Vlinx

VESR9xx

Serial Servers



Vlinx Serial Servers

Model VESR9xx

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using domestic and imported parts by

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1. Introduction

Thank you for purchasing a VESR9xx Serial Server product! This product has been manufactured to the highest standards of quality and performance to ensure your complete satisfaction.



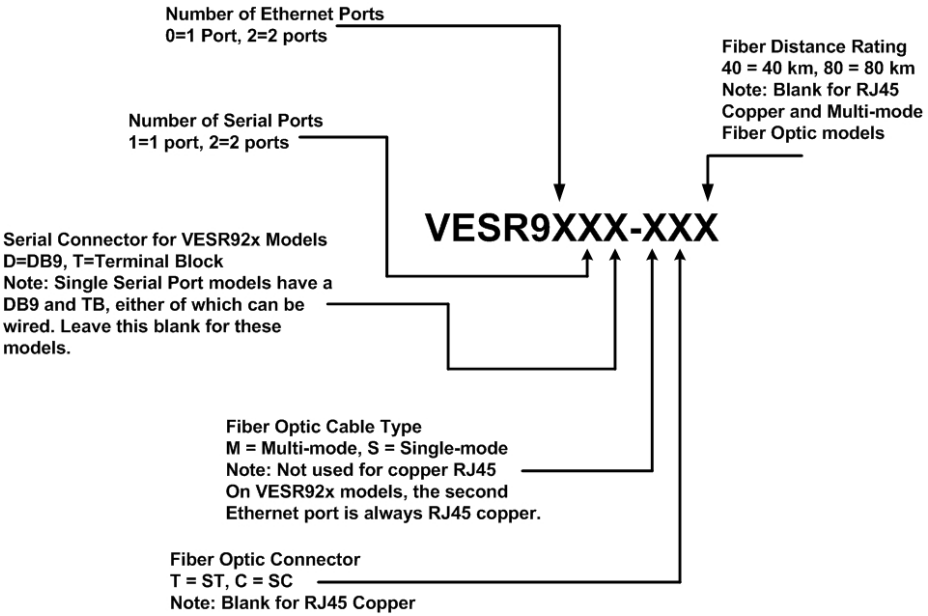
Figure 1. A VESR902T Serial Server

About VESR9xx Serial Servers

VESR9xx 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 ports can be accessed over a LAN/WAN using Direct IP Mode, Virtual COM Port, or Paired Mode connections. VESR9xx Serial Server**s** feature 10BaseT or 100BaseTX copper network media and several fiber optic media options, depending on the model. VESR92x serial servers feature an additional copper Ethernet pass-through port. VESR9xx Serial Server**s** are built for use in industrial environments, featuring an IP30 approved slim line DIN rail mountable case. They operate from a range of DC power supply voltages and feature pluggable terminal block power connectors.

VESR9xx Serial Server Model Numbering

VESR9xx Serial Server are a growing family of products. Models are available with one or two serial connections and one or two Ethernet connections. Network connection options include 10BaseT/100BaseTX copper or several different fiber optic options (on models with a pass-through port, the pass-through port is copper). The following diagram shows the model numbering scheme:



List of VESR9xx Serial Server Models

The following table lists the various VESR9xx Serial Server models available.

Model Number	Features
VESR901	Vlinx , 1PORT, DB9, ESS, DIN, CU ETHERNET
VESR901-SC	Vlinx , 1PORT, DB9, ESS, DIN, FIBER, SC
VESR901-SC40	Vlinx , 1PORT, DB9, ESS, DIN, FIBER, SC, 40KM
VESR901-SC80	Vlinx , 1PORT, DB9, ESS, DIN, FIBER, SC, 80KM
VESR901-ST	Vlinx , 1PORT, DB9, ESS, DIN, FIBER, ST
VESR901-ST40	Vlinx , 1PORT, DB9, ESS, DIN, FIBER, ST, 40KM
VESR901-ST80	Vlinx , 1PORT, DB9, ESS, DIN, FIBER, ST, 80KM
VESR901-MC	Vlinx , 1PORT, DB9, ESS, DIN, FIBER, MULTIMODE, SC
VESR901-MT	Vlinx , 1PORT, DB9, ESS, DIN, FIBER, MULTIMODE, ST
VESR902D	Vlinx , 2PORT, DB9, ESS, DIN, CU ETHERNET
VESR902D-SC	Vlinx , 2PORT, DB9, ESS, DIN, FIBER, SC
VESR902D-SC40	Vlinx , 2PORT, DB9, ESS, DIN, FIBER, SC, 40KM
VESR902D-SC80	Vlinx , 2PORT, DB9, ESS, DIN, FIBER, SC, 80KM
VESR902D-ST	Vlinx , 2PORT, DB9, ESS, DIN, FIBER, ST
VESR902D-ST40	Vlinx , 2PORT, DB9, ESS, DIN, FIBER, ST, 40KM
VESR902D-ST80	Vlinx , 2PORT, DB9, ESS, DIN, FIBER, ST, 80KM
VESR902D-MC	Vlinx , 2PORT, DB9, ESS, DIN, FIBER, MULTIMODE, SC
VESR902D-MT	Vlinx , 2PORT, DB9, ESS, DIN, FIBER, MULTIMODE, ST
VESR902T	Vlinx , 2PORT, TB, ESS, DIN, CU ETHERNET
VESR902T-SC	Vlinx , 2PORT, TB, ESS, DIN, FIBER, SC
VESR902T-SC40	Vlinx , 2PORT, TB, ESS, DIN, FIBER, SC, 40KM
VESR902T-SC80	Vlinx , 2PORT, TB, ESS, DIN, FIBER, SC, 80KM
VESR902T-ST	Vlinx , 2PORT, TB, ESS, DIN, FIBER, ST
VESR902T-ST40	Vlinx , 2PORT, TB, ESS, DIN, FIBER, ST, 40KM
VESR902T-ST80	Vlinx , 2PORT, TB, ESS, DIN, FIBER, ST, 80KM
VESR902T-MC	Vlinx , 2PORT, TB, ESS, DIN, FIBER, MULTIMODE, SC
VESR902T-MT	Vlinx , 2PORT, TB, ESS, DIN, FIBER, MULTIMODE, ST
VESR921	VLINX, 1PORT, DB9, ESS, DIN, 2 CU ETHERNET
VESR921-MC	VLINX, 1PORT, DB9, ESS, DIN, FIBER, MULTI, SC, CU
VESR921-MT	VLINX, 1PORT, DB9, ESS, DIN, FIBER, MULTI, ST, CU

