User Manual

VLINX

VESP211

SERIAL SERVER

Version 1.0

Vlinx Serial Servers

Model VESP211

Documentation Number: VESP211-0712m

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using domestic and imported parts by

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B&B Electronics Mfg. Co. Inc – November 2011

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SECTION 1

Introduction

Thank you for purchasing a **VESP211 Serial Server** product! This product has been manufactured to the highest standards of quality and performance to ensure your complete satisfaction.

Figure 1.   A VESP211 Serial Server

About VESP211 Serial Servers

VESP211 Serial Servers connect serial devices (RS-232, RS-422 or RS-485) to Ethernet networks, allowing the serial device to become a node on the network. The serial port can be accessed over a LAN/WAN using Direct IP Mode, Virtual COM Port, or Paired Mode connections. VESP211 Serial Servers support 10BaseT or 100BaseTX copper networks. The product is built for use in industrial environments, and features a heavy duty metal enclosure that is panel (standard) or DIN rail mountable (with optional adapter). The product includes a DC power supply with a 2.1mm barrel connector.

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VESP211 Serial Server Model Numbering

The **VESP211 Serial Server** family of products includes three models:

- VESP211-232, which uses a DB-9M connector and supports the RS-232 serial interface
- VESP211-485, which uses a pluggable, five-position terminal strip and supports the RS-485 serial interface
- VESP211 which uses a DB-9M connector and supports the RS-232, RS-422 and RS-485 serial interfaces

All models incorporate one serial connection and one Ethernet connection.

VESP211 Features

- Multi-interface serial port (VESP211)
- DB-9M serial port connector (VESP211 and VESP211-232)
- Five-position pluggable terminal strip (VESP211-485)
- Configuration can be done via network or direct serial connection
- Rugged panel mountable metal case
- Accepts 12 VDC power (power adapter included)
- 10/100 Mbps Ethernet with Auto Selection
- LAN and WAN Communications
- TCP Client or Server, or UDP operation - configurable
- Virtual COM port and Paired Mode capabilities
- Firmware Upload over the network for future revisions/upgrades
- Software Support - XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit)
- Configuration of Ethernet and serial port settings using Vlinx Manager software

Vlinx Manager Configuration Software

Vlinx Manager configuration software enables you to find connected serial servers, configure them, upgrade serial server firmware, and save/load configuration files. It features a graphical user interface (GUI) that is convenient and easy to use. The software also makes it easy to add and remove virtual COM ports on your computer.

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SECTION 2

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VESP211 Hardware

VESP211 Serial Servers are enclosed in a rugged panel mountable enclosure and feature:

- LED indicators
- Power, Ethernet and serial connectors
- A recessed Reset (mode) switch.

Package Checklist

VESP211 Serial Servers are shipped with the following items included:

- VESP211 Serial Server Module
- Quick Start Guide
- CD with User Manual, Quick Start Guide
- DC Power Supply

VESP211 Serial Server Enclosures and Mounting

All VESP211 models are built into similar enclosures. Modules are panel mountable.

Figure 2.   Front View of the VESP211 Serial Server

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LED Indicators

VESP211s have three LED indicators: a **Ready** LED, an **Ethernet** LED, and a **Serial** LED.

Figure 3.   Front Panel of the VESP211

Ready LED

The **Ready** LED (green) blinks once per second if the system is operating correctly. If the LED is off, it indicates the system is not operating correctly (or that it is in Console Mode).

Ethernet LED

The **Ethernet** LED illuminates if the Ethernet port is connected and blinks when data is transmitted or received.

Serial LED

The serial port has an associated LED. The **Serial Port** LED blinks (green) when data is being transmitted or received on the serial port. When the LED is On, it indicates that the serial port is open.

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Note: *LEDs on the serial server are also used to indicate various Reset modes, as described in the following section.*

Reset Switch

A recessed momentary **Reset** switch is located on the side of the enclosure. To activate the switch, insert a small plastic tool through the hole in the enclosure and press lightly.
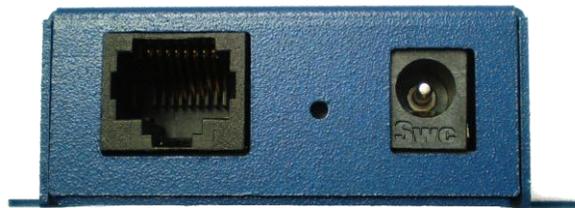
Figure 4.   Ethernet Connector, Reset Switch (recessed) and Power Connector

The Reset switch can be used to:

- Initiate a Hardware Reset
- Enter Console Mode
- Reload factory defaults

Using the Reset Switch to Initiate a Hardware Reset

Hold the Reset switch in for 0 to 2 seconds. The Ready LED stops blinking while the switch is being held in. The Serial LED illuminates while the switch is being held in. Release the switch in less than two seconds or the serial server will enter Console Mode.

Using the Reset Switch to Enter Console Mode

Hold the Reset switch for between two and ten seconds. The Ready LED stops blinking while the switch is being held in. The Serial LED illuminates for the first two seconds; then Serial LED goes out and the Ready LED illuminates. Release the switch in less than 10 seconds or the serial server will reset to factory default settings.

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Using the Reset Switch to exit Console Mode

Press and hold the Reset switch for two seconds, or remove power from the serial server, wait a few seconds, and turn the power on again. The LEDs go back to their normal states when the device resumes normal operation.

Using the Reset Switch to Reload Factory Default Settings

Hold the Reset switch for more than ten seconds. The Serial LED illuminates for the first two seconds; then the Ready LED illuminates. After 10 seconds, both the Serial and Ready LEDs illuminate. Release the switch after more than 10 seconds. The serial server will reset to factory default settings.

Ethernet Connector

The Ethernet connection uses an RJ45 receptacle. The serial server is connected to a standard Ethernet network drop using a straight-through RJ45 (male) Ethernet cable.

Note: *Refer to Appendix D for connection pin-outs.*

Serial Port Connectors

VESP211 Serial Servers feature two serial port connector configurations, depending on the model:

- VESP211 and VESP211-232 use DB-9M connectors for RS-232, RS-422 and RS-485 connections.

Figure 5.   DB-9M Serial Port Connector

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- VESP211-485 serial servers use five-position removable terminal blocks for RS-422 and RS-485 connections.
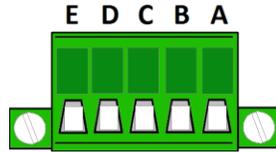
Figure 6.   Five-Position Pluggable Terminal Blocks

Note: *Refer to Appendix D for connection pin-outs.*

Power Connector

VESP211 serial servers use a barrel jack connector for power. The connector accepts a 2.1 millimeter plug and requires 12 VDC at 2.5 W maximum.
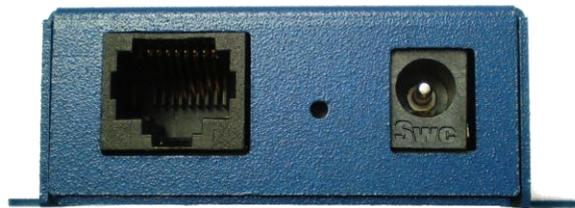
Figure 7.   Ethernet Connector, Reset Switch (recessed) and Power Connector

Mounting Hardware

VESP211 Serial Server modules can be panel mounted using the built-in mounting brackets.

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Figure 8.   VESP211 Enclosure with Panel Mount Bracket

An optional DIN rail mount adapter is available from B&B Electronics.

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SECTION 3

Initial Setup and Connections

This section describes how to setup and connect VESP211 Serial Servers.

Note: *In this section devices to be connected to the serial server's serial connection are simply referred to as the "serial device".*

Connecting the Power Supply

Connect a **DC power supply** by plugging a 12 VDC power source into the barrel jack on the top of the serial server. The center connection must be positive (+). (Polarity of the connection is indicated on the label on the front of the serial server.) The power supply must be capable of supplying 2.5 watts maximum.

Connecting VESP211 Serial Servers to Serial Devices

VESP211 Serial Servers can be connected to serial devices using RS-232, RS-422, RS-485 2-wire and RS-485 4-wire.

RS-232

The **RS-232 interface** supports seven RS-232 signal lines (TD, RD, DTR, DSR, RTS, CTS, DCD) plus Signal Ground.

Signals are single ended and referenced to Ground. Default communications parameters are 9600, 8, N, 1 and no flow control implemented.

Note: *The VESP211 is configured as a DTE. If it is connected to a serial device configured as a DTE, use a null modem (cross-over) cable. If the serial device is a DCE, use a straight-through cable.*

RS-422

The **RS-422 interface** supports two signal pairs: TDA (-), TDB (+), RDA (-), RDB (+) and GND. The data lines are differential pairs (A & B) in which the B line is positive relative to the A line in the idle (mark) state. Ground provides a common mode reference.

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RS-485

The **RS-485 interface** supports 2-wire or 4-wire operation.

When configured for **4-wire operation** the connection supports two signal pairs: TDA (-), TDB (+), RDA (-), RDB (+) and GND. This makes full-duplex operation possible. The data lines are differential pairs (A & B) in which the B line is positive relative to the A line in the idle (mark) state. Ground provides a common mode reference.

When configured for **2-wire operation** the connection supports one signal pair: Data A (-) and Data B (+) signal channels using half-duplex operation. The data lines are differential with the Data B line positive relative to Data A in the idle (mark) state. Ground provides a common mode reference.

Note: *Refer to Appendix D for connector pinout information.*
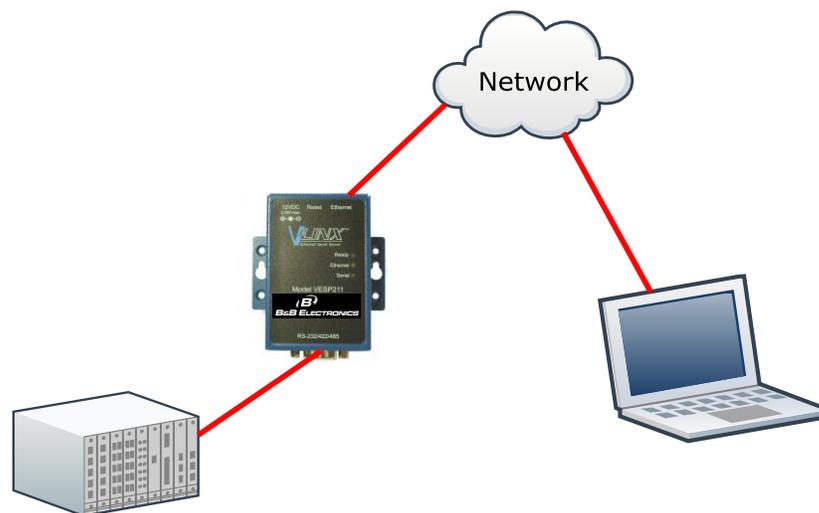
Figure 9.   VESP211 Connections

Connecting VESP211 Serial Servers to a Network

Ethernet Connection (10BaseT/100BaseTX)

The **Ethernet connection** uses a **standard** RJ45 connector. A standard network cable is connected from the serial server to a network drop. PCs configuring and/or communicating with the serial server are also connected to the network.

