

BFR3000 – Modbus Router

Product User Guide

Revision: 2.0.6
Platform: N34

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Overview

The BFR3000 Modbus Router product can move messages between Modbus RTU or Modbus ASCII networks and Modbus TCP/IP networks.

To configure the router you will set the router's network settings, configure device specific parameters for initial operation, and integrate the device into your application.

If at any time you need further assistance do not hesitate to call Real Time Automation support.

Support Hours are Monday-Friday 8am-5pm CST

Toll free: 800-249-1612

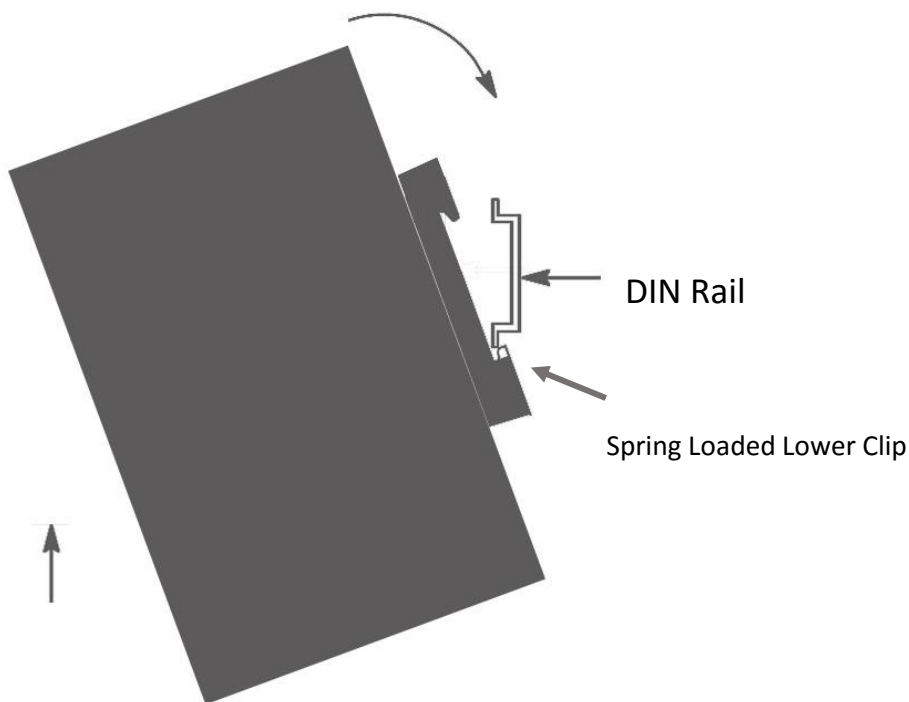
Email: support@rtaautomation.com

Mounting with a DIN Rail

Installing

Follow these steps to install your interface converter.

- 1) Mount your DIN Rail.
- 2) Hook the bottom mounting flange under the DIN Rail.
- 3) While pressing the BFR3000 against the rail, press up to engage the spring loaded lower clip and rotate the unit parallel to the DIN Rail.
- 4) Release upward pressure.



Removing

Follow these steps to remove your interface converter.

- 1) Press up on the unit to engage the spring loaded lower clip.
- 2) Swing top of the unit away from the DIN rail

Getting Started

You will need the following:

The BFR3000 router

The provided CD-ROM

- IPSetup.exe can also be downloaded: _

<http://www.rtaautomation.com/product/460-gateway-support/>

A PC with an internet browser

- Firefox / Internet Explorer / Google Chrome compatible

Powering the Router

A 24VDC power source to the 2-pin terminal on the router.

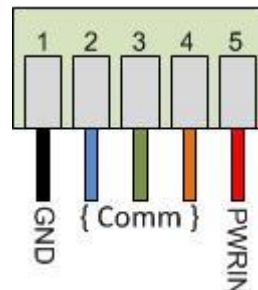
- The unit draws 175 mA at 12VDC
- The router has a voltage operating range from 12-24VDC.

Powering The Router

The following steps will allow you to properly and safely power the gateway.



Warning improper wiring will cause unit failure
Use the Barrel Connector OR the Screw
Terminals power connection, NOT both



- 1) Connect a 24VDC power source to the gateway.
 - a. The unit draws 125 mA at 24VDC
 - b. The gateway has a voltage operating range from 8-28VDC, 24VDC is recommended.



Hazardous Environment Power & Installation Instructions

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D, or non-hazardous locations only.

WARNING – EXPLOSION HAZARD - Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

WARNING – EXPLOSION HAZARD - Substitution of components may impair suitability for Class I, Division 2.

THIS EQUIPMENT IS AN OPEN-TYPE DEVICE AND IS MEANT TO BE INSTALLED IN AN ENCLOSURE SUITABLE FOR THE ENVIRONMENT SUCH THAT THE EQUIPMENT IS ONLY ACCESSIBLE WITH THE USE OF A TOOL.

WARNING – POWER JACK (Barrel Connector, J1) IS FOR MAINTENANCE USE ONLY AND MAY ONLY BE USED WHILE THE AREA IS KNOWN TO BE FREE OF IGNITIBLE CONCENTRATIONS OF FLAMMABLE GASES OR VAPORS. IT IS NOT TO BE CONNECTED UNDER NORMAL OPERATION.

In Hazardous Environments the unit must be powered with between 12-24 VDC, 860 mA (6 W) max. Supervised. The unit is certified to be operated at -40°C to 50°C.



Hazardous Environment Power & Installation Instructions

Cet équipement est conçu pour être utilisé uniquement dans des lieux de classe I, division 2, groupes A, B, C et D, ou non dangereux.

AVERTISSEMENT - RISQUE D'EXPLOSION - Ne débranchez pas l'équipement à moins que le courant ne soit coupé ou que la zone ne présente aucun danger.

AVERTISSEMENT - RISQUE D'EXPLOSION - La substitution de composants peut compromettre l'adéquation à la classe I, division 2.

CET APPAREIL EST UN DISPOSITIF DE TYPE OUVERT ET IL FAUT L'INSTALLER DANS UN ENCEINTE ADAPTÉ À L'ENVIRONNEMENT TEL QU'IL N'EST ACCESSIBLE À L'UTILISATION D'UN OUTIL.

