# JFW Industries, Inc.

# 50SA-181 MANUAL

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## Additional Documents Provide with Manual:

1. Mechanical Outline Drawing
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# 1. Introduction

## 1.1 Description

The JFW model 50SA-181 is switch assembly comprised of four 1P2T failsafe electro-mechanical switches. When the unit is powered up, the 1P2T switches are set port J1. The unit is controlled remotely via Ethernet or RS-232. The unit is manually controlled on the front panel using the keypad and LCD display. In Ethernet mode, up to 4 users can simultaneously connect to the test system.

In addition to this manual a CD is also provided. The CD contains the following:
1) Manual
2) Specification Sheet
3) Outline Drawing
4) JFW Test Program

## 1.2 Mechanical Specifications

The 50SA-181 is designed in a bench top style enclosure. The outline drawing details all necessary package dimensions and connector layouts. The unit is AC powered via a 3-prong receptacle on the rear panel. A standard power cord is supplied with the unit. The power supply itself is a universal AC power supply that can handle input AC voltages 100-240 VAC (47-63 Hz).

The 50SA-181 is AC current protected by use of a 2 Amp "Slo-Blo" AC fuse. The fuse is field replaceable in the event of any failure to the fuse. The fuse itself is a 5x20 mm "Slo-Blo" type fuse and is stocked by JFW (JFW #025-021, Littelfuse#215-002).

## 1.3 Front Panel Display

If the slide switch on the rear panel is set to Ethernet mode when the unit is powered on, then the LCD will display the text ***Ethernet Mode***. When a valid Ethernet connection to the unit has be made (using the correct IP address and port number), the text ***1 User Connected*** will be displayed. When the connection is closed, the text will be update to read ***0 Users Connected***.

If the slide switch on the rear panel is set to RS-232 mode when the unit is powered on, then the LCD will display the test ***RS-232 Mode***. The current baud rate setting will also be displayed on the LCD. When the unit receives the Change Baud Rate remote command, the new baud will be immediately displayed.

# 2. Manual Mode

## 2.1 Switching Modes

If the unit is connected remotely to a user in Ethernet mode and you switch to manual mode using the *Manual/Remote* button, the unit will close that Ethernet connection before starting manual mode. While in manual mode, no remote Ethernet connections are allowed.

If the unit is in RS-232 mode and you switch to manual mode, the unit will stop executing RS-232 commands that it receives. When you switch back from manual mode to RS-232 mode, all RS-232 commands that were received while in manual mode are deleted from the receive buffer.


## 2.2 Using the Keypad

Manual control is based on the location of the "**>**" cursor on the left side of the LCD. The cursor indicates which line you are currently on. You may switch between the different lines with the Up and Down arrows located on the left side of the LCD. When the ">" cursor is on the *SWITCH* line, the switch address may be changed. When the ">" cursor is on the *Port* line, the port value may be changed.

Both the switch address and the port settings can be changed by using the number buttons (0-9) or the "+" and "-" buttons. Using the "+" and "-" keys while on the *SWITCH* line is a convenient way to quickly scroll through all of the current port settings.

The JFW logo on the keypad is also a button. If you press the logo button, the current revision level of the firmware will be display. The information will be displayed for 8-9 seconds, then return to the main menu automatically.

# 3. RS-232 Mode

## 3.1 Overview

This unit is RS-232 controlled via a standard 9-Pin D connector on the rear of the unit that is labeled "RS-232". The test system must be in RS-232 mode for the RS-232 port to be active. The remote command format and examples can be found in the *JFW Command Set* section of this manual. The command formats are the same for both RS-232 and Ethernet control. If commands are sent incorrectly to the unit, you will receive error messages.

The baud rate can be set at 9600, 19200, or 38400. The current baud rate is displayed on the front panel by the LCD. To change to a different baud rate, the remote command *Change Baud Rate* must be sent. This remote command is fully described in the *JFW Command Set* section of this manual.

The slide switch on the rear panel allows the user to select between Ethernet and RS-232 modes. Set the slide switch to the desired mode and turn the unit off. When the unit is turned on, it will boot up in the selected mode.

## 3.2 RS-232 Cable

Included with the system should be one "Null Modem" cable (JFW part #012-174). This cable is used to interface with the RS-232 Port. This cable is DE-9P to DE-9S and is the "Null Modem" type. The female connector will plug into the serial port on most PC's, and the male connector will connect to the "RS-232 Port" of the 50SA-181.

