Model VSA-31-IP

IP to Dual RS232 Controller

For use with Hall Research Switch-Cat® products

VSA-31-IP

SUPPORT & ORDERING INFORMATION

For technical support, Call **714-641-6607** or fax **714-641-6698**
Order by phone: **toll-free** in the U.S. **800-959-6439**
Web site: **www.hallresearch.com**
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UMA 1166 Rev. B

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This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been designed to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at there own expense will be required to take whatever measures may be necessary to correct the interference.
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

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Hall Research Inc.

Home of the Mini-Cat®

1. Introduction

1.1 General

The model VSA-31-IP is a member of Hall Research powerful RS232 product line. The unit allows the user a flexible interface to perform the following functions:

- Monitor the RS232 communication between 2 serial devices from a remote LAN connection
- Independently send and receive RS232 signals to separate serial devices from a remote LAN connection at any speed
- Timeout feature - Default back to a standard communication path after 3 minutes to ensure that the 2 serial devices are always connected
- Detect connection to RS232-A port from a remote LAN connection without disturbing the communication between RS232-A and RS232-B

When the VSA-31-IP is used to add IP capability to a classroom equipped with Hall Research Switch-Cat® system, it is inserted in the RS-232 path between the VSA-31 Receiver and the Projector. It draws power from the VSA-31 Receiver and includes the cable for connection to the VSA-31 Receiver.

Figure 1 – Typical Setup

1.2 Features

- Dual RS232 Ports
- Supports all Serial baud rates, parity and data bits
- 10/100 Base-T Ethernet ready
- User selectable IP Address, MAC, Gateway and Net Mask
- 2 LED's for indication of Power, IP-to Serial Routing, and/or Ethernet Status
- Detect serial device connected to RS232-A port without disturbing the serial communication. (Theft Detection or Power Loss)
- Can be inserted in-line to silently monitor RS232 communication between RS232-A ◄► RS232-B ports from a remote LAN connection
- Communication path is selectable between RS232-A ◄► RS232-B , IP ◄► RS232-A or IP ◄► RS232-B
- Can be powered from the RS232 (B side) port or from optional external Power Supply
- Includes F/F DB9 null modem cable for connection to the VSA-31 Receiver
- Compact Size
- Made in USA

2. Installation

2.1 Connecting the Unit

Refer to Figure 1 and 2 below for connector identification.

Connect the “RS232-A” and the “RS232-B” ports to the serial devices using appropriate cables (for example, since the VSA-31 Receiver has a DB9 Male connector, a Female/Female RS-232 NULL Modem cable should be used).

Connect the “LAN” port to a network Ethernet connection using standard CATx cables (not supplied with unit)

Connect the “PWR” jack to the power supply (optional) or connect the unit to a Hall Research compatible device capable of powering the unit via the RS232-B port using the supplied RS232 Null Modem cable.

Figure 2 – End Panel Views

Figure 3 – Top View

2.2 Connector Pin Out

RS-232-A Connector: This 9-pin D-sub connector is normally used to connect to the "Controlled" device, such as a Projector (though any serial device is acceptable).

RS-232-A PORT		Direction To/From Unit
PIN	Definition	
2	RxD	←
3	TxD	→
5	GND	
7	RTS	Pulled High

RS-232-B Connector: This 9-pin D-sub connector is normally used to connect to the "Controller" device, such as a VSA-31 Receiver (though any serial device is acceptable). This connector can also be used to power the VSA-31-IP unit. The power source must be capable of 12-15 vDC @ 250 mADC minimum.

RS-232-B PORT		Direction To/From Unit
PIN	Definition	
2	RxD	←
3	TxD	→
4	DTR	Pulled High
5	GND	
6	PWR IN	12-15 vDC 250 mADC
7	RTS	Pulled High

PWR connector: This is a standard 2.5mm plug connection. The unit's power supply is 12-15 volts DC with a minimum rating of 250 mADC. Upon application of power from the 2.5mm PWR connector or by the RS-232-B Pin 6, the 10/100 and Status LED's will either blink or become illuminated solid. Refer to Section 2.2 for a description of the LED functions.

LAN connector: This is a standard RJ-45 Ethernet connection capable of be connected to any 10/100 BaseT network.

2.3 Indicators

The VSA-31-IP has one RED and one GREEN LED. The function of each LED is changed depending on the mode of operation, Ethernet connection status and power status.