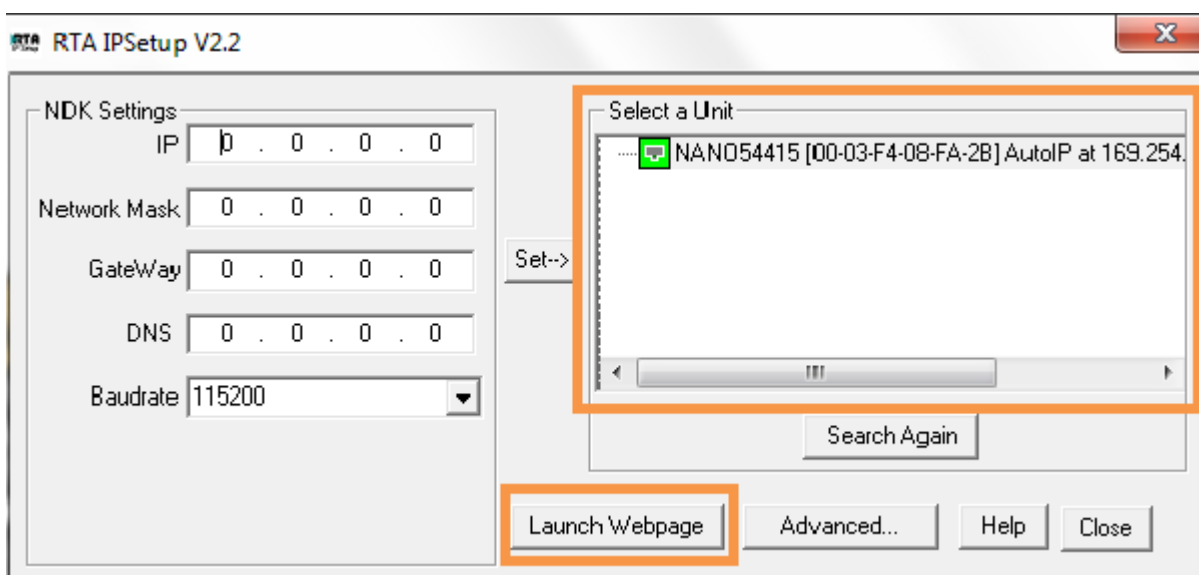
AVERTISSEMENT - LE POWER JACK (bornes à vis, J1) est destiné exclusivement à la maintenance et ne peut être utilisé que lorsque la zone est connue pour être exempte de concentrations inintéressantes de gaz ou de vapeurs inflammables. IL NE DOIT PAS ÊTRE CONNECTÉ SOUS UN FONCTIONNEMENT NORMAL.

Dans les environnements dangereux, l'unité doit être alimentée entre 12-24 VDC, 860 mA (6 W) max. Supervisé. L'appareil est certifié pour fonctionner entre -40 ° C et 50 ° C.

Accessing the Main Page

The following steps will help you access the browser based configuration of the router. By default, DHCP is enabled. If the router fails to obtain an IP address over DHCP it will Auto IP with 169.254.X.Y.

- 1) Insert the provided CD-ROM into a computer also on the network.



- 2) Run the IPSetup.exe program from the CD-ROM.
- 3) Find unit under “Select a Unit”.
 - a. Change IP address to match that of your PC if DHCP has failed.
 - i. You will know DHCP has failed if the router’s IP address is Auto IP at 169.254.X.Y.
 - ii. If successful it will say DHCP’d at ex: 192.168.0.100 or however your DCHP Client is setup.
- 4) Click **Launch Webpage**. The Operation Mode Selection page should appear.

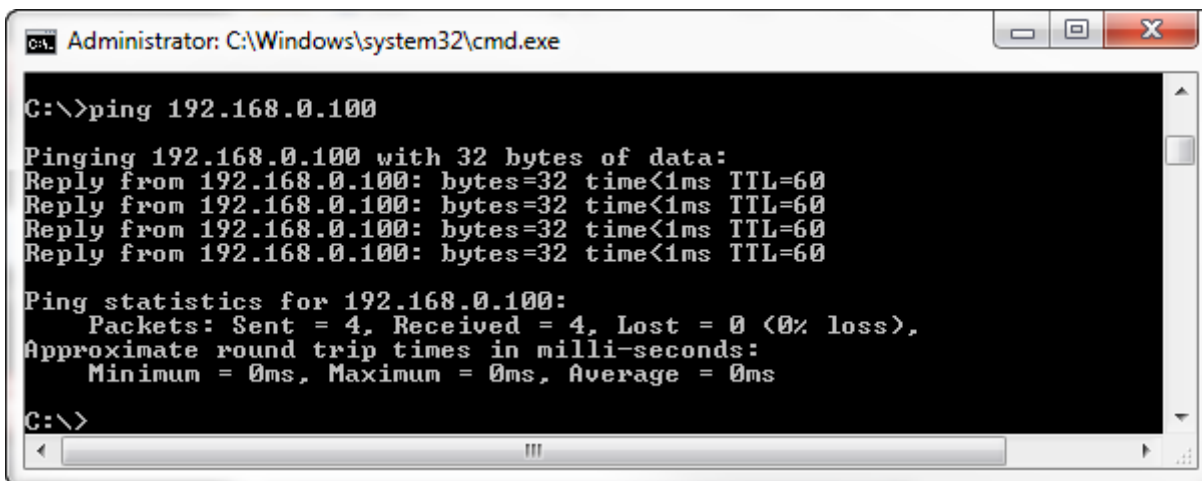
Default setting is set to DHCP. If DHCP fails, default IP Address is 169.254.x.y

Error: Main Page Does Not Launch

If the Main Page does not launch, please verify the following:

1. Check that the PC is set for a valid IP Address
 - a. Open a MS-DOS Command Prompt
 - b. Type “ipconfig” and press enter
 - c. Note the PC’s IP Address, Subnet, and Default Gateway
2. The router must be on the same Network/Subnet as the PC whether its setup for DHCP/Static.