## 3.3 RS-232 Port Settings

When sending commands to the 50SA-181, your computer's RS-232 port settings must be configured as follows. The baud rate must be set at 9600, 19200, or 38400. The parity must be set to "none". The data length must be set to "8" data bits. The stop bit must be set to "1". If your RS-232 port is not configured with these settings, the 50SA-181 will not receive and execute the commands sent. It will not send back an error either, because communication was never established.

| | |
|---|---|
| BAUD RATE | 9600 (or 19200, 38400) |
| PARITY | none |
| DATA LENGTH | 8 bits |
| STOP BITS | 1 |
| FLOW CONTROL | none |

# 4. Ethernet Mode

## 4.1 Overview

The 50SA-181 is Ethernet controlled via a standard RJ-45 Ethernet connector on the rear of the unit. The Ethernet port is a 10/100Base-T port that follows TCP/IP protocol. The remote command format and examples can be found in the *JFW Command Set* section of this manual. The command formats are the same for either Ethernet or RS-232 control. If commands are sent incorrectly to the unit, you will receive an error message.

The slide switch on the rear panel allows the user to select between Ethernet and RS-232 modes. Set the slide switch to the desired mode and turn the unit off. When the unit is turned on, it will boot up in the selected mode.

## 4.2 Multiple Ethernet Connections

The firmware for 50SA-181 allows for multiple Ethernet connections. There can be up to 4 users connected to the test system simultaneously. All users will connect to the test system using the same IP address and port number. When you send the identification command (IDN), it will send back an ASCII message that includes the number of current Ethernet connections to the test system.

All commands sent to the test system are stored in a receive buffer. Each command is executed sequentially until there are no more remote commands in the receive buffer. It takes about 1 millisecond for the firmware to process a *Set Switch* or *Read Switch* remote command.

# 5. Ethernet Configuration

This 50SA-181 comes configured with the following Ethernet settings.

I.P. Address **192.168.1.225**
Gateway **192.168.1.1**
Netmask **255.255.255.0**
Port **3001** (hard-coded into the unit and can not be changed)

In order to configure the IP settings, the test system must be in Ethernet mode. Use the Null Modem cable (JFW part #012-174) supplied with the test system to make the physical connection from your COM port to the "Ethernet Config. Port" on the rear panel. Open up a terminal session through your computer's COM port using a program like HyperTerminal. The terminal session should use the following COM port settings:

Baud Rate: 9600
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control: None

The four commands listed below are used to change the IP properties. When the commands have been executed, the test system will send back an ASCII message. See the example session in the next section.

| | |
|---|---|
| SET IP xxx.xxx.xxx.xxx | Changes the I.P address |
| SET NETMASK xxx.xxx.xxx.xxx | Changes the Netmask |
| SET GATEWAY xxx.xxx.xxx.xxx | Changes the Gateway |

After you have changed the IP settings, you can verify the changes using the *Show* and *Show Eth0* commands. After these commands are sent, the test system will echo back an ASCII message that shows all of the updated settings. See the example in the next section.

| | |
|---|---|
| SHOW | Displays the Gateway setting |
| SHOW ETH0 | Displays IP address and Netmask settings |

# 6. Ethernet Configuration Session

This is a sample Ethernet configuration session that show step by step how to configure the Ethernet settings. It shows the commands that are sent and the response of the test system.

The current settings are: IP address **192.168.1.222**
Gateway **192.168.1.2**
Netmask **255.255.255.2**
Port **3001** (hard-coded in system and can't be changed)

The new settings will be: IP address **192.168.1.250**
Gateway **192.168.1.1**
Netmask **255.255.255.0**
Port **3001** (hard-coded in system and can't be changed)

Step 1: Position the slide switch on the back panel to Ethernet mode.

Step 2: Turn on the power to the test system. The test system is now in Ethernet mode.

Step 3: Connect the Null modem cable from you computer's serial port to the port on the test system labeled "Ethernet Config. Port".

Step 4: Open a terminal program (such as Hyperterminal for Windows) and configure the serial settings to 9600 Baud, 8 data bits, no parity, 1 stop bit, no flow control.

