Vlinx

MESR321

Isolated Industrial Modbus Gateway



Vlinx MESR321

Models MESR321

Documentation Number: MESR321-xx_R001_2113m

This product was designed and manufactured in Ottawa, Illinois, USA, Using domestic and imported parts by



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Table of Contents

1.	Introduction	3
	About MESR321s	3
	MESR321 Model Numbering	
	MESR321 Features	4
	Configuration Software	4
2.	MESR321 Hardware	
	Package Checklist	5
	MESR321 Enclosures and Mounting	
	LED Indicators	
	Mode Switch	
	Ethernet Connector	
	Fiber Optic Connectors Serial Port Connectors	
	Power Connector	
	Mounting Hardware	
3.	Setup and Connections	
	Connecting the Power Supply	
	Connecting MESR321s to Modbus networks	11
	Connecting the MESR321	
	Connecting MESR321s to a Network	13
	Network Connection (10BaseT/100BaseTX)	14
	Fiber Optic Connection	
	MESR321 Configuration Connections	
	Installing Modbus Configuration Manager Software	
	Configuring the MESR321 via the Network Connection	
	Configuring the MESR321 on Networks without a DHCP Server	
	Configuring the MESR321 via the Serial Port (Console Mode)	38
	MESR321 Operational Connections	
	Using MESR321s in Direct IP Mode	41
	Initiating a Hardware Reset on the Modbus Gateway Reloading Factory Defaults	42
4. Up	ograding Firmware	
	Downloading Firmware Files	
	Uploading the Firmware to the Modbus Gateway	
5.	Diagnostics	
	Testing a Modbus Gateway Connection	
	Monitor Function	47
6.	Setup Examples	48
7.	Modbus Help	52
	Modbus ASCII/RTU Basics	52
	Hints and Tips	53
8.	Appendices	
	Appendix A: Default Gateway Settings	
	Appendix B: Product Specifications	
	General Specifications	
	Controls, Indicators and Connector Specifications	
	Approvals and certifications	59

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9.	Glossary	67
	MESR321 Serial Port Pinouts	66
	MESR321 Serial Port Pinouts	65
	Appendix D: Connector Pinouts	
	Appendix C: Dimensional Diagrams	
	Network Specifications	
	Serial Interface Specifications	
	Fiber Optic Cable Information	59

1. Introduction

Thank you for purchasing a MESR321 product! This product has been manufactured to the highest standards of quality and performance to ensure your complete satisfaction.

About MESR321s

MESR321s connect Modbus networks (RS-232, RS-422 or RS-485) to Ethernet networks, allowing the Modbus network to become a node on the network. The serial ports can be accessed over a LAN/WAN using Direct IP Mode connections. MESR321s feature 10BaseT or 100BaseTX copper network media and fiber optic media options, depending upon the model.

MESR321**s** are built for use in industrial environments, featuring an IP30 slim line DIN rail mountable case. They operate over a range of DC power supply voltages and feature pluggable terminal block power connectors. An external power supply, sold separately, is required.

MESR321 Model Numbering

MESR321s are a growing family of products. Network connection options include 10BaseT/100BaseTX copper or LC fiber optic options.

List of MESR321 Models

Model Number	Features
MESR321	1 Terminal Block/DB9 Port, DIN, 2 CU Ethernet
MESR321-SL	1 Terminal Block/DB9 Port, DIN, 1 CU Ethernet, 1 LC Fiber, single-mode
MESR321-ML	1 Terminal Block/DB9 Port, DIN, 1 CU Ethernet, 1 LC Fiber multi-mode
Models with 2 fiber optic	are possible for large projects:
Please cont	act B&B Electronics for more information

MESR321 Features

- DB9M and pluggable terminal block serial port connector options
- The DB9 port is for RS-232.
- The terminal block serial port is software selectable as RS-422 or RS-485 2- and 4-wire
- Configuration of Ethernet and serial port settings using software
- Configuration can be done via network, web page 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, Auto MDI/MDIX
- LAN and WAN Communications
- TCP Client or Server operation configurable
- Firmware Upload for future revisions/upgrades
- Software Support Windows XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), 2008 Server (32/64 bit), Windows 7 (32/64 bit)

Configuration Software

The configuration software enables you to find connected Modbus gateways, configure them, upgrade Modbus gateway firmware, and save/load configuration files. It features a graphical user interface (GUI) that is convenient and easy to use.

2. MESR321 Hardware

MESR321s are enclosed in DIN rail mountable enclosures and feature LED indicators, power, Ethernet and serial connectors and a recessed Mode switch.

Package Checklist

MESR321 Modbus Gateways are shipped with the following items included:

- MESR321 Modbus Gateway Module
- DIN rail and panel mounting hardware
- Quick Start Guide
- CD with User Manual, Quick Start Guide and firmware, and configuration software.

MESR321 Enclosures and Mounting

All **MESR321** models are built into similar enclosures. Modules are DIN rail and panel mountable.

LED Indicators

MESR321s have a Power LED, a Ready LED and Data LEDs.

LEDs			Power	
POWER	OFF	Power is not connected	Power	Link 1
	ON	Power is connected		
READY	OFF	System is in Console Mode	Ready	
	BLINK	System is in Normal Mode		
P1 DATA	ON	Serial Port is available	P1 Data	
	BLINK	Data is present on serial port		Link 2
RJ45 Ether	net Port LE	DS		
SPEED	OFF	10BaseT connection		
	ON	100BaseTX connection	Link	Speed
LINK	ON	Ethernet Connected		
	BLINK	Data present on Ethernet port		
Fiber Ether	net Port LE	DS		
LINK	OFF	No connection		
	ON	100BaseFX connection	Ethe	ernet

Figure 1. LEDs

Mode Switch

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

Link Speed	Link Speed Power	Е Д С В А
Mode	Ready P1 Data	
Ethernet 1	Ethernet 2	Port
	www.bb-elec.com	Envire Series Series



The Mode switch can be used to:

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

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

Ethernet Connector

Modbus gateway models using 10BaseT/100BaseTX network connections use an RJ45 receptacle. The Modbus gateway is connected to a standard Ethernet network drop using a straight-through RJ45 (male) Ethernet cable.



Figure 3. Ethernet Connectors. E2 is pass-through.

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

Fiber Optic Connectors

MESR321 family serial servers use LC fiber connectors.

Serial Port Connectors

MESR321 family serial servers feature one DB9M connector for RS-232 and a five-position removable terminal block for RS-422 and RS-485 connections.



Figure 4. DB-9 Serial Port Connector



Figure 5. Five-Position Pluggable Terminal Block

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

Power Connector

Power options include a 5.08 mm 3-position pluggable terminal block and 2.5 mm barrel connector.





Figure 6. Power Connection

Mounting Hardware

MESR321 modules can be DIN rail mounted. The DIN mounting clip is included with each module.



Figure 7. DIN Clip on Modbus Gateway Module.

3. Setup and Connections

Note: In this section devices to be connected to the Modbus gateway's serial connection are simply referred to as the "Modbus network".

Connecting the Power Supply

Connect a DC power supply to the power terminals on the top of the Modbus gateway. Polarity of the wires is indicated on the label on the side of the Modbus gateway. Acceptable voltages are between 10 VDC and 48 VDC. The power supply must be capable of supplying 4 watts.



Figure 8. MESR Power Connection

Connecting MESR321s to Modbus networks

MESR321s can be configured to connect to Modbus networks 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..

RS-422 4-wire connections support two signal pairs: RXA(-), RXB(+) and TXA(-), TXB(+), plus 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: RXA(-), RXB(+) and TXA(-), TXB(+), plus 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: DataB(+) and DataA(-) 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 MESR321

The **MESR321** has one DB9M serial connector that supports RS-232; it also has a 5-position terminal block connector that supports RS-422 and RS-485 (2- and 4-wire).