Once you have both devices on the same network, you should be able to ping the router using a MS-DOS Command Prompt.



```
Administrator: C:\Windows\system32\cmd.exe

C:\>ping 192.168.0.100

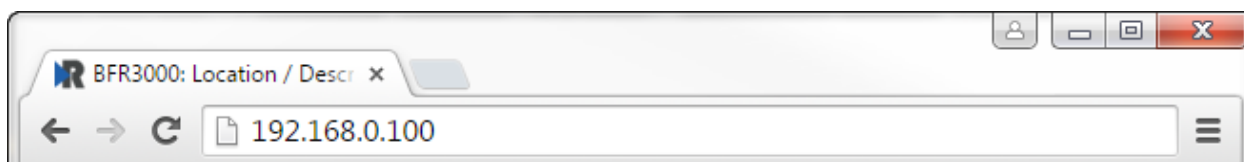
Pinging 192.168.0.100 with 32 bytes of data:
Reply from 192.168.0.100: bytes=32 time<1ms TTL=60
Reply from 192.168.0.100: bytes=32 time<1ms TTL=60
Reply from 192.168.0.100: bytes=32 time<1ms TTL=60
Reply from 192.168.0.100: bytes=32 time<1ms TTL=60

Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

The Screenshot above shows a router that is currently set to a static IP Address of 192.168.0.100.


If you are able to successfully ping your router, open a browser and try to view the main page of the router by entering the IP Address of the router as the URL.



Operation Mode Selection

Upon startup, you will be directed to the Operation Mode Selection page. There are 3 modes of operation to select from:

- **Modbus TCP/IP Client to Modbus RTU/ASCII Slave(s)** – Use this mode to connect up to 5 Modbus TCP/IP Client devices with up to 255 Modbus RTU/ASCII Slaves.
- **Modbus TCP/IP Server(s) to Modbus RTU/ASCII Master** – Use this mode to connect up to 255 Modbus TCP/IP Server devices with a Modbus RTU/ASCII Master.
- **Modbus TCP/IP Client to Modbus RTU/ASCII Master** – Use this mode to connect up to 5 Modbus TCP/IP Client devices with a Modbus RTU/ASCII Master.

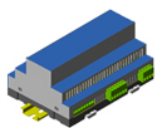


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BFR3000


Real Time Automation, Inc.

Operation Mode Selection

Modbus TCP/IP Client




Modbus RTU Slave(s)



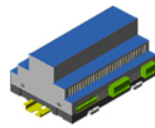
Connect your Modbus TCP/IP Client to/from
Modbus RTU ▼ Slave(s)

Select

Modbus TCP/IP Server(s)



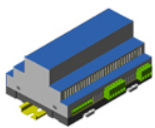
Modbus RTU Master



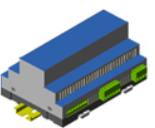
Connect your Modbus TCP/IP Server(s) to/from
Modbus RTU ▼ Master

Select

Modbus TCP/IP Client



Modbus RTU Master



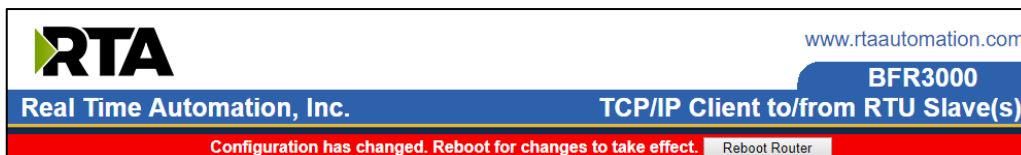
Connect your Modbus TCP/IP Client to/from
Modbus RTU ▼ Master

Select

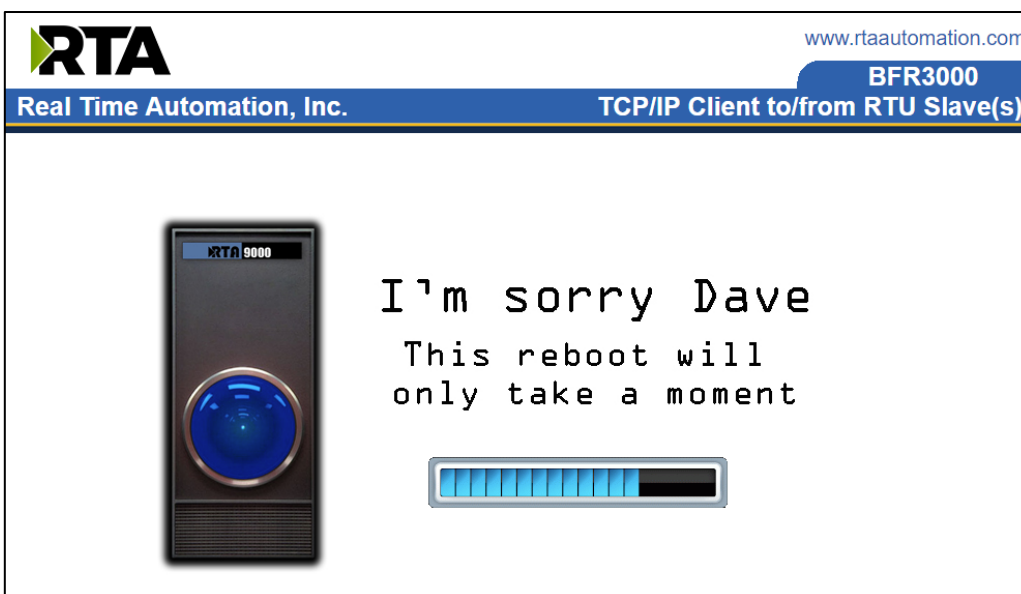
- 1) Under the Mode you would like to configure, select if the Modbus slave or master device is RTU or ASCII from the dropdown.
- 2) Press the **Select** button to continue with the setup.

Committing Changes to the Settings

- ◆ Changes made to the settings of the router will not take effect until the router is restarted.
- ◆ Changes will not be stored if the router's power is removed prior to rebooting.
- ◆ The router detects changes and will prompt you with a red notice box to reboot the router after change.



- ◆ **NOTE:** The router does not need to be restarted after every change. Multiple changes can be made before a restart, but they will not be committed until the router is rebooted.
- ◆ The webpage will redirect to our rebooting page shown below.



- ◆ After the router has restarted, which can take up to 15 seconds, the router will automatically redirect to the diagnostics page. You will know the save was successful if the red box is no longer present.

If you don't understand the load screen reference you need to add Stanley Kubrick's 2001: Space Odyssey to your must watch list. We recommend finding a Betamax version.

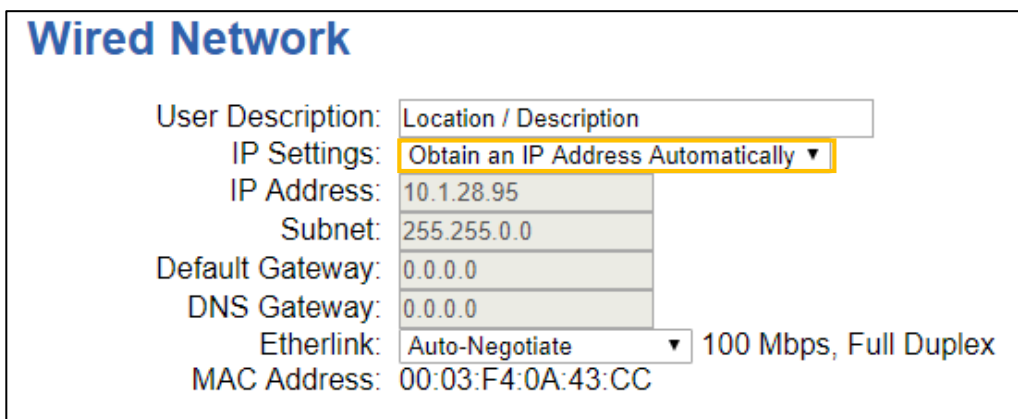
Network and Hardware Configuration

The Network and Hardware Configuration area is where you assign a description, change the IP Settings and serial port settings.

Wired Network Configuration

- 1) From the navigation menu, select **Network and Hardware** under Configuration.
- 2) Enter in a User Description to help identify the router.
- 3) Enter IP Address, Subnet, Default Gateway, and DNS information.

NOTE: Changes can only be made on the webpage to the IP Address, Subnet, Default Gateway, and DNS Gateway when the IP Settings parameter is set to “Use the Following IP Address”.