Step 5: You are now ready to send commands to configure the Ethernet port. Text that you type is shown below in bold. The <enter> is the enter key on your keyboard.

```
help <enter>

TCP/IP User Block Console Version 1.1

Available commands: (type "help <command>" for more info)
echo            - Turn on or off echoing of characters.
set             - Configure various options.
add nameserver  - Add a nameserver to the current l
mail            - Send an e-mail.
show            - Show current configuration.
help            - This help screen.
OK

show <enter>

Current Configuration:
      I/O Parameter:  9600
      Gateway:        192.168.1.2
      Name Servers:
      Mail Server:
      Mail From:      user@somewhere.com
      Interfaces:     ETH0
OK
```

**show eth0 <enter>**

```
Current ETH0 Configuration:
      Status:                up
      IP Address:            192.168.1.222
      Netmask:               255.255.255.2
      MTU:                   600
      Ping Config:           off
      Ping Config Done:      no
OK
```

**set ip 192.168.1.250 <enter>**

```
IP address set to: 192.168.1.250
OK
```

**set netmask 255.255.255.0 <enter>**

```
Netmask set to: 255.255.255.0
OK
```

**show eth0 <enter>**

```
Current ETH0 Configuration:
      Status:                up
      IP Address:            192.168.1.250
      Netmask:               255.255.255.0
      MTU:                   600
      Ping Config:           off
      Ping Config Done:      no
OK
```

**set gateway 192.168.1.1 <enter>**

```
Gateway set to: 192.168.1.1
OK
```

**show <enter>**

```
Current Configuration:
      I/O Parameter:  9600
      Gateway:        192.168.1.1
      Name Servers:
      Mail Server:
      Mail From:      user@somewhere.com
      Interfaces:     ETH0
OK
```

# 7. JFW Command Set

The following command set is used for both Ethernet mode and RS-232 mode. The command set consists of the following commands:



If you send a remote command to the unit that is not properly formatted, you will receive one of the following error messages.

**Error1** **Command is formatted incorrectly.**
This error occurs if a command does not follow it's proper command syntax.

**Error2** **Switch address out of range.**
This error occurs if the switch address is not 1-4.
There are 4 total RF switches in this test system.

**Error3** **Port value out of range.**
This error occurs when the port value is out of range.
Switches are 1P2Ts. Valid port settings are 1-2.

## 7.1 Identification Command

Syntax: **IDN<CR>**
<CR> = carriage return

Description: This command returns the identification information for the test system and is followed by a carriage return and a line feed. It includes the firmware revision level. In Ethernet mode, it will also include how many Ethernet connections are currently established with the test system.

Examples: **IDN<CR>**
In RS-232 mode, the following will be sent back to the user:
"**JFW Industries Inc., Model 50SA-181, Firmware Rev 0<CR><LF>**"

**IDN<CR>**
In Ethernet mode when three users are connected, the following will be sent:
"**JFW Industries Inc., Model 50SA-181, Firmware Rev 0<CR><LF>**"
"**Current Ethernet Connections = 3<CR><LF>**"

Notes: Command is not case sensitive, but must be terminated by a carriage return.

## 7.2 Change Baud Rate Command

Syntax: **CBx<CR>**
x = new baud rate
<CR> = carriage return

Description: This command changes the baud rate of the test system. After receiving the command, the unit will reboot and start up at the new baud rate. The baud rate is stored in memory so that the test system will start up at the new baud rate if the unit looses power.

| | | |
|---|---|---|
| Examples: | **CB9600<CR>** | Changes the baud rate to 9600 baud |
| | **CB19200<CR>** | Changes the baud rate to 19200 baud |
| | **CB38400<CR>** | Changes the baud rate to 38400 baud |

Notes: "x" must be either 9600, 19200, or 38400.
Command is not case sensitive, but must be terminated by a carriage return

## 7.3 Disconnect Command

Syntax: **DIS<CR>**
<CR> = carriage return

Description: This command causes the test system to close the existing Ethernet connection. This command is only used while in Ethernet mode.

Examples: **DIS<CR>**
The message "**50SA-181 Connection Closing**" is sent back to the user.
Then, the Ethernet connection is be closed.

Notes: Command is not case sensitive, but must be terminated by a carriage return.

## 7.4 Close Command

Syntax: **CLOSE<CR>**
<CR> = carriage return

Description: This command causes the test system to close all other user's Ethernet connections to the test system, but leaves your Ethernet connection open. This command is only used while in Ethernet mode.