Model Number	Features
VESR921-SC	VLINX, 1PORT, DB9, ESS, DIN, FIBER, SC, CU
VESR921-SC40	VLINX, 1PORT, DB9, ESS, DIN, FIBER, SC, 40KM, CU
VESR921-SC80	VLINX, 1PORT, DB9, ESS, DIN, FIBER, SC, 80KM, CU
VESR921-ST	VLINX, 1PORT, DB9, ESS, DIN, FIBER, ST, CU
VESR921-ST40	VLINX, 1PORT, DB9, ESS, DIN, FIBER, ST, 40KM, CU
VESR921-ST80	VLINX, 1PORT, DB9, ESS, DIN, FIBER, ST, 80KM, CU
VESR922T	VLINX, 2PORT, TB, ESS, DIN, 2 CU ETHERNET
VESR922T-MC	VLINX, 2PORT, TB, ESS, DIN, FIBER, MULTI, SC, CU
VESR922T-MT	VLINX, 2PORT, TB, ESS, DIN, FIBER, MULTI, ST, CU
VESR922T-SC	VLINX, 2PORT, TB, ESS, DIN, FIBER, SC, CU
VESR922T-SC40	VLINX, 2PORT, TB, ESS, DIN, FIBER, SC, 40KM, CU
VESR922T-SC80	VLINX, 2PORT, TB, ESS, DIN, FIBER, SC, 80KM, CU
VESR922T-ST	VLINX, 2PORT, TB, ESS, DIN, FIBER, ST, CU
VESR922T-ST40	VLINX, 2PORT, TB, ESS, DIN, FIBER, ST, 40KM, CU
VESR922T-ST80	VLINX, 2PORT, TB, ESS, DIN, FIBER, ST, 80KM, CU

VESR9xx Serial Server Features

Three series models

- VESR9x1-x (single serial port)
- VESR9x2D-x (two serial ports with DB9M)
- VESR9x2T-x (two serial ports with pluggable terminal blocks)

Fiber models available for each of the above series

Ethernet pass through ports are available on VESR92x series models.

Multi-interface serial ports

DB-9M and pluggable terminal block serial port connector options

All ports are software selectable as RS-232, RS-422 or RS-485 2- and 4-wire

Configuration can be done via network or direct serial connection

Slim line DIN rail mountable case

Accepts DC power over a wide voltage range

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 for future revisions/upgrades

Software Support - Windows 2000, 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.

2. VESR9xx Serial Server Hardware

VESR9xx Serial Servers are enclosed in DIN rail mountable enclosures and feature LED indicators, power, Ethernet and serial connectors and a recessed Mode switch.

Package Checklist

VESR9xx Serial Servers are shipped with the following items included:

VESR9xx Serial Server Module

Quick Start Guide

CD with User Manual, Quick Start Guide and firmware

VESR9xx Serial Server Enclosures and Mounting

All VESR9xx Serial Server models are built into similar enclosures. Modules are DIN rail mountable.

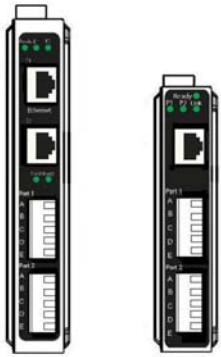


Figure 2. Front View of the VESR922T and VESR902T Serial Server

LED Indicators(VESR90x)

VESR9xx Serial Servers have three LED indicators: a **Link LED**, a **Ready LED** and two **Serial Port LEDs**.

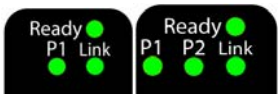


Figure 3. LEDs on 1 and 2 Port Serial Servers

Link LED

The **Link** LED illuminates (green) if the Ethernet connection is operating in 100BaseTX mode. The LED is off if the mode is 10BaseT. When the LED is blinking it indicates that there is data traffic on the Ethernet link.

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.

Serial Port LEDs

VESR901-x serial servers feature one serial port. VESR902D,and VESR902T-x serial servers feature two serial ports. Each serial port has an associated LED. Serial Port LEDs blink (green) when data is being transmitted or received on the serial port. When the LED is On it indicates the serial port is open.

LED Indicators (VESR92x)

VESR92x Serial Servers have four LED indicators: **E1 and E2 LEDs**, a **Ready LED** and two **Serial Port LEDs**.

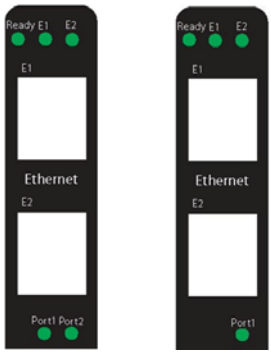


Figure 4. LEDs on 1 and 2 Port Serial Servers

E1 and E2 LEDs

The **E1 and E2** LEDs illuminate (green) if the Ethernet connection is operating in 100BaseTX mode. The LEDs are off if the mode is 10BaseT. When the LED is blinking it indicates that there is data traffic on the Ethernet link.

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.

Serial Port LEDs

VESR921-x serial servers feature one serial port. VESR922x, serial servers feature two serial ports. Each serial port has an associated LED. Serial Port LEDs blink (green) when data is being transmitted or received on the serial port. When the LED is On it indicates the serial port is open.

Mode Switch

A recessed momentary reset switch is located on the top of the enclosure. To activate the switch, insert a small plastic tool through the hole in the enclosure and press lightly.



Figure 5. Top View of the Serial Server

The Mode switch can be used to:

Initiate a Hardware Reset

Enter Console Mode

Reload factory defaults

Note: Refer to Section 3. Serial Server Setup and Connections for more information on using the Mode switch.

Ethernet Connector

Serial server models using 10BaseT/100BaseTX network connections use an RJ45 receptacle. The serial server is connected to a standard Ethernet network drop using a straight-through RJ45 (male) Ethernet cable. VESR92x models feature a second RJ45 receptacle which acts an Ethernet pass-through connection. This connection functions similar to an Ethernet switch and allows the connection of other devices to the network.



Figure 6. Ethernet Connector

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

Fiber Optic Connectors

Serial server models using fiber Optic network connections use either SC or ST connectors, depending on the specific model.

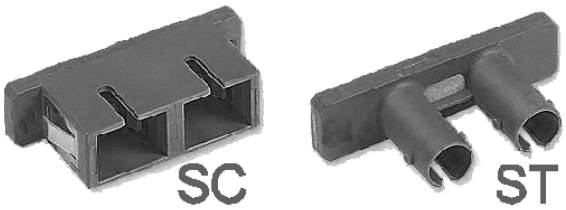


Figure 7. SC and ST Fiber Optic Cable Connectors

Serial Port Connectors

VESRxx Serial Servers use three serial port connector configurations, depending on the model:

VESR901-x serial servers feature one serial port and use a DB-9M connector for RS-232 and a five-position removable terminal block for RS-422 and RS-485 connections.

VESR902D-x serial servers feature two serial ports, both using DB-9M connectors for RS-232, RS-422 and RS-485 connections.

VESR902T-x serial servers feature two serial ports, both using five-position removable terminal blocks for RS-232, RS-422 and RS-485 connections.

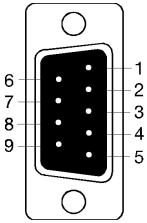


Figure 8. DB-9 Female Serial Port Connector with Pinout



Figure 9. Five-Position Pluggable Terminal Blocks

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

Power Connector

The power connector is a 5.08 mm 2-position pluggable terminal block.



