Configuring RAD-900-IFS with GW EIP/MODBUS 1E/1DB9 for EtherNet/IP I/O Emulation using EDS file (implicit messaging)

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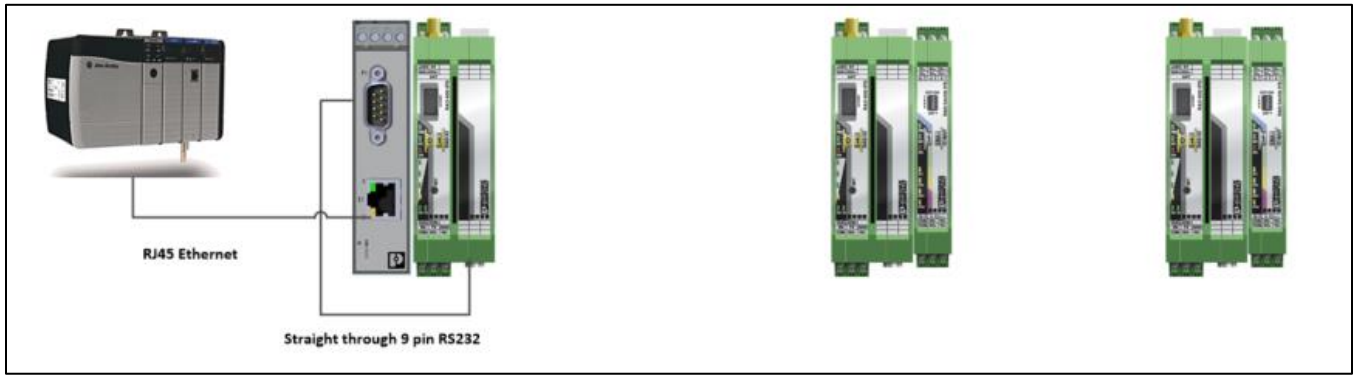
Contents

Introduction

Objectives:

This document covers configuring the RAD-900-IFS wireless module and the GW EIP/MODBUS 1E/1DB9 for I/O to EtherNet/IP communication between a master site and two remote slave sites. The communication between the Rockwell controller and the GW EIP/MODBUS 1E/1DB9 and the GW EIP/MODBUS 1E/1DB9 and the RAD-900-IFS network will use an EDS file (implicit messaging).



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Requirements:

The following hardware and software is used in the development of this procedure

- Wireless Module – 2901540 - RAD-900-IFS (Quantity 3)
- Combination I/O modules – 2901533 – RAD-DAIO6-IFS (Quantity 2)
- Antenna - 2904801 - RAD-900-ANT-OMNI-2-2-RSMA (Quantity 3)
- Communication Gateway – 1062540 - GW EIP/MODBUS 1E/1DB9 (Quantity 1)
- Software
  - PSI CONF 2.74 or higher – available at www.phoenixcontact.com/catalog/2901540
  - Studio 5000