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VESP211 Serial Server Configuration Connections

VESP211 Serial Servers can be configured using several methods:

- Via the network using Vlinx Manager software

- Via the network using a web browser

- Via the serial port using Vlinx Manager software (Console Mode)

Configuring via the Network using Vlinx Manager

VESP211 Serial Servers can be configured over the network using Vlinx Manager software running on a networked PC. Vlinx Manager includes a discovery function that makes it possible to detect the serial server on the network whether you know its IP address or not. Once the serial server has been detected, the Manager can be used to configure its settings.

Note: *For more information on how to use Vlinx Manager to configure your serial server, refer to Section 4: Configuring the Serial Server*

Figure 10.   Network Setup

Configuring via the network using a Browser

VESP211 Serial Servers can also be configured over the network using a standard internet browser such as Internet Explorer or Firefox running on a networked PC. To do so you must know the IP address of the serial server. Your serial server comes from the factory pre-configured to receive an IP address from a DHCP Server. If DHCP assignment is not available it will default to 169.254.102.39

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Note: For more information on how to use Vlinx Manager to configure your serial server, refer to Section 4:
             Configuring the Serial Server
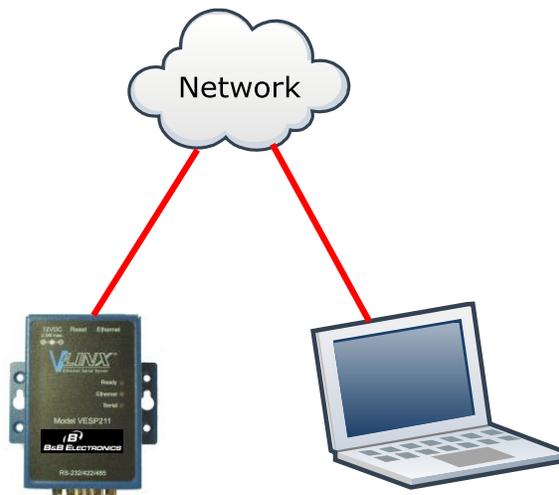
Configuring via the Serial Port using Vlinx Manager (Console Mode)

Your serial server can be configured via the serial port using Vlinx Manager. To use this feature the serial port must be connected to the serial port of a PC (using a null modem cable).

Figure 11.   Console Mode Setup

To configure the serial server it must be put into Console Mode, using the Reset switch.

Note: Refer to Section 2 for information on how to use the Reset switch to enter Console Mode.

VESP211 Serial Server Operational Connections

VESP211 Serial Servers can operate in Direct IP, Virtual COM Port and Paired Modes.

In **Direct IP Mode** applications using TCP/IP or UDP/IP socket programs can communicate with the COM ports on the serial server. In this type of application the serial server is configured as a TCP or UDP server. The socket program running on the PC establishes a communication connection with the serial server. The data is sent directly to and from the serial port on the server.

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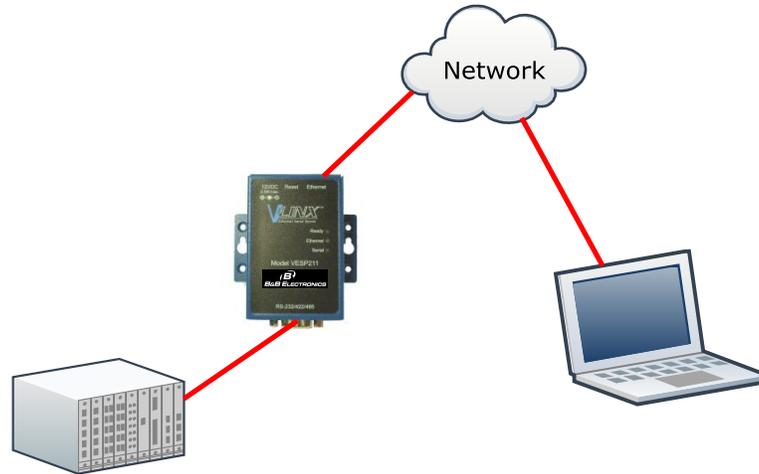
Figure 12.   Direct IP and Virtual COM Port Connection

In **Virtual COM Port Mode** a PC can communicate across the network to the serial server as if the serial ports on the serial server are the PC's serial ports. When a virtual COM port is configured on the PC (using Vlinx Manager) a new COM port appears in the Device Manager. Windows programs using standard Windows API calls are able to interface to virtual COM ports. When a program on the PC opens the new COM port, it communicates directly with the remote serial device connected to the serial server.

In **Paired Mode**, two serial servers (connected to serial devices via their serial ports) are connected to the network. The serial devices communicate directly, transferring data between devices as a point-to-point serial connection. Paired Mode is set up as shown in the following diagram and configured using Vlinx Manager software or web interface.
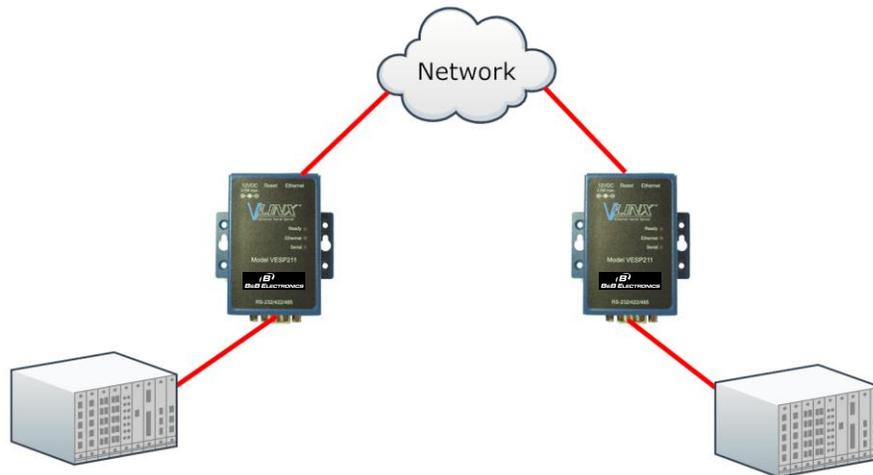
Figure 13.   Paired Mode Setup

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Installing and Starting Vlinx Manager

Vlinx Manager is a Windows-based application used to configure serial servers. Install it on your PC from the included CD. Installation should launch automatically when the CD is placed in the CD-ROM drive. If it does not automatically launch, click Start on the Windows Desktop and, at the Run command, type the drive letter and Vlinx Manager.exe. Follow the prompts to install the software.

Once the program is installed, go to the Start > Programs menu and run the program.

The Vlinx Manager Discovery window appears.

Figure 14.   Discovery Window

Discovering Serial Servers

If you are configuring the serial server via the network, select **Network**; if you are configuring it via the serial port, select **Serial Port**.

If you already know the IP address of the serial server, click **The device is at this IP address**; if not, leave **I don't know the IP address of the device** selected.

Click **Connect**. The Progress bar provides information to indicate whether serial servers are detected.

The text in the Progress box appears in various colors, depending on the message type.

Color	Description
Black	A step in the discovery process.
Dark Blue	A device was not found.
Dark Green	A device was found.
Dark Red	An error occurred.

If one or more devices are found, the discovery window closes automatically and the Configuration window appears.

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SECTION 4

Configuring the Serial Server

Overview of the Vlinx Manager

The Vlinx Manager configuration window includes three areas:

- Icons
- Serial Server Information Table
- Configuration pane
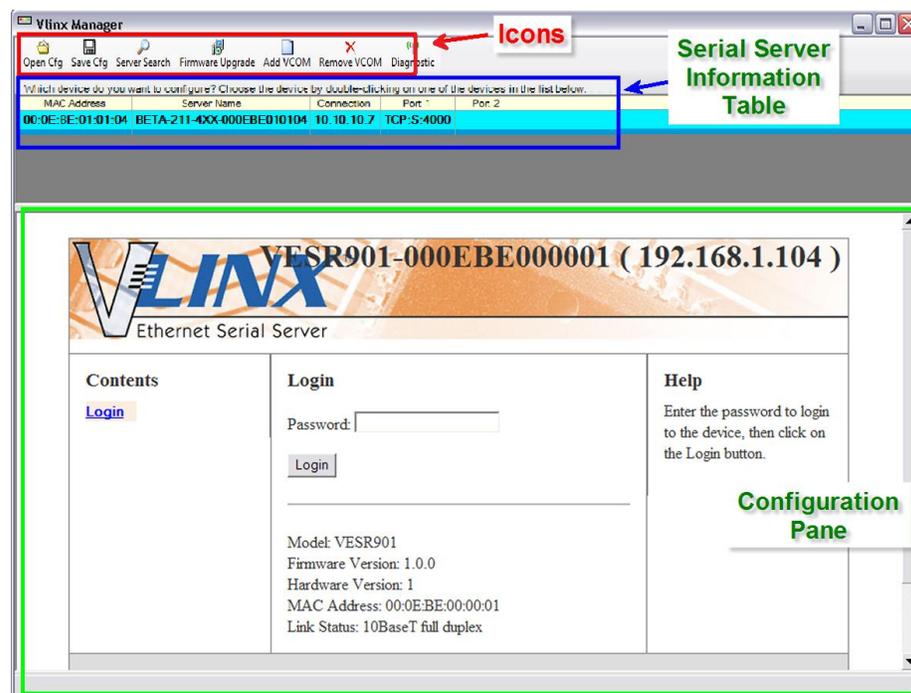
Figure 15.   Vlinx Manager Configuration Window

Note: The screen shots shown in this manual refer to the VESR901. Your screen will display the model name/number and serial number of your device. All menus, functions and options shown on the screen shots in this manual apply to your device.