If you select RS-232 mode when you configure the Modbus gateway, you must connect the Modbus serial network to the Modbus gateway via a serial cable. The MESR321 is a DTE. If the Modbus network is a DTE, use a null modem (cross-over) cable. If the Modbus network is a DCE, use a straight-through cable. DTE and DCE ports are complementary, the **Output** signals on a DTE port are *Inputs* to a DCE port, and *Output* signals on a DCE port are *Inputs* to a DTE port, and *Output* signals on a DCE port are *Inputs* to a DTE port. The signal names match each other and connect pin for pin. Signal flow is in the direction of the arrows. (See figure below)

modelin odelo - oddigite	CONIC			
DTE Device (Computer)	ОВ9	DTE to DCE Connections	DCE Device (Modern)	ов9
Pin# DB9 RS-232 Signal Names		Signal Direction	Pin# DB9 RS-232 Signal Names	
#1 Carrier Detector (DCD)	CD		#1 Carrier Detector (DCD)	CD
#2 Receive Data (Rx)	RD		#2 Receive Data (Rx)	RD
#3 Transmit Data (Tx)	TD		#3 Transmit Data (Tx)	TD
#4 Data Terminal Ready	DTR		#4 Data Terminal Ready	DTR
#5 Signal Ground/Common (SG)	GND		#5 Signal Ground/Common (SG)	GND
#6 Data Set Ready	DSR		#6 Data Set Ready	DSR
#7 Request to Send	RTS		#7 Request to Send	RTS
#8 Clear to Send	CTS		#8 Clear to Send	CTS
Soldered to DB9 Metal - Shield	FGND		Soldered to DB9 Metal - Shield	FGND

Modem Cable - Straight Cable DB9 to DB9

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

Note: Refer to Appendix D for connector pin out information.



Figure 9. MESR321 Connections

Connecting MESR321s to a Network

Network Connection (10BaseT/100BaseTX)

When connecting a Modbus gateway equipped with a 10BaseT/100BaseTX network connection (RJ45 connector) a standard network cable is connected from the Modbus gateway to a network drop. PCs configuring and/or communicating with the Modbus gateway are also connected to the network.

Fiber Optic Connection

When connecting a Modbus gateway equipped with a fiber optic interface to a fiber optic link the appropriate fiber optic cable must be connected between the Modbus gateway and the network interface.

MESR321 Configuration Connections

MESR321s can be configured over the network or via a serial port.

Installing Modbus Configuration Manager Software

- The Modbus Configuration Manager Software is contained on the CD which is packaged with the product. Insert the CD into your CD ROM drive. The software should automatically begin the installation process. If AUTO RUN is disabled on your computer, open the CD drive and double click on the executable file. The file name is Modbus Gateway Manager Vx.x.x.
 - a. The following screen will be displayed on your computer.



Figure 10. Modbus Gateway Manager Installation Welcome Screen

b. Click "Next." The License Agreement Screen will be displayed on your computer.



Figure 11. Modbus License Acceptance Screen

c. Click "Next." The User Information Screen will be displayed on your computer. Enter your name and organization (optional) and select if the software will be accessible to your account or anyone who uses the computer.

🙀 Vlinx Modbus Gatewa	y Manager Setup	_ 🗆 🗵
User Information		
Enter the following inform	nation to personalize your installation.	-0-
Full N <u>a</u> me:	<u> </u>	
Organization:		
share this computer. ' users. Install this appli	You must have administrator rights to install the settings f ication for: Anyone who uses this computer	or all
	C Only for me ()	
Wise Installation Wizard (R)		
	< Back Next >	Cancel

Figure 12. User Information Screen

d. Click "Next." The Destination Folder Screen will be displayed on your computer. The default directory is:

C:\Program Files\BB Electronics\Vlinx\Modbus Gateway Manager\

If desired, you can select another location by pressing the "Browse" button.

Vlinx MESR321 Modbus Gateway



Figure 13. Destination Folder Screen

e. Click "Next." The Ready to Install Application Screen will be displayed on your computer. You can select the "Back" button to change destination folder.

🙀 Ylinx Modbus Gateway Manager Setup	
Ready to Install the Application Click: Next to begin installation.	
Click the Back button to reenter the installation information or click Cancel to exit the wizard.	
Wise Installation Wizard (R)	
< Back Next >	Cancel

Figure 14. Ready to Install Application Screen

f. Click "Next." The software will begin installing.

Setup and Connections

Vlinx MESR321 Modbus Gateway

🙀 Ylinx Modbus Gateway Manager Setup	
Updating System The features you selected are currently being installed.	3
Wise Installation Wizard (R)	Cancel

Figure 15. Software Installing Screen

g. Click "Next." The Installation Complete screen will be displayed on your computer. Click "Finish" to finish the installation.



Figure 16. Installation Complete Screen

Configuring the MESR321 via the Network Connection

When configuring via the network, either Modbus Configuration software or the web interface can be used.

Configuring with Modbus Configuration Manager

MESR321s can be configured over the network Modbus Configuration manager software running on a PC.

To open Modbus Configuration Manager:

 From the Desktop, click Start → Programs → B&B Electronics → Vlinx → Vlinx Modbus Gateway Manager→Modbus Gateway Manager. An alternate method is to double click the shortcut installed on the desktop.



Figure 17. Opening Vlinx Modbus Gateway Manager



Figure 18. Vlinx Modbus Gateway Manager Shortcut Icon

2. The Vlinx Modbus Configuration Manager Device Discovery window appears.

🔽 Vlinx Modbus Gateway Manager 1.3.2	
Modbus Gateway	
Connection Progress:	
How do you want to connect to the device?	
Network O Serial Port	
Network Options	
I don't know the IP address of the device.	
C The device is at this IP address.	
Con	nect Exit
the second se	

Figure 19. Modbus Configuration Manager Discovery Window

3. If you do not know the IP address, check the "Network" and "I don't know the IP address of this device" selections and press the "Connect Button." The software will discover any MESR321 Gateways on the network. The configuration manager screen will be displayed on your computer. All available devices will be listed on the top portion of this screen. If you know the IP address, you may select "The Device is located at this IP address" and input the address in the box provided.

🚺 Vlinx Modbus Gateway N	1anager 1.3.2		<u>_ </u>
Open Save Search		(ip) 🗐 ? gnostic Monitor About	
Utble device de jour vent lo configure? Doorse fiel device in the life below. Serven Name Concordingure? Doorse field envice by calcing on one of the devices in the life below. MESR321-000EEE000001 10.1.1.1.30 00.6.2.8E.00.00.00 MESR321-000EEE000010 10.1.2.1.30 00.6.2.8E.00.00.10 MESR321-000EEE000010 10.1.2.1.30 00.6.2.8E.00.00.10 MESR321-000EEE000010 10.1.2.1.30 00.6.2.8E.00.00.10 MESR321-000EEE000010 Login Help Meshadde Login Help Password Dogin Dogin Model MESR321 Firmware Version: 1.3.2 Hardware Version: 1.3.2 Hardware Version: 1.3.2 Hardware Version: 0.0.0.0.00 MAC Addees: Link Status: 100BaseTX full duplex Cogningle © 2007 - 2012. All rights reserved			
MESH321-000EBE000010	10.1.2.139	00:06:86:00:00:10	
Modbu	s Gatew		000EBE00000F (10.1.11.198)
Contents	1	ogin	Help
			device, then click on the Login
	F H	irmware Version: 1.3.2 iardware Version: 1 fAC Address: 00:0EBE:00:00:0F	
		Copyright © 2007 - 2012. All rights reserved.	
1			N

Figure 20. Configuration Manager Screen

4. All Modbus Gateways on the network will be displayed in the top portion of the screen. To select a gateway, simply click the appropriate device on the top portion of the screen.

- a. The main portion of the screen displays the Model, Firmware version, Hardware Version, MAC Address, and Link Status. The IP Address is also displayed on the top portion of the screen and title graphic area.
- 5. There is no password unless you choose to enter one. The default password is no password at all. Click the "Login" button. The "General" Settings screen will be displayed on your computer.
- 6. Vlinx Modbus Manager Settings Screen Overview



Figure 21. Settings Screen Overview

- a. This area shows Modbus Gateways available on the network.
- b. This area is used to skip directly to the specific configuration screen you need to access. An alternate method of accessing the configuration screens is to use the "Next" button in area C.
- c. This area contains dialog boxes specific the configuration screen.

1. Note: Any configuration changes you make need to be saved using the "Save" button.

- d. This area contains helpful information about the configuration screen you are currently on.
- e. This area contains shortcuts to specific functions.
 - 1. "Open" allows you to load a previously saved configuration file into your Modbus Gateway.

- 2. "Save" allows you to save your configuration to a file. This should not be confused with the "Save" button described in 6.c above.
- 3. "Search" allows you to search for Modbus Gateways on the network.
- 4. "Upgrade" allows you to upgrade your Modbus Gateway's firmware.
- 5. "Diagnostic" allows you to test a configured Modbus Gateway. See Section 5.
- 6. "Monitor" allows you to monitor a Modbus Gateway. See Section 5.
- 7. "About" contains information about your Modbus Gateway.
- 7. General Settings

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(10.1.2.13
(10.1.2.13
fame is a unique ma
us Gateway. It must b defined by RFC-952 a
irements are:
ters from 'A' to 'Z' a from 'V to 'F and '
use '-' symbol as the fi
sist of numbers only.