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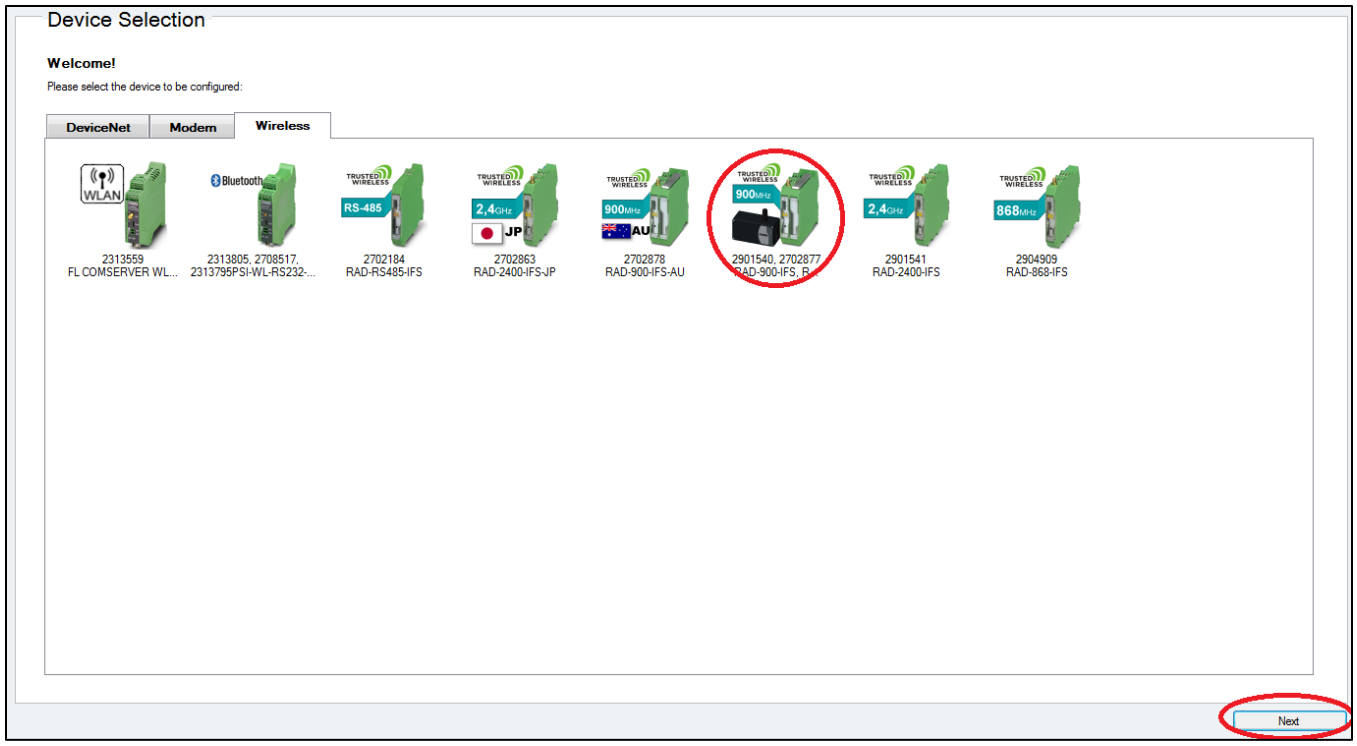
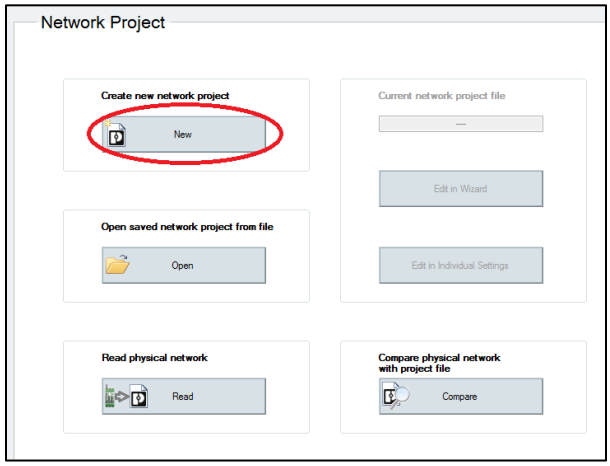
Procedure

Configuring the RAD-900-IFS wireless modules for PLC Mode communication

1. Set the yellow thumbwheels of the three RAD-900-IFS modules to 01, 02 and 03 and reference the data sheet for power connections. Set the white thumbwheels of the RAD-DAIO6-IFS modules to 01 and 02. Connect the RAD-DAIO6-IFS modules to the RAD-900-IFS modules via the TBUS connectors supplied in the box. The RAD-DAIO6-IFS module with thumbwheel setting 01 should be connected to RAD-900-IFS module with yellow thumbwheel setting 02. The RAD-DAIO6-IFS module with thumbwheel setting 02 should be connected to RAD-900-IFS module with yellow thumbwheel setting 03. Apply power to all three wireless modules.
2. Open PSI-CONF 2.60 and select the 900 MHz selection under the Wireless tab. Click ‘Next’