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Icons

Figure 16.   Configuration Window Icons

- **Open Cfg** - choose a previously saved configuration file.
- **Save Cfg** - save the current configuration to a file.
- **Server Search** - initiate another search for servers.
- **Firmware Upgrade** - open the Firmware Upgrade
- **Add VCOM** - open the Add Virtual COM Port window
- **Remove VCOM** - open the Remove Virtual COM Port window
- **Diagnostic** - open the Diagnostics window

Serial Server Information Table

The serial server information table contains information about all serial servers that have been discovered on the network or serial ports.

MAC Address	Server Name	Connection	Port 1	Port 2	
00:0E:BE:01:01:04	BETA-211-4XX-000EBE010104	10.10.10.7	TCP:S:4000		
00:0E:BE:00:0C:5C	VESR902D-000EBE000C5C	10.10.10.118	TCP:S:4000	TCP:S:4001	

Figure 17.   Serial Server Information Table

The table includes columns, and displays information, for:

- **MAC Address** - the MAC Address of the serial server
- **Server Name** - the name reported by the serial server
- **Connection** - the IP address of the serial server
- **Port 1, Port 2, Port 3** and **Port 4**
  - First communications protocol used by the serial server (TCP client, TCP server or UDP)
  - TCP port number or UDP port number
  - The virtual COM port assignment on the local PC (if assigned)
  - Whether the serial server's serial port is being used by anyone on the network

The status of whether the serial server is in use is updated periodically.

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When a serial server's IP address is configured for a network that is not within the local network's range, the serial server's information is displayed in a different color (orange).

Configuration Pane

The configuration pane is essentially a web browser.

Figure 18.   Configuration Pane

It includes the following:

- **Masthead** with the name and IP address of the currently selected serial server

- **Contents** sidebar (on the left side) containing hyperlinks to the following configuration pages:
  - **General**
  - **Network**
  - **Port x Settings** (x = port number; each serial port connection is represented by a hyperlink)
  - **Port x Serial** (x = port number; each serial port connection is represented by a hyperlink)
  - **Save**
  - **Login/Logout**

- **Configuration** settings area in the middle of the pane where you can select the settings desired for operation of the serial server

- **Help** sidebar (on the right side) containing helpful descriptions, explanation and suggestions for configuring the serial server

Logging In

You can log in to any serial server listed in the Server Information Table.

To log in:

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1. Double-click the row associated with the desired serial server. The **Login** page appears.

2. Type the password into the **Password** box. The password is blank by default.
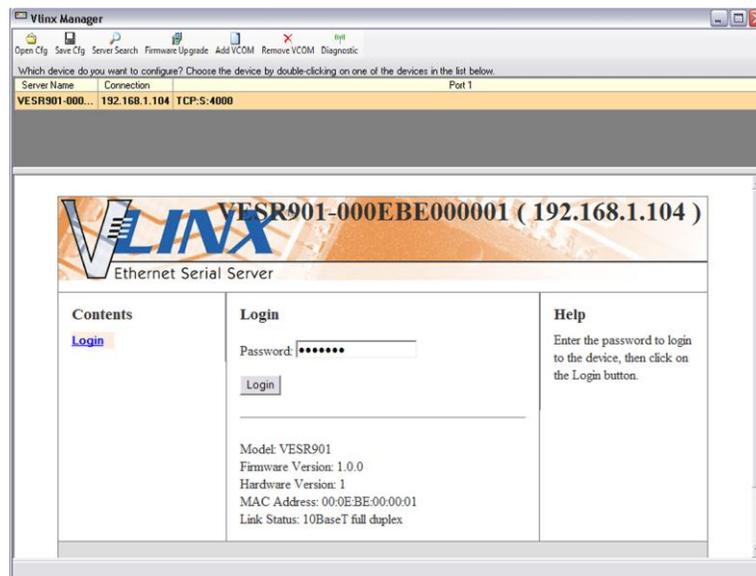
Figure 19.   Login Page

3. Click **Login**.

   The **General Configuration** page appears.

Navigating the Configuration Pages

There are two ways to move from page to page in the Vlinx Manager software: by clicking a specific link, or by clicking **Next** or **Back** to move through the pages sequentially.

Note: Always remember to click Save before leaving a page to ensure your settings are saved.

Setting up the Serial Server Name and Password

On the **General Configuration** page you can do the following:

- Change the name of the serial server
- Initiate a login password change

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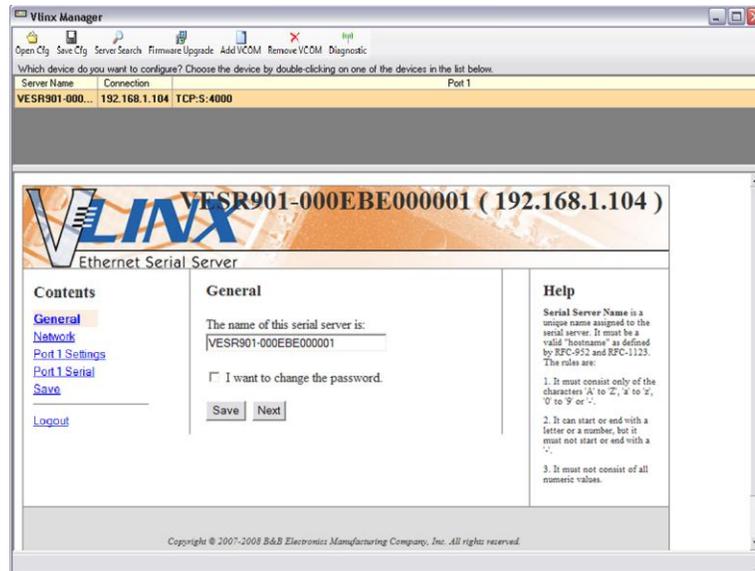
Figure 20.   General Configuration Page

Changing the serial server's name:

1. Type the new name into the **Serial Server Name** text box.

2. Click **Save**.

Changing the password:

1. Select the **I want to change the password** check box.
    Two text boxes appear.

Figure 21.   Changing the Password

2. Type the new password into both boxes

3. Click **Save**.

Setting up IP Addressing

On the **Network Configuration** page you can configure the serial server to use dynamic (DHCP) or static IP addressing on the network.

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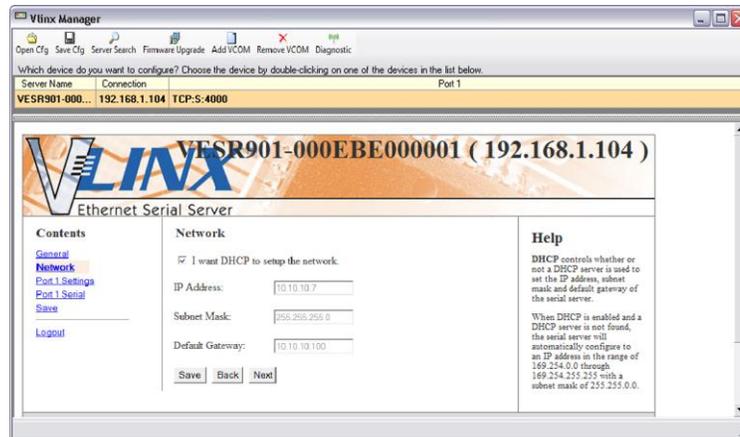
Figure 22.   Network Configuration Page

Setting up Dynamic IP Addressing

1. Select the **I want to use DHCP to setup the network** check box.

Setting up Static IP Addressing

1. Ensure the **I want to use DHCP to setup the network** box is un-checked.

Figure 23.   IP Address Settings

2. Type the **IP Address**, **Subnet Mask** and **Default Gateway** addresses in the appropriate boxes.

Setting up Serial Ports

On the **Serial Port Configuration** page you can configure the communications parameters of the current serial port. Parameters include port mode, baud rate, data bits, parity, stop bits and type of flow control.

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Figure 24.   Serial Port Configuration Page

1. **Mode** - select the type of serial connection (RS-232, RS-422, RS-485 2-wire or RS-485 4-wire) required to connect the serial device to the serial server.
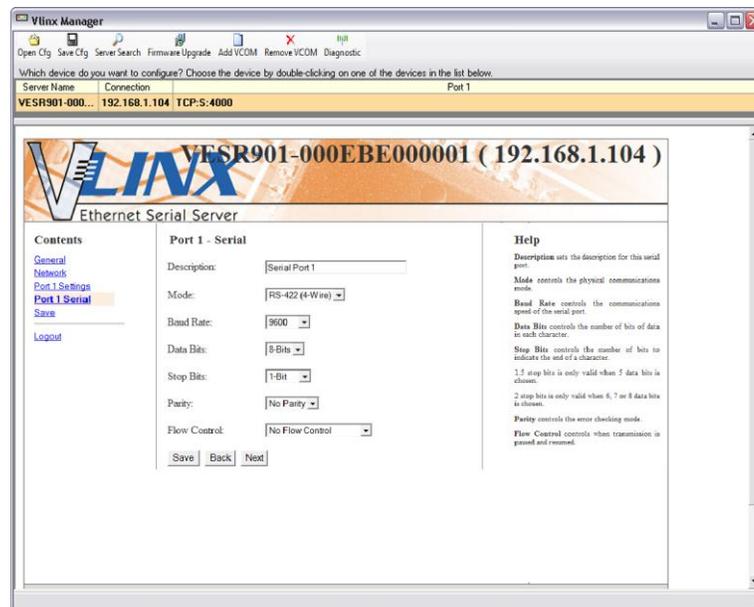
2. **Baud Rate** - select the Baud Rate (between 75 baud and 230,400 baud) required to communicate with the serial device connected to the serial server.

3. **Data Bits** - select the number of Data Bits (5, 6, 7 or 8) required to communicate with the serial device connected to the serial server.

4. **Stop Bits** - select the number of Stop Bits (1, 1.5, or 2) required to communicate with the serial device connected to the serial server.

5. **Parity** - select the Parity setting (None, Even, Odd, Mark or Space) required to communicate with the serial device connected to the serial server.

6. **Flow Control** - select the Flow Control setting (None, RTS/CTS or XON/XOFF) required to communicate with the serial device connected to the serial server.

Setting up Port Network Parameters

On the **Port Network Parameters Configuration** page you can configure the port to use UDP, TCP. VCOM or Paired protocols in several different modes.

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TCP Configuration

TCP (Transmission Control Protocol) provides reliable connection-oriented network communication with error checking. In TCP mode the serial server can be configured as a client or a server.

When you configure the serial server as a **TCP client** it initiates connections with a server on the network. You must set up the IP address and port number of the server that you want the client (serial server) to communicate with. You also select whether you want the serial server to connect at power up or only when it receives data from the device connected to its serial port.