Example: Four users are connected to the test system. Send an IDN to verify.

**IDN<CR>**
"**JFW Industries Inc., Model 50SA-181, Firmware Rev 0<CR><LF>**"
"**Current Ethernet Connections = 4<CR><LF>**"

**CLOSE<CR>**

Sending the close command will disconnect the other 3 users and leave you as the only Ethernet connection. Send an IDN to verify.

**IDN<CR>**
"**JFW Industries Inc., Model 50SA-181, Firmware Rev 0<CR><LF>**"
"**Current Ethernet Connections = 1<CR><LF>**"

Notes: Command is not case sensitive, but must be terminated by a carriage return.

## 7.5 Set Switch Command

Syntax: **SSx y<CR>**
x = switch number
y = port value
<CR> = carriage return

Description: This command sets switch "x" to port "y".

Examples: **SS1 1<CR>** Sets switch #1 to port J1.
**SS1 2<CR>** Sets switch #1 to port J2.

Notes: "x" must be 1-4 (There are 4 total switches in this test system).
"y" must be 1-2 (There are 2 ports)
Command is not case sensitive, but must be terminated by a carriage return.

## 7.6 Read Switch Command

Syntax: **RSx<CR>**
x = switch address
<CR> = carriage return
<LF> = line feed

Description: This command returns the port setting for switch "x".

Examples: **SS1 1<CR>** Sets switch #1 to (J1).
**RS1<CR>** Reads back port value of switch #1.
Sends back "**Switch #1 = J1<CR><LF>**".

**SS2 2<CR>** Sets switch #2 to port J2.
**RS2<CR>** Reads back port value of switch #2.
Sends back "**Switch #2 = J2<CR><LF>**".

Notes: "x" must be 1-4 (there are 4 total switches in this test system).
Command is not case sensitive, but must be terminated by a carriage return.