The screenshot shows the 'Wired Network' configuration interface. It includes a title 'Wired Network' in blue. Below it are several configuration fields: 'User Description' with a text input field containing 'Location / Description'; 'IP Settings' with a dropdown menu set to 'Obtain an IP Address Automatically'; 'IP Address' with a text input field containing '10.1.28.95'; 'Subnet' with a text input field containing '255.255.0.0'; 'Default Gateway' with a text input field containing '0.0.0.0'; 'DNS Gateway' with a text input field containing '0.0.0.0'; 'Etherlink' with a dropdown menu set to 'Auto-Negotiate' and a status indicator '100 Mbps, Full Duplex'; and 'MAC Address' with a text input field containing '00:03:F4:0A:43:CC'.

- 4) Once you are done configuring the Description and the Network Settings, click the **Save Parameters** button.

If you are changing the IP Address of the router, the change will not take effect until the unit has been rebooted. After reboot, you must enter the new IP Address into your browser to access the configuration screens.

It is recommended to leave the DNS Gateway set to 0.0.0.0 and the Ethernet Link as Auto-Negotiate.

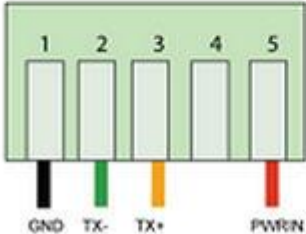
Hardware Configuration

The Hardware Configuration page is where you set port specific parameters. These settings must match the settings of the device(s) that you are connecting to.

When you have completed your port configuration, click the **Save Parameters** button.

Hardware

Port: Port 0 (T-Strip) ▼
Mode: RS485 (2-wire; Half Duplex) ▼
Baud Rate: 19200 ▼
Parity: None ▼
Data Bits: 8 ▼
Stop Bits: 1 ▼
Flow Control: None ▼
RTS: High (Default) ▼ (RS232 only)
DTR: High (Default) ▼ (RS232 only)



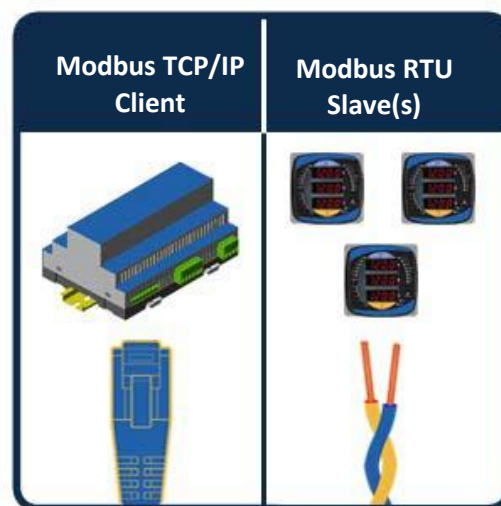
LED 1: Modbus TCP/IP
LED 2: Modbus RTU

Save Parameters

The default jumper configurations are set up for the following serial modes:

- Port 0 - RS485
- Port 1 – RS232

If you require a different serial mode, please refer to the [Hardware_Jumper_Configuration.pdf](#) on the CD to make jumper changes.



Operation Mode:

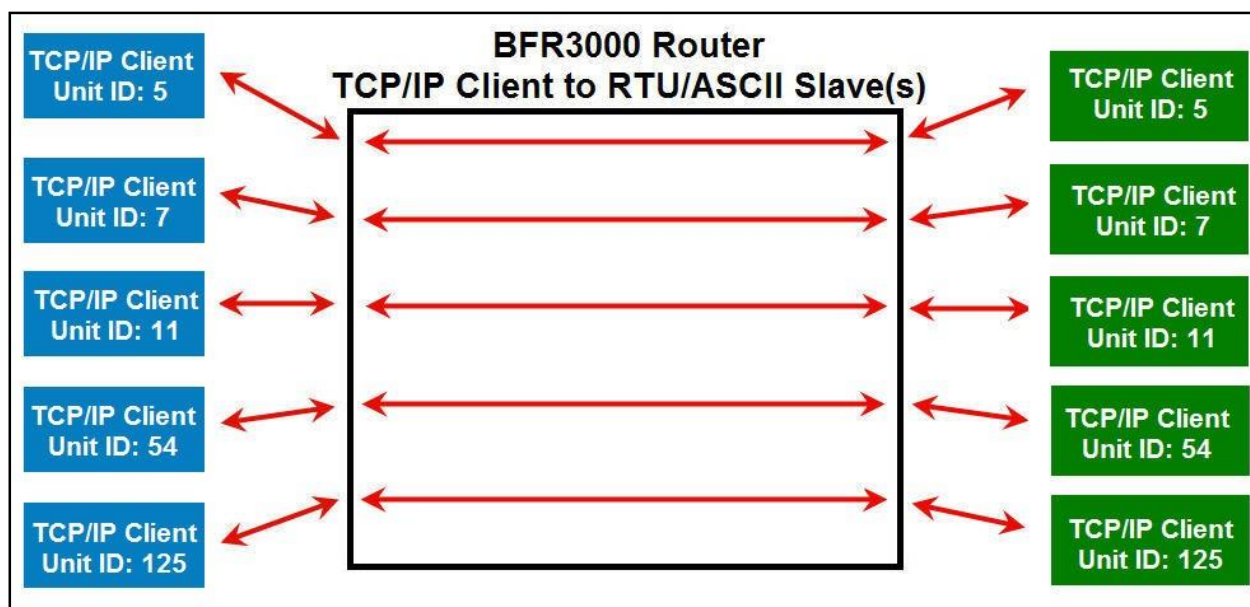
Modbus TCP/IP Client to/from Modbus RTU/ASCII Slave(s)

Modbus TCP/IP Client to/from Modbus RTU/ASCII Slave(s)

In this mode of operation up to 5 Modbus TCP/IP Clients may send/receive messages from up to 255 Modbus RTU Slave device(s).

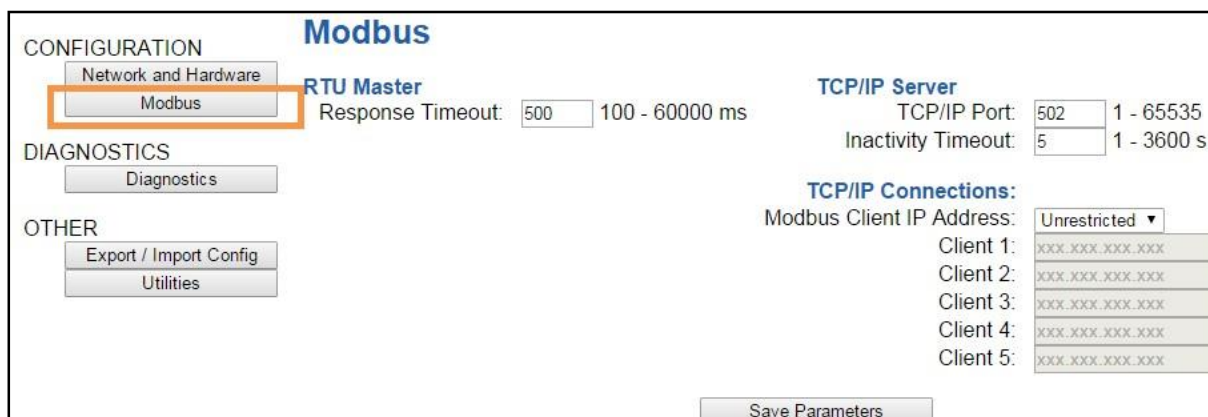
The Modbus TCP/IP Client requests are transparently passed to Modbus RTU slaves. The Unit ID field on Modbus TCP/IP is used as the Modbus RTU Slave ID field when transmitted on the serial network.

- No other message fields are modified.
- If a TCP/IP Client tries to access a Slave device that is not connected then the router will provide timeouts.



Modbus Configuration

- 1) From the navigation menu, select **Modbus** under Configuration.



The screenshot shows the Modbus Configuration page. On the left, there is a navigation menu with sections: CONFIGURATION (containing Network and Hardware, Modbus, and RTU Master), DIAGNOSTICS (containing Diagnostics), and OTHER (containing Export / Import Config and Utilities). The 'Modbus' option is highlighted with an orange box. The main content area is titled 'Modbus' and contains two sections: 'RTU Master' and 'TCP/IP Server'. The 'RTU Master' section has a 'Response Timeout' field set to 500, with a range of 100 - 60000 ms. The 'TCP/IP Server' section has a 'TCP/IP Port' field set to 502 (range 1 - 65535) and an 'Inactivity Timeout' field set to 5 (range 1 - 3600 s). Below these is the 'TCP/IP Connections' section, which includes a 'Modbus Client IP Address' dropdown menu set to 'Unrestricted' and five rows for 'Client 1' through 'Client 5', each with a text input field containing 'xxx.xxx.xxx.xxx'. At the bottom right is a 'Save Parameters' button.

RTU Master

- 2) Response Timeout: Enter in the amount of time the router will wait for the response from the Modbus RTU/ASCII Slave(s) before declaring a message has timed out.

TCP/IP Server

- 3) TCP/IP Port: Enter in the port that our TCP/IP Server will have so that the TCP/IP Client can communicate. Port 80 is not allowed.
- 4) Inactivity Timeout: Enter in the amount of time the router will wait for communication from the Modbus TCP/IP Client device before it closes the connection.