3. Click on ‘New’



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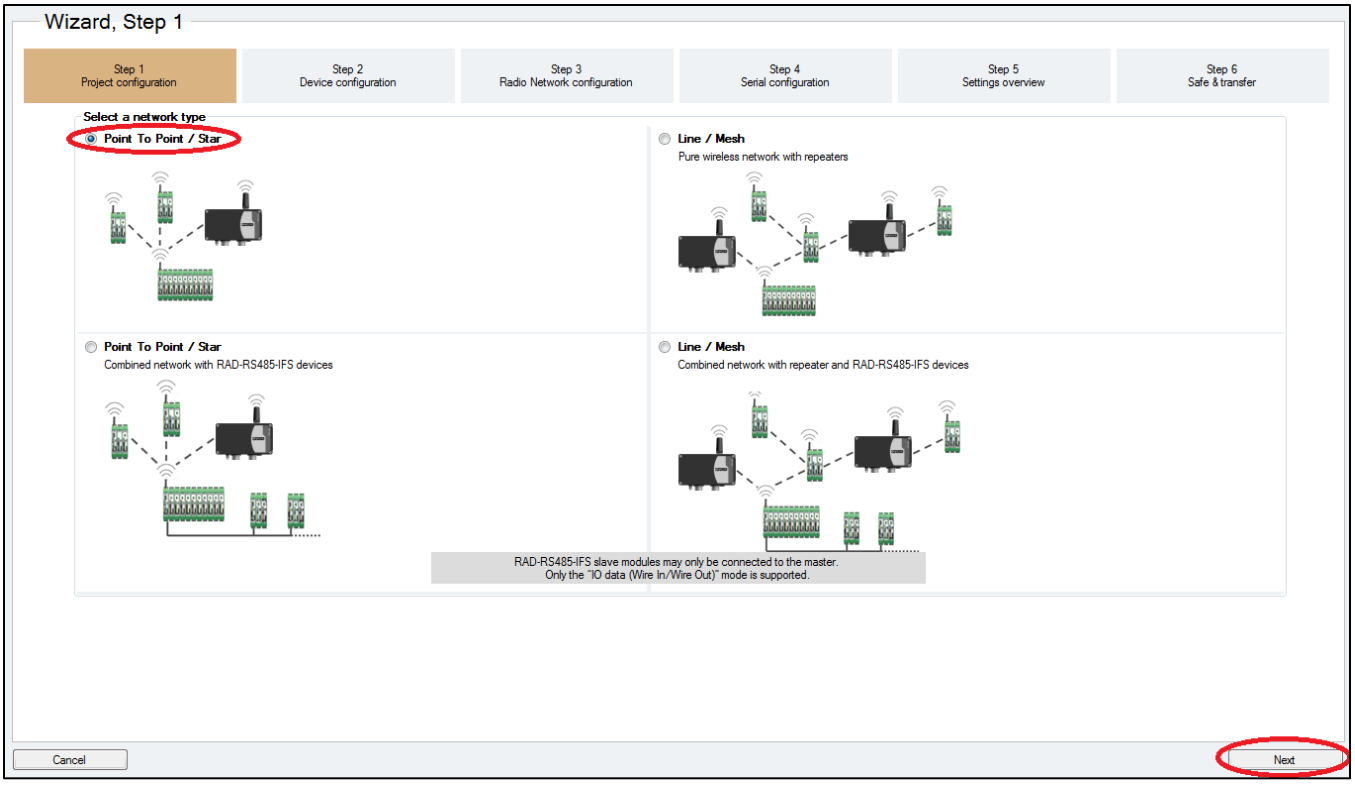
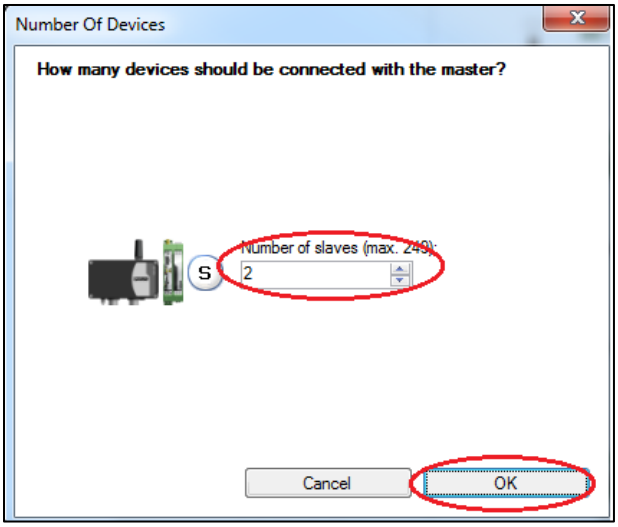
4. Select ‘Point To Point / Star’ and click ‘Next’