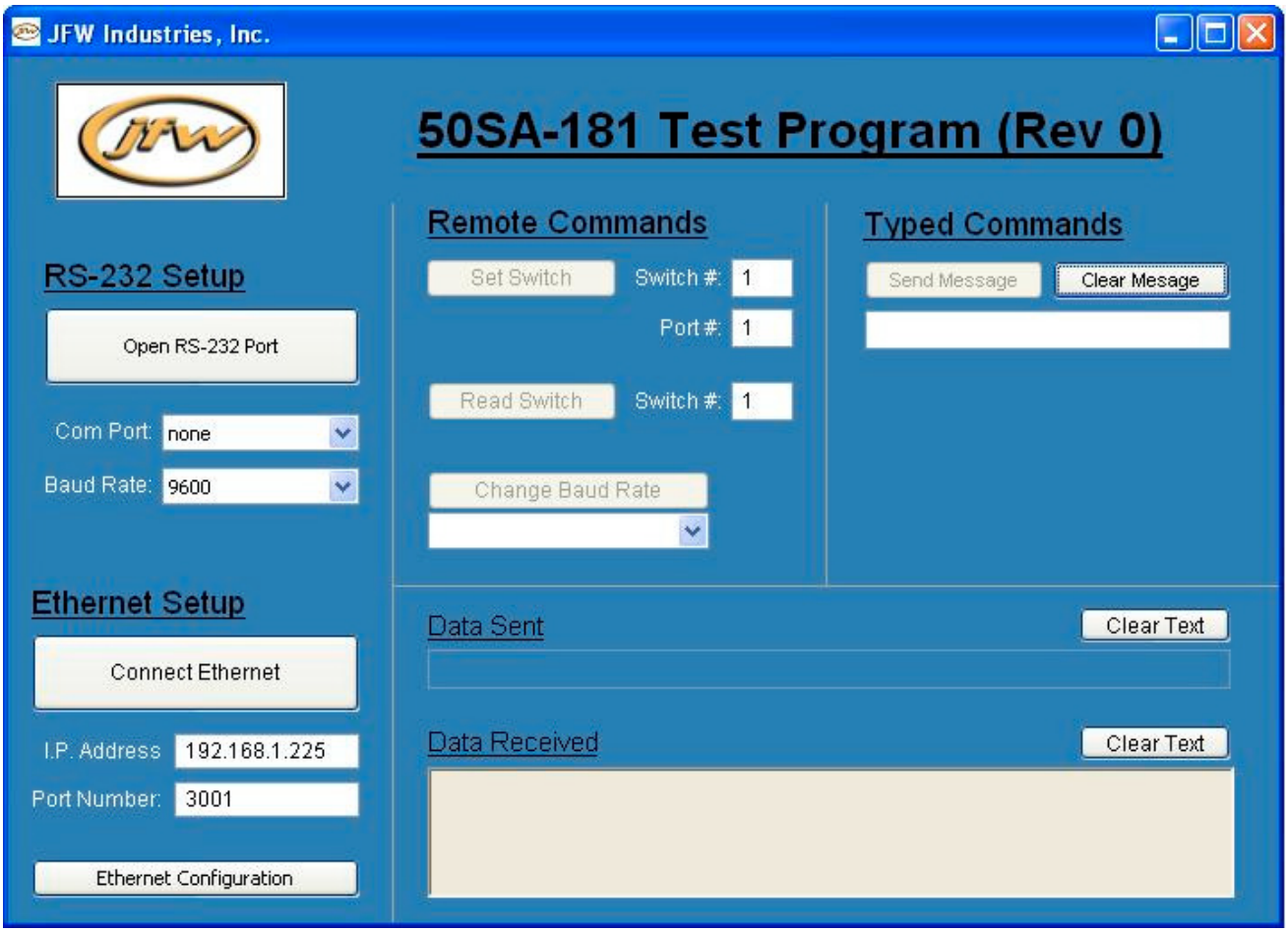
# 8. JFW Test Program

No installation program needs to be run in order to use the JFW test program. Just copy the executable file located on the CD that is provided with this manual onto any location on your computer.

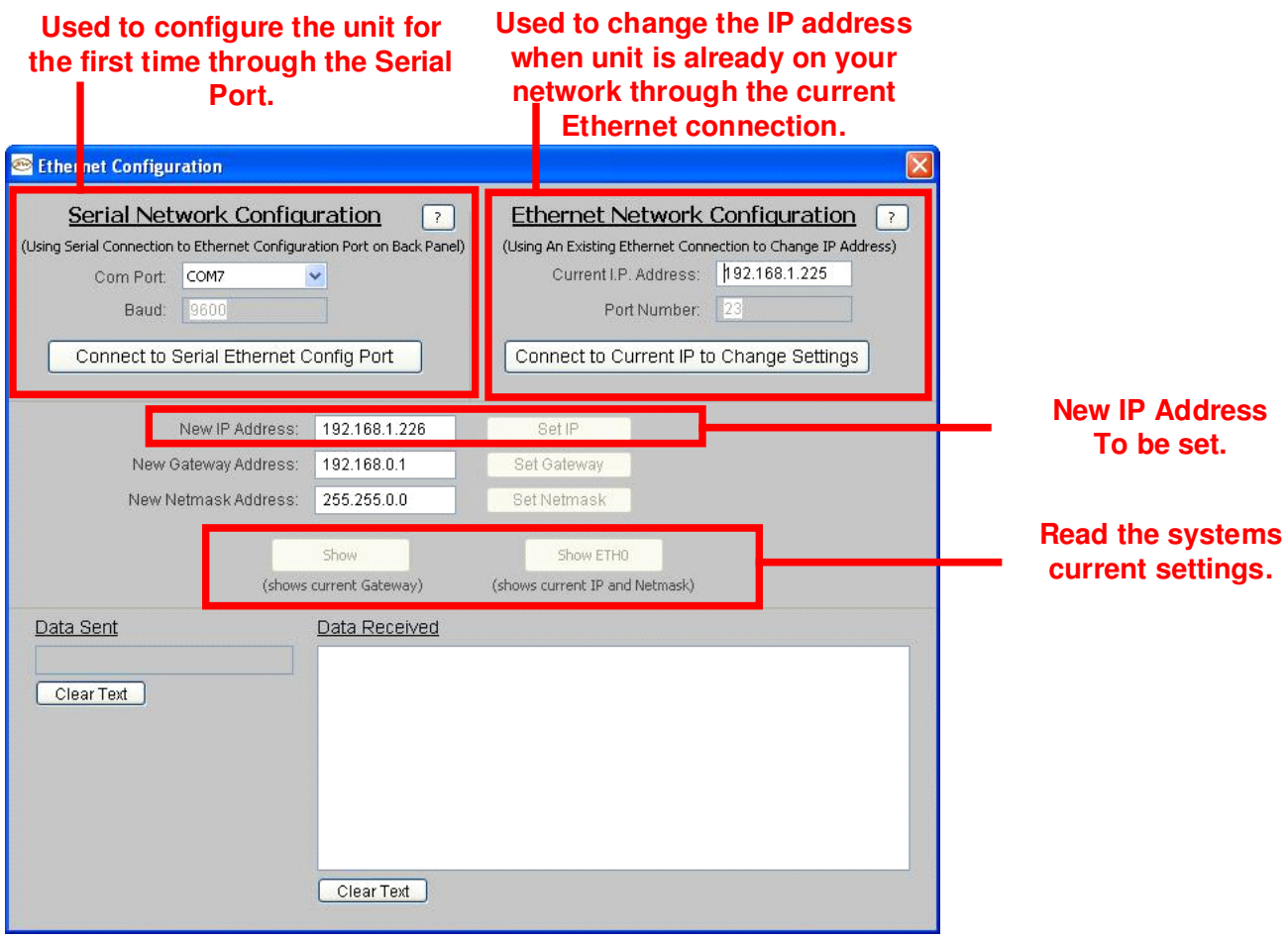
While using the program, you will see the commands you send displayed in the "Data Sent" window and any response from the test system in the "Data Received" window.

