal connected to the modem.
  - You may need to use cable with no CTS, DCD or RTS.
  - Verify the communications parameters.
5. Check CTS line not pulled low by incorrect modem register settings.

### **Modem does not answer**

- DTR may need to be high for modems to go off hook.
- Check Cable is correct, especially DTR.
- Check the cable against a modem cable wiring diagram.
- Check modem configured to autoanswer (ie. Hayes modem s0 not = 0).

### **Modem Answers but no data to port**

1. Check cable, especially DCD.
2. Check modem registers aren't set to hold DCD always high. - Set modem register so that DCD follows the carrier.
3. Check communication parameters when modem answers.
4. When modems connect, they often change their communications parameters to match the connection speed. These may disagree with the port.
  - Connect a terminal to the modem - you may need a cable with no CTS, DCD or RTS connection. Dial into the modem from elsewhere to check for this.If this is the problem, either:
  - If possible, lock the modem interface speed to that of the port. This is the preferred solution.
  - Set up a cycling getty on the port. When you log in, press <Break> until the baud rate is correct. The required baud rate must be in the /etc/gettydefs entry for the port.

### **Modem does not hang up at end of call**

1. Check HUPCL flag is set in the gettydefs entry for port.
2. Check modem registers aren't set to hold DCD always high. If so: - Set register so that DCD follows carrier.
3. Check modem registers are set for a drop in DTR to terminate the connection.

## **Characters are lost or corrupted**

1. Check that the modem flow control is equal to the port flow control setting.
2. Check cable is correct.
3. If Hardware Flow Control is used, check that the RTS and CTS lines are connected.
4. Check for a bad line by dialling up locally.
5. Check that the modem baud rate is equal to the port baud rate.
6. If cycling getty is used, then check required baud rate is supported by `/etc/gettydefs` entry.
7. If cycling getty is not used, make sure modem registers are set to lock interface speed to the port baud rate.

## **Modem hangs up when it shouldn't**

1. Check as for Modem problem for a noisy line.
2. Check if DTR or DCD indicators on modem go off momentarily before hangup. If line is noisy, you may be able to set your modem to ignore short carrier losses.
3. Is the problem with the application?
4. Does the problem show only with some applications?
5. Does the problem also happen if you use the modem on a standard serial port as well?

## **General errors**

### **Particular ports no longer operate**

1. Move terminal/cable to another port.
2. Run diagnostic loopback test on offending port.
3. If fault is suspected, contact your Support Center.

## Spurious r & w letters with MS-Word on Wyse 60's

1. Word puts Wyse 60 terminals into PC-term (i.e. scan-code) mode, and sets the port to use codes \x145 and \x147 for Xon and Xoff respectively. (These are set according to the XN=\145 and XF=\147 entries in /usr/lib/word/termscan.)
2. If your terminal XPC HNDSHK setting is off, it will still send ^S and ^Q characters, when it handshakes. These are the scan codes for r and w respectively.

To fix this problem, turn XPC HNDSHK on in the terminal setup screen.

## PCI configuration

The first step in problem elimination is to ensure that the host adapter is configured in the PCI BIOS. To verify that the host adapter is configured into the BIOS, refer to the section on 'DOS Diagnostics'. On some systems, you may be required to manually setup the PCI slot using the system BIOS setup utility. See the section on 'Manual PCI BIOS configuration'. You should also ensure that the IRQ selected does not clash with any ISA boards installed in the system.

If you are unable to configure the BIOS to find the host adapter, this may be due to a PCI compatibility issue. In this case, we recommend running a program called PCI.EXE which has been included in the DIAGS directory on the DOS driver diskette. The output from this program will help our Support staff determine if your system is PCI compliant.

The most common problem encountered during installation is related to the 'routing' of interrupts by the PCI BIOS and the support for this functionality in the operating system.

If the EasyIO8-PCI host adapter is not found by the driver on booting the operating system, you must verify that the interrupt which has been allocated by the BIOS corresponds with that being used by the driver. Check the boot banner to determine the IRQ allocated by the BIOS (remember that this will be in octal under Xenix). If the host adapter is not operational, try setting the IRQ in **easyadm** to this IRQ value instead of the default of 'Auto'. Refer to the previous section on 'Unix Operating System support for PCI'.