Figure 10. Power Connection

Mounting Hardware

VESR9xx Serial Server modules can be DIN rail mounted. The DIN mounting clip and spring is included on each module.



Figure 11. DIN Clip on a Serial Server Module

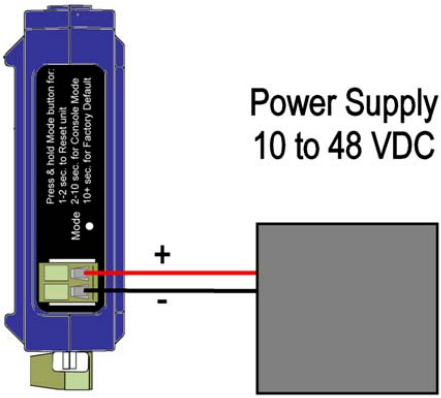
3. Serial Server Setup and Connections

This section describes how to setup and connect VESRxx 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** to the power terminals on the top of the serial server. Polarity of the wires is indicated on the label on the side of the serial server. Acceptable voltages are between 10 VDC and 48 VDC. The power supply must be capable of supplying 4 Watts for VESR90x models and 6.0 Watts for VESR92x models.



Connecting VESR9xx Serial Servers to Serial Devices

VESR9xx Serial Servers can be configured to connect to serial devices using RS-232, RS-422, RS-485 2-wire and RS-485 4-wire.

RS-232 connections support eight signal lines plus Signal Ground. Signals are single ended and referenced to Ground. Default communications parameters are 9600, 8, N, 1 and no flow control implemented.

RS-422 connections support 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.

RS-485 connections support 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.

Connecting the VESR901-x

The **VESR901-x** has one serial connection that supports RS-232, RS-422 and RS-485 (2- and 4-wire). The unit has two connectors: a DB-9M connector and a 5-position terminal block.

If you select RS-232 mode when you configure the serial server, you must connect the serial device to the serial server via a serial cable. The VESR901 is a DTE. If the serial device is a DTE, use a null modem (cross-over) cable. If the serial device is a DCE, use a straight-through cable.

If you select RS-422 mode, RS-485 2-wire mode, or RS-485 4-wire mode when you configure the serial server, you must connect the serial device appropriately, via the 5-position terminal block.

Note: Refer to Appendix D for connector pinout information.

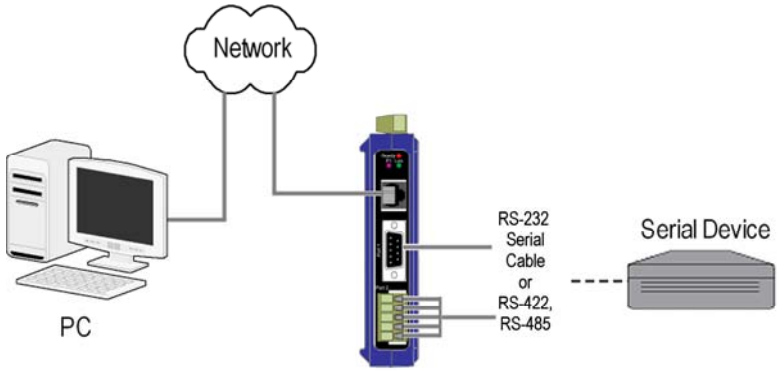


Figure 12. VESR901 Connections

Connecting the VESR902T-x

The **VESR902T-x** has two serial connections that support RS-232, RS-422 and RS-485 (2- and 4-wire). The unit has two connectors, both of which are 5-position terminal blocks. Make the appropriate connections to the terminal blocks to match the serial connection mode you select when configuring the serial server.

Note: Refer to Appendix D for connector pinout information.

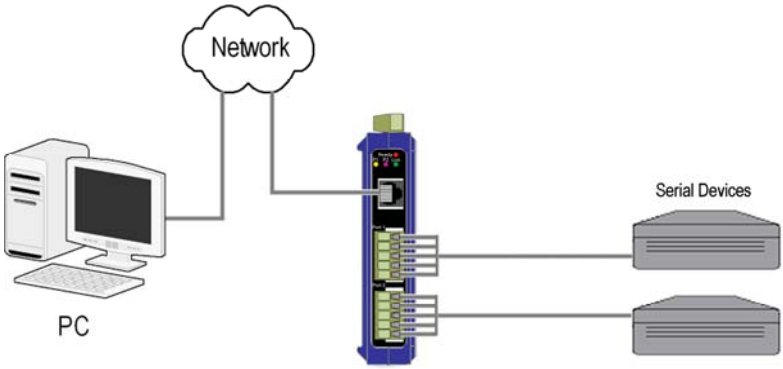


Figure 13. VESR902T-x Connections

Connecting the VESR902D-x

The **VESR902D-x** has two serial connections that support RS-232, RS-422 and RS-485 (2- and 4-wire). The unit has two connectors, both of which are DB-9M connectors. You must connect the serial device to the serial server via a serial cable. The VESR902D is a DTE. If the serial device is a DTE, use a null modem (cross-over) cable. If the serial device is a DCE, use a straight-through cable.

Note: Refer to Appendix D for connector pinout information.

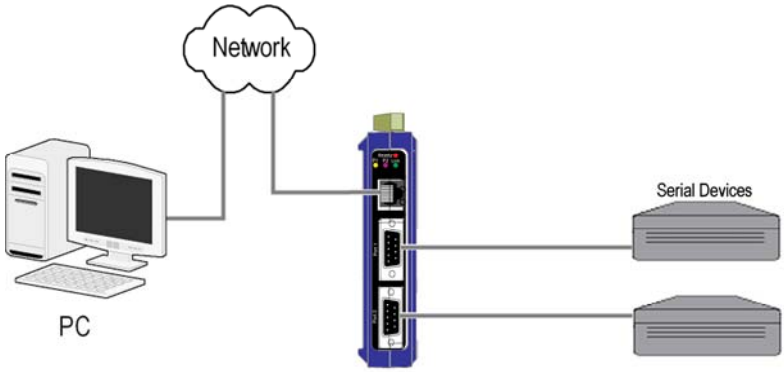


Figure 14. VESR902D-x Connections

Connecting VESR9xx Serial Servers to a Network

Network Connection (10BaseT/100BaseTX)

When connecting a serial server equipped with a 10BaseT/100BaseTX network connection (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.

Fiber Optic Connection

When connecting a serial server equipped with a fiber optic interface to a fiber optic link the appropriate fiber optic cable must be connected between the serial server and the network interface. Refer to the List of

VESR9xx Serial Server Models at the beginning of this manual for a list of supported fiber types, distances and connectors.

Ethernet Pass-through Port

VESR92x serial servers are configured with an additional RJ45 network port. This port can be used to connect additional Ethernet devices, such as a local workstation, to the network.