5. Set the number of slaves to ‘2’ and click “OK’.



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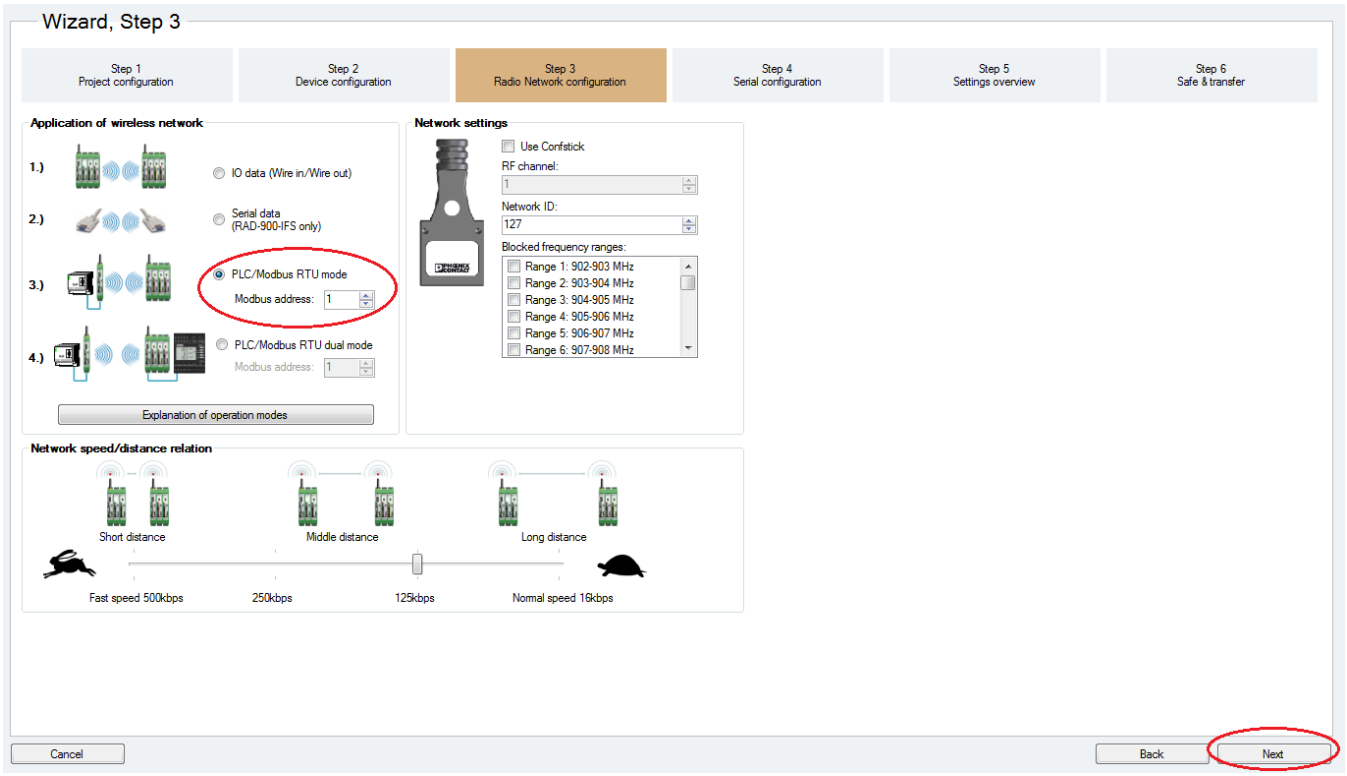
6. On Wizard, Step 2, confirm information is correct and click ‘Next’.
7. On ‘Wizard, Step 3’, select ‘PLC/Modbus RTU mode’ in the ‘Application of wireless network section’. Leave the Modbus address at 1. In PLC mode, the Modbus address will function as a single Modbus ID for the entire wireless network. For a simple bench test the rest of the settings can be left unchanged, but depending on the environment that the system will be installed in the “Network Settings’ and ‘Network speed/distance relation’ settings may need to be adjusted. Click ‘Next’