When the serial server is configured as a **TCP server** it waits for connections to be initiated by another network device. You must set up the TCP port number that it will listen to for connections and set the maximum (up to eight) number of simultaneous connections it will accept. You can filter the connections it will accept based on specific IP addresses or ranges of IP addresses that you specify.

Figure 25.   TCP Configuration

Setting the serial server to operate as a TCP Client

1. Select **TCP** protocol.

2. Select **to initiate connections (client)**

3. Type the IP address into the **I want to connect to IP address:** box

4. Type the TCP port number of the server into the **on TCP port number:** box.

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5. Select:

- **at power up** - if you want the serial server to always be connected
- **when the serial port receives data** - if you only want to establish a connection when there is data to be sent.

Setting the serial server to operate as a TCP Server

1. Select **TCP** protocol.

2. Select **to wait for connections (server)**.

   The configuration options change. The server IP address box disappears and the **number of connections** box appears.

3. Type the port number in the **I want to wait for connection on TCP port number:** box.

4. Select the maximum number of connections desired in the **and limit the number of connections to:** drop down box.

I want to wait for connections on TCP port number:
4000

and limit the number of connections to:
1 connection

- and allow everyone to connect
- and allow a specific IP address to connect
- and allow a specific range of IP addresses to connect
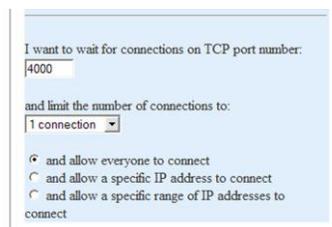
Figure 26.   TCP Server Settings

UDP Configuration

UDP (User Datagram Protocol) enables applications using UDP socket programs to communicate with the serial ports on the serial server. UDP protocol provides connectionless communications, which allows data to be broadcast to and received from multiple nodes on a network.

In UDP mode, if you want to control what network node receives data, you must specify the IP address and UDP port the data will be sent to. You can choose to send to:

- Nobody
- All nodes at a specific UDP port number. (This is called broadcast.)
- Specific IP addresses and UDP port numbers. (This is called unicast.)
- A range of IP addresses and UDP port numbers. (This is called unicast range.)

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You can also configure the serial server to receive from nodes on the network using the same list of configuration options.

Figure 27.   UDP Configuration

Setting the serial server to use UDP

1. Select **UDP** protocol.

   Options are provided for sending and receiving data to and from:
   - Nobody
   - Everyone on a specific UDP Port
   - Only specific IP addresses
   - Only a range of IP addresses

   Additional configuration fields appear depending on the options chosen.

2. Select the required **Send** options:

   a. **nobody** - sends to nobody

   b. **everyone on a specific UDP port (send broadcast)** - sends to all UDP ports on the network (specified later)

   c. **only specific IP addresses (send unicast)** - sends to specific network IP addresses (specified later)

   d. **only a range of IP addresses (send unicast range)** - sends to all IP addresses within a specified range (specified later)

3. Configure the **Send IP addresses and port numbers**:

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- If you selected: **everyone on a specific UDP port (send broadcast)**, type the UDP port number into the **This is the UDP port I want to send data to:** box
- If you selected: only **specific IP addresses (send unicast)**, type the IP addresses and port numbers into the **These are the IP addresses I want to send data to:** text boxes
- If you selected: **only a range of IP addresses (send unicast range)**, type the ranges of IP addresses and port numbers into the **These are the IP addresses I want to send data to:** text boxes

4. Select the required **Receive** options:

    a. nobody - receives from nobody

    b. **everyone** on **a specific UDP port (receive broadcast)** - receives from all UDP ports on the network (specified later)

    c. **only specific IP addresses (receive unicast)** - receives from specific network IP addresses (specified later)

    d. **only a range of IP addresses (receive unicast range)** - receives from all IP addresses within a specified range (specified later)

5. Configure the **Receive IP addresses and port numbers**:

    - If you selected: **everyone on a specific UDP port (receive broadcast)**, type the UDP port number into the **This is the UDP port I want to receive data from:** box
    - If you selected: **only specific IP addresses (receive unicast)**, type the IP addresses and port numbers into the **These are the IP addresses I want to receive data from:** text boxes
    - If you selected: **only a range of IP addresses (receive unicast range)**, type the ranges of IP addresses and port numbers into the **These are the IP addresses I want to receive data from:** text boxes

6. Click **Save**

Setting up Virtual COM (VCOM) Operation

When the Network Protocol is set to **VCOM (Virtual COM Port)** the serial server communicates over the network with a PC, acting as a remote COM port for the computer.

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Figure 28.   VCOM Configuration

Note: *Both the serial server and the computer must be configured for VCOM operation. To set up a virtual COM port on the computer, refer to the section on Adding Virtual COM Ports.*

1. To enable VCOM operation, select **VCOM** protocol.

2. Click **Save**

Setting up Paired Mode Operation

Paired Mode enables two serial servers to operate across the network like a "wire replacement" between two serial devices. (Paired Mode is also called *serial tunneling*.) Serial devices connected to serial servers on each end of the link can communicate as it they were connected by a serial cable.

For Paired Mode to work one serial server must be configured as a TCP server and the other as a TCP client.

The serial server configured as the **TCP client** initiates the connection. You must set up the IP address and port number of the server that you want the client (serial server) to communicate with. You also select whether you want the serial server to connect at power up or only when it receives data from the device connected to its serial port.

The serial server configured as a **TCP server** waits for connections to be initiated by another network device. You must set up the TCP port number on which it will listen for connections and set the maximum (up to four) number of simultaneous connections it will accept. You can filter the connections it will accept based on specific IP addresses or ranges of IP addresses that you specify.

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Figure 29.   Paired Mode Configuration

Setting the serial server to operate in Paired Mode as a client

1. Select **Paired** protocol.

2. Select **to initiate connections (client)**

3. Type the IP address and TCP port numbers of the server in the appropriate text boxes.

4. Select:
    *   **at power up** - if you want the serial server to always be connected
    *   **when the serial port receives data** - if you only want to establish a connection when there is data to be sent.

Setting the serial server to operate in Paired Mode as a server

1. Select **Paired** protocol.

2. Select **to wait for connections** (server).

Figure 30.   Paired Mode Settings

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3. Type the TCP port number to be used in the **I want to wait for connections on TCP port number** box.

4. Select the number of connections in the **and limit the number of connections to** drop down box.

5. Select:

   - **and allow everyone to connect** - if you want any server to connect

   - **and allow a specific IP address to connect** - if you want to specify up to four IP addresses to be able to connect

   - **and allow a specific range of IP addresses to connect** - if you want to specify a range of IP addresses that can connect

6. If you selected

   - **and allow a specific IP address to connect**, in the area of the window that appears, select one or more IP address boxes and type in the desired IP address

   These are the IP addresses I want to allow to connect:

   ☐ IP address: 169.254.0.51
   ☐ IP address: 169.254.0.52
   ☐ IP address: 169.254.0.53
   ☐ IP address: 169.254.0.54

   Figure 31.   IP Addresses

   - **and allow a specific range of IP addresses to connect**, in the area of the window that appears, select an IP address box and type in the IP addresses that specify the desired range

   These are the IP address ranges I want to allow to connect:

   ☐ IP address: 169.254.0.50   through: 169.254.0.60
   ☐ IP address: 169.254.0.70   through: 169.254.0.80
   ☐ IP address: 169.254.0.90   through: 169.254.0.100
   ☐ IP address: 169.254.0.110   through: 169.254.0.120

   Figure 32.   IP Address Ranges

Setting up Advanced Network Settings

On the **Advanced Network Settings** window you can configure how and when connections are made and data packets are sent.

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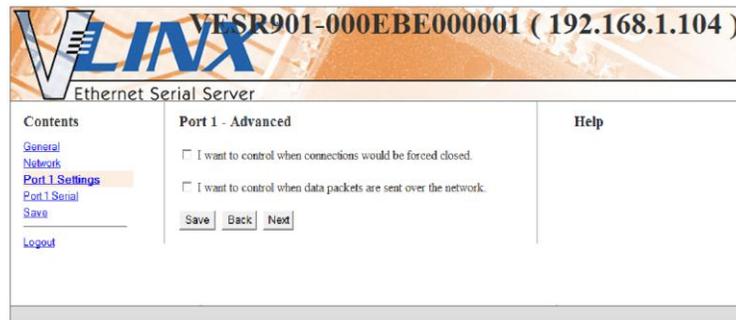
Figure 33.   Advanced Network Settings Window with nothing selected

Configuring when connections will be forced closed

1. Select the **I want to control when connections would be forced closed** checkbox.

    The **Network Watchdog** and **Serial Watchdog** configuration boxes appear.
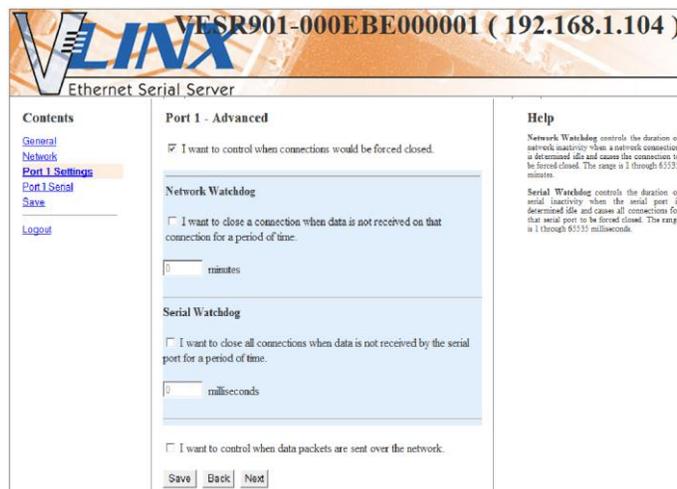
Figure 34.   Advanced Configuration - Forcing Connections Closed

To close a connection if no data is received for a period of time

1. Select the **I want to close a connection when data is not received on that connection for a period of time** checkbox

2. Type the desired time period (in milliseconds) into the text box.

To close a connection if no data is received by a serial port for a period of time

1. Select the **I want to close all connections when data is not received by the serial port for a period of time** checkbox.

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2. Type the desired time period (in milliseconds) into the text box.

Configuring when data packets are sent

1. Select the **I want to control when data packets are sent over the network** checkbox.

   The **Character Count**, **Forced Transmit**, **Intercharacter Timeout**, **Delimiter 1**, **Delimiter 2** and **Delimiter Removal** configuration boxes appear.