	10/100 (GREEN)	Status (RED)	RS232 Path	Time Limit
No Power Applied to Unit	OFF	OFF	NONE	NONE
Power Applied, but no Ethernet connection	Slow Blink	Slow Blink	RS232-A to RS232-B	None
Power Applied, Ethernet Connection achieved	ON (LAN 10/100 Status)	ON (LAN Status)	RS232-A to RS232-B	None
Connection: RS-232-A to LAN	ON (LAN 10/100 Status)	Fast Blink	RS232-A to LAN	3 Minutes (if IP fails to restore A<>B connection)
Connection: RS-232-B to LAN	Fast Blink	ON (LAN 10/100 Status)	RS232-B to LAN	3 Minutes (if IP fails to restore A<>B connection)

3. Configuration

3.1 Ethernet Configuration

The Ethernet configuration of the VSA-31-IP must be correctly setup in order for the end user to be able to communicate with the device across the network. Incorrect configuration will result in the user not being able to communicate with the device. The VSA-31-IP comes from the factory with a default configuration setup in the unit as follows:

IP Address: 192.168.123.199
Gateway:.....192.168.123.1
Net Mask:.....255.255.255.0

If the configuration of the end users LAN is compatible with these default settings, then the user is not required to make changes to the Ethernet Configuration.
If the configuration is not compatible, use the Hall Research DS Manager to change the unit's configuration.
Set the IP Address to any STATIC unused address available on the end-users network. This IP Address of the VSA-31-IP must be in the same node as any computer attempting to access the device. If the computer attempting to access the device is on another network node, then the end-user is responsible for configuring any network routers or switches necessary to allow access to the devices IP

Address on Ports 23 and 1001. Contact your network IT administrator for assistance with these settings.
Set the Gateway Address to the required IP Address of the end-users Gateway. If the end-user will always access the VSA-31-IP device from a computer connected on the same network node, then the Gateway Address may be left at its default value. Contact your network IT administrator for assistance with these settings.
Set the Net Mask to the required values compatible with the end-users network. If the end-user will always access the VSA-31-IP device from a computer connected on the same network node, then the Net Mask may be left at its default value. Contact your network IT administrator for assistance with these settings.

3.2 Serial Configuration

At Power-Up, the VSA-31-IP makes a default connection from the RS-232-A port to the RS-232-B port.
In this mode, all communication between the RS-232-A and RS-232-B port is transmitted to the LAN connection on the VSA-31-IP units IP address, Port 1001. No information transmitted from the LAN connection will be sent to the RS-232-A or RS-232-B ports.
All communication through the LAN Port must occur at whatever baud rate, parity, data bits and stop bit used by the RS-232-A and RS-232-B ports.
In order to communicate with the VSA-31-IP via the LAN, the unit must be configured to operate at the same baud rate, parity, data bits and stop bit settings being used by the devices connected to the RS-232-A and RS-232-B ports.
If you will not be communicating via the LAN to the VSA-31-IP unit, then the end-user does not need to change anything.
The VSA-31-IP serial parameters may be altered by the following methods:

- Use the Hall Research VSA-31-IP Software GUI
- Use the Hall Research DS Manager to change the related parameters
- Use a HyperTerminal TCP connection to the IP Address on the VSA-31-IP using a Telnet connection to Port 23 using the appropriate commands.

The VSA-31-IP also has the ability to communicate bi-directionally from the LAN port to the RS-232-A port or the LAN port to the RS-232-B port.
Any information transmitted to the unused RS-232 port is discarded.
To change the direction of the communication, the end-user is required to control 3 I/O lines via the VSA-31-IP IP Address Port 23.
In this mode, the end-user has a time limit of 3 minutes from the time the connection is changed from the default RS-232-A to/from RS-232-B path. The time limit starts whenever the VSA-31-IP units P1 line is set from “0” to “1”. If more than 3 minutes is required to communicate on the LAN port, the end-user is responsible for toggling the VSA-31-IP unit P1 line from “0” to “1” (if using Hall Research VSA-31-IP Software GUI, this is done automatically) .

4. Operation

4.1 RS-232-A to/from RS-232-B with LAN Monitoring

At power-up, the VSA-31-IP unit defaults to a RS232-A to/from RS232-B path. Communication occurs without user intervention at whatever baud rate, parity, data bits and stop bits used by the devices connected to the RS-232-A and RS-232-B ports.

All communication along the RS-232-A and RS-232-B path is echoed to the IP Address of the VSA-31-IP on Port 1001. This communication can be monitored using a HyperTerminal TCP connection.
The baud rate, parity, data bits and stop bits of the VSA-31-IP unit must match the settings of the devices communicating on the RS-232-A and RS-232-B ports.