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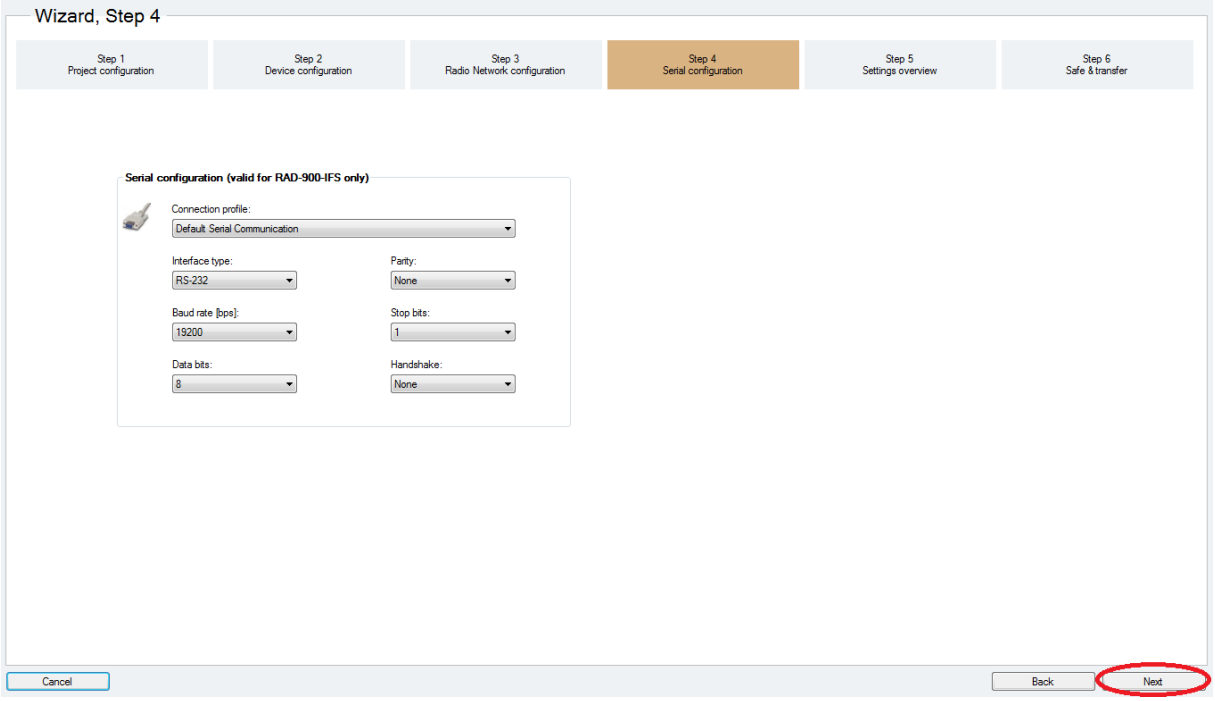
8. On ‘Wizard, Step 4’, leave the settings at default and click ‘Next’.