Figure 22. General Settings Screen

a. This screen enables you to assign a unique name to the gateway. This allows you to easily identify a particular gateway when multiple devices are used on the same network. To change the name, type a new name in the "The Name of this Modbus Gateway is" box. The name must be a valid "hostname" as defined by RFC-952 and RFC-1123. Allowed characters are A to Z, a to z, 0 to 9 and "-". The "-"symbol cannot be the first or last character. The name cannot consist of numbers only. **To save the new name click the "Save" button.**

b. You can also change the gateway's password on this screen. To do this, check the "I want to change the password" box. New password entry boxes will appear on the screen.

	.2.139 00:0E:BE:00:00:10	
SR321-000EBE00000F 10.1 R321-000EBE00000F 10.1	11139 00.0E.9E:00.00.0F	
Modbus	Bateway.	321-000EBE000010 (10.1.2.139
Contents	General	Help
General Network Modbus TCP Port I Sarial Port I Modbus Port I IO Remap Modbus Priority Save Lagout	The name of this Modbus Gateway is [MESF321-000EBE000010 F I want to change the password. Type the new password again to confirm it Sowe Next	Medher Caterory Name is a uncor num real Tortrana's a direct PTF-021 an EPC-1122. Name requirements as: I. Allowed an characteric from V to 2' and 7. 2. By not allowed to use' probabilist the first or the last one. 3. The name cath "consist of numbers only. Paraveced is the paravecle assigned to the dotter of the state of the paravecle assigned to the Mode of the paravecle assigned to the Mode of the state of the paravecle assigned to the Mode of the paravecle assigned to the stated executive Value value areas is from J to 27, 's to 27, 'B to 27.
Save	Bave Next	Parsword C entered a seco entered correc

Figure 23. Changing The Password

- c. Type your new password in the "Type the new password box." Verify the password by typing it again in the box provided. **To save the new password click the "Save" button.**
- 8. Network Settings
 - a. To get to the Network Settings Screen you can either click the "Next Button" or click on the "Network" link on the left side of the screen.



Figure 24. Network Settings Screen (DHCP Selected)

- b. The default network configuration is to receive an IP address assignment from a DHCP server. **DHCP** controls whether or not a DHCP server is used to set the IP address, subnet mask and default gateway of the Modbus Gateway. When DHCP option is enabled but the DHCP server is not found, the Modbus Gateway will automatically configure IP address 169.254.102.39 with a subnet mask 255.255.0.0
- c. To configure your Modbus Gateway without using a DHCP Server, uncheck the "I want DHCP to setup the network" box. You will need to know the IP Address, Subnet Mask, and Default Gateway.

IP Address field contains static internet protocol address of the Modbus Gateway.

Subnet Mask field contains mask that is used to define sub network.

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

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

For Class C network (IP addresses 192.0.0.0 through 223.255.255.255), the default subnet mask is 255.255.255.0.

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

Default Gateway field contains default route to remote networks.

Vlinx Modbus Gateway Mai	nager 1.3.2	
😂 🛄 🔎 Xoen Save Search	調 (空) 目 ? Upgrade Diagnostic Monitor About	
	nfigure? Choose the device by clicking on one of the devices in the list below.	
	Connection	Mac Address
SR321-000EBE000010 1	0.1.2.139 00:0E:BE:00:00:10	
SR321-000EBE00000F 1	0.1.11.199 00:0E:BE:00:00:0F	
Modbus	Gateway	MESR321-000EBE000010 (10.1.2.139)
Contents	Network	Неір
General Network	\Box I want DHCP to setup the network.	DHCP controls whether or not a DHCP server is used to set the IP address, sobret make and default gateway of the Modbus Gateway.
Modbus TCP Port 1 Serial Port 1 Modbus	IP Address: 10.1.2.139 Subnet Mask: 255.255.0.0	Whan DECP options is seakled but the DECP server is not found, the Moder Gateway rule automatically configures an IP address in the range or 1692244.000 through 1692244255.255 with a submet mask 2552255.00
Port 1 ID Remap	Default Gateway: 10.1.0.33	IP Address field contains static internet protocol address of the Modbur Gateway.
Modbus ID Routing Modbus Priority	Save Back Next	Subnet Mash field contains mask that is used to define sub network.
Save		For Class & network (IP addresses 0.0.0.0 through 127.255.255.255), the default subset mark is 255.0.0.
Logout		For Class B network (IP addresses 128.0.0.0 through 191.255.255.255), the default robust mark is 255.255.0.0
		For Class C network (IP addresses 192.0.0.0 through 223.255.255.255), the default subnet mask is 252.255.255.0

Figure 25. Network Settings Screen (DHCP not Selected)

- d. More information about assigning an IP address without using a DHCP Server is contained in the section Configuring the MESR321 on Networks without a DHCP Server.
- e. Save changes by Clicking the "Save" button.
- 9. Modbus TCP Settings
 - a. To access this screen, click the "Next Button" or click on the Modbus TCP link on the left side of the screen.
 - b. This screen allows you Modbus TCP client and server settings

linx Modbus Gateway Man	-	
en Save Search	間 (中) 目 ? Upgrade Diagnostic Monitor About	
h device do you want to con	figure? Choose the device by clicking on one of the devices in the list below.	
Server Name D	onnection M.	lac Address
R321-000EBE000010 10	0.1.2.139 00:0E:BE:00:00:10	
321-000EBE00000F 10	1.1.11.199 00:0E:BE:00:00:0F	
		MESR321-000EBE000010 (10.1.2.139
Modbus	Gateway	
Contents	Modbus TCP	Help
ieneral	TCP Client Settings	Connect to port identifies TCP port to b used by the Modbus Gateway in TCP clies
letwork Aodbus TCP	TOT Chem Settings	mode. Valid value range is from 1 to 65535.
	Connect to Port: 502	Response timeout is the maximum amou of time to wait for a response to request that sent to the device connected through TC.
ort 1 Serial	Descus Times at	Valid value range is from 1 to 65535.
Port 1 Modbus Port 1 ID Remap	Response Timeout: 100	Listen on port identifies TCP port to be us by the Modbus Gateway in TCP server mod Valid value range is from 1 to 65535.
fodbus ID Routing	TCP Server Settings	Maximum Clients controls the murber simultaneous TCP clients that can be convected
lodbus Priority	Listen on Port: 502	Connection Filter Mode controls whi TCP clients can connect.
ave		
	Limit the number of connections to: 16 connections	
ogout		
	6	
	 and allow everyone to connect and allow a specific IP address to connect 	
	 and allow a specific IP address to connect and allow a specific range of IP addresses to connect 	
	~ and anow a specific range of it addresses to connect	
	Save Back Next	

Figure 26. Modbus TCP Settings Screen

- c. TCP Client Settings
 - 1. Connect to Port identifies TCP port to be used by the Modbus Gateway in TCP client mode. Valid value range is from 1 to 65535.
 - 2. Response Timeout is the maximum amount of time to wait for a response to a request that is sent to the device connected through TCP. Valid value range is from 1 to 65535.
 - 3. Save settings by clicking the "Save" button.
- b. TCP Server Settings
 - 1. Listen on Port identifies TCP port to be used by the Modbus Gateway in TCP server mode. Valid value range is from 1 to 65535.
 - 2. "Limit the number of connections to" pull down box allows you to control the number of simultaneous TCP clients that can be connected. Choices are 1 through 16.
 - 3. Connection Filter Mode controls which TCP clients are able to connect. The default is: "and allow everyone to connect."
 - a. You can select "allow specific IP addresses to connect." This filter is limited to 4 IP addresses.

26

Vlinx MESR321 Modbus Gateway

📟 Modbus Config	guration Manag	jer 1.0.0		_ 8 ×
Open Save	Search Up	聞 (ゆ) 目 ? grade Diagnostic Monitor About		
Which device do y	ou want to configu	ure? Choose the device by clicking on one of the devices in the list below.		
Server Name	Connection	Mac Addr	ess	
MESR901	10.1.2.113	00:0B:EB:FF:FF:01		
websave	10.1.0.226	00:0E:BE:00:00.50		
Modbus ID	Pouting	TCP Server Settings	simultaneous TCP clients that can be	
Modbus Pri			connected.	
modelatin	<u>onty</u>	Listen on Port: 502	Connection Filter Mode controls which TCP clients can connect.	
Save		·	TOP cherks can connect.	
		Limit the number of connections to: 16 connections		
Logout				
		 and allow everyone to connect and allow a specific IP address to connect 		
		Ind allow a specific range of IP addresses to connect		
		 and anow a specific range of it addresses to connect 		
		These are the IP addresses I want to allow to connect		
		These are the LP addresses I want to allow to connect.		
		IP address: 0.0.0.0		
		□ IP address: 0.0.0.0		
		□ IP address: 0.0.0.0		
		□ IP address: 0.0.0.0		
		Save Back Next		
		Save Back Next		

Figure 27. TCP Connection Filter "Allow Specific IP addresses to Connect

- b. You can select "a specific range of IP addresses to connect." This filter is limited to 4 IP address ranges.
- c. Save settings by clicking the "Save" button.