Figure 35.   Advanced Configuration - Configuring when data packets are sent

To wait until a specific amount of data is received on the serial port before sending it across the network

1. Select: **I want to wait for a specific amount of data to be received by the serial port before sending it** in the **Character Count** box

2. Type the desired number of characters into the text box.

To force the serial server to send data received on the serial port within a specified length of time

1. Select: **I want to wait no longer than a specific amount of time after data is received before sending it** in the **Forced Transmit** box

2. Type the desired time period (in milliseconds) into the text box.

To force the serial server to send data within a specified length of time after receiving it

1. Select: **I want to send data immediately when no more characters are received for** in the **Intercharacter Timeout** box.

2. Type the desired time period (in milliseconds) into the text box.

To force the serial server to start buffering data only when it receives a specified ASCII character on its serial port. No data will be buffered until this character is received.

1. Select: **I want to begin buffering data when a specific character is received by the serial port** in the **Delimiter 1** box.

2. Type the ASCII character into the text box.

Note: *Delimiter 1 cannot be used alone. Either Delimiter 2 or one of the transmit timers must be used with it.*

To force the serial server to send data when it receives another specified ASCII character on its serial port

1. Select: **I want to send data immediately when another specific character is received by the serial port** in the **Delimiter 2** box.

2. Type the ASCII character into the text box.

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To force the serial server to remove the delimiter characters from the data when it sends it on its serial port

1. Select: **I want to remove the delimiter characters from the data before sending the data.**

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Saving/Restoring the Configuration Settings

When all configuration windows are complete the **Save Configuration** page appears.
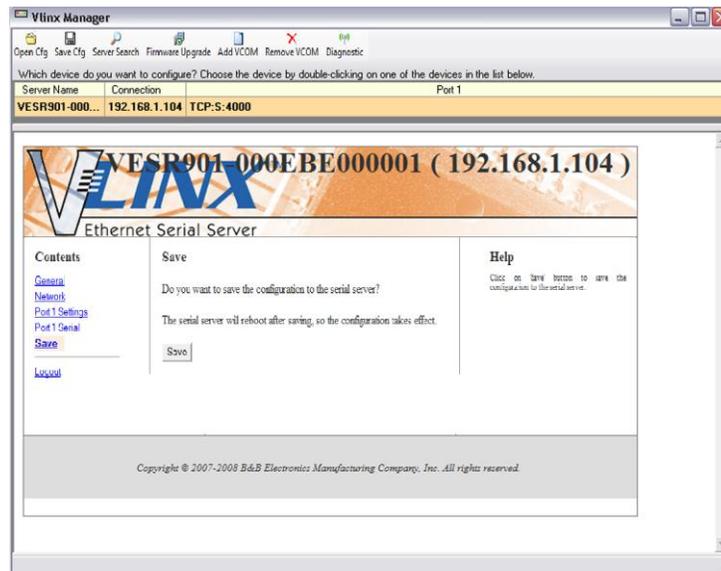
Figure 36.   Save Configuration Page

To save the configuration to the serial server, and re-boot it so that the configuration settings will take effect

1. Click **Save.**

To restore the configuration settings that existed before beginning configuration

1. Click **Restore Defaults.**

Adding Virtual COM Ports

Clicking the **Add VCOM** icon (located at the top of the Vlinx Manager Configuration window) opens the **Add Virtual COM Port** dialog box.

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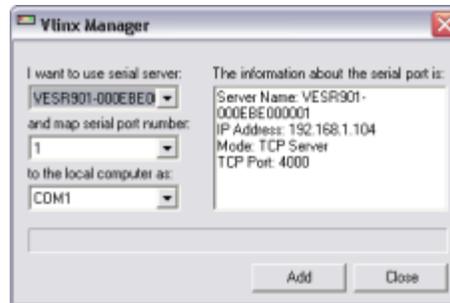
Figure 37.   Add Virtual COM Port Dialog Box

Using the drop down boxes you can select the serial server you want to map the virtual COM port to, the number of the serial port on the serial server and the COM port on the local computer. The information box displays the server name, its IP address, operating mode and TCP port.

1. On the **Vlinx Manager** window, click the **Add VCOM** icon.

    The **Add Virtual COM Port** dialog box appears.

2. Select the serial server to which you want to map the virtual COM port.

3. Select the serial port number on the serial server.

4. Select the COM port number you want to use on the local computer.

5. Click the **Add** button.

    When the process of adding the virtual COM port is complete (indicated by the progress bar), the **Serial port is successfully installed** dialog box appears.

6. Click **OK**

Removing Virtual COM Ports

Clicking the **Remove VCOM** icon (located at the top of the Vlinx Manager Configuration window) opens the **Remove Virtual COM Port** dialog box.

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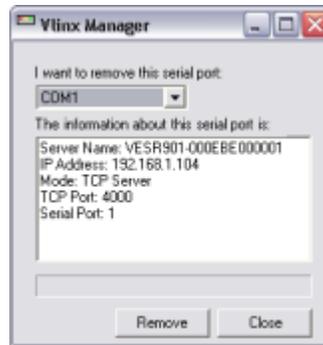
Figure 38.   Remove Virtual COM Port Dialog Box

Using the drop down boxe you can select the virtual COM port on the local computer. The information box displays the server name, its IP address, operating mode and TCP port.

1. Click the **Remove VCOM** icon.

    The **Remove Virtual COM Port** dialog box appears.

2. Select the COM port number you want to remove from the local computer.

3. Click the **Remove** button.

    When the process of removing the virtual COM port is complete (indicated by the progress bar), the **Serial port is successfully deleted** dialog box appears.

4. Click **OK**

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<div style="background:#1F3864; color:white; text-align:center; padding:10px;">

SECTION 4

</div>

Upgrading the Serial Server Firmware

Occasionally, updated firmware may become available for your serial server. The firmware can be upgraded using the Vlinx Manager software. The following procedure describes the firmware updating process:

1. Click the **Firmware Upgrade** button to open the **Firmware Upgrade** window.
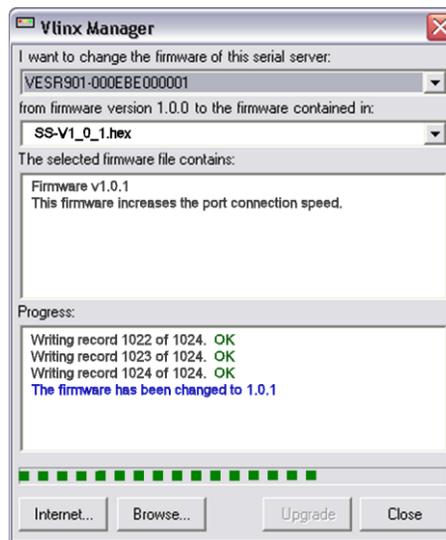
Figure 39.   Firmware Upgrade Dialog Box

The name of the currently selected serial server appears in the top drop down list. Other serial servers (that have already been discovered) can be selected from the drop down list, if desired.

The current firmware version of the selected serial server is shown in the text below the serial server name.

Information about the selected firmware file is shown in the third text box.

Downloading Firmware Files

The **Firmware File** list (second box) displays all firmware files in the firmware installation folder. Only firmware that is compatible with the selected serial server is available in this list.

To download the latest firmware files from an FTP site on the Internet

1. Click the **Internet** button at the bottom of the window.

    The Vlinx Manager connects to an FTP server on the Internet.

2. Click the **Check for Updates** button.

    Progress Bar and **Progress Box** display information about and progress of the download.

To download the latest firmware files from a file

1. Click the **Browse** button to open an **Open File** dialog box.

2. Browse to the drive and folder containing the firmware file.

3. Select and download the file to the local firmware folder.

Uploading the Firmware to the Serial Server

1. In the **Serial Server Selection** drop down list, select the serial server to be upgraded.

2. In the **Firmware Description** drop down list, select the firmware to upload to the serial server.

3. Click the **Upgrade** button.

    Progress Bar and **Progress Box** provides information on the progress of the transfer.

4. In the **Firmware File** drop down list, select the firmware file to upload to the serial server.

5. Click **Upgrade**.

    The Progress box and Progress bar display information on the upgrading process.

6. When the upgrade process is complete, click **Close**.

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SECTION 7

Diagnostics

Clicking the **Diagnostic** icon opens the **Diagnostics** dialog box and enables you to check the operation of connected serial servers and VCOM ports on the local computer.

The **Computer Information** box displays information about the type of network connections, the IP addresses, Subnet Masks and Default Gateways in use.
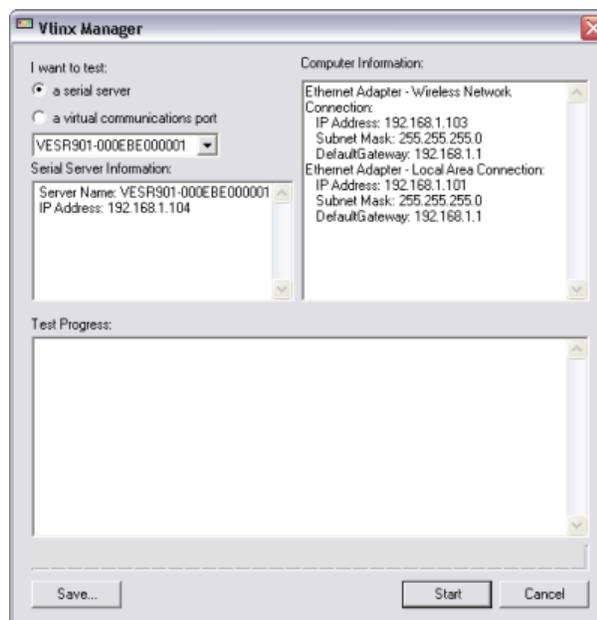
Figure 40.   Diagnostics Dialog Box

Testing a Serial Server Connection

1. Click the **Diagnostic** icon.

    The **Diagnostics** dialog box appears.

2. Select the option: **a serial server**

3. In the drop down box select the specific serial server you want to check.

4. Click the **Start** button

    Information about the progress of the pinging process is displayed in the **Test Progress** box.