- 5) Modbus Client IP Address: Select from the dropdown how restrictive our TCP/IP Server should be about incoming Modbus TCP/IP Client connections:
 - a. Unrestricted – Allows any Modbus TCP/IP Client to make a connection to our TCP/IP Server in the router.
 - b. Restricted – Allows only the Modbus TCP/IP Clients at the specified IP Addresses to make a connection to our TCP/IP Server in the router.
- 6) When finished, press the **Save Parameters** button to save the changes made on this page. If settings have changed, you will be prompted to reboot the router for the changes to take effect.

Diagnostics

From the navigation menu, select **Diagnostics** under Diagnostics.

Pressing the **Clear** button will clear out the all counts.

CONFIGURATION		Diagnostics				
<div>Network and Hardware</div> <div>Modbus</div>		<div>Clear</div>				
DIAGNOSTICS		Device Name	Current State	Requests	Responses	Errors
<div>Diagnostics</div>		1	OK	76	75	0
OTHER		2	OK	75	75	0
<div>Export / Import Config</div> <div>Utilities</div>		Overall Total	OK	151	150	0
		<div>Current # TCP Connections Open: 1</div> <div>RTU Error (Slave ID): 0</div> <div>RTU Error (CRC): 0</div> <div>RTU Error (Late Response): 0</div>				

This table is organized the following way:

- Device Name – Modbus RTU/ASCII Slave ID that the router is communicating with.
- Current State – Displays the current state of each row. There are 3 states:
 - OK: Requests being sent out are getting valid responses.
 - Error: The last request sent out got an error response from the Modbus RTU/ASCII side.
 - Timeout: The last request sent out did not get a response within the timeout period specified.
- Requests – Number of Modbus Requests sent to slave device.
- Responses – Number of Modbus Responses sent from slave device.
- Errors – Number of Error Messages sent from slave device.
- Timeouts – Number of Timeout Messages from slave device.
- Overall Total row – This row displays the total of all the values in that column.

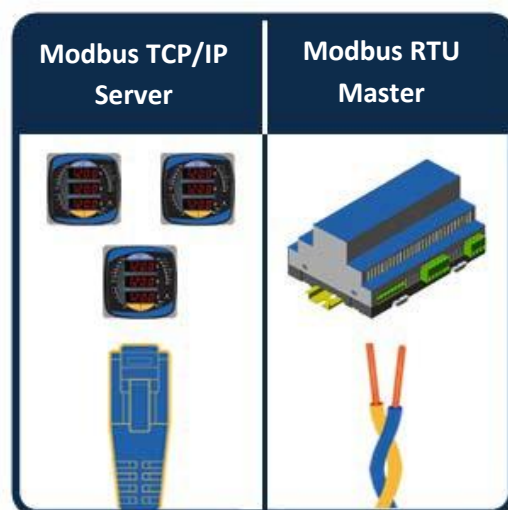
Current # TCP Connections Open – This displays the number of Modbus TCP/IP Client connections to the router.

RTU Error (Slave ID), RTU Error (CRC), RTU Error (Late Response) – These are errors that may occur when the Modbus RTU/ASCII network has problems. These values should be 0 in a functional system.

LED Behavior

LED 1 : Modbus TCP/IP	
Blink Green	No current TCP Connections a) Have never had any TCP Connections b) Had TCP Connections but all of them have timed out and are now closed
Solid Green	At least 1 TCP Connection is made and is communicating to the router
Off	Ethernet cable is unplugged

LED 2 : Modbus RTU/ASCII	
Blink Green	No RTU/ASCII Connection has ever been made
Solid Green	All RTU/ASCII Connections are valid and are communicating to the router within the Inactivity Timeout configured
Blink Red	Inactivity Timeout has been reached for one or more Slaves. Will remain in this state until a valid message is received for the Slave ID that is currently in a Timeout state.



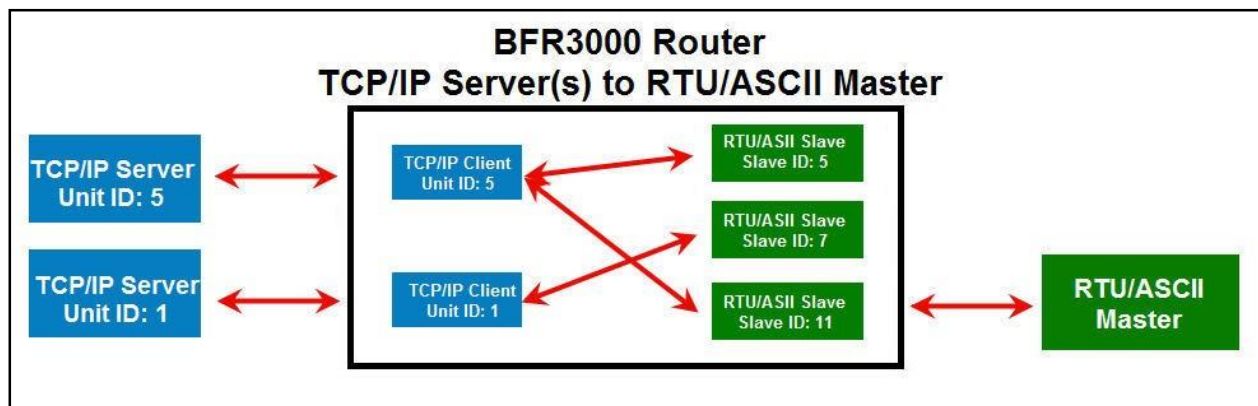
Operation Mode:

**Modbus TCP/IP Servers to/from Modbus
RTU/ASCII Master**

Modbus TCP/IP Server(s) to/from RTU/ASCII Master

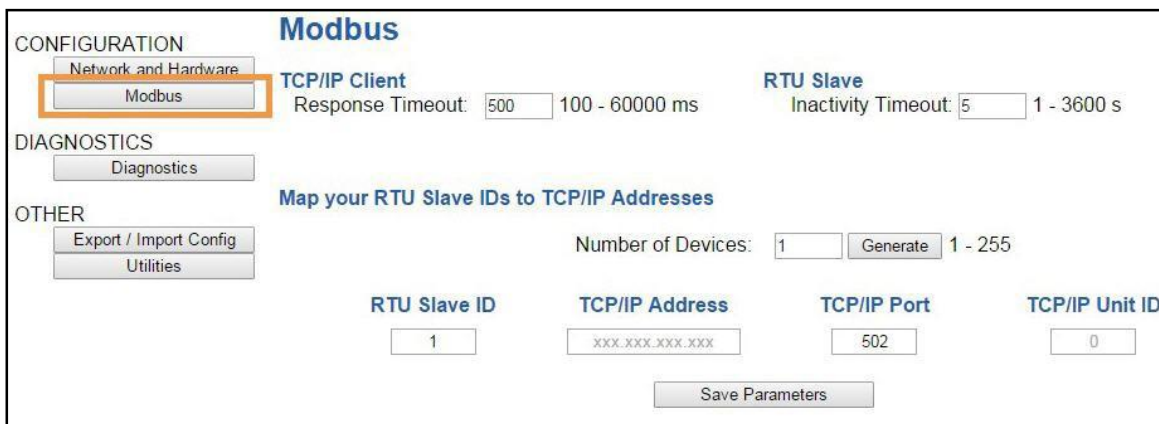
In this mode of operation a Modbus RTU/ASCII Master can connect up to 255 Modbus TCP/IP Server devices. The Modbus RTU message sent to a Slave ID is converted to a Modbus TCP/IP message and mapped to a corresponding Modbus TCP/IP address, Port and Unit ID.

- No other message fields are modified.
- Modbus Slave ID's can be mapped to any Modbus TCP/IP Unit ID and IP Address.
- Multiple Modbus TCP/IP Unit ID's can share a single IP address.



Modbus Configuration

- 1) From the navigation menu, select **Modbus** under Configuration.