9. On ‘Wizard, Step 5’, review the data and click ‘Next’

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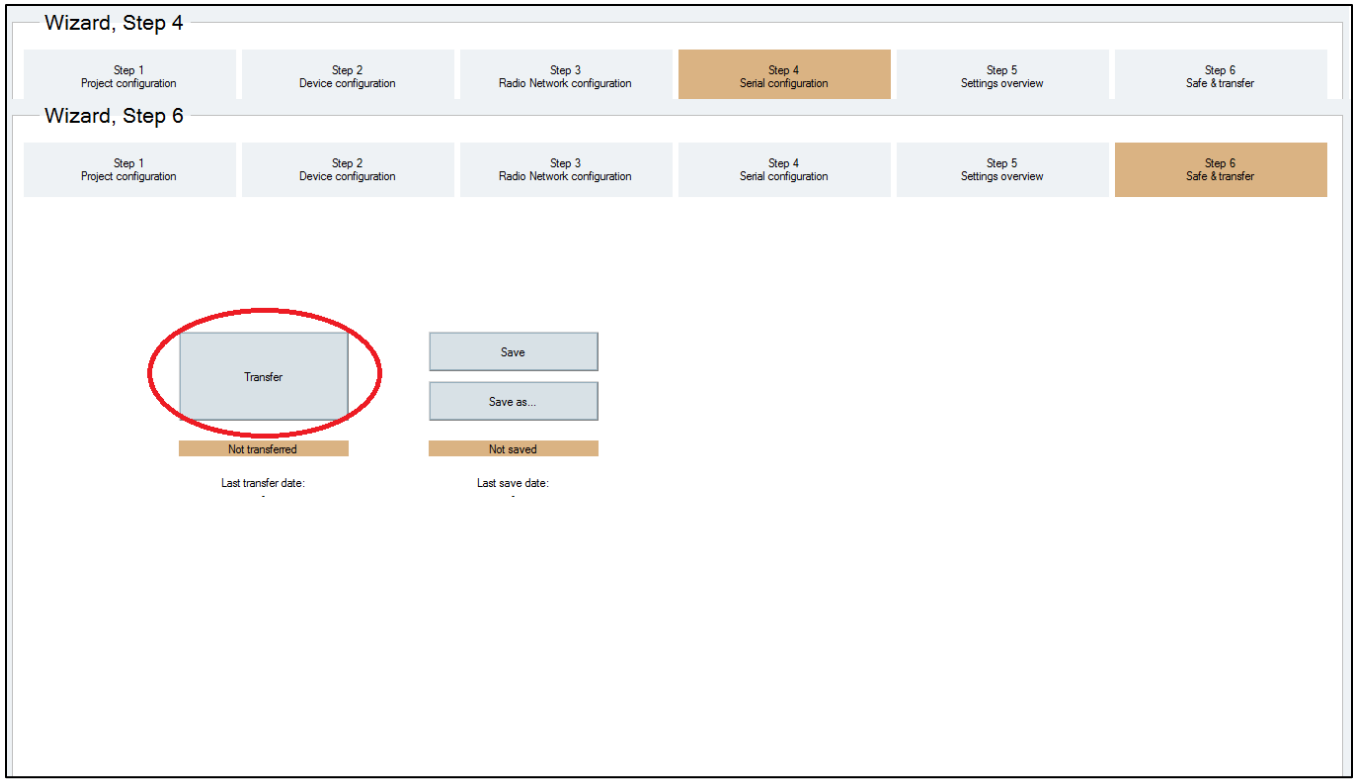
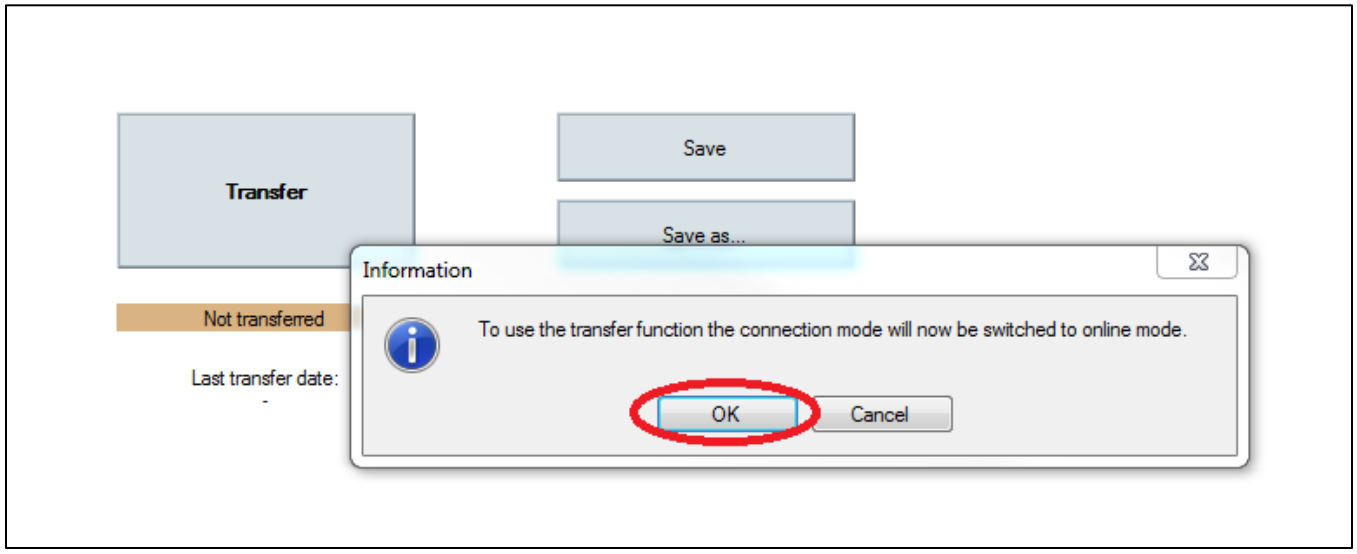
10. On ‘Wizard, Step 6’, make sure your programming cable is connected from your computer to the wireless module with Yellow thumb wheel setting '01’. Click ‘Transfer’ to send the configuration to the wireless modules. You will be prompted to save your configuration. Choose a file location to save your program.