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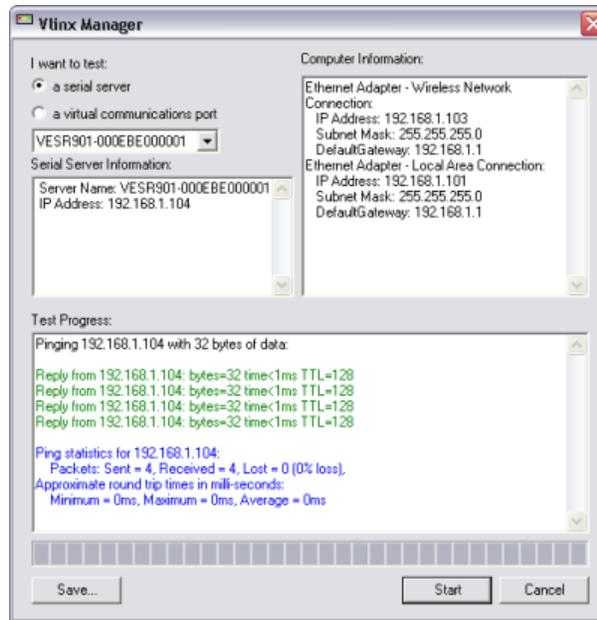
Figure 41.   Testing a Serial Server Connection

Testing a Virtual COM Port

1. Loopback the serial port (i.e. connect TD to RD)

2. Click the **Diagnostics** icon.

    The **Diagnostics** dialog box appears.

3. Select the option: **a virtual communications port**

4. In the drop down box select the specific COM port you want to check.

5. Click the **Start** button

    Information about the progress of the pinging process is displayed in the **Test Progress** box.

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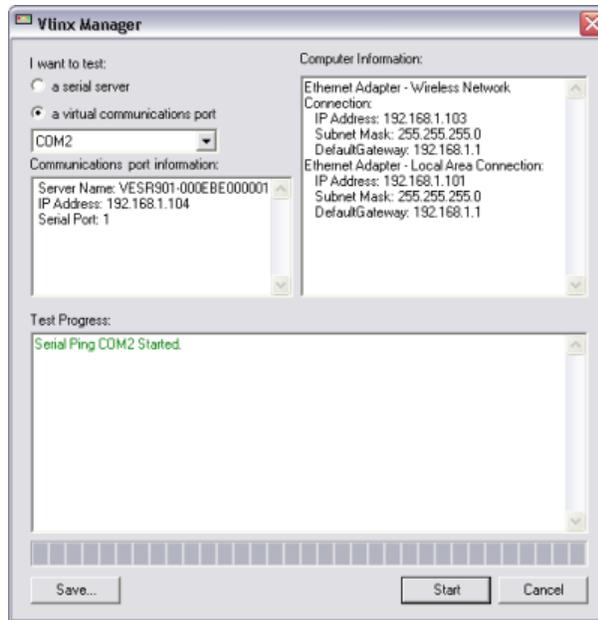
Figure 42.   Testing a VCOM Port

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SECTION 8

Description of Serial Server Properties

The following serial server properties are ordered alphabetically to assist you in finding the information you need.

Baud Rate is the communication speed of the link between the serial server and the device attached to its serial port. Both these devices must be configured to operate at the same baud rate. Baud rate values range from 75 to 230,400 Baud. (Refer to Appendix B for specific baud rates that are supported.)

Character Count controls the maximum number of characters to buffer before sending the characters to the network. Larger values decrease the number of network packets, but increase the amount of time to receive characters. Smaller values increase the number of network packets, but decrease the amount of time to receive characters. The range is 1 through 8192.

Configuration files contain all configuration settings for the serial server. When the serial server settings have been configured you can save the settings using Vlinx Manager. Existing configuration files can be Opened (from Vlinx Manager), which loads them into the serial server. This allows the same configuration to be applied to multiple serial servers, or to reload a previously used configuration.

Data/Parity/Stop Bits. The number of Data bits, type of Parity and number of Stop bits selected define the serial port parameters at which the serial server will operate. These parameters must be configured to match the parameters set on the serial device connected to the serial server's serial port.

- **Data Bits** controls the number of bits of data in each character. Options include 5, 6, 7 or 8 data bits.
- **Parity** controls the error checking mode. Options are No Parity, Odd, Even, Mark or Space.
- **Stop Bits** controls the number of bits to indicate the end of a character. Options include 1, 1.5 and 2. (1.5 bits is only valid when 5 data bits is selected, which is rare. The 2 stop bits setting is only valid when 6, 7 or 8 data bits is selected.)

The **Default Gateway** address sets the default route to remote networks, enabling users to access the serial server from outside the local network.

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Delimiter 1, Delimiter 2 and Delimiter Removal. Delimiters and Delimiter Removal enable you to control how characters received on a serial port are sent across the network. Delimiters are ASCII characters specified by the user when configuring the serial server. The serial server takes action when it recognizes the specified character(s) on its serial port.

- **Delimiter 1** is a *start delimiter.* The range of ASCII values is 1 through 255.

- **Delimiter 2** is an *end delimiter*. The range of ASCII values is 1 through 255.

- **Delimiter Removal** controls removing of Delimiter 1 and Delimiter 2 from the received characters before the received characters are sent to the network.

  How Delimiters Work. When only Delimiter 2 (the end delimiter) is enabled, characters received by the serial port are accumulated in a buffer. When the end delimiter is received on the serial port, the buffered characters, including the end delimiter, are sent to the network. All characters received after the end delimiter are again buffered until another end delimiter is received.

  When both Delimiter 1 (start delimiter) and Delimiter 2 (end delimiter) are enabled, characters received by the serial port will be discarded until the start delimiter character is detected on the serial port. The serial server then buffers the start delimiter character and all subsequent characters received after it until the end delimiter is detected. When the end delimiter is received, the buffered characters, including the start and end delimiters, are sent to the network.

  When Delimiter Removal is enabled it removes the delimiter character(s) before sending the other characters across the network.

DHCP (Dynamic Host Configuration Protocol) is a protocol used on special servers that supply IP addresses to network nodes on request.

When DHCP is enabled on the serial server, on power up it sends a DHCP request to the DHCP server, which assigns a dynamic IP address, subnet mask, and default gateway to the serial server.

When DHCP is disabled (static IP addressing), the IP Address, Subnet Mask and Default Gateway fields must be set manually by entering the appropriate addresses in these fields. If you do not know what addresses to use in these fields, ask your network administrator.

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Note 2:   *A dynamic address assigned by the DHCP server may change if the server loses the Ethernet connection or power is removed. If a device on the network that normally communicates with the serial server is configured to communicate with a specific IP address of the serial server, and the IP address has been changed, the device will not be able to communicate with the serial server.*

The **Firmware Version** number (Vx.x.x) indicates the serial server's currently loaded firmware release. From time to time new firmware is made available and can be uploaded into the serial server using Vlinx Manager.

Flow Control determines the type of handshaking that is used to control sending and receiving of messages. Options include No Flow Control, Hardware Flow Control (RTS/CTS) and Software Flow Control (XON/XOFF). The Flow Control setting must match the requirements of the serial device connected.

Note: *Select No Flow Control when setting the port as RS-422 or RS-485 4-wire.*

Forced Transmit controls the maximum amount of time that characters can be buffered before sending the characters to the network. Larger values decrease the number of network packets, but increase the amount of time to receive characters. Smaller values increase the number of network packets, but decrease the amount of time to receive characters. The range is 1 through 65535.

The **Hardware Version** number of the serial server hardware is displayed on the Login page of Vlinx Manager.

Inter-character Timeout controls the maximum duration between received characters before sending the characters to the network. Larger values may decrease the number of network packets, but increase the amount of time to receive characters. Smaller values may increase the number of network packets, but decrease the amount of time to receive characters. The range is 1 through 65535.

IP Address. Software or hardware attempting to access the serial server via the network must know the IP Address of the server. In DHCP mode (factory default), the serial server requests and receives a dynamic IP address from a DHCP server when it first connects to the network. If there is not a DHCP Server on your network, this device will automatically default to IP Address ***169.254.102.39***. If the serial server is unable to connect to your network using this address, there are two methods to manually configure the IP Address.

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1. **Method One:** Change your PC Network to Match the Serial Server

   a.   Open the network connection on your PC
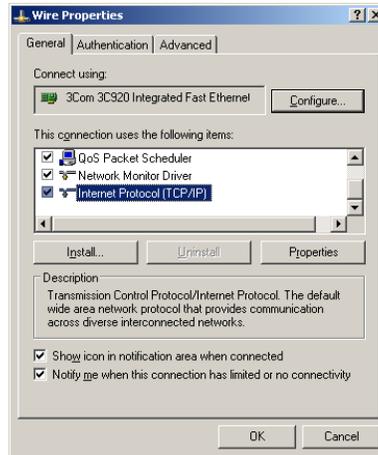
Figure 43.   Network IP Properties

   b.   Click **Internet Protocol (TCP/IP)** and then click **Properties**. Change the parameters to the following:

   • IP Address = 169.254.102.1

   • Subnet Mask = 255.255.255.0

   • Default Gateway = 169.254.102.100

Figure 44.   TCP/IP Properties

   c.   Use the Vlinx Manager software to search for, discover, and configure the unit.

2. **Method Two:** Change the serial server's network setting to match your PC using Console Mode

   a.   Connect a null modem serial cable (crossover cable) from Port 1 on the serial server to an available COM port on your PC.

   b.   Open Hyper Terminal or similar serial emulation software and connect to the COM port used in the step above. Ensure the port is configured to 115,200 baud, 8 data bits, and 1 stop bit.

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c. Enter Console Mode. Press and hold the serial server's reset switch for 2 to 10 seconds. The LED indicators will respond as follows:

Model	Port 1 LED	Port 2 LED	Ready LED
1 Port	OFF	N/A	ON
2 Port	OFF	ON	OFF

d. Release the Reset button. The Ready LED will blink once per second for 5 seconds. This indicates that the serial server is re-booting in Console Mode.

e. When the serial server has successfully restarted in Console Mode, the Ready LED will be off and the Port 1 LED will be on.

f. Open the Vlinx™ Manager Software and select Serial Port as the method to connect to the device.

g. After logging in, click **Network**.

h. De-select **I want DHCP to setup the Network**.

i. Re-configure the serial server's network settings to an address within the range of your PC's network setting.

For example, if your PC is configured to the following settings:

IP Address = 192.168.0.1

Network Mask = 255.255.255.0

Default Gateway = 192.168.0.100

Configure the serial server to:

IP Address = 192.168.0.50

Network Mask = 255.255.255.0

Default Gateway = 192.168.0.100

- Save the settings and remove power from the serial server.
- Apply power to the serial server.
- Open the Vlinx™ Manager Software and select "Network" as the method to connect to the serial server

Link Status of the currently selected serial server is shown on the Login page of Vlinx Manager. Link status indicates the type of Ethernet connection between the computer and serial server. It will either display 10BaseT or 100BaseTX in full duplex or half duplex. Link status is dependant on the LAN, switches, hubs used in the LAN topology.