The screenshot shows the 'Modbus' configuration page. On the left, there is a navigation menu with 'CONFIGURATION' (containing 'Network and Hardware' and 'Modbus'), 'DIAGNOSTICS' (containing 'Diagnostics'), and 'OTHER' (containing 'Export / Import Config' and 'Utilities'). The 'Modbus' option is highlighted. The main content area is titled 'Modbus' and contains two sections: 'TCP/IP Client' and 'RTU Slave'. The 'TCP/IP Client' section has a 'Response Timeout' field set to '500' with a range of '100 - 60000 ms'. The 'RTU Slave' section has an 'Inactivity Timeout' field set to '5' with a range of '1 - 3600 s'. Below these is a section titled 'Map your RTU Slave IDs to TCP/IP Addresses' with a 'Number of Devices' field set to '1' and a 'Generate' button. At the bottom, there is a table with four columns: 'RTU Slave ID', 'TCP/IP Address', 'TCP/IP Port', and 'TCP/IP Unit ID'. The first row shows values: '1', 'xxx.xxx.xxx.xxx', '502', and '0'. A 'Save Parameters' button is located at the bottom right of the table.

TCP/IP Client

- 2) Response Timeout: Enter in the amount of time the router will wait for the response from the Modbus TCP/IP Server(s) before calling the message a timeout and closing the connection.

RTU Slave

- 3) Inactivity Timeout: Enter in the amount of time the router will wait for communication from the Modbus RTU Master device before it raises an alarm.
 - a. Modbus RTU LED will turn red

Map your RTU Slave IDs to TCP/IP Addresses

- 4) Number of Devices: Number of mappings.
- 5) RTU Slave ID: Slave ID on Modbus RTU. This field must be unique.
- 6) TCP/IP Address: Enter in the Ethernet TCP/IP address of the Modbus TCP/IP Server.
- 7) TCP/IP Port: Enter which port number will be used. Port 80 is not allowed.
- 8) TCP/IP Unit ID: Enter the Unit ID for the Modbus TCP/IP Server.
- 9) When finished, press the **Save Parameters** button to save the changes made on this page. If settings have changed, you will be prompted to reboot the router for the changes to take effect.

Diagnostics

From the navigation menu, select **Diagnostics** under Diagnostics. This page will automatically refresh every second with the latest values.

Pressing the **Clear** button will clear out the entire table and any total counts.

CONFIGURATION

Network and Hardware

Modbus

DIAGNOSTICS

Diagnostics

OTHER

Export / Import Config

Utilities

Diagnostics

Clear

Device Name	Current State	Requests	Responses	Errors	Timeouts
10.1.54.40:502:1	OK	1535	1535	0	0
10.1.54.41:502:5	OK	1535	1535	0	0
10.1.54.40:502:1	OK	1535	1535	0	0
Overall Total	OK	4605	4605	0	0

Current # TCP Connections Open: 2

This table is organized the following way:

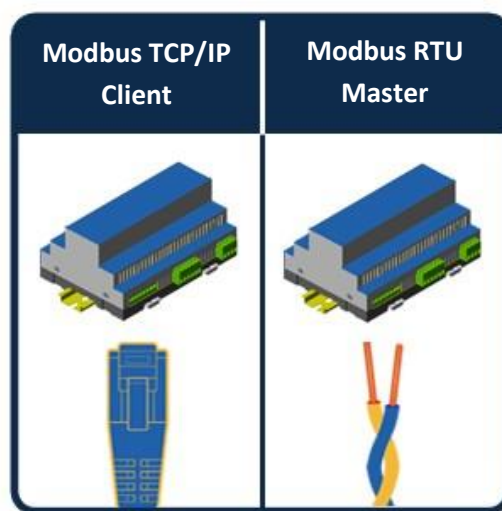
- Device Name – Displays name as “TCP/IP Address: TCP/IP Port: TCP/IP Unit ID”
- Current State – The current state of that row.
 - OK: Each request being sent out is getting a valid response.
 - Error: Error received from the Modbus TCP/IP device.
 - Timeout: No response from the Modbus TCP/IP within the Timeout period.
- Requests – Number of requests to Modbus TCP/IP Server.
- Responses – Number of responses sent from the Modbus TCP/IP Server.
- Errors – Number of Modbus error message Responses per Modbus TCP/IP Server.
- Timeouts – Number of timeout errors per Modbus Server
- Overall Total row – This row displays the total of all the values in that column.

Current # TCP Connections Open – This displays the current number of TCP Client connections to the router. The router can support up to 5 at one time.

LED Behavior

LED 1 : Modbus TCP/IP	
Blink Green	No current TCP Connections
Solid Green	At least 1 TCP Connection is made and is communicating to the router
Blink Red	Attempted to open a TCP Connection but failed
Off	Ethernet cable is unplugged

LED 2 : Modbus RTU/ASCII	
Blink Green	No RTU/ASCII Connection has ever been made
Solid Green	RTU/ASCII Connection is valid and is communicating to the router within the Inactivity Timeout configured
Blink Red	RTU/ASCII Request has been received by the router, but the TCP/IP Server device is not present

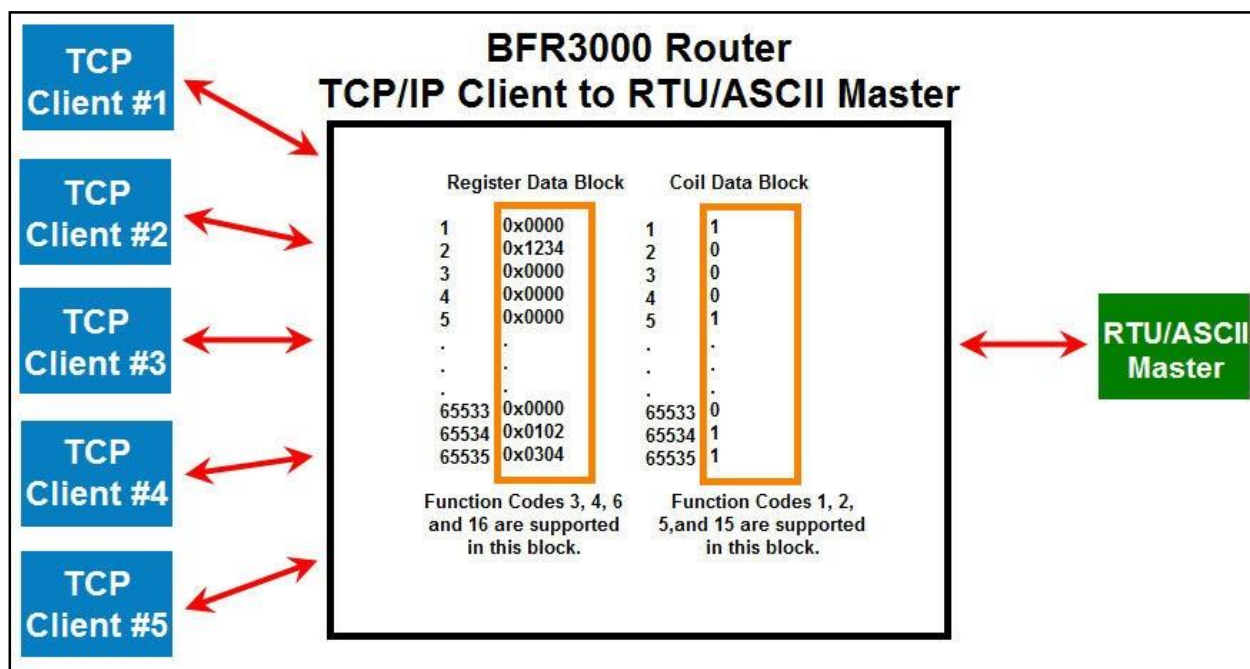


Operation Mode:

**Modbus TCP/IP Client to/from Modbus
RTU/ASCII Master**

Modbus TCP/IP Client to/from RTU/ASCII Master

In this mode of operation, the TCP/IP Client device and RTU/ASCII Master device essentially share the same data values. Up to 5 Modbus TCP/IP Clients can talk with the router at a given time. In this mode, the data table for the Input Coils and Coil Status are overlapping, just like the data table for the Input Registers and Holding Registers. This means that a read request (Function Code 0x02) of Input Status 10 will return the same value as a read request (Function Code 0x01) of Coil Status 10 would return.