11. When prompted, click ‘OK’ to go online to the wireless module



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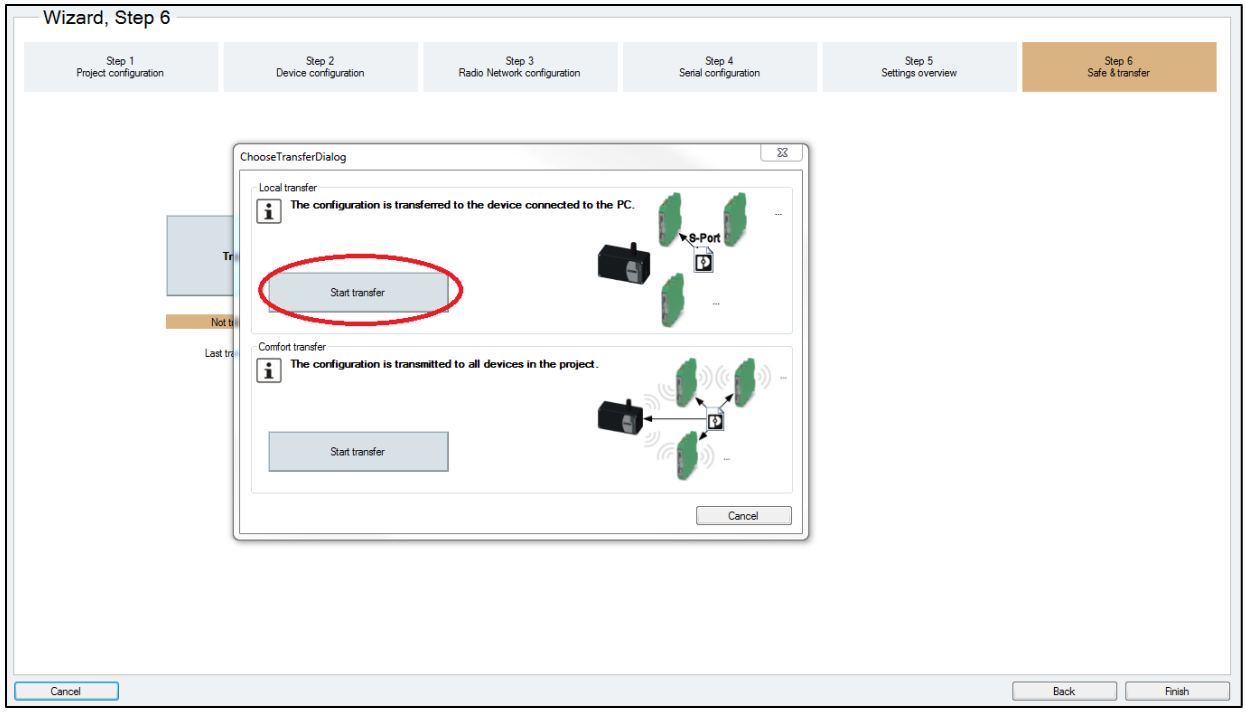
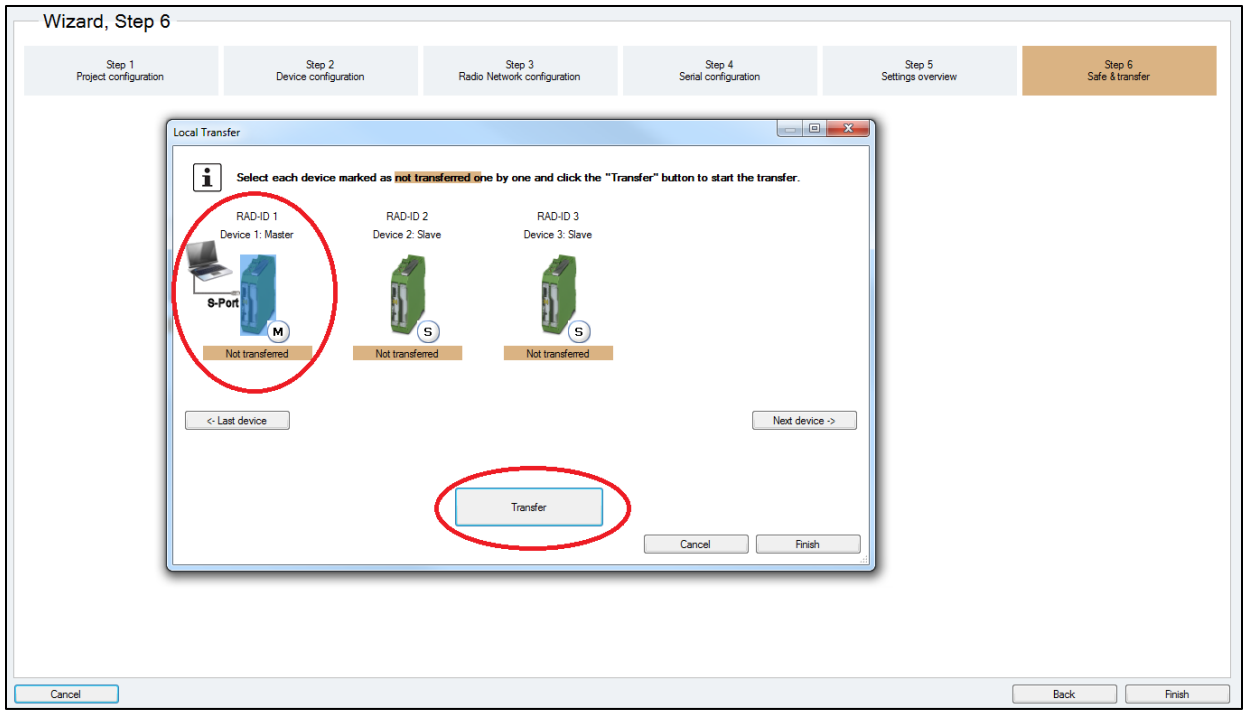
12. Click on ‘Start Transfer’ under ‘Local Transfer’ to send the configuration to each device. Once you transfer the configuration to one wireless module, move your programming cable to the next wireless module. The Transfer Window will show you which module you are connected to and which modules have had the configuration transferred.





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13. Once you have sent the configuration to each wireless module, the wireless network configuration is complete. The RF Link LEDs on the wireless modules should illuminate. On the master wireless module (Yellow Thumbwheel on 01) should have one amber LED illuminated (assuming there is more than one slave wireless module in the network) and depending on the antennae on the slave wireless modules, there should be an amber and module green LEDs illuminated. Red ERR LEDs will be flashing at this point since there is no Modbus communication.

The wireless network configuration is complete and is set up for PLC Mode communication.

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