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The **MAC Address** is a hardware level address of the serial server that cannot be changed. It is assigned in the factory. Every Ethernet device manufactured has its own unique MAC address. The MAC address of each serial server is printed on the device's label. The MAC address of each device is shown in the Serial Server Information Table. The MAC address of the currently selected serial server is also displayed on the Login page of Vlinx Manager.

The **Model** number of the currently selected serial server is displayed on the Login page of Vlinx Manager.

Network Protocols available for use on VESP211 serial servers include TCP, UDP, VCOM and Paired Mode.

Network Watchdog controls the duration of network inactivity when a network connection is determined idle and causes the connection to be forced closed. The range is 1 through 65535 milliseconds.

Paired Mode enables two serial servers to operate across the network like a "wire replacement" between two serial devices. (Paired Mode is also called *serial tunneling*.) Serial devices connected to serial servers on each end of the link can communicate as it they were connected by a serial cable.

- For Paired Mode to work one serial server must be configured as a TCP server and the other as a TCP client.
- The serial server configured as the **TCP client** initiates connections. You must set up the IP address and port number of the server that you want the client (serial server) to communicate with. You also select whether you want the serial server to connect at power up or only when it receives data from the device connected to its serial port.
- The serial server configured as a **TCP server** waits for connections to be initiated by another network device. You must set up the TCP port number on which it will listen for connections and set the maximum (up to eight) number of simultaneous connections it will accept. You can filter the connections it will accept based on specific IP addresses or ranges of IP addresses that you specify.

Password. When you first receive the VESP211 serial server from the factory the password is blank so that you can initially access the serial server without entering a value into this field. To ensure security you should create and save a password the first time you configure the serial server. After a password has been set up it must be entered each time you login to Vlinx Manager. The password is used to access the configuration pages from the Vlinx Manager Login page and can be changed from the General page.

Serial Interface Modes. Four serial interface modes of operation are:

- **RS-232** - Point-to-point serial communications connection used by PC COM ports and many other systems. Capable of baud rates up to 115.2

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kbaud over short distances (typically 50 feet). Typically uses DB-9 connectors but terminals are also used on VESP211 serial servers.

- **RS-422** - Point-to-point communications using a transmit pair and a receive pair. RS-422 can operate at higher speeds and longer distances than RS-232. Typically uses two shielded twisted pairs and screw terminals but DB-9 connectors are also used on VESP211 serial servers.

- **RS-485 2-wire** - Similar speed and distance specifications as RS-422 but allows multidrop connections. Typically uses one shielded twisted pair and screw terminals but DB-9 connectors are also used on VESP211 serial servers.

- **RS-485 4-wire** - Similar speed and distance specifications as RS-422 but allows full-duplex connections. Typically uses two shielded twisted pairs and screw terminals but DB-9 connectors are also used on VESP211 serial servers..

Select the appropriate serial interface mode for the type of connection between the serial server's serial port and the device connected to it.

Note: *Refer to the Appendix D for connector and pin-out details.*

Serial Server Name is a unique name assigned to the serial server. It must be a valid hostname as defined by RFC-952 and RFC-1123. The rules are:

- It must consist only of the characters "A" to "Z", "a" to "z", "0" to "9" or "-"

- It can start or end with a letter or a number, but it must not start or end with a "-".

- It must not consist of all numeric values.

The **Server Serial Port Number** of the currently selected port is shown in this field. For more information refer to the TCP/UDP Ports table in Appendix B, which shows the ports used for several modes of operation.

Serial Watchdog controls the duration of serial inactivity when the serial port is determined idle and causes all connections for that serial port to be forced closed. The range is 1 through 65535 milliseconds.

The **Subnet Mask** specifies the network mask the serial server uses when on a subnetted network.

- For a Class A network (IP addresses 0.0.0.0 through 127.255.255.255) the default subnet mask is 255.0.0.0.

- For a Class B network (IP addresses 128.0.0.0 through 191.255.255.255) the default subnet mask is 255.255.0.0

- For a Class C network (IP addresses 192.0.0.0 through 233.255.255.255) the default subnet mask is 255.255.255.0

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- For a Class D network (IP addresses 224.0.0.0 through 239.255.255.255) and Class E Networks (IP addresses 240.0.0.0 through 255.255.255.255) the subnet mask is ignored.

- VESP211serial servers come from the factory with a default subnet mask value of: 255.255.255.0

TCP (Transmission Control Protocol) provides reliable connection-oriented network communication with error checking. In TCP mode the serial server can be configured as a client or a server.

TCP client. When the serial server is configured as a TCP client it initiates connections with a server on the network. You must set up the IP address and port number of the server that you want the client (serial server) to communicate with. You also select whether the serial server is to connect at power up or only when it receives data from the device connected to its serial port.

TCP server. When the serial server is configured as a TCP server it waits for connections to be initiated by another network device. You must set up the TCP port number that it will listen to for connections and set the maximum (up to eight) number of simultaneous connections it will accept. You can filter the connections it will accept based on specific IP addresses or ranges of IP addresses that you specify.

UDP (User Datagram Protocol) enables applications using UDP socket programs to communicate with the serial ports on the serial server. UDP protocol provides connectionless communications, which allows data to be broadcast to and received from multiple nodes on a network. (Because it is a connectionless protocol UDP does not guarantee the delivery of a datagram and the datagram is only be sent once.)

- In UDP mode, if you want to control what network node receives data, you must specify the IP address and UDP port the data will be sent to. You can choose to send to:
    - Nobody
    - All nodes at a specific UDP port number. (This is called broadcast.)
    - Specific IP addresses and UDP port numbers. (This is called unicast.)
    - A range of IP addresses and UDP port numbers. (This is called unicast range.)
- You can also configure the serial server to receive from nodes on the network using the same list of configuration options.
- When the Network Protocol is set to **VCOM (Virtual COM Port)** the serial server communicates over the network with a PC, acting as a remote COM port for the computer.

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- Both the serial server and the computer must be configured for VCOM operation. Virtual COM ports can be set up on the PC using the Vlinx Manager software.

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SECTION 9

Appendix

Appendix A: Default Server Settings

Setting	Default Value
Server Name	MODEL NUMBER
Serial Number	Printed on the label
Password	password field is blank from factory
DHCP	Enable
IP Address	BASED ON DHCP SERVER If a DHCP assignment is not available, the device will default to 169.254.102.39
Net Mask	255.255.0.0
Gateway	169.254.1.1
Firmware Version	X.X.X (Current Version)
Hardware Version	X.X (Current Version)
Port	1
Serial port mode	RS-232
Baud Rate	9600
Data bits	8
Parity	None
Stop bits	1
Flow Control	None
Protocol	TCP
Serial timeout	0 seconds
TCP alive timeout	0 minutes
Connection Mode	Server
Delimiter HEX 1	00
Delimiter HEX 2	00
Remove delimiters	Disable
Force transmit	0 ms
Inter-character timer	0 ms
Character count	0
Max connection	1

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Appendix B: Product Specifications

General Specifications

Hardware and included accessories	Device	Serial Server
	CD	CD with Vlinx Manager software for XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit)
Optional Accessories	Cable	232NM9 Null Modem Crossover Cable for DTE to DTE connection
Configuration Options	Via serial port	Using Vlinx Manager via a serial connection, (press Reset button to enter Console Mode)
	Via network	Using Vlinx Manager via a Ethernet connection
		Using a web browser such as Internet Explorer 7,8 or 9 or Firefox 3.6 and over
Software	Vlinx Manager for serial server configuration	XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit)
Environment	Operating Temperature	-40 to 80 °C (-40 to 176 °F)
	Storage Temperature	-40 to 85 °C (-40 to 185 °F)
	Operating Humidity	10 to 95% non-condensing
	Maximum Ambient Surrounding Air Temp	80 °C
Certifications	UL 60950	
	FCC	Part 15 Class A
	CE	
	NEMA TS2	
Enclosure	Rating	IP30
	Mounting	Panel mount
	Dimensions (VESP211) main body	2.1 x 3.1 x 0.87 in (5.2 x 7.9 x 2.2 cm)
	Including mounting tabs	2.9 x 3.1 x 0.87 in (7.4 x 7.9 x 2.2 cm)
Power Supply	Voltage Requirements	10 to 30 VDC
	Power Consumption	2.5 W max
Terminal Blocks	Wire Size	28 to 16 AWG
	Wire Type	Copper Wire Only
	Tightening Torque	5 KG-CM
	Wire Temp Rating	105 °C Minimum
		Sized for 60 °C Ampacity
	Note:	One Conductor Per Terminal

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Controls, Indicators and Connector Specifications

Switches	Reset button	Hold in for 0 to 2 seconds for hardware reset
		Hold in for 2 to 10 seconds for Console Mode (Do a hardware reset or recycle power to exit Console Mode)
		Hold in for more than 10 seconds to reset to factory defaults
Indicators	Serial LED	Color = Green
		On = Port open
		Blink = Data traffic
	Ethernet LED	Color = Yellow or Green
		On = 100BaseTX
		Off = 10BaseT
		Blink = Data traffic
	Ready LED	Color = Green
		Blink (once per second) = System OK
		Off = System NOT OK
Connectors	10BaseT/100BaseTX Ethernet	Single RJ-45F (8 pin)
	Serial	VESP211: DB9 connector
		VESP211-232: DB9 connector
		VESP211-485: terminal block connector
	DC Power	barrel connector

Serial Interface Specifications

Serial Interfaces	Mode Selection	RS-232/422/485 software selectable
	RS-232 lines	TXD, RXD, RTS, CTS, DTR, DSR, DCD, GND
	RS-422 lines	TXDA(-), TXDB(+), RXDA(-), RXDB(+), GND
	RS-485 lines (2 wire)	Data(-), Data(+), GND
	RS-485 lines (4 wire)	TXDA(-), TXDB(+), RXDA(-), RXDB(+), GND
	Baud Rates	75, 150, 300, 600, 1200, 2400, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 57600, 115200, 230400
	Data Bits	5, 6, 7, 8
	Parity	None, even, odd, mark, space
	Stop bits	1, 1.5, 2
	Flow control	None, RTS/CTS, XON/XOFF
	RS-422/485 biasing	Auto 1K ohm pullups and pulldowns
	RS-422/485 termination	120 ohm with user-installed jumpers
	RS-485 data control	Auto control via MCU