Modbus Configuration

- 1) From the navigation menu, select **Modbus** under Configuration.

Modbus

TCP/IP Server

TCP/IP Port: 1 - 65535

Inactivity Timeout: 1 - 3600 s

RTU Slave

Slave ID: 1 - 255

Inactivity Timeout: 1 - 3600 s

TCP/IP Server

- 2) TCP/IP Port: Enter in the port that our TCP/IP Server will have so that the TCP/IP Client can communicate. Port 80 is not allowed.
- 3) Inactivity Timeout: Enter in the amount of time the router will wait for communication from the Modbus TCP/IP Client device before it closes the connection.

RTU Slave

- 4) Slave ID: Enter in the slave ID that our Modbus RTU/ASCII Slave should have so that the Modbus RTU/ASCII Master can communicate to the router.
NOTE: This value should be unique among all slave devices on the network.
- 5) Inactivity Timeout: Enter in the amount of time the router will wait for communication from the Modbus RTU Master device before it closes the connection.
- 6) When finished, press the **Save Parameters** button to save the changes made on this page. If settings have changed, you will be prompted to reboot the router for the changes to take effect.

Diagnostics

From the navigation menu, select **Diagnostics** under Diagnostics. This page will automatically refresh every second with the latest values.

Pressing the **Clear** button will clear out the entire table and any total counts.

CONFIGURATION Network and Hardware Modbus		Diagnostics Clear			
DIAGNOSTICS Diagnostics		Function	TCP	TCP	RTU
		Code	Requests	Responses	Requests
					Responses
OTHER		FC01: Rd Coil Status	461	461	389
		FC03: Rd Holding Reg	333	333	389
		FC05: Wr Single Coil Status	3	3	1
		FC16: Wr Mult Holding Reg	1	1	1
		FC06: Wr Single Holding Reg	0	0	1
		FC15: Wr Mult Coil Status	1	1	1
		Overall Total	799	799	782
Current # TCP Connections Open: 2					

This table is organized the following way:

- Function Code – Shows the Function Codes received from either the TCP/IP Client side or the RTU/ASCII Master side. A description of the Function Code is displayed after the “:” in the column.
- TCP Requests/TCP Responses – Number of TCP Requests or Responses. The number of requests should equal the number of responses.
- RTU Requests/RTU Responses – Number of RTU/ASCII Requests or Responses. The number of requests should equal the number of responses.
- Overall Total row – This row displays the total of all the values in that column.

Current # TCP Connections Open – This displays the current number of TCP Client connections to the router. The router can support up to 5 at one time.

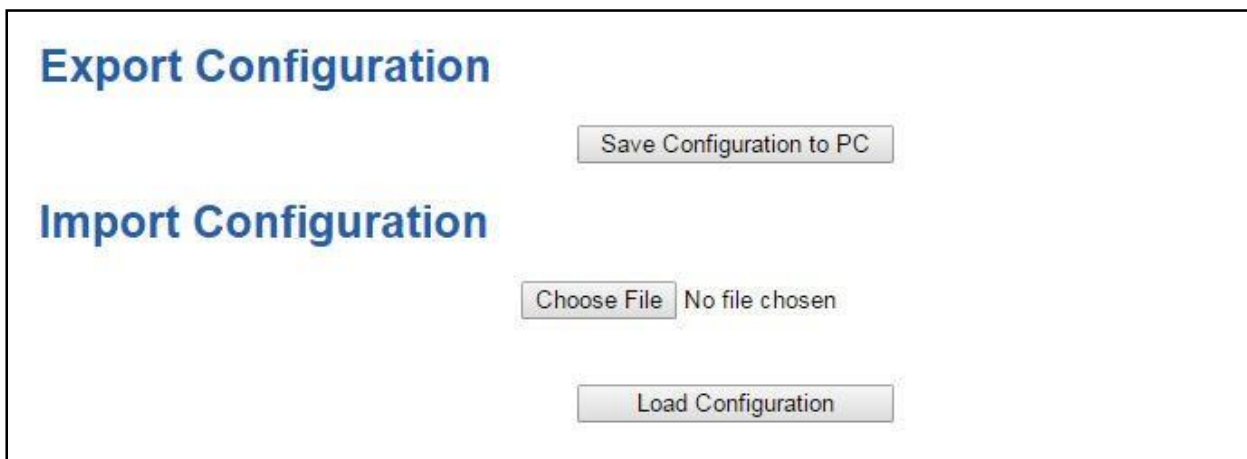
LED Behavior

LED 1 : Modbus TCP/IP	
Blink Green	No current TCP Connections a) Have never had any TCP Connections b) Had TCP Connections but all of them have timed out and are now closed
Solid Green	At least 1 TCP Connection is made and is communicating to the router
Off	Ethernet cable is unplugged

LED 2 : Modbus RTU/ASCII	
Blink Green	No RTU/ASCII Connection has ever been made
Solid Green	RTU/ASCII Connection is valid and is communicating to the router within the Inactivity Timeout configured
Blink Red	Inactivity Timeout has been reached. Will remain in this state until a message is received

Export/Import Configuration

To access these the export or import configuration features in the router, click the **Export/Import Config** button under the OTHER navigation pane.



The screenshot shows a web interface for configuration management. It has two main sections: 'Export Configuration' and 'Import Configuration'. Under 'Export Configuration', there is a button labeled 'Save Configuration to PC'. Under 'Import Configuration', there is a 'Choose File' button next to the text 'No file chosen', and a 'Load Configuration' button below it.

Export Configuration

- 1) Click the **Save Configuration to PC** button.
- 2) A prompt will then ask the type of file to save as. Any type will suffice.
 - ◇ This will save all of the configuration except for the router's IP Network Settings, since this must be unique.