The VSA-31-IP unit Serial Parameters may be altered by the following methods:

- Use the Hall Research VSA-31-IP Software GUI
- Use the Hall Research DS Manager to change the related parameters
- Use a HyperTerminal TCP connection to the IP Address on the VSA-31-IP using a Telnet connection to Port 23 using the appropriate commands.

4.2 RS-232-A to/from LAN

In order to command the VSA-31-IP unit to communicate on the **RS-232-A to LAN path**, the VSA-31-IP unit must be told to create that connection path by configuring the units P0 and P1 lines (if using Hall Research VSA-31-IP Software GUI, this is done automatically).
Set “P0” to Low (0)
Set “P1” to High (1)
Set “P1” to Low (0)
Set “P1” to High (1)
The Status (RED) led will flash quickly and the 10/100 (GREEN) led will be ON.

The **LAN and RS-232-A** port will now communicate at whatever serial parameter settings have been configured. Obviously, the device connected to the RS-232-A port and the LAN must have the same settings for the communication to be meaningful.

There is a 3 minute time limitation in this state before the VSA-31-IP unit will change automatically to the default (RS-232-A to/from RS-232-B) path.

4.3 RS-232-B to/from LAN

In order to command the VSA-31-IP unit to communicate on the **RS-232-B to LAN path**, the VSA-31-IP unit must be told to create that connection path by configuring the units P0 and P1 lines (if using Hall Research VSA-31-IP Software GUI, this is done automatically).
Set “P0” to Low (1)
Set “P1” to High (1)
Set “P1” to Low (0)
Set “P1” to High (1)
The 10/100 (GREEN) led will flash quickly and the Status (RED) led will be ON.

The LAN and RS-232-B port will now communicate at whatever serial parameter settings have been configured. Obviously, the device connected to the RS-232-B port and the LAN must have the same settings for the communication to be meaningful.

There is a 3 minute time limitation in this state before the VSA-31-IP unit will change automatically to the default (RS-232-A to/from RS-232-B) path.

The following table shows the different configurations possible using the VSA-31-IP unit's P0, P1 and P8 lines.

RS232 Connection	10/100 & Status LED's	PO	P1	P6	P8	Notes
At POWER UP NO IP Connection	Both Red & Green LED's Flash @ ~1.3 Hz					A ◄—►B communication possible, but none thru IP. No time limitation
AT POWER UP A ◄—►B IP 'Sniffs'	Both Red & Green LED's Reflect Ethernet Connection Status	X (Don't Care) DEFAUL T = 1	X (Don't Care) DEFAUL T = 1	Low = RS232 A Active High = RS232 A In-Active	High = Use JP1 Low = Ignore JP1	A ◄—►B communication possible, IP (Port 1001) sees the communication at whatever baud rate is being used by A & B. No time limitation
A ◄—►B IP 'Sniffs'	Both Red & Green LED's Reflect Ethernet Connection Status	X (Don't Care)	0	Low = RS232 A Active High = RS232 A In-Active	High = Use JP1 Low = Ignore JP1	A ◄—►B communication possible, IP (Port 1001) sees the communication at whatever baud rate is being used by A & B. No time limitation
A ◄—►IP	Red 10/100 Led Flashing @ 3 Hz Green Status Led reflects Ethernet Connection Status	0	1	Low = RS232 A Active High = RS232 A In-Active	High = Use JP1 Low = Ignore JP1 Set LOW to disable 3 Minute Time Limitation	A ◄—►IP communication possible, IP (Port 1001) sees the communication at whatever baud rate is being used by A. 3 Minute time limitation for each P1 Rising Edge Transition
B ◄—►IP Green STATUS Led Flashing @ 3 Hz	Green Status Led Flashing @ 3 Hz Red 10/100 reflects Ethernet Connection Status	1	1	Low = RS232 A Active High = RS232 A In-Active	High = Use JP1 Low = Ignore JP1 Set LOW to disable 3 Minute Time Limitation	B ◄—►IP communication possible, IP (Port 1001) sees the communication at whatever baud rate is being used by B. 3 Minute time limitation for each P1 Rising Edge Transition

4.4 DS Manager

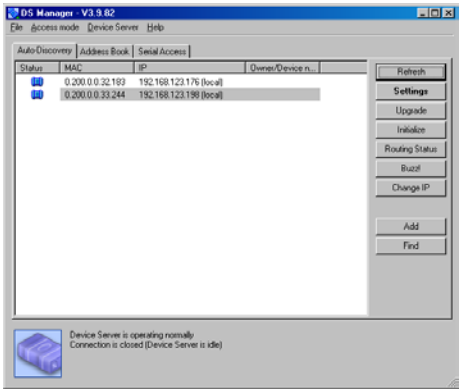
When the Hall Research DS Manager is run, a window is shown that displays all of the IP equipped devices reachable in the same network node.