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Network Specifications

Memory	Serial Memory	8 KB per port
	Network Memory	4 KB
I/P Port Addresses	5300	Heartbeat & Configuration setting in TCP Mode (i.e. Pair Mode)
	8888	VESP211 update
Network Communications	LAN	10/100 Mbps Auto-detecting 10BaseT or 100BaseTX
Network Physical Layer Standards	Ethernet	IEEE 802.3 auto-detecting & auto MDI/MDX 10BaseT and 100BaseTX
Protocols Supported		TCP, IPv4, UDP, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
	IP Mode	Static, DHCP
	TCP/UDP	User definable
	UDP	Unicast or Multicast
Connection Modes		Server, Client, VCOM, Paired
Client Connection		At power up or upon data arrival
Search		Serial direct COM and Ethernet autosearch or specific IP
Diagnostics		Display PC IP, ping, test VCOM, save test config (text readable)
Firmware Upgrade		Via serial, Ethernet or auto web search
Character count		1 to 8192
Delimiters	Hex 1	01 to FF
	Hex 2	01 to FF
Timeouts	Inter-character	1 to 65535 ms
	Serial	1 to 65535 ms
	TCP keepalive	1 to 65535 min
	Force transmit	1 to 65535 ms
	Max character count	1 to 8192 bytes

TCP/UDP Ports Table

Port	Description	Comments
80/tcp	Always open for the web server.	This port is used for configuration of the device using a web browser. This port is always open no matter how you configure the device.
		If you want to use this method to configure the device from outside of a firewall, then a firewall must allow incoming connections to this port.
		If you want to use this method to configure the device from the outside of a NAT, the NAT must be configured to forward to this port.
771/tcp	This port is open when any serial port is configured for VCOM mode.	This port is used for communications with the VCOM device driver installed on the computer. This port is open only if you configure any serial port for VCOM mode.
		If you want to use VCOM from outside of a firewall, then you must allow incoming connections on this port. If you want to use VCOM from outside of a NAT, then you must forward to this port.
7000/tcp	Always open for serial server configuration over TCP.	This port is used for configuration and firmware upgrade of the device using the serial server manager. This port is always open no matter how you configure the device.
		If you want to configure the serial server from outside of a firewall using the serial server manager, then the firewall must be configured to allow incoming connections on 7000/tcp and allow packets addressed to 7000/udp to be received
		Note: Configuring over 7000/udp is not supported.

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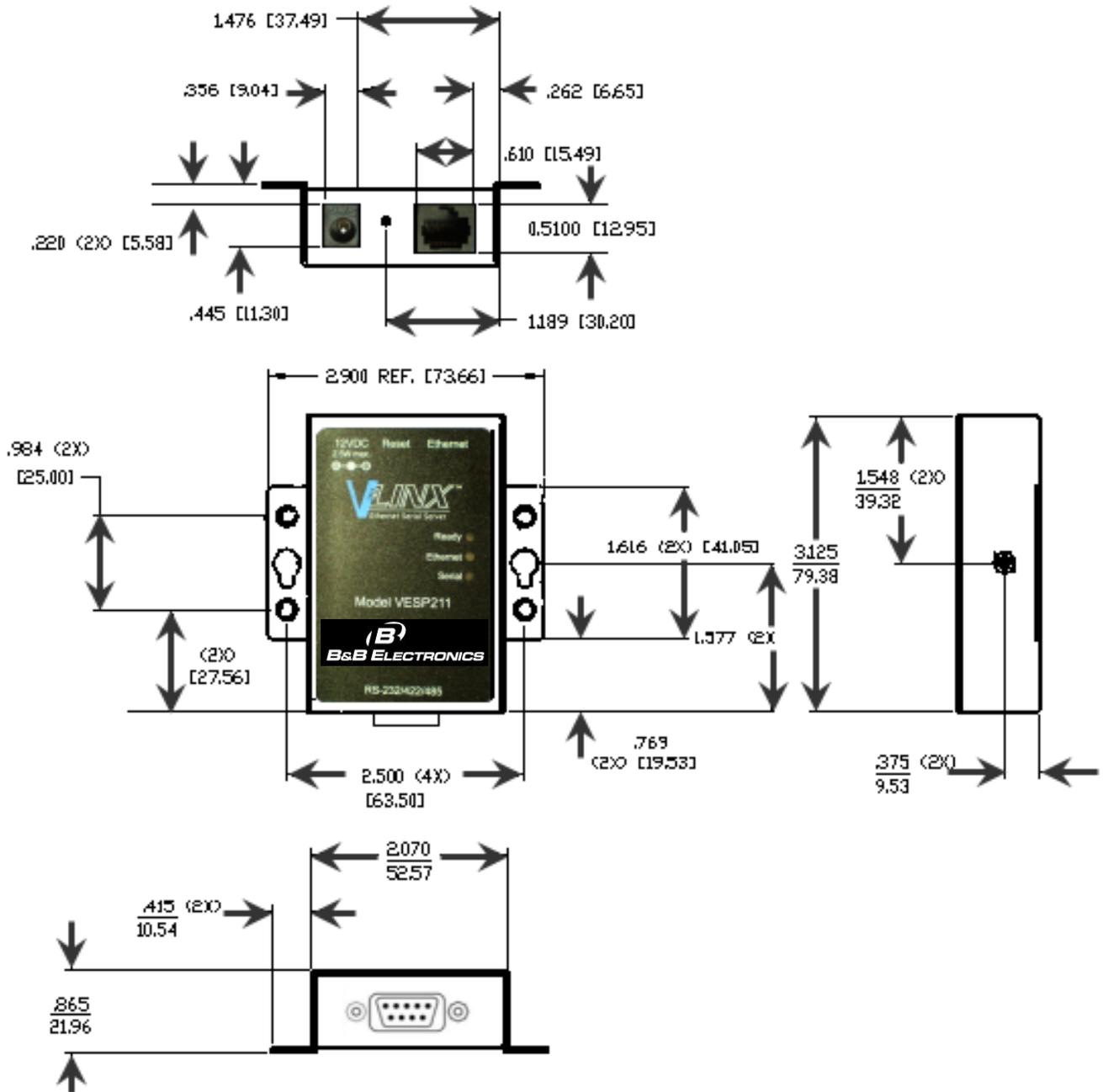|		
60000/tcp	This port is open when serial port 1 is configured for paired-mode server.	These ports are used to transfer handshake line state and break state in paired mode configuration. These ports are open only if you configure the port for paired-mode server. Note that serial port 1 uses 60000/tcp, serial port 2 uses 60001/tcp, serial port 3 uses 60002/tcp and serial port 4 uses 60003/tcp. If a port is not configured for paired-mode server, then the corresponding port is not open. If you want to connect to a paired-mode server from outside of a firewall, then you must allow incoming connections on these ports. If you want to connect to a paired-mode server from outside of a NAT, then you must forward to these ports.
60001/tcp	This port is open when serial port 2 is configured for paired-mode server.	Not Applicable
60002/tcp	This port is open when serial port 3 is configured for paired-mode server.	Not Applicable
60003/tcp	This port is open when serial port 4 is configured for paired-mode server.	Not Applicable
68/udp	This port is open when the network mode is DHCP.	This port is used if you configure the device for DHCP mode (as opposed to Static IP). It is used to communicate with the DHCP server. This should only be used inside of a firewall or NAT.
7000/udp	Always open for serial server configuration over UDP.	These ports are used for configuration and firmware upgrade of the device using the serial server manager. These ports are always open no matter how you configure the device. If you want to configure the serial server from outside of a firewall using the serial server manager, then the firewall must be configured to allow incoming connections on 7000/tcp and allow packets addressed to 7000/udp to be received
8899/udp	Always open for serial server discovery.	This port is used for discovering serial servers. This port is always open no matter how you configure the device. Note: The device discovery only works on a local subnet. The port may not need to be configured in a firewall or NAT.
Other	User-specified ports.	Other TCP and UDP ports may be open depending on what you specify for the device configuration. THESE ARE THE PORTS SPECIFIED IN THE CONFIGURATION FILE. If you want to use these other ports from outside of a firewall, then you must allow these ports. If you want to use these other ports from outside of a NAT, then you must forward to these ports

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Appendix C: Dimensional Diagram

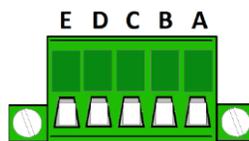*Figure 45.   Dimensional Diagram of a VESP211 Serial Server (dimensions in inches & millimeters)*

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Appendix D: Connector Pinouts

DB-9M Connnector
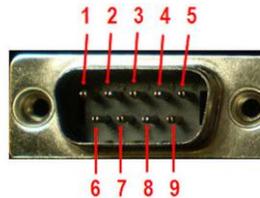
DB-9M Pin	RS-232	Direction (RS-232)	RS-422/485 4-Wire	RS-485 2-Wire
1	DCD	Input	RDA (-)	---
2	RD	Input	RDB (+)	---
3	TD	Output	TDB (+)	Data B (+)
4	DTR	Output	TDA (-)	Data A (-)
5	GND	---	GND	GND
6	DSR	Input	---	---
7	RTS	Output	---	---
8	CTS	Input	---	---
9	---	---	---	---

Terminal Block

Terminal	RS-422	RS-485
A	TDA (-)	Data A (-)
B	TDB (+)	Data B (+)
C	RDA (-)	---
D	RDB (+)	---
E	GND	GND

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Note 1:   *In the RS-422 mode, TX lines are outputs and RX lines are inputs. Connect the serial server TDB(+) line to the RDB(+) line of the serial device, and the serial server TDA(-) to the RDA(-) of the serial device.*

Note 2:   *Ground is signal ground and provides a common mode reference for the RS-422 Receiver and Transmitters.*

Standard Ethernet Cable RJ-45 Pin-out
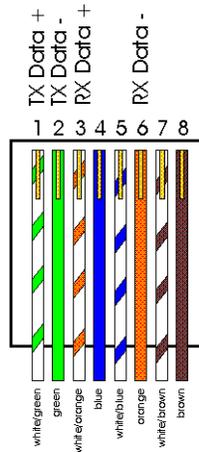
RJ-45 Pin	Signal	Wire Color	RJ-45 Pin
1	TX+	White-Green	1
2	TX+	Green	2
3	RX+	White-Orange	3
4	Not used	Blue	4
5	Not used	White-Blue	5
6	RX-	Orange	6
7	Not used	White-Brown	7
8	Not used	Brown	8

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