Vinx Modbus Gateway Manager 1.		_0_
Open Save Search Upgrade	((p) E ? e Diagnostic Monitor About	
Which device do you want to configure? 0 Server Name Connectio	Choose the device by clicking on one of the devices in the list below. n Mac Address	
MESR321-000EBE000010 10.1.2.13		
MESR321-000EBE00000F 10.1.11.19	99 00:0E:BE:00:00:0F	
Port I Modelus Port I ID Remap Modbus ID Routing Modbus Priority Save Logaut	Accepting Timeout 100 TCP Server Settings Listen on Port: 502 Limit the number of connections to: 16 connections • C and allow everyone to connect • C and allow a specific IP address to connect • G and allow a specific range of IP addresses to connect • These are the IP address range I want to allow to connect: • IP address: 00.00 • IP address: 00.00 • IP address: 00.00 • Back Next	 Lainn na port children (107 port to be und by the Massaugus in TCP serve mode. Maximum Client control the number of connected. Connection Filter Mode controls which TCP classic connect.

Figure 28. TCP Connection Filter "Allow Specific Range of IP Addresses to Connect

10. Port 1 Settings

To access this screen, click the "Next" button or click the Port 1 Serial link on the left side of the screen.

a. This screen allows you to change the serial port settings.

🚺 Vlinx Modbus Gateway Manager 1.	3.2		
Open Save Search Upgrade	(iq) ? Diagnostic Monitor About		
Which device do you want to configure? C			
Server Name Connection MESR321-000EBE000010 10.1.2.13		Mac Address	
MESR321-000EBE00000F 10.1.1.19			
MESR321-000EBE00000F 10.1.11.19	9 00:0E:BE:00:00:0F		
Modbus Gat	eway	MESR32	21-000EBE000010 (10.1.2.139)
Contents	Port 1 - Serial		Help
General	Description:	Serial Port 1	Description sets the description for this serial port. Maximum length is 32 symbols. Allowed
Network	Description	Senar Port I	characters are symbols from 'A' to 'Z', from 'a' to 'z', numbers from '0' to '9' and the space.
Modbus TCP	Mode:	RS-232	Mode controls the physical communications mode.
Port 1 Serial Port 1 Modbus	Baud Rate:	9600 💌	Baud Rate controls the communications speed of the serial port.
Port 1 ID Remap	Data Bits:	8-Bits	Data Bits controls the number of bits of data in each character.
Modbus ID Routing	Stop Bits:	1-Bit 💌	Only 8 data bits is valid when the protocol of the device connected to the port is RTU.
Modbus Priority	Drop Ditt.		Stop Bits controls the number of bits to
Save	Parity:	No Parity 💌	indicate the end of a character. Parity controls the error checking mode.
Logout	Save Back N	ext	A same control on choir choreau, no sa
		Copyright © 2007 - 2012. All rights reserved.	
1			

Figure 29. Serial Port Screen

- b. Description sets the description for this serial port. Maximum length is 32 symbols. Allowed characters are symbols from 'A' to 'Z', from 'a' to 'z', numbers from '0' to '9' and the space.
- c. Mode Controls the physical communications mode for the MESR321. The Mode can be RS-232, RS-422 (4-Wire), RS-485 (2-Wire), or RS-485 (4-Wire).
 - d. Baud Rate Controls the communications speed of the serial port. The Baud Rate can be 75, 150, 300, 600, 1200, 2400, 4800, 7200, 9600, 14.4k, 19.2k, 28.8k, 38.4k, 57.6k, 115.2k, 230.4k.
- e. Stop Bits Controls the number of bits to end a character. Choices are 1 or 2.
- f. Parity Controls the error checking mode. Choices are Odd, Even, Mark, or Space.
- g. Save settings by clicking the "Save" button.
- 11. Port 1 Modbus

a. To access this screen, click the "Next" button or click the "Port 1 Modbus" Link on the left side of the screen. This screen allows you to change the Modbus settings for the port.

🚺 Vlinx Modbus Gateway Manager 1.	3.2	<u>< 0 -</u>
Coen Save Search Upgrade	(m) Provide Contract (m) (m) Provide Contract (m) Provide Cont	
	house the device by clicking on one of the devices in the list below.	
Server Name Connection		o Address
MESR321-000EBE000010 10.1.2.13	9 00:0E:BE:00:00:10	
MESR321-000EBE00000F 10.1.11.19	9 00:0E:BE:00:00:0F	
Modbus Gat	eway	
Contents	Port 1 - Modbus	Help
General Network Modbus TCP	Attached: Sleves 💌	Attached is selectable between Marter and Slaves. If Marter is selected, the Modus Gateway will must in TCP server mode, if Slaves is selected, it will run in TCP client mode.
Port 1 Serial	Modbus: RTU 💌	Modbus indicates the protocol of the device connected to the port. It can be either RTU or ASCII.
Port 1 Modbus Port 1 ID Remap Modbus ID Routing	Enable modbus broadcast Enable OBh Exception Enable senial message buffering	Modbus Breakast is used to send Modbus broakast to a specific small port. Modbus broakast is Shave ID Ob. If selected the Gateway will end broakast messages out the senial port and will not expect a reporce. If understand it will use shave D Ob to a standard
Modbus Priority Save	Innov stria mosing boaring Modbus Serial Retries Milliseconds Modbus Message Timeout	Medbus OBA Exception. When the Modbus slave davase does not report before the timework has been residence has a bale support second to the state of the state of the state exception code is transmitted to the Marker that militated the Modbus message.
	10 Milliseconds TX Delay Save Back Next Advanced	Medbus Serial Message Buffering: If option is selected, the gateway will buffer up to unselected, the gateway will seriout with a Oth if it has a message out on the port with no response yet.
		Medbus Serial Retries is the maximum number of times that the Modbus queway will retry to send a Modbus mersage to a Modbus classe, before reporting a OBb ecception if it is selected. Number of twistics is limited to 5.
		Modbus Message Timeout is the maximum amount of time to wait for a response to the message. Valid value range is from 1 to 65535.

Figure 30. Modbus Port Screen





- b. Attached This is selectable between Master and Slaves. If <u>Master is</u> selected, the Modbus Gateway will run in TCP server mode, if Slaves is selected, it will run in TCP client mode.
- c. Modbus indicates the protocol of the device connected to the port. It can be either RTU or ASCII.
- d. Modbus Broadcast Check this box to send Modbus broadcasts to a specific serial port. Modbus broadcast is Slave ID 0h. If selected the Gateway will send broadcast messages out the serial port and will not expect a response. If unselected it will use slave ID 0h as a standard address.
- e. Enable 0Bh Exception Check this box to enable. When the Modbus slave device does not respond before the timeout has been reached or has a bad response (check sum does not match), the 0Bh exception code is transmitted to the Master that initiated the Modbus message.
- f. Enable Serial Message Buffering If this option is selected, the gateway will buffer up to 32 messages request per port. If this option is unselected, the gateway will respond with a 06h if it has a message out on the port with no response yet.
- g. Modbus Serial Retires Select 0 through 5. This sets the maximum number of times that the Modbus gateway will retry to send a Modbus message to a Modbus client, before reporting a 0Bh exception if it is selected. Number of retries is limited to 5.
- Milliseconds Modbus Message Timeout This is the maximum amount of time to wait for a response to the message. Valid value range is from 1 to 65535.
- i. Milliseconds TX Delay This is the minimum amount of time after receiving a response before the next message can be sent out. Valid value range is from 1 to 65535.
- j. Save settings by clicking the "Save" button.

12. Port 1 ID Remap

- a. To access this screen, click the "Next" button or click the "Port 1 ID Remap" link on the left side of the screen.
- b. This screen allows you to set Modbus Slave ID Remap settings.