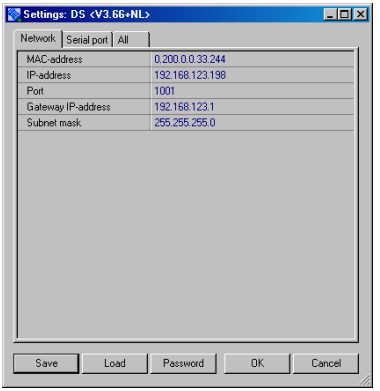
If no devices are displayed, you must click the “REFRESH” button to update the window. If you still see no IP equipped devices, check with your IT administrator to ensure that all the proper network routings are in place.

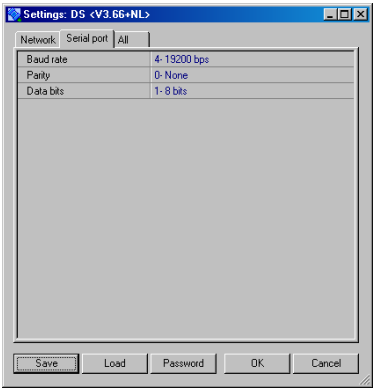
The user must select the desired device and click the “SETTINGS” button to obtain access to that device’s configurable parameters.

To change a parameter, click on the field next to the parameter’s name and enter the appropriate information.

Click the OK button when finished and the information will be uploaded into the VSA-31-IP module. There will be a short time delay while the VSA-31-IP module reboots.







4.4 Software GUI

The VSA-31-IP Software GUI allows the end-user to monitor and control multiple VSA-31-IP modules from one computer via a LAN connection.

The VSA-31-IP Software GUI has separate documentation describing its usage and operation. Refer to http://www.hallresearch.com/page/Products/VSA-31-IP for the latest documentation pertaining to the VSA-31-IP and the Software GUI.

The computer must be able to access the VSA-31-IP modules IP Address from the computer location the Software GUI is being executed on. If you can not ping the VSA-31-IP modules IP Address then you will not be able to control or monitor the modules status.

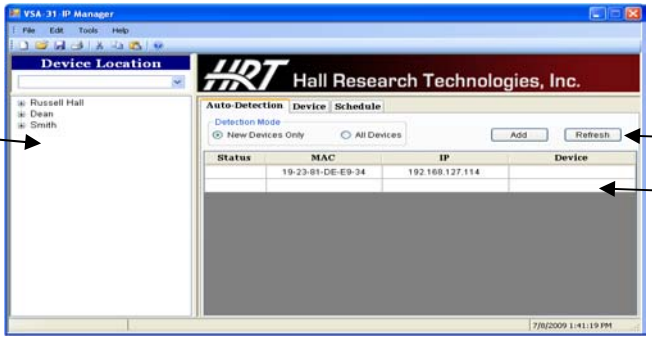
The software GUI contains a list of the VSA-31-IP MAC and IP Addresses so that it can communicate with each module and ultimately control the devices connected to the RS-232-A and RS-232-B ports.

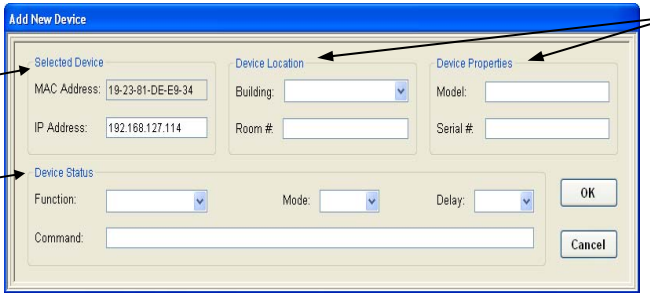
Use the Hall Research DS Manager to configure each module that will be used in the system and make note of **Each Units** IP address and MAC address. Each MAC and IP address **MUST BE UNIQUE** for proper LAN communication. The information for each VSA-31-IP module must be entered into the Software GUI so that device can be located via the network LAN.