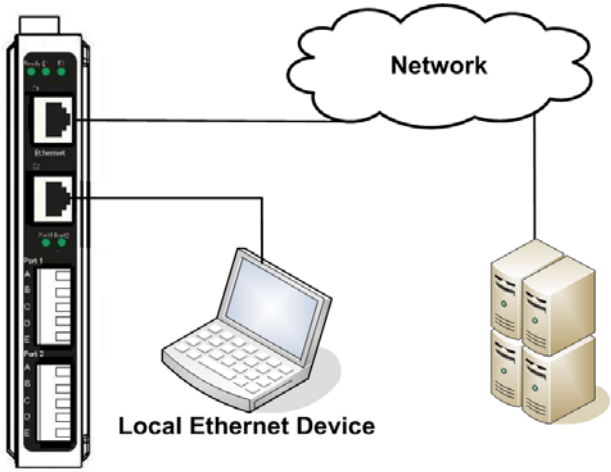


Figure 15. Ethernet Pass-through Port

VESR9xx Serial Server Configuration Connections

VESR9xx Serial Servers can be configured over the network or via a serial port.

Configuring the VESR9xx Serial Server via the Network Connection

When configuring via the network, either Vlinx Manager software or the web interface can be used.

Configuring with Vlinx Manager

VESR9xx Serial Servers can be configured over the network Vlinx Manager software running on a PC.

To open Vlinx Manager:

1. From the Desktop, click Start→Programs→B&B Electronics→Vlinx →Vlinx Manager→ VESR Serial Server

   The Vlinx Manager Discovery window appears.



Figure 16. Vlinx Manager Discovery Window

2. Configure your serial server as required.

> *Note: For more information on configuration options refer to Section 4: Description of Serial Server Properties.*

Configuring with the Web Interface

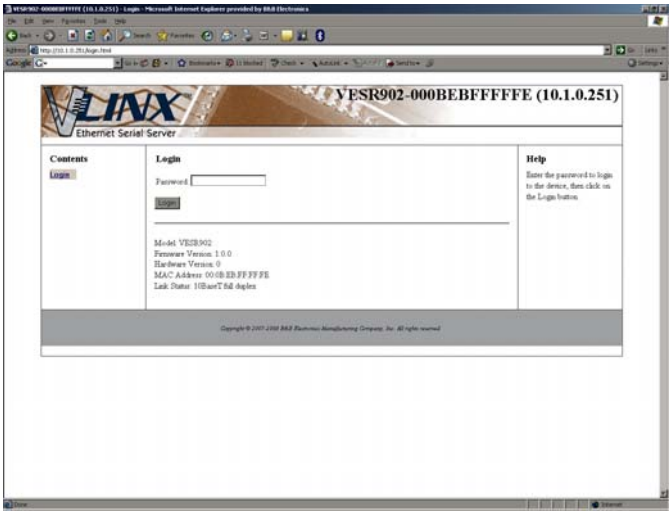
VESR9xx Serial Servers can be configured over the network using a standard internet brower such as Internet Explorer or Firefox.

To open the web configuration interface:

1. On a PC connected to the network, open a browser.
2. In the browser's address bar, type the IP address of the serial server.

> *Note: 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*

The web interface Login page appears.



3. Configure your serial server as required.

> *Note: For more information on configuration options refer to Section 4: Description of Serial Server Properties.*

Configuring the VESR9xx Serial Server via the Serial Port (Console Mode)

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

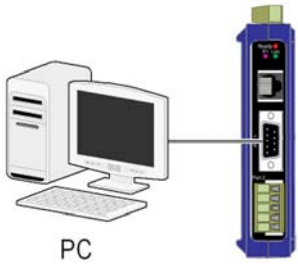


Figure 17. Console Mode Setup

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

To enter Console Mode, press and hold the Mode switch for between two and ten seconds. The LED indicators respond as follows:

1. The Ready LED blinks three times per second while the button is being pressed.
2. The serial server is in Console Mode when:

On the VESR901: Port 1 LED is On and the Ready LED is Off.

On VESR902x models: Port 1 LED is On and the Port 2 LED is Off.

To configure the serial server, open the Vlinx Manager software and set up the serial server's parameters as required.

> *Note: For more information on configuration options refer to Section 4: Description of Serial Server Properties.*

To exit Console Mode, press and hold the Reset switch for two seconds, or turn off the power from the VESR9xx, wait a few seconds, and turn the power on again.

The LEDs go back to their normal states when the device resumes normal operation.

VESR9xx Serial Server Operational Connections

VESR9xx Serial Servers can operate in Direct IP, Virtual COM Port and Paired Modes.

Using VESR9xx Serial Servers in Direct IP Mode

A **Direct IP** connection allows applications using TCP/IP or UDP/IP socket programs to 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.

To set up a Direct IP Mode connection:

1. Connect the serial server to the network and a serial device as described in previous sections.
2. Configure the serial server with the appropriate network settings (using Vlinx Manager or the web interface).
3. Configure your software application with the appropriate IP address and port number to communicate with the serial device(s).

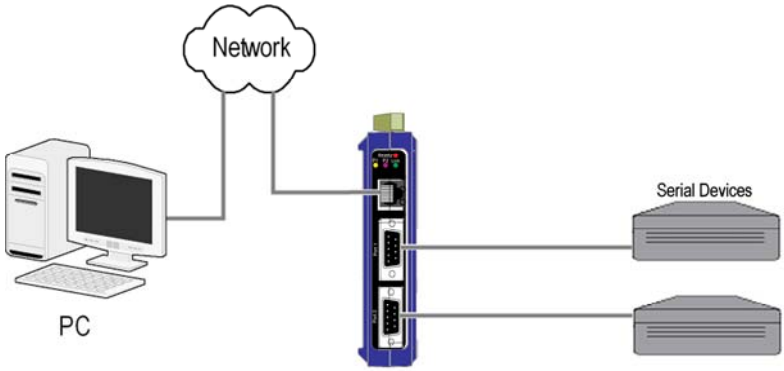


Figure 18. Direct IP and Virtual COM Port Connection

Using VESR9xx Serial Servers in Virtual COM Port Mode

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.

To set up a Virtual COM Port Mode connection:

1. Connect the serial server to the network and a serial device as described in previous sections.
2. Configure the serial server for VCOM operation (using Vlinx Manager).
3. Configure your software application to communicate via the virtual COM port.

Using VESR9xx Serial Servers in Paired Mode

When using serial servers 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 set up as shown in the following diagram and configured using Vlinx Manager software or web interface.

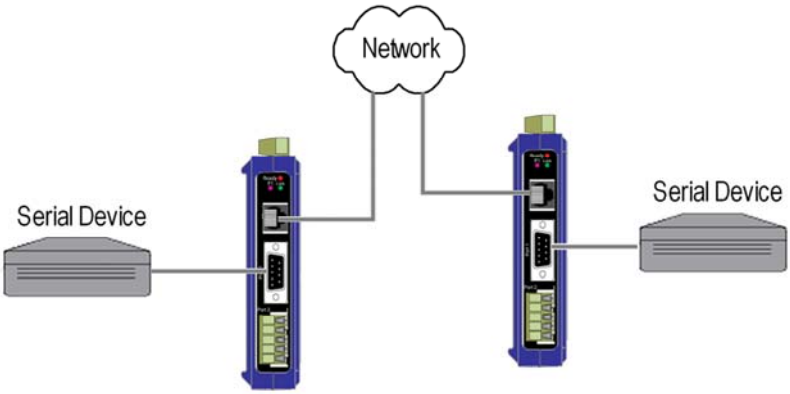


Figure 19. Paired Mode Setup

To set up a Paired Mode connection:

1. Connect two serial servers to serial devices and to the network.
2. Configure the serial server for Paired Mode operation (using Vlinx Manager or the web interface).