🚺 Vlinx Mod	ibus Gateway M	1anager 1.3.2				
		19	(m) E ?			
Open :	Save Search	Upgrade Dia	agnostic Monitor About			
			e the device by clicking on	n one of the devices in the list below.		
Server		Connection		M	ac Address	
	00EBE000010		00:0E:BE:00:00:10			
MESR321-00	OEBE 00000F	10.1.11.199	00:0E:BE:00:00:0F			
V	Modbu	S Gatew	Vay	Carl & L	MESR321-00	0EBE000010(10.1.2.139)
Cont	ents	1	Port 1 - Modbus	Slave ID Remapping		Help
Genera	<u>u</u>		From ID:	- To Port ID: -		The first box in line is the starting ID of a range you want to remap. Valid value range is
Networ						from 1 to 247.
Modbu	s TCP		From ID:	- To Port ID: -		The second box in line is the last ID of that
			From ID:	- To Port ID: -		range. Valid value range is from 1 to 247.
Port 1 S						The third box in line is the start of the remap range on the serial port. Valid value
	<u>Aodbus</u>		From ID:	- To Port ID: -		range is from 1 to 247.
Port 1	ID Remap		From ID:	- To Port ID: -		The fourth box in line is anto filled in based on the range filled in the first 3 boxes. Valid value range is from 1 to 247.
Modbu	s ID Routing					
Modbu	s Priority		Save Back Net	1xe		
Save		1			1	
		_				
Logout						
				Copyright © 2007 - 2012. All rights reserved		

Figure 32. Port ID Remap Screen

- c. The first box in line is the start of the remap range on the serial port you want to remap. Valid value range is from 1 to 247.
- d. The second box in line is the last serial port of that range. Valid value range is from 1 to 247.
- e. The third box in line is the starting ID of a range to remap to. Valid value range is from 1 to 247.
- f. The fourth box in line is auto filled in based on the range filled in the first 3 boxes. Valid value range is from 1 to 247.
- g. Save settings by clicking the "Save" button.
- 13. Modbus ID Routing
 - a. To access this screen click the "Next" button or click the "Modbus ID Routing" Link on the left side of the screen.
 - b. This screen allows you to set the Modbus Slave ID routing.

inx Modbus Gateway Manager	1.3.2	
) 🖬 🔑 👘		
	ade Diagnostic Monitor About	
ch device do you want to configure Server Name Connec	? Choose the device by clicking on one of the devices in the list below. tion Mac Addre:	P.0
R321-000EBE000010 10.1.2		
R321-000EBE00000F 10.1.11.	199 00.0E:8E:00:00:0F	
	M M	ESR321-000EBE000010 (10.1.2.139
Modbus Go		*
Contents	Modbus Slave ID Routing	Help
General	ID: 🔽 1 - 247 To IP Address 🔽 10.1.0.213	The first box in line is the starting ID of a range you want to route. Valid value range is
Network		from 1 to 247.
Modbus TCP		The second box in line is the last ID of that range. Valid value range is from 1 to 247.
Port 1 Serial	ID: _ To IP Address _	The third box in line is a port or IP address
Port 1 Modbus	ID: To IP Address	which has slave devices attached.
Port 1 ID Remap	ID: 🗆 - 🛛 To IP Address 💌	The fourth box in line is an IP address of the slave device if IP address is chosen in the third
	ID: D - To IP Address	box.
Modbus ID Routing		
Modbus Priority		
Save		
	ID: - To IP Address	
Logout	ID: - To IP Address	
	Save Back Next Advanced	
	Copyright © 1007 - 2012. All rights reserved.	

Figure 33. Modbus ID Routing Screen

- c. The first box in line is the starting ID of a range you want to route. Valid value range is from 1 to 255.
- d. The second box in line is the last ID of that range. Valid value range is from 1 to 255.
- e. The third box in line is a port or IP address which has slave devices attached.
- f. The fourth box in line is an IP address of the slave device if IP address is chosen in the third box.
- g. Save settings by clicking the "Save" button.
- 14. Modbus Priority
 - a. To access this screen, click the "Next" button or click the "Modbus Priority" link on the left side of the screen.
 - b. This screen allows you to configure the gateway to move high priority messages to the front of the serial message buffer.

linx Modbus Gateway Manag		_
	명 (아) 이 ? rade Diagnostic Monitor About	
n device do you want to configu	re? Choose the device by clicking on one of the devices in the list below.	
		Address
R321-000EBE000010 10.1. 321-000EBE00000F 10.1.1		
10.1.1	1.135 00.0E.BE.00.00.0P	
Modbus G	atoway	
Modbos O		
Contents	Modbus Priority	Help
<u>General</u> Network	Priority 1	These settings allow the gateway to move high priority messages to the front of the senial message buffler. The priority can be based on
Addbus TCP	IP Address:	the originating IP address, the Modbus ID, the Modbus function code, or any combination of
	Modbus ID:	the three. Up to five different priorities can be set.
Port 1 Serial Port 1 Modbus	Function Code:	IP Address sets a static Internet protocol
ort I Modpus ort 1 ID Remap	Priority 2	address for the Modbus Gateway. Modbus ID has valid value range from 1 to
	TP Address:	247.
Modbus ID Routing	Modbus ID:	Function Code has valid value range from 1 to 99.
Modbus Priority	Function Code:	
Save	Priority 3	
	· · · · · · · · · · · · · · · · · · ·	
ogout	IP Address:	
	□ Modbus ID:	
	Function Code:	
	Priority 4	
	IP Address:	
	Modbus ID:	
	Function Code:	
	Priority 5	

Figure 34. Modbus Priority Screen

- c. These settings allow the gateway to move high priority messages to the front of the serial message buffer. The priority can be based on the originating IP address, the Modbus ID, the Modbus function code, or any combination of the three. Up to five different priorities can be set.
- d. IP Address Used to set a static Internet protocol address for the Modbus Gateway.
- e. Modbus ID Valid range is from 1 to 255.
- f. Function Code Valid range is from 1 to 99.
- g. Save settings by clicking the "Save" button.

Note: For more information on configuration options refer to Section 4: Description of Modbus gateway Properties.
Configuring with the Web Interface

MESR321s can be configured over the network using a standard web browser such as Internet Explorer or Firefox.

To open the web configuration interface:

1. On a PC connected to the network, open a web browser.



Figure 35. Open Web Browser

2. In the browser's address bar, type the IP address of the Modbus gateway.



Figure 36. Type IP Address

Note: Your Modbus gateway comes from the factory pre-configured to receive an IP address assignment from a DHCP server. If a DHCP Server is not available on your network, it will default to 169.254.102.39.

The web interface Login page appears.

Vinx Modbus Gateway Manager 1		_0
Open Save Search Upgrad	e Diagnostic Monitor About	
Which device do you want to configure? Server Name Connection	Choose the device by clicking on one of the devices in the list below.	
MESR321-000EBE000010 10.1.2.1		
MESR321-000EBE00000F 10.1.11.1	99 00:0E:8E:00:00:0F	
Modbus Ga		21-000EBE000010 (10.1.2.139)
Contents	Login	Help
	Password	Enter the password to login to the device, then click on the Login button.
	Login	
	Model: MESR321	
	Firmware Version: 1.3.2	
	Hardware Version: 1	
	MAC Address: 00:0E/BE:00:00:10	
	Link Status: 100BaseTX full duplex	
	Copyright @ 2007 - 2012. All rights reserved.	

Figure 37. Modbus Gateway Login Screen

3. The screens for configuring your gateway using a web browser are the same as those used to configure using the <u>Vlinx Modbus Manager software</u>.

Configuring the MESR321 on Networks without a DHCP Server

Your Modbus Gateway comes from the factory set up to receive an IP assignment from a DHCP Server. If there is not a DHCP server on your network, the Modbus Gateway will default to IP address <u>169.254.102.39</u>. If this address does not work with your PC, there are two methods to manually configure the network information.

- 1. Method 1: Change your PC Network to Match the Modbus Gateway
 - a. Open your network connection



b. Click on Internet Protocol (TCP/IP) and click <properties>. Change the parameters to the following:

IP Address = 169.254.102.1

Subnet Mask = 255.255.0.0

Default Gateway = 169.254.102.100

Internet Protocol (TCP/IP) Propertie	s ? 🗙				
General					
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.					
O Obtain an IP address automatical	y				
── Use the following IP address: ──					
<u>I</u> P address:	169.254.102.1				
S <u>u</u> bnet mask:	255.255.0.0				
Default gateway:	169 . 254 . 102 . 100				
O Obtain DNS server address autor	C Obtain DNS server address automatically				
─● Use the following DNS server add	tresses:				
Preferred DNS server:					
<u>A</u> lternate DNS server:					
	Advanced				
	OK Cancel				

c. Use the Vlinx Modbus Manager Software to search for, discover, and configure the Modbus Gateway.