The commands that will be sent to the RS232 devices are unique and must be entered correctly in order to get a specific response from that device. The following commands are required and must be supported by the devices connected to the VSA-31-IP module.

- **Lamp Hours**
  - This command requests the RS232-A device to return the current number of hours the devices LAMP has been illuminated
- **Power Status**
  - This command requests the RS232-A device to return the status of whether it is turned on or off

The figures below show screens that could be only similar to the actual Software GUI screens. Refer to http://www.hallresearch.com/page/Products/VSA-31-SP for the latest updates concerning the VSA-31-IP Software GUI





4.5 Access via Port 23 and Port 1001

A HyperTerminal TCP/IP connection can be used to access either PORT 23 or 1001.

- Port 1001 is used for the RS232 communication through the VSA-31-IP. All communication occurs at the baud rate of the devices attached to the RS-232-A and RS-232-B ports. The LAN connection Baud Rate must match the speed being used by the RS232 ports for meaningful communication to occur.

- Port 23 is used to change specific parameters in the VSA-31-IP module such as its IP Address, Gateway Address, Baud Rate…etc.

To run a HyperTerminal window, open the application and set it up for TCP/IP connection on PORT 23 along with the VSA-31-IP IP address as the host address.

Commands to PORT 23 have the following format and replies:

STX	Command/Reply	CR

- STX character (ASCII code 0x02 or CTRL-B from the keyboard)

The unit will respond with the following codes indicating the status of the command requested. Anything other than 'Accepted' indicates a problem with that command/connection to the VSA-31-IP Module:

<^B>A means Accepted
<^B>C means Error
<^B>R means Rejected
<^B>D means Denied
<^B>F means Failed
<^B>S means Bad Sequence

In the following table, the following notations are used:

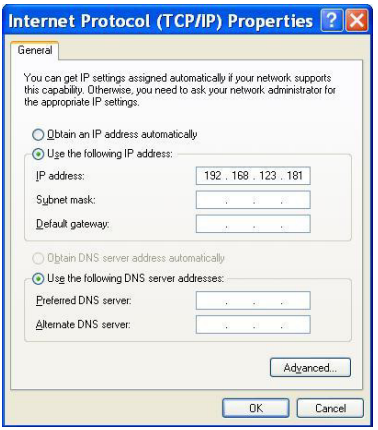
<^B> denotes the STX Character, 1 Byte of 0x02
<CR> denotes the CR Character, 1 Byte of 0x0D

Command	Purpose	Reply	Notes
<^B>L<CR>	Log Into Module	<^B>A<CR>	
<^B>O<CR>	Log Out of Module	<^B>A<CR>	
<^B>E<CR>	Reboot Module	None	IP Connection to module will be lost
<^B>GFE<CR>	Get Modules MAC Address	<^B> xxx.xxx.xxx.xxx.xxx.xxx<CR> Where xxx.xxx.xxx.xxx.xxx.xxx represents the MAC Address	