- 3) Save this file to the PC.

Import Configuration

- 1) Click **Choose File** and search for the configuration to load to the BFR3000.
- 2) Click **Load Configuration**. If successful, you will be redirected to the main page and be forced to reboot the router. If the load failed, you will be prompted with an error.

Utilities

The Utilities screen offers additional features and functionality in the router including Operation Mode, Logging, Security, Update Firmware Capability, and Restart Options.

Here you can also:

- Change which Operation Mode you are running.
- Configure logging settings for diagnostic purposes.
- Configure security settings.
- Upgrade the firmware right from the webpage.
- Various options to reset the router.

Operation Mode

To change which Operation Mode currently configured in the router, click on the Utilities button under the OTHER navigation menu and then Operation Mode button. Clicking this button will redirect to the Operation Mode Selection page. From there, select which mode to run.

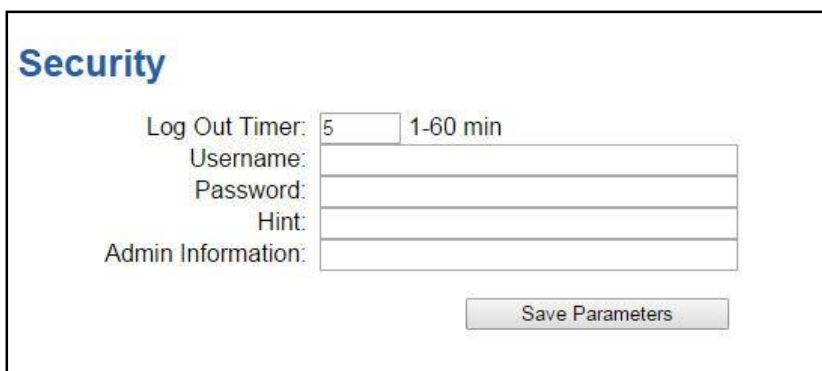
Logging

Most users will not need to do anything with these feature. If there are problems with the router, a RTA Technical Support Specialist will direct you in how to use this feature.

Security Configuration

To configure security for a single username and password, click the **Utilities** button under the OTHER navigation pane and then click the **Security** button.

- 1) Log Out Timer: The system will automatically log inactive users off after this period of time.
- 2) Username: Enter a username, max of 30 characters, case sensitive.
- 3) Password: Enter a password for the username, max of 30 characters, case sensitive.
- 4) Hint: A helpful reminder of what the password is.
- 5) Admin Information: Enter in contact information in case username/password is forgotten.
- 6) Click the **Save Parameters** button to save.

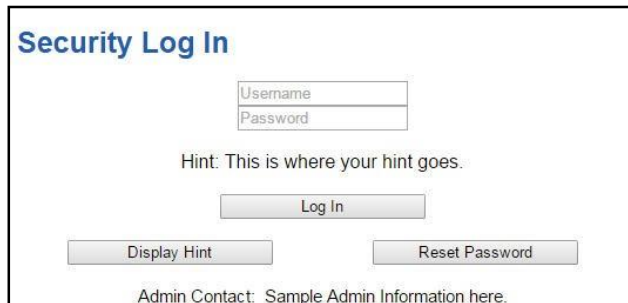


The screenshot shows a web form titled "Security" in blue text. It contains the following fields and controls:

- Log Out Timer:** A numeric input field with the value "5" and a range indicator "1-60 min".
- Username:** A text input field.
- Password:** A text input field.
- Hint:** A text input field.
- Admin Information:** A text input field.
- Save Parameters:** A button located at the bottom right of the form.

Security – Log In

- 1) Username: Name of the user to login.
- 2) Password: Password of the user to login.
- 3) Log In: If login is successful, the user will be redirected to the Diagnostics Page.
- 4) Display Hint: Displays the hint specified for the user if one was set up.
- 5) Reset Password: This is used to reset security settings. Confirm reset password must be selected to confirm this action. Once confirmed, there is a 15 minute window to do a hard reset of the router by physically removing and restoring power from the router. Once power is restored, you may navigate to the IP address of the router as normal.



The image shows a web form titled "Security Log In". It contains two input fields for "Username" and "Password". Below these fields is a hint text: "Hint: This is where your hint goes." There are three buttons: "Log In", "Display Hint", and "Reset Password". At the bottom, there is a text label "Admin Contact: Sample Admin Information here."

Reset Router

There are 3 options to reset the router.

Restart the Router – Saves the current settings of the router and performs a software reboot.

Reset to Last Powerup – Brings the device back to its last power up settings.

Reset to Shipped Defaults – Brings the device back to its original manufacturing defaults, including setting the router to DHCP mode.

Once the option is selected, click the **Reset** button to execute.

Completing the Installation

You have now set up your router for communication and are ready to place the device in your application.

If at any time you need further assistance do not hesitate to call Real Time Automation support.

Support Hours are Monday-Friday 8am-5pm CST

Toll free: 800-249-1612

Email: support@rtaautomation.com