- 2. Method 2: Change the Modbus Gateway's network settings to match your PC using Console Mode
 - a. Connect a null modem serial cable (crossover cable) from Port 1 on the Modbus Gateway to an available COM port on your PC.
 - b. Enter Console Mode. Press and hold the Modbus Gateway's Mode switch for 2 to 10 seconds. Release the reset button. The READY LED will blink for five seconds. This indicates that the Modbus Gateway is re-booting in Console Mode.
 - c. When the Modbus Gateway has successfully restarted in Console Mode, the READY LED will be OFF and the PORT 1 LED will be ON.
 - d. Open the Vlinx Modbus Manager Software and select "Serial Port" as the method to connect to the Modbus Gateway.
 - e. After logging in, click on <Network>.
 - f. Un-check the box next to "I Want DHCP to setup the Network."
 - g. Re-configure the Modbus Gateway's network settings to something within the range of your PC's network settings. For example:

PC Network Settings

IP Address = 192.168.0.1

Subnet Mask = 255.255.0.0

Default Gateway = 192.168.0.100

Change the Modbus Gateway's network settings to:

IP Address = 192.168.0.50

Subnet Mask = 255.255.0.0

Default Gateway = 192.168.0.100

- h. Save the settings and remove power from the Modbus Gateway.
- i. Re-apply power. Open the Vlinx Modbus Manager Software and select "Network" as the method to connect to the device.

Configuring the MESR321 via the Serial Port (Console Mode)

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



Figure 38. Console Mode Setup

To configure the Modbus gateway 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 while the button is being pressed.
- 2. When the Modbus gateway has booted into Console Mode the Ready LED will be OFF.

To configure the Modbus gateway, open the software and set up the Modbus gateway's parameters as required.

2. Under Connection, select "Serial Port."

🚺 Ylinx Modbus Gateway Manager 1.3.2	
Modbus Gatewo	TM TY
Connection How do you want to connect to the device? Network © Serial Port Serial Port Options © Search all serial ports for the device. © The device is connect to this serial port. COM1	Progress:
	Connect Exit

Figure 39. Connection

3. If you do not know which COM port your gateway is connect to, select "Search all serial ports for the device" under Serial Port Options. If you do know, you may specify the COM port by selecting "The device is connected to this serial port" under Serial Port Options and using the pull down menu to choose the COM port.



Figure 40. Serial Port Selection

4. The remaining screens are identical to those shown in configuring your gateway using a network connection.

To exit Console Mode, press and hold the Reset switch for two seconds.

Saving your configuration will also take you out of Console Mode.

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

MESR321 Operational Connections

Using MESR321s in Direct IP Mode

A Direct IP connection allows applications using TCP/IP socket programs to communicate with the COM ports on the Modbus gateway. In this type of application the Modbus gateway is configured as a TCP server. The socket program running on the PC establishes a communication connection with the Modbus gateway. 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 Modbus gateway to the network and a Modbus network as described in previous sections.
- 2. Configure the Modbus gateway with the appropriate network settings (using or the web interface).
- 3. Configure your software application with the appropriate IP address and port number to communicate with the Modbus network(s).



Figure 41. Direct IP Connection

Initiating a Hardware Reset on the Modbus Gateway

To initiate a Hardware Reset on the Modbus gateway, 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 while the button is being pressed.
- 2. When the Modbus gateway has reset and rebooted into Normal Mode the Ready LED will be blinking.

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.

The Modbus gateway reloads all factory default configuration parameters. When the device has reset and rebooted the Ready LED will be blinking.

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

Note: Factory default parameters are listed in Appendix A

4. Upgrading Firmware

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

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

🚺 Vlinx Modbus Gateway Manager 🛛 🗙 🗙
I want to change the firmware of this serial server:
MESR321-JB-000EBE00001C
from firmware version 1.4.0 to the firmware contained in:
Browse
The selected firmware file contains:
Progress:
Internet Upgrade Close

Figure 42. Firmware Upgrade Dialog Box

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

The current firmware version of the selected Modbus gateway is shown in the text below the Modbus gateway 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.

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 Modbus Manager software 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 Modbus Gateway

To upgrade the firmware:

- 1. In the **Modbus Gateway Selection** drop down list, select the Modbus gateway to be upgraded.
- 2. In the **Firmware Description** drop down list, select the firmware to upload to the Modbus gateway.
- 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 Modbus gateway.
- 5. Click Upgrade.

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

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

5. Diagnostics

Clicking the **Diagnostics** icon opens the **Diagnostics** dialog box and enables you to check the operation of connected Modbus gateways 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.

🚺 Vlinx Modbus Gateway Manager					×
I want to test:		Computer Informa	ition:		
MESR321-000EBE000010 MESR Information:	•	Ethernet Adapter IP Address: 10 Subnet Mask:	.1.5.23 255.255.0.0	nnection	<u> </u>
Server Name: MESR321- 000EBE000010 IP Address: 10.1.2.139	4	DefaultGatewa	ay: 10.1.0.33		
	7				7
Progress:					_
					4
					.
Save			Start	Cance	:

Figure 43. Diagnostics Dialog Box

Testing a Modbus Gateway Connection

To run diagnostics on a Modbus gateway:

1. Click the **Diagnostics** icon.

The **Diagnostics** dialog box appears.

- 2. In the drop down box select the specific Modbus gateway you want to check.
- 3. Click the Start button

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

🚺 Vlinx Modbus Gateway Manager		×
I want to test:	Computer Information:	
MESR321-000EBE000010 MESR Information: Server Name: MESR321- 000EBE000010 IP Address: 10.1.2.139	Ethernet Adapter - Local Area Connection 2: IP Address: 10.1.5.23 Subnet Mask: 255.255.0.0 DefaultGateway: 10.1.0.33	×
Test Progress:		Y
Pinging 10.1.2.139 with 32 bytes of data: Reply from 10.1.2.139: bytes=32 time<1ms TTI Reply from 10.1.2.139: bytes=32 time<1ms TTI Reply from 10.1.2.139: bytes=32 time<1ms TTI Reply from 10.1.2.139: bytes=32 time<1ms TTI	L=255 L=255	*
Ping statistics for 10.1.2.139: Packets: Sent = 4, Received = 4, Lost = 0 (f Approximate round trup times in milli-seconds: Minimum = 0ms, Maximum = 1ms, Average =	r	
Save	Start Cancel	

Figure 44. Testing a Modbus Gateway Connection

Monitor Function

The Monitor button is used to display a screen that shows information about events and data transfer through the Modbus Gateway.

To start monitoring, select a Modbus Gateway and press the "Start" button.

The "Auto Scroll" check box enables and disables automatic scrolling of the displayed text.

The "Clear" button clears the displayed text.

Press the "Stop" button to stop monitoring.

Press the "Save" button to save the information to a file.

6. Setup Examples

Modbus gateways can be used to integrate Modbus networks in a wide variety of settings. But as each setting has its own requirements, users may not understand how a gateway helps, or if it's appropriate for their specific needs.

The following scenarios are examples only, and many others are possible. Refer to the Modbus Serial Server page on the B&B Electronics web site for detailed information regarding other applications.

Log into your gateway.

1. Access the serial port one setup screen by clicking the link on the left side of the screen.

🚺 Vlinx Modbus Gateway Manager 1	.3.2			
Open Save Search Upgrad	(به) 🗐 ? e Diagnostic Monitor Abou			
Which device do you want to configure?	Choose the device by clicking	on one of the devices in the list below.		
Server Name Connection		Mac Address		
MESR321-000EBE000010 10.1.2.1 MESB321-000EBE00000E 10.1.1.1				
MESH321-000EBE00000P	55 00.02.82.00.00.0F			
Modbus Ga	teway.	MESR3	21-000EBE000010 (10.1.2.139)	
Contents	Port 1 - Serial		Help	
<u>General</u> <u>Network</u> Modbus TCP	Description:	Serial Port 1	Description sets the description for this serial port. Maximum length is 32 symbols. Allowed characters are symbols from 'A' to 'Z', from 'a' to 'Z', numbers from 'U' to 'S' and the space.	
	Mode:	RS-232	Mode controls the physical communications mode.	
Port 1 Serial Port 1 Modbus	Baud Rate:	9600 💌	Baud Rate controls the communications speed of the serial port.	
Port 1 ID Remap	Data Bits:	8-Bits 💌	Data Bits controls the number of bits of data in each character.	
Modbus ID Routing Modbus Priority	Stop Bits:	1-Bit 💌	Only 8 data bits is valid when the protocol of the device connected to the port is RTU.	
	Panity:	No Parity 🔻	Stop Bits controls the number of bits to indicate the end of a character.	
Save	r any.	No Party	Parity controls the error checking mode.	
Logout	Save Back N	iext		
Caypright © 2007 - 2012. All rights reserved.				