Initiating a Hardware Reset on the Serial Server

To initiate a Hardware Reset on the serial server, press and hold the Mode switch for 0 to 2 seconds, and then release it. The LED indicators respond as follows:

1. The Ready LED blinks three times per second while the button is being pressed.
2. The serial server is in Reset Mode when:

On the VESR901: Port 1 LED is On and the Ready LED is Off.

On VESR902x models: Port 1 LED is On and the Port 2 LED is Off.

3. The LEDs go back to their normal states when the device resumes normal operation.

Reloading Factory Defaults

To reload Factory Defaults, press and hold the Mode switch for more than 10 seconds. The LED indicators respond as follows:

1. The Ready LED blinks three times per second while the button is being pressed.
2. The serial server is in Factory Default Mode when:

On the VESR901: Port 1 LED and the Ready LED are both On.

On VESR902x models: Port 1 LED and the Port 2 LED are both On.

The serial server reloads all factory default configuration parameters.

3. The LEDs go back to their normal states when the device resumes normal operation.

Note: Factor default parameters are listed in Appendix A

4. Description of Serial Server Properties

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

Baud Rate

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

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 65535.

Configuration Files

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

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.)

Default Gateway

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

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 recognises the specified character(s) on its serial port.

Delimiter 1

Delimiter 1 is a *start delimiter*. The range of ASCII values is 0 through 255.

Delimiter 2

Delimiter 2 is an *end delimiter*. The range of ASCII values is 0 through 255.

Delimiter Removal

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 delimter 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

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.

Notes:

This product is factory defaulted to the DHCP mode. It is intended that your network's DHCP Server provide the IP address assignment. If there is not a DHCP server on your network, the device will default to IP address 169.254.102.39.

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 IPaddress of the serial server, and the IP address has been changed, the device will not be able to communicate with the serial server.

Firmware Version

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

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

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.

Hardware Version

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

Inter-character Timeout

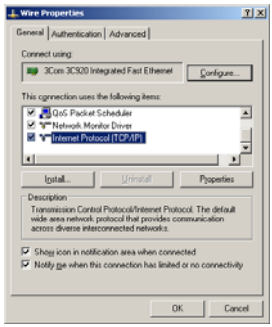
Inter-character Timeout controls the maximum duration between received characters before sending the characters to the network. Larger values may decrease the number of network packets, but increase the amount of time to receive characters. Smaller values may increase the number of network packets, but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

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

    a. Open the network connection on your PC



b. Click on Internet Protocol (TCP/IP) and 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



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.

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 on <Network>.

h. Un-check the box next to "I want DHCP to setup the Network."

i. Re-configure the serial server's Network Settings to something within the range of your PC's Network Setting. For example

   <u>If your PC is configured to:</u>

   IP Address = 192.168.0.1

   Network Mask = 255.255.255.0

   Default Gateway = 192.168.0.100

   <u>Configure the serial server to:</u>

   IP Address = 192.168.0.50

   Network Mask = 255.255.255.0

   Default Gateway = 192.168.0.100

j. Save the settings and remove power from the serial server.

k. 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

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.

MAC Address

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 it own unique MAC address. The MAC address of each serial server is printed on the device's label. The MAC address of the currently selected serial server is also displayed on the Login page of Vlinx Manager.

Model

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

Network Protocols

Network Protocols available for use on VESR9xx serial servers include TCP, UDP, VCOM and Paired Mode .

Network Watchdog

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

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 VESR9xx 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 kbaud over short distances (typically 50 feet). Typically uses DB-9 connectors but terminals are also used on VESR9xx 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 VESR9xx 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 VESR9xx 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 VESR9xx 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

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.

Server Serial Port Number

The **Server Serial Port Number** of the currently selected port is shown in this field.

VESR901-x serial servers feature one serial port.

VESR902D-x and VESR902T-x serial servers feature two serial ports.

Serial Watchdog

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.

Subnet Mask

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

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.

VESR9xxserial servers come from the factory with a default subnet mask value of: 255.255.255.0

TCP (Transmission Control Protocol)

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 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.

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)

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.

VCOM (Virtual COM Port)

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.

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.

5. Upgrading the Serial Server Firmware

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

1. Click the **Upgrade** button to open the **Firmware Upgrade** dialog box.

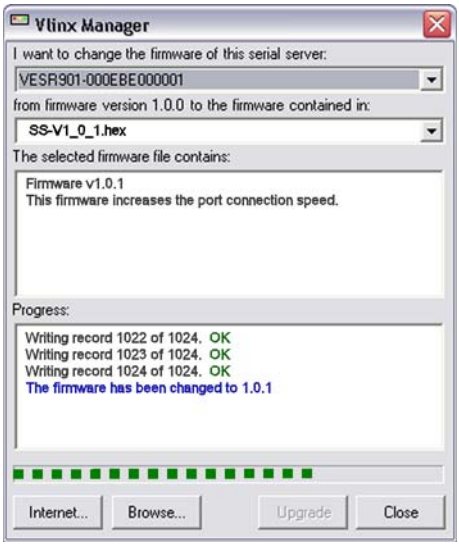


Figure 20. Firmware Upgrade Dialog Box

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

To upgrade the firmware:

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**.

6. Diagnostics

Clicking the **Diagnostics** 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.

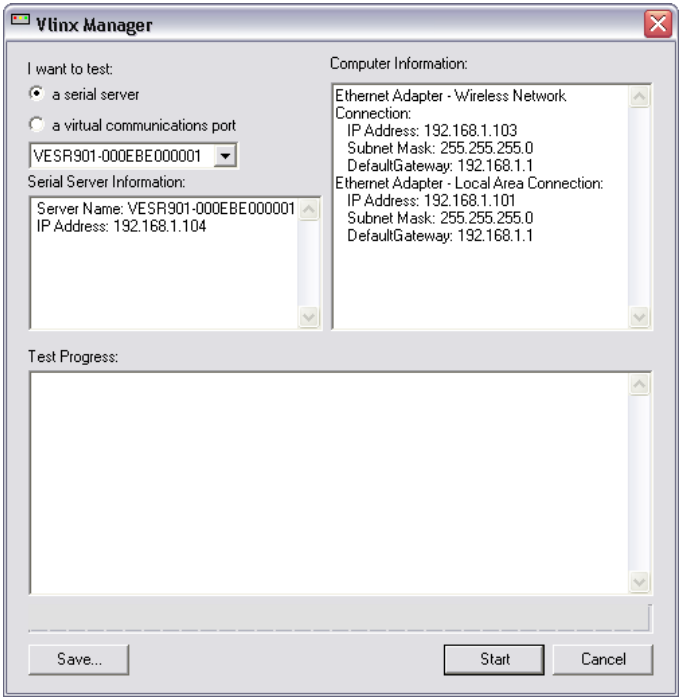


Figure 21. Diagnostics Dialog Box

Testing a Serial Server Connection

To run diagnostics on a serial server:

1. Click the **Diagnostics** 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.

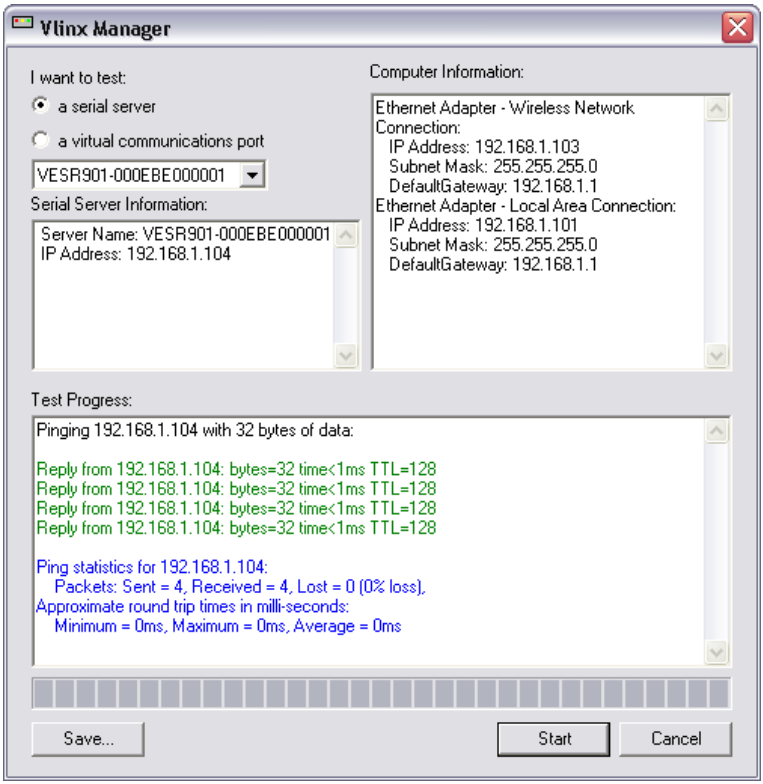


Figure 22. Testing a Serial Server Connection

Testing a Virtual COM Port

To run diagnostics on a virtual COM port:

1. Click the **Diagnostics** icon.

   The **Diagnostics** dialog box appears.

2. Select the option: **a virtual communications port**
3. In the drop down box select the specific COM port you want to check.
4. Click the **Start** button. Information about the progress of the pinging process is displayed in the **Test Progress** box.

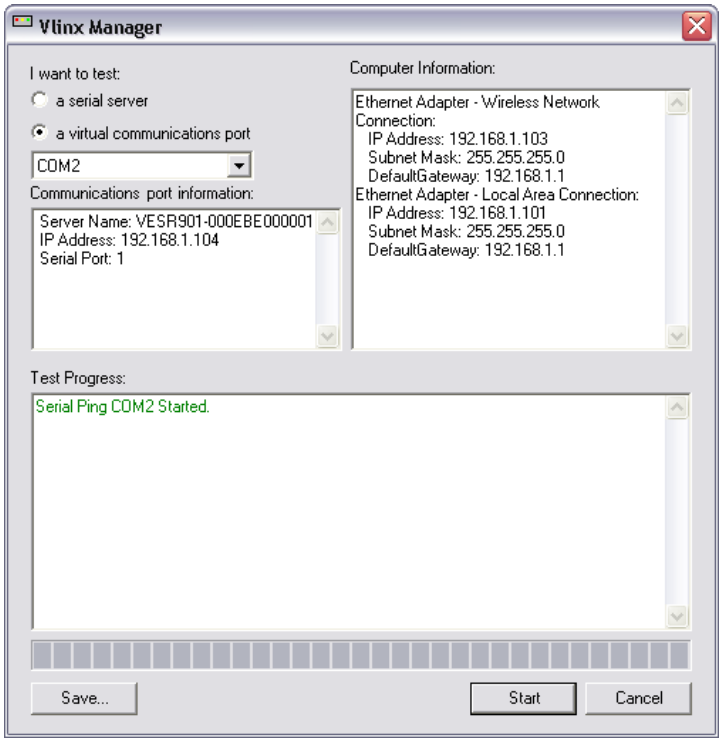


Figure 23. Testing a VCOM Port

7. Appendix A: Default Server Settings

Setting	Default Value
Server Name	MODEL NUMBER
Serial Number	printed on side of unit
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	255.255.255.0
Gateway	169.254.102.100
MAC Address	Fixed - see bottom label
Firmware Version	X.X.X (Current Version)
Hardware Version	X.X (Current Version)
Port	1, 2
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
TCP/UDP port	Port 1 = 4000, Port 2 = 4001
Max connection	1

8. Appendix B: Product Specifications

General Specifications

Hardware and included accessories	Device	Serial Server
	CD	CD with Vlinx Manager software for Windows 2000, 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
	Rail	ERS35 one-meter length of steel 35mm DIN Rail
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 standard web browser such as Internet Explorer 6.0/7.0 or Firefox 1.5/2.0
Software	Vlinx Manager for serial server configuration	Windows 2000, 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	FCC	Part 15 Class A
	CE	
	UL	File E222870
	UL Class1 Div2	Groups A, B, C, D (HAZLOC) File E245458
	TS2	
Enclosure	Rating	IP30
	Mounting	DIN rail mount (35 mm)
	Dimensions (VESR90x)	1.2 x 3.3 x 4.7 in (3.1 x 8.4 x 11.9 cm)
	Dimensions (VESR92x)	1.2 x 4.3 x 6.2 in (3.1 x 10.9 x 15.7 cm)
Power Supply	Voltage Requirements	10 to 48 VDC (58 VDC Maximum)

	Power Consumption	VESR90x – 4.0W (max) VESR92x – 6.0W (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

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 (one per port)	Color = Green On = Port open Blink = Data traffic
	Link LED (VESR 90x) E1 / E2 LED (VER92x)	Color = 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)
	SC fiber	SC connector
	ST fiber	ST connector
	Serial	ESR901-x: one DB-9M connector
		ESR902D-x: Two DB-9M connectors
		ESR902T-x: Two pluggable lockable 5.08 mm terminal blocks
	DC Power	5.08mm 2-position pluggable, lockable terminal block

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 4.7K ohm pullups and pulldowns
	RS-422/485 termination	Auto termination with thru hole resistor (user supplied)
	RS-485 data control	Auto control via MCU