## Typed Command

Allows you to send any ASCII message you want to the test system. Just type your message in the text box and click on the Send Message button. Your Message is displayed in the "Data Sent" window.



# Ethernet Configuration with JFW Test Software




Ethernet Configuration can be done using the provided JFW Test Software. When the unit is tested here at JFW we set it up on a standard 192.168.1.1 network so depending on your own network settings, you may not immediately be able to connect to the test system.
If this is the case you will first need to change the network settings of the unit serially via the serial "Ethernet Config" port on the rear panel of the unit.

1) Open the Ethernet Configuration window of the test program, located below the Ethernet Connection section.
2) From here, select the COM Port you have connected to the "Ethernet Config" RS-232 connector on the rear panel in the drop-down box under Network Configuration, and click "Connect to Serial Ethernet Config Port" button.

The three Set buttons should activate, allowing you to now reprogram the IP Address, Gateway, and Netmask below. The Show and ShowETH0 buttons allow you to read the current settings of the unit.

**4)** Once the Gateway and Netmask have been programmed to your network, you should be able to connect to the unit at the IP you selected. At this point you may change the IP address via Ethernet by connecting to it on port 23 under the Change Current IP Address section. Only the IP address can be changed via Ethernet however.

# 9. FAQ's

If you are reading this page because you are having problems with a JFW test system, please contact JFW at **317-887-1340** or **sales@jfwindustries.com**. One of our engineers would be more than happy to help you troubleshoot the unit and get you back on track.

**Why is the unit not responding to my Ethernet port configuration commands?**
The Ethernet is configured using the "Ethernet Config. Port" on the back panel. It is a RS-232 port. You must use a Null Modem type RS-232 cable. You must use the following RS-232 port settings with this port: baud rate (9600), data bits (8), parity (none), stop bits (1), flow control (none).

**How do I find out the revision level of my firmware?**
Right after the unit is powered on, the firmware revision level is displayed on the LCD. The firmware revision level is also included with the information sent back from an "identification" remote command. In manual mode, you can press the JFW logo on the keypad. The JFW logo is a button that will display the firmware revision level.

**I just switched from Ethernet mode to RS-232 mode using the switch on the back panel, but I am still in Ethernet mode. Why did the mode not change?**
You must turn the unit off and then back on for the change to take affect.

**Why won't the unit respond to my Ethernet commands?**
Verify the following settings: IP address, Gateway, Netmask, and Port Number. Remember that the Port Number is hard-coded to 3001 and can not be changed. Check your command format in the "Remote Command Set" section of this manual.

**Why won't the unit respond to my RS-232 commands?**
Verify the following RS-232 settings: baud rate, parity (none), data bits (8), and stop bits (1). The current baud rate is displayed on the front panel by the LCD. Check you command format in the "Remote Command Set" section of this manual.

**Why don't I get a response from the unit when I send the remote command "RS1"?**
All remote commands must be terminated with carriage returns. Attach a carriage return to your command string right after the "1".