Figure 45. Serial Port 1 Setup

2. Configure Serial Port 1. In this case it is RS-232, 19.2 kbps, 8 data bits, 1 stop bit, and no parity. Save the settings

3. Access Port 1 Modbus by clicking the link on the left side of the screen.

🚺 Vlinx Modbus Gateway Manager	1.3.2	
Coen Save Search Upgra	(@) 🗐 ? de Diagnostic Monitor About	
	P Choose the device by clicking on one of the devices in the list below.	
Server Name Connect		Mac Address
MESR321-000EBE000010 10.1.2.	139 00:0E:BE:00:00:10	
Modbus Ga	iteway	
Contents	Port 1 - Modbus	Help
<u>General</u> <u>Network</u> Modbus TCP	Attached: Sleves 💌	Attached is selectable between Master and Slaves. If Master is selected, the Modbus Gateway will mu in TCP server mode, if Slaves is selected, it will mu in TCP chert mode.
Port 1 Serial	Modbus: RTU 💌	Modbus indicates the protocol of the device connected to the port. It can be either RTU or ASCII.
Port 1 Modbus Port 1 ID Remap Modbus ID Routing Modbus Priority	Enable modbus broadcast Enable 0Bh Exception Enable serial message buffering	Modeur Develocit is used to not Modeu broadcut to a specific scale port Modeu broadcut is Slave ID On. If elected the Gateway will scale broadcut resuspace south scale port and will not expect a suprome. If scales is a start of the scale is the scale of the scales is a start of the scale is the scale of the scales is a start of the scale is the scale of the scale scales is a start of the scale of the scale of the scale of the scales is a start of the scale of the scale of the scale of the scale of the scale of the scale
Save Logout	1 Modbus Serial Retries 2000 Milliseconds Modbus Message Timeout	Modew 020. Exception. Volum the Modew share device down to reprove the down the turnscut has been reached on has a bal reports (check sam down or match), the OBE ecception code is transmitted to the Master that initiatel the Modew message.
	100 Milliseconds TX Delay Save Back Next Advanced	Modbury Sorial Massage Bufforing If options scaleded the gateway cull-barries to 22 message regard per port if this option is unselected, the gateway wull mesoned with a 60h if it has a message out on the port with no meropones yet.
		Modbus Serial Retries is the maximum number of times that the Modbus gatewaywill retry to send a Modbus message to a Modbus chent, before reporting a ODB acception if it is selected Number of Netros Simulated to 5.
		Modbus Message Timeout is the maximum amount of time to wait for a response to the message. Valid value range is from 1 to 65535.

Figure 46. Port 1 Modbus

- 4. Configure the Port 1 Modbus Settings. In this case Attached should be slaves, Modbus should be RTU. The other settings depend on your application.
- 5. Configure Port 2 Serial and Modbus in the same fashion.
- 6. Access Modbus ID Remapping for each port and configure as necessary.

🚺 Vlinx Modbus Gateway Manage	er 1.3.2		<u>=0</u>
Open Save Search Upg	nade Diagnostic Monitor About		
	re? Choose the device by clicking on o	ne of the devices in the list below.	
Server Name Conn	ection	Mac Address	
MESR321-000EBE000010 10.1.			
MESR321-000EBE00000F 10.1.1	1.199 00.0E:BE:00:00:0F		
Modbus G		MI	SR321-000EBE000010 (10.1.2.139)
Contents		Slave ID Remapping	Help
General Network	From ID:	To Port ID:	The first box in line is the starting ID of a range you want to remap. Valid value range is from 1 to 247.
Modbus TCP	- From ID:	To Port ID:	The second box in line is the last ID of that range. Valid value range is from 1 to 247.
Port 1 Serial	□ From ID:	To Port ID:	The third box in line is the start of the remap range on the serial port. Valid value
Port 1 Modbus Port 1 ID Remap	From ID: -	To Port ID: -	range is from 1 to 247.
	- From ID:	To Port ID: -	The fourth box in line is auto filled in based on the range filled in the first 3 boxes. Valid value range is from 1 to 247.
Modbus ID Routing Modbus Priority	Save Back Next	1	
Save	I		
Logout			
		Copyright © 2007 - 2012. All rights reserved.	
Г. 			

Figure 47. Port 1 Modbus Slave ID Remapping

7. Access Modbus ID Routing. Configure as necessary. In this example, Slave ID 200 is mapped to serial Port 1, Slave ID 1 through 5 and 205 are mapped to serial port 2.

🚺 Vlinx Modbus Gateway Mana	ager 1.3.2		
Open Save Search U		ምን 🗐 ? nostic Monitor About	
		the device by clicking on one of the devices in the list below.	
	onnection	Mac Address	
MESR321-000EBE000010 10.		00:0E:BE:00:00:10	
MESR321-000EBE00000F 10.1	.1.11.199	00:0E:8E:00:00:0F	
Modbus	Gatew		1-000EBE000010 (10.1.2.139)
Contents	N	Addbus Slave ID Routing	Help
General Network Modbus TCP Pont I Serial Pont I Modbus Pont I D Remap Modbus ID Routing Modbus Phony Save Logout		D: P 1 247 To IP Address 101.0213 D: - To IP Address IP Advanced IP IP IP IP IP	The first bas in line is the stating ID of a range yow wait to realt V-all Vales range is from 1 to 247. The readed bas in line is the last ID of that range. Valid vales range is from 1 to 247. The third has been is line is a your to 247. The third has in line is a your to 24 allows. The form how in line is a wort of P address which has share devices statistical. The form how in line is a wort of P address of the layer device if IP address is chosen in the third how.
		Copyright © 2007 - 2012. All rights reserved.	

Figure 48. Modbus ID Routing

8. Access Modbus Priority and configure as necessary.

🚺 Ylinx Modbus Gateway Manager 1.3	3.2		
Open Save Search Upgrade	((p) ? Diagnostic Monitor About		
Which device do you want to configure? Cl	-	the devices in the list below.	
Server Name Connection		Mac Address	
MESR321-000EBE000010 10.1.2.13 MESR321-000EBE00000F 10.1.11.199			
MESR321-000EBE00000F 10.1.11.199	9 00:0E:BE:00:00:0F		
Modbus Gate	eway		
Contents	Modbus Priority		Help
General	Priority 1		These settings allow the gateway to move high priority messages to the front of the serial
Network Modbus TCP	🗆 IP Address:		message buffer. The priority can be based on the originating IP address, the Modbus ID, the
mouse for	🗆 Modbus ID:		Modbus function code, or any combination of the three. Up to five different priorities can be set.
Port 1 Serial	Function Code:		IP Address sets a static Internet protocol
Port 1 Modbus Port 1 ID Remap	Priority 2		address for the Modbus Gateway.
<u>rok no nomo</u>	TP Address		Modbus ID has valid value range from 1 to 247.
Modbus ID Routing	Modbus ID:		Function Code has valid value range from 1 to 99.
Modbus Priority	Function Code:		
Save	Priority 3		
Logout	-		
Logout	IP Address:		
	🗖 Modbus ID:		
	□ Function Code:		
	Priority 4		
	🗆 IP Address:		
	🗆 Modbus ID:		
	🗆 Function Code:		
	Priority 5		

Figure 49. Modbus Priority

7. Modbus Help

Modbus ASCII/RTU Basics

The Modbus protocol emerged in the mid-1970s as an early protocol for linking terminals with Modicon PLCs using a master/slave (sometimes called a master/client) relationship. A simple, open, message-based protocol, it caught on quickly and became a de facto standard in the industry. It supports asynchronous point-to-point and multidrop communications and can be used with a variety of serial interfaces (RS-232, RS-422, RS-485, modems, etc).

The original Modbus specification included two possible transmission modes: ASCII and RTU. Modbus RTU mode is the most common implementation, using binary coding and CRC error-checking. Modbus ASCII messages, though somewhat more readable because they use ASCII characters, is less efficient and uses less effective LRC error checking. ASCII mode uses ASCII characters to begin and end messages whereas RTU uses time gaps (3.5 character times) of silence for framing. The two modes are incompatible so a device configured for ASCII mode cannot communicate with one using RTU.

All Modbus communications are initiated by Modbus masters using a polling query/response format. The master can send broadcast messages (using a slave address of 0), which all slaves accept, but do not reply to. More commonly the master polls individual slaves sequentially. In each poll it sends a message containing a **device address**, followed by a **function code**, any **data** that maybe required, and an **error check** field. The addressed slave responds with a similar message structure. Typically it repeats back its address and the function code, and then sends a field indicating the number of bytes of data it is sending, followed by the data and the error check field.

Slave addresses can range from 1 to 247. Function codes include several common ones typically used in all applications, and additional ones that may be implemented in specific cases. Common function codes include: Read Coil Status (01), Read Input Status (02), Read Holding Registers (03) and Read Input Registers (04).