Command	Purpose	Reply	Notes
<^B>SFExxx.xxx.xxx.xxx.xxx.xxx<CR> Where xxx.xxx.xxx.xxx.xxx.xxx represents the MAC Address	Set Modules MAC Address	<^B>A<CR>	1st Digit must be EVEN. Must REBOOT for changes to take effect It is recommended that the MAC address not be changed
<^B>GIP<CR>	Get Modules IP Address	<^B>Aaaa.bbb.ccc.ddd<CR> Where aaa.bbb.ccc.ddd represents the IP Address	
<^B>SIPaaa.bbb.ccc.ddd<CR> Where aaa.bbb.ccc.ddd represents the IP Address	Set Modules IP Address	<^B>A<CR>	Must REBOOT for changes to take effect
<^B>GPN<CR>	Get Modules Port Number	<^B>Aaaaaa <CR> Where aaaaa represents the Port Number from 0 to 65534	Defaults to 1001
<^B>SPNaaaaa<CR> Where aaaaa represents the Port Number	Set Modules Port Number	<^B>A<CR>	Must REBOOT for changes to take effect
<^B>GGI<CR>	Get Modules Gateway Address	<^B>Aaaa.bbb.ccc.ddd<CR> Where aaa.bbb.ccc.ddd represents the Gateway Address	
<^B>SGIaaa.bbb.ccc.ddd<CR> Where aaa.bbb.ccc.ddd represents the Gateway Address	Set Modules Gateway Address	<^B>A<CR>	Must REBOOT for changes to take effect
<^B>GNM<CR>	Get Modules SubNet Mask	<^B>Aaaa.bbb.ccc.ddd<CR> Where aaa.bbb.ccc.ddd represents the SubNet Mask	
<^B>SNMaaa.bbb.ccc.ddd<CR> Where aaa.bbb.ccc.ddd represents the SubNet Mask	Set Modules SubNet Mask	<^B>A<CR>	Must REBOOT for changes to take effect
<^B>GBR<CR>	Get Modules Baud Rate	<^B>Aaa <CR> Where aa represents the Baud Rate as follows: 0 = 1200 5 = 38400 10 = 600 1 = 2400 6 = 57600 11 = 28800 2 = 4800 7 = 115200 3 = 9600 8 = 150 4 = 19200 9 = 300	
<^B>SBRaa<CR> Where aa represents the Baud Rate as follows: 0 = 1200 5 = 38400 10 = 600 1 = 2400 6 = 57600 11 = 28800 2 = 4800 7 = 115200 3 = 9600 8 = 150 4 = 19200 9 = 300	Set Modules Baud Rate	<^B>A<CR>	Must REBOOT or LOG OUT for changes to take effect
<^B>GPR<CR>	Get Modules Parity	<^B>Aaa <CR> Where aa represents the Parity as follows: 0 = Off or None 1 = Even 2 = Odd 3 = Mark 4 = Space	
<^B>SPRaa<CR> Where aa represents the Parity as follows: 0 = Off or None 1 = Even 2 = Odd 3 = Mark 4 = Space	Set Modules Parity	<^B>A<CR>	Must REBOOT or LOG OUT for changes to take effect

Command	Purpose	Reply	Notes
<^B>GBB<CR>	Get Modules Serial Data Bits Per Byte	<^B>Aaa <CR> Where aa represents the Data Bits per Byte as follows: 0 = 7 1 = 8	
<^B>SBBaa<CR> Where aa represents the Data Bits per Byte as follows: 0 = 7 1 = 8	Set Modules Serial Data Bits Per Byte	<^B>A<CR>	Must REBOOT or LOG OUT for changes to take effect

Note on IP Settings via port 23



If you are unable to access the unit's port 23 from your PC using the IP Modules default or last known IP address, it could be that the IP address of the IP Module is not compatible on your LAN. One way around this is to connect your PC directly to the IP Modules RJ45 port using a cross over cable, or use a switch or router not connected to anything else but your PC and the IP Module, and then configure your PC for a static IP address compatible with the current address of the IP Module. If the IP Module has the factory default of 192.168.123.199, a PC address of 192.168.123.nnn may be entered where nnn is any number except 199.

5. Troubleshooting

There are no field serviceable parts or circuits in the device. If you think that the device is malfunctioning, please verify the following:

- The LED's are lit indicating that power is applied to the unit via the RS232-B port or from an external power supply.

- You are using the correct RS232 cables for the devices that are attached to the RS-232-A and RS-232-B ports. Using the wrong cable (e.g. … Using a straight-thru cable when a null modem cable is required) will prevent the RS232 communication from working.

- When attempting to utilize the LAN connection, verify that you can get a response when you ping the devices IP address. If you are unable to get a response from the VSA-31-IP via a ping, ensure that the computer you're using is on the same network node as the VSA-31-IP. (For example, your computer IP address is **192.168.123.**104 and the VSA-31-IP IP address is **192.168.123.**150). ***Contact your IT Administrator for assistance.***

5.1 Contacting Hall Research

If you determine that your VSA-31-IP is malfunctioning, do not attempt to repair the unit. There are no user serviceable parts inside the unit. Opening the unit will void the warranty.

Contact the Hall Research Technical Support department at 714-641-6607 to obtain an RMA (Return Authorization) number.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description.

5.2 Shipping and Packaging

If you need to transport or ship your device:

- Package it carefully. We recommend that you use the original container if possible.
- Before you ship the units back to Hall Research for repair or return, contact us to get a Return Authorization (RMA) number.

6. Specifications

Dimensions: 2.6 inch (Wide) x 2.6 inch (Deep) x 1.10 inch (High)

Weight: 0.26 Pounds (120 g)

Input Power: 12-15 vDC, 200 mADC max via RS232 Port “B” or 2.5 mm PWR connector

Enclosure: Black Plastic ABS-94VO, UL File#56070

Temperature: Operating: 32 to 122 Deg F (0 to 50 Deg C); Storage: -40 to +185 Deg F (-40 to +85 Deg C)

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