Under SCO OpenServer5, if the following message is displayed in the boot banner:

```
WARNING: ATA: Cannot install intr vecno=X,type=3,IPL=5  
Vector X is private
```

this indicates that another device is configured into the kernel with the same interrupt as was assigned to the EasyIO8-PCI by the system BIOS.

You must either re-configure the device in the kernel that is using IRQ X to some other available interrupt, or manually configure the BIOS settings for the EasyIO8-PCI to use some other interrupt than IRQ X

## DOS Diagnostics

The Stallion Technologies DOS Diagnostics may be used to check proper operation of the host adapter and to determine the IRQ and I/O address allocated by the BIOS. After booting to DOS, place the DOS driver diskette in the floppy drive, change directory to DIAGS and start board diagnostics by typing DIAG. Select the EasyIO8-PCI board type from the menu and use the default autodetect settings (all 0). If the board is detected, the IRQ and I/O address that have been allocated by the BIOS will be displayed.

Note these values as they may be required for the Unix driver installation. Run the port loopback test to ensure operation of the ports. If the board fails loopback test on all ports, it is likely that the system has been unable to route interrupts to the PCI slot. In this case, it will be necessary to manually configure the BIOS.

## Manual PCI BIOS Configuration

Refer to your system manuals for details of how to configure your PCI BIOS. Choose an interrupt that will not clash with other boards in the system. Use the system configuration utility to configure that slot by 'routing' IntA to your selected interrupt (2,3,4,5,7,9,10,11,12,14 or 15 as required). If present, the Function Number of Device should be set to '0', Device Function should be set to 'Enabled' and Bus Mastering should be set to 'Enabled'. Save the BIOS settings and reboot.

Once the EasyIO host adapter passes diagnostics, it may be configured into the Operating System.

## Section 11: EasyTerm (Unix)

---

This section introduces EasyTerm, Stallion's terminal emulation utility, and describes its installation.

A complete reference version of this manual can be found on the DOS driver diskette, or at Stallion's web site ([www.stallion.com](http://www.stallion.com)).

'EasyTerm' is an ANSI standard terminal emulation program, designed for use with multi-user operating systems. It was designed to emulate the console of a XENIX system (including multiple windows) on a DOS PC computer, connected as a remote terminal. Major features include:

- software compatibility with XENIX console for text-based applications
- conforms to ANSI 3.64 (1979) and ISO DP 6429 standards for screen and keyboard controls
- recognises additional screen controls used by XENIX
- multiple window display for multiple session support
- concurrent output to non-displayed windows
- fully buffered interrupt-driven communications
- buffered local (parallel) printer support
- screen print facility and auxiliary print mode
- data capture facility
- fast video scrolling & optimised video updating
- variable data word format at 110 - 38400 baud on native COM ports and 110 - 145000 baud on selected multiport COM ports.
- hardware or software handshaking
- standard PC graphics character set
- TSR (terminate stay resident) mode
- scan code mode operation

## Installing EasyTerm

### System Requirements

EasyTerm is intended to run on a DOS PC, with: one or more floppy disk drives and/or a hard disk drive; 128k available RAM (after DOS is loaded); a Monochrome, CGA, EGA or VGA video card and suitable monitor; one serial port; running PC-DOS or MS-DOS 2.00 or later.

A parallel port may be used for a local printer. Any keyboard style may be used. Baud rates up to 38400 are supported on native ports, but errors may occur at high transmission rates, depending on the speed of the machine. Native serial ports must be configured as follows:

Port	Address	IRQ
COM1	03F8H	4
COM2	02F8H	3
COM3	03E8H	4
COM4	02E8H	3

EasyTerm may be run from a floppy disk, or may be copied to a hard disk. Make a backup copy of the original EasyTerm disk, and store the original in a safe place. *Do not use the original disk for daily operations.*

If installing EasyTerm on a hard disk, copy the required files to a suitable subdirectory. The file EasyTerm.EXE is the only file required for EasyTerm to be run. It will create a default configuration file (EasyTerm.CNF) when run. A batch file called INSTALL.BAT has been provided to automatically copy all files to the C:\STALLION\EasyTerm directory.