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	VESR9xx update
Network Communications	LAN	10/100 Mbps Auto-detecting 10BaseT or 100BaseTX
Network Physical Layer Standards	Ethernet	IEEE 802.3 autodetecting & 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		0 to 65535
Delimiters	Hex 1	00 to FF (send serial data if delimiter hex 1 only is set and received)
	Hex 2	00 to FF (send serial data if delimiter hex 1 and 2 are set and received)
Timeouts	Inter-character	0 to 65535 ms
	Serial	0 to 65535 sec
	TCP alive	0 to 255 min
	Force transmit	0 to 65535 ms
	Max character count	0 to 8192 bytes

9. Appendix C: Dimensional Diagrams

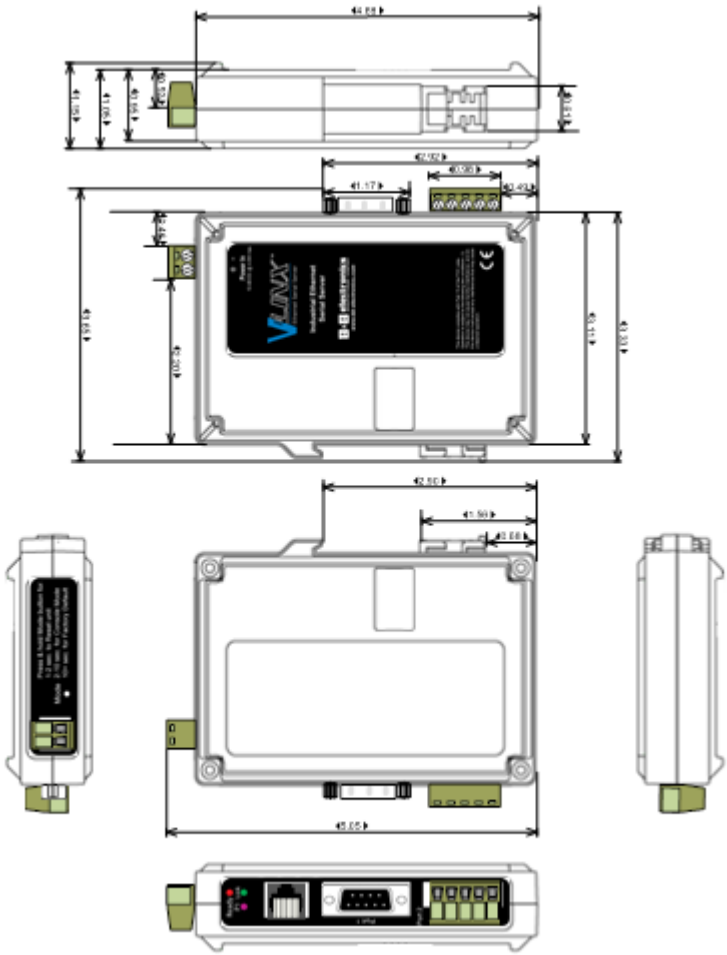


Figure 24. Dimensional Diagram of a VESR901 Serial Server

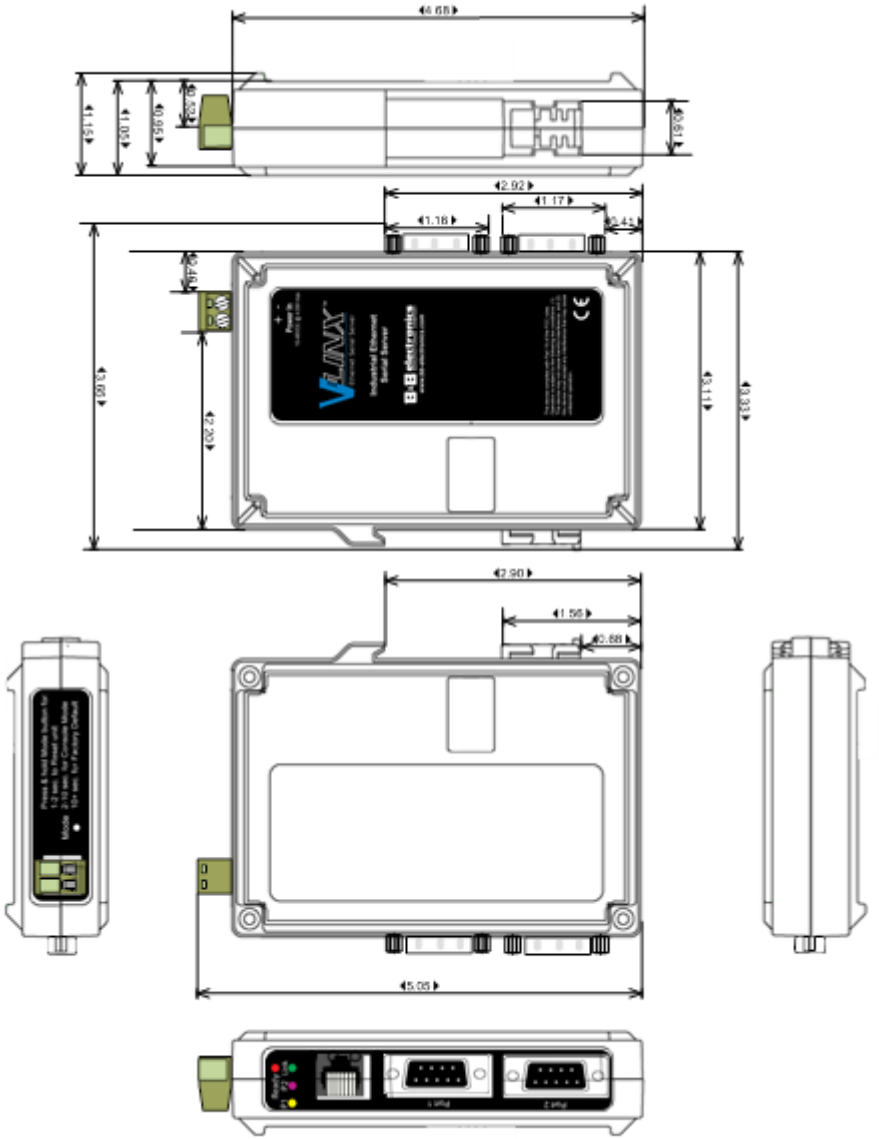


Figure 25. Dimensional Diagram of a VESR902D Serial Server

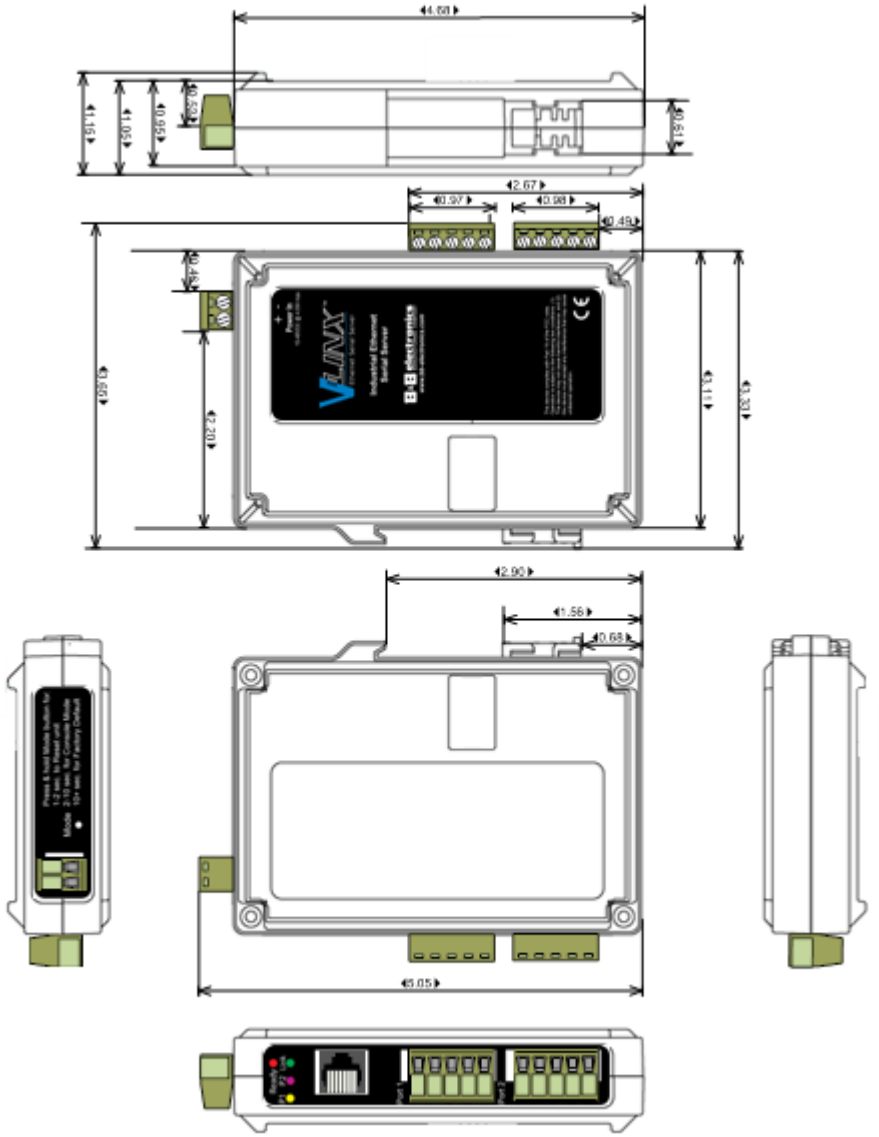


Figure 26. Dimensional Diagram of a VESR902T Serial Server

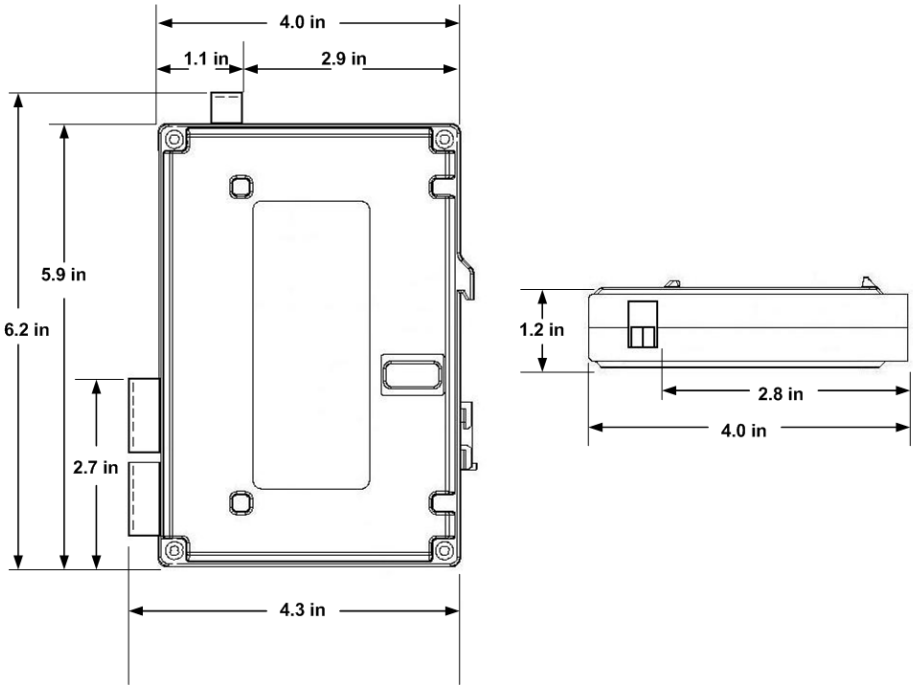
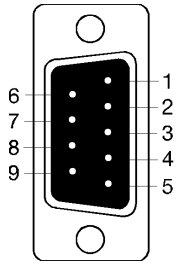


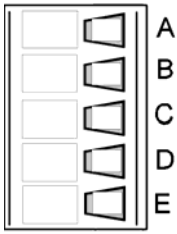
Figure 27. Dimensional Diagram of a VERR92x Serial Server