When a master sends a message to a slave it expects to receive a valid response within certain length of time. If the slave does not receive the message, or if the slave receives the message but an error is detected, it does not respond.

If the slave cannot respond appropriately for some other reason (e.g. it does not recognize the function code), it will return a message containing an exception response.

Hints and Tips

A few simple suggestions that may assist you if your system is experiencing problems include:

- Slowing down the polling rate may be helpful if power cycling doesn't cure the problem.
- A common misperception is that every serial network must terminate with a resistor. While this was true of early serial network configurations, it's typically the wrong answer.

8. Appendices

This section includes the following Appendices:

- Appendix A: Default Gateway Settings
- Appendix B: Product Specifications
- Appendix C: Dimensional Diagrams
- Appendix D: Connector Pinouts

Appendix A: Default Gateway Settings

Setting	Default Value
Gateway Name	User assigned
Password	password field is blank from factory
DHCP	Enabled from factory
IP Address	DHCP will configure. If a DHCP Server is not available, the unit will default to 169.254.102.39
Net Mask	255.255.0.0
Default Gateway	169.254.1.1
MAC Address	Fixed - see bottom label
Firmware Version	(Vx.x.x)
Hardware Version	(Vx.x.x)
Port	1
Serial port mode	RS-485
Baud Rate	9600
Data bits	8
Parity	None
Stop bits	1
Protocol	ТСР
Serial timeout	0 seconds
Inter-character timer	0 ms
TCP port	502
Max connection	1

Appendix B: Product Specifications

This section includes the following specifications:

- General Specifications
- Controls, Indicators and Connector Specifications
- Serial Interface Specifications
- Network Specifications

General Specifications

Hardware and included	Device	Modbus gateway module
accessories	201100	
	CD	CD with software for Win 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		
	Rail	ERS35 one-meter length of steel 35mm DIN Rail
Configuration Options	Via serial port	Using via a serial connection, (press Reset button to enter Console Mode)
	Via network	Using via a Ethernet connection
		Using a standard web browser such as Internet Explorer, Firefox or Chrome
Software	for Modbus gateway configuration	Win XP (32/64 bit), 2003 Server (32/64 bit), Vista (32/64 bit), Windows 7 (32/64 bit), Windows 2008 Server (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
Enclosure	Rating	IP30
	Mounting	DIN rail mount (35 mm)
	Dimensions	5.5 x 3.5 x 1.4 in (13.9 x 8.7 x 3.5 cm)
Power Supply (External Supply	Voltage Requirements	10 to 48 VDC
Required)	Power Consumption	4.0W (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
	Serial to Ethernet	2 kV
Port to Port Isolation	Serial to Power	2 kV
	Ethernet to Power	1.5 kV

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	
	RJ45 Ethernet Link LED	Color = Green On = 100BaseTX Off = 10BaseT Blink = Data traffic
	Ready LED	Color = Green Blink (once per second) = System in Normal Mode Off = System in Console Mode
	Fiber Ethernet Link LED	Off= No connection On = 100BaseFX connection
Connectors	10BaseT/100BaseT X Ethernet	Single RJ-45F (8 pin)
	LC fiber	LC connector
	Serial	One DB9M (RS-232) connector and one pluggable lockable 5.08 mm terminal (Rs-422/485)
DC Power		One barrel plug and one terminal block

Approvals and certifications

Emissions	FCC Class B, CISPR Class B (EN55022)		
CE	EN61000-6-2:2005	(Heavy Industrial)	
	EN61000-4-2:2008	(ESD)	+/-8kV Contact, +/-15kV Air
	EN61000-4-3:2006	(RI)	10V/m, 80-1000MHz; 3V/m, 1.3 to 2.7 GHz
	EN61000-4-4:2004	(EFT Burst)	+/-2kV DC ports; +/-1kV signal ports
	EN61000-4-5:2005	(Surge)	+/- 0.5 kV DC Ports, +/- 1 kV Signal Ports
	EN61000-4-6:2005	(CI)	10 VRMS, 0.15 to 80 MHz
	EN61000-4-8:2001	(Magnetic)	10A/m, 50Hz & 60Hz
Shock	IEC60068-2-27	50G peak, 11ms, 3 axes	
Vibration	IEC60068-2-6	10-500Hz, 4G, 3 axes	
Freefall (Drop)	IEC60068-2-32	10 total drops from sides, corner and edges, 1M	

Fiber Optic Cable Information

Mode and Distance	Wavelength	Output Power	Receive Sensitivity
Multi-mode (2 km)	1310 nm	-23 to -14 dBm	= -31 dBm</td
Single-mode (15 km)	1310 nm	15 to -8 dBm	= -34 dBm</td
Single-mode (40 km)	1310 nm	-5 to 0 dBm	= -35 dBm</td
Single-mode (80 km)	1550 nm	-5 to 0 dBm	= -34 dBm</td

Serial Interface Specifications

Mode Selection	RS-232/422/485 software selectable	
RS-232 lines	TXD, RXD, RTS, CTS, DTR, DSR, DCD, GND	
RS-422 lines (4 wire)	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, 14.4k, 19.2k, 28.8k, 38.4k, 57.6k, 115.2k, 230.4k	
Data Bits	5, 6, 7, 8	
Parity	None, even, odd, mark, space	
Stop bits	1, 1.5, 2	
RS-422/485 biasing	Auto 1 K ohm pullups and pulldowns	
RS-485 data control	Auto control via MCU	

Network Specifications

Memory	Serial Memory	8 K-bytes per port
	Network Memory	8 K-bytes
TCP Ports	80	Web Server
	502	Modbus client/server port – user configurable
	7000	TCP Configuration
UDP Ports	7000	UDP Configuration
	8899	Device Discovery
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, 100BaseTX and 100BaseFX
Protocols Supported		TCP, IPv4, ARP, HTTP 1.0, ICMP/PING, DHCP/BOOTP
	IP Mode	Static, DHCP or Auto IP
	TCP	User definable
Connection Modes		Server, Client,
Search		Serial direct COM and Ethernet auto search or specific IP
Firmware Upgrade		Via serial, Ethernet or auto web search
Timeouts	Modbus Message	1 to 65535 ms, default set at 2,000 ms
	TX Delay	1 to 65535 ms, default set at 10 ms
		Custom Timeouts
	Inter-character	100 to 5000 ms, default set at 0 – user to set if enabled
	Inter-message	100 to 5000 ms, default set at 0 – user to set if enabled

Appendices

Appendix C: Dimensional Diagrams



Figure 50. Dimensional Diagram of an MESR321 Modbus Gateway With Two Copper Ports



Figure 51. Dimensional Diagram of an MESR321 Modbus Gateway with Two Fiber Ports



Figure 52. Dimensional Diagram of an MESR321 Modbus Gateway with One Copper and One Fiber Port

Appendix D: Connector Pinouts

MESR321 Serial Port Pinouts



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	No Connection	

MESR321 Serial Port Pinouts



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

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

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

9. Glossary

Term	Definition
ADU	Application Data Unit
ASCII	American Standard Code for Information Interchange
Baud Rate	Number of bits per second
CRC	Cyclical Redundancy Checking
Data Bits	Number of bits per byte, normally 7 with Modbus ASCII, and 8 with Modbus RTU
DHCP	Dynamic Host Configuration Protocol
Flow Control	The process of managing the rate of data transmission between two nodes.
Function Code	A code field that tells the Gateway what kind of action to perform
Modbus Gateway	A bridge to get from Modbus TCP to Modbus Serial
GUI	Graphical User Interface
IP	Internet Protocol
IPv4	Internet Protocol version 4
LED	Light emitting diode. Used as a visual indicator
MBAP	MODBUS Application Protocol
MEI	Multi Electrical Interface via RS-232/422/485
Modbus	A request/reply protocol and offers services specified by function codes.
Parity Bit	A binary digit that is added to ensure that the number of bits with value of one in a given set of bits is always even or odd. It may also be a Mark (1), or a Space (0).
PDU	Protocol Data Unit
RS-232	Interface between Data Terminal Equipment and Data Circuit- Terminating Equipment Employing Serial Binary Data Interchange

Term	Definition
RS-422	Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Point to Point Systems
RS-485	Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems
RTU	Remote Terminal Unit
Stop Bit	Number of bit times after a character is transmitted before the next character can start transmission.
ТСР	Transmission Control Protocol
Unit ID	Unit Identifier. This is the same as the slaves address.
MESR	B&B's Modbus Ethernet Gateway Series
Vlinx	B&B's family name for the Gateway line