### Data Cabling

If you intend running the port at higher than 9600 baud, a hardware handshake cable is recommended. If connecting via modem, use a straight through cable as shown in the diagram labelled "Modem". Refer to the technical reference section of the EASY ATA user manual for a description of cabling requirements.

### Startup

To run the program (after booting DOS), simply type "EasyTerm <cr>" (the program must reside on the currently logged drive and directory, or in a directory in the current search path). The /R parameter is optional, and will cause EasyTerm to install itself as a TSR (terminate but stay resident) program.

**Warning:** EasyTerm uses interrupt-driven communications routines to ensure safe data transfer at rates up to 38400 baud. EasyTerm cannot co-reside with memory resident programs which mask interrupts for any length of time, or data will be lost.

An example of this is a 'key-click' utility. On bootup, EasyTerm looks for a file named "EasyTerm.CNF" in the currently logged drive and directory. If this file exists, it is loaded and the settings contained in the file are used. If the file is not found, default settings are used.

A banner page will appear, which includes a version number. Press any key (or wait for timeout period) to clear this page and continue. If a valid configuration file was not available on bootup, EasyTerm will automatically enter the setup mode at this point. Online help is available by typing ALT-H.

### **Host software configuration**

Any host software used to support multiple sessions and/or attached printers must be configured with the correct codes for selecting terminal functions such as window selection and printer output control. Refer to Appendix A for codes recognised by EasyTerm.

If EasyTerm is to be used with the XENIX MSCREEN facility, copy or append the contents of the supplied mscreen.cap file to /etc/mscreencap on the XENIX system. Refer to the miscellaneous section of the XENIX Operating System User's Reference manual for information about running MSCREEN.

### **Scan code mode**

If EasyTerm is to be used with WORD 5.0, you should create the following entries in the /usr/lib/word/termscan file.

```
ZO=\E[1s:ZF=\E[0s:\
XN=\145:XF=\147:\
```

These entries describe the escape sequences to turn scan code mode off and on and which characters are to be used for software flow control while in scan code mode. We suggest copying the ansi section of the file, changing the name to easyterm then adding these entries. You will need to set up the port as "easyterm" in the ATA software and set TERM=easyterm for the scan code changes to take effect.

Scan code mode is required in WORD to allow the use of hot-keys involving the function keys.

**Note:** Multiple sessions are not supported by EasyTerm while in scan code mode. Do NOT attempt to change sessions while running WORD.

### **EasyTerm and EASY ATA**

Select the "easyterm" terminal type using stalladm or simply use ansi as your terminal type.

## Section 13: Hardware specifications

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### EasyIO Rev 3

- ISA 8 bit I/O interface
- Signetics 28L194 (4 port) or 26C198 (8 port) UARTS
- Up to 8 boards per system (64 ports maximum)
- Manually selectable IRQ level (EasyIO4)
- Software selectable IRQ level (EasyIO8)
- Manually selectable edge or level-mode IRQs (EasyIO4)
- Programmable edge or level-mode IRQs (EasyIO8)
- Supports interrupt sharing on EISA systems, one interrupt for 8 boards
- I/O address window 8 bytes, 200-3EFh, via switch settings
- No memory address window required
- Operating temperature range 10C to 33C
- Non-operating temperature range -2C to 60C
- Humidity non condensing 20% to 80%

### EasyIO PCI

- Short 32-bit host adapter
- Compliant with PCI v2.1 specification.
- Auto-configured by PCI BIOS.
- Interrupt line (INTA) may be shared by multiple host adapters.
- Occupies 128 bytes of I/O space.
- FIFO's support full speed PCI transfers.
- Power + 5V @ 200 mA.
- Operating temperature range 0C to 55C
- Non-operating temperature range -2C to 60C
- Humidity non-condensing 0% to 95%
- Regulatory Approvals:
  - FCC Class A.
  - FCC Class B, CE
  - EN55022/EN50082-1, CE

## EasyIO Rev 1 & 2

- ISA 8 bit I/O interface
- 12.5 MHz CD1400 RISC I/O processors
- Up to 8 boards per system (64 ports maximum)
- Software selectable interrupt level
- Programmable edge and level-mode interrupts
- I/O address window 8 bytes, 200-3EFh, via switch settings
- No memory address window required
- Operating temperature range 10C to 33C
- Non-operating temperature range -2C to 60C
- Humidity non condensing 20% to 80%