10. Appendix D: Connector Pinouts

VESR901 & VESR921 Series

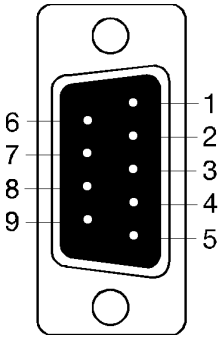


DB9 M Pin	Direction	RS-232
1	Input	DCD
2	Input	RXD
3	Output	TXD
4	Output	DTR
5	---	GND
6	Input	DSR
7	Output	RTS
8	Input	CTS
9	Input	RI



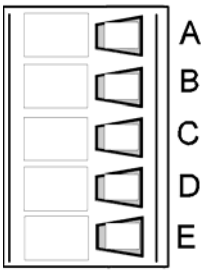
Terminal	RS-422/485 4-Wire	RS-485 2-Wire
A	TDA (-)	Data A (-)
B	TDB (+)	Data B (+)
C	RDA (-)	---
D	RDB (+)	---
E	GND	GND

VESR902D Series



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 A (-)
4	DTR	Output	TDA (-)	Data B (+)
5	GND	---	GND	GND
6	DSR	Input	---	---
7	RTS	Output	---	---
8	CTS	Input	---	---
9	RI	Input	---	---

VESR902T & VESR922T Series

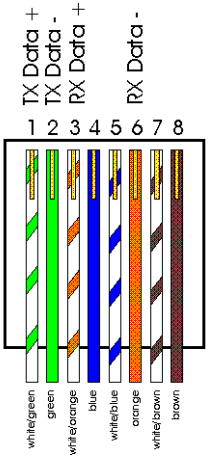


Terminal	RS-232	Direction (RS-232)	RS-422	RS-485
A	RTS	Output	TDA (-)	Data A (-)
B	TD	Output	TDB (+)	Data B (+)
C	CTS	Input	RDA (-)	---
D	RD	Input	RDB (+)	---
E	GND	---	GND	GND

In the RS-422 mode, TX lines are outputs and RX lines are inputs. Connect the serial server TXB(+) line to the RXB(+) line of the serial device, and the serial server TXA(-) to the RXA(-) of the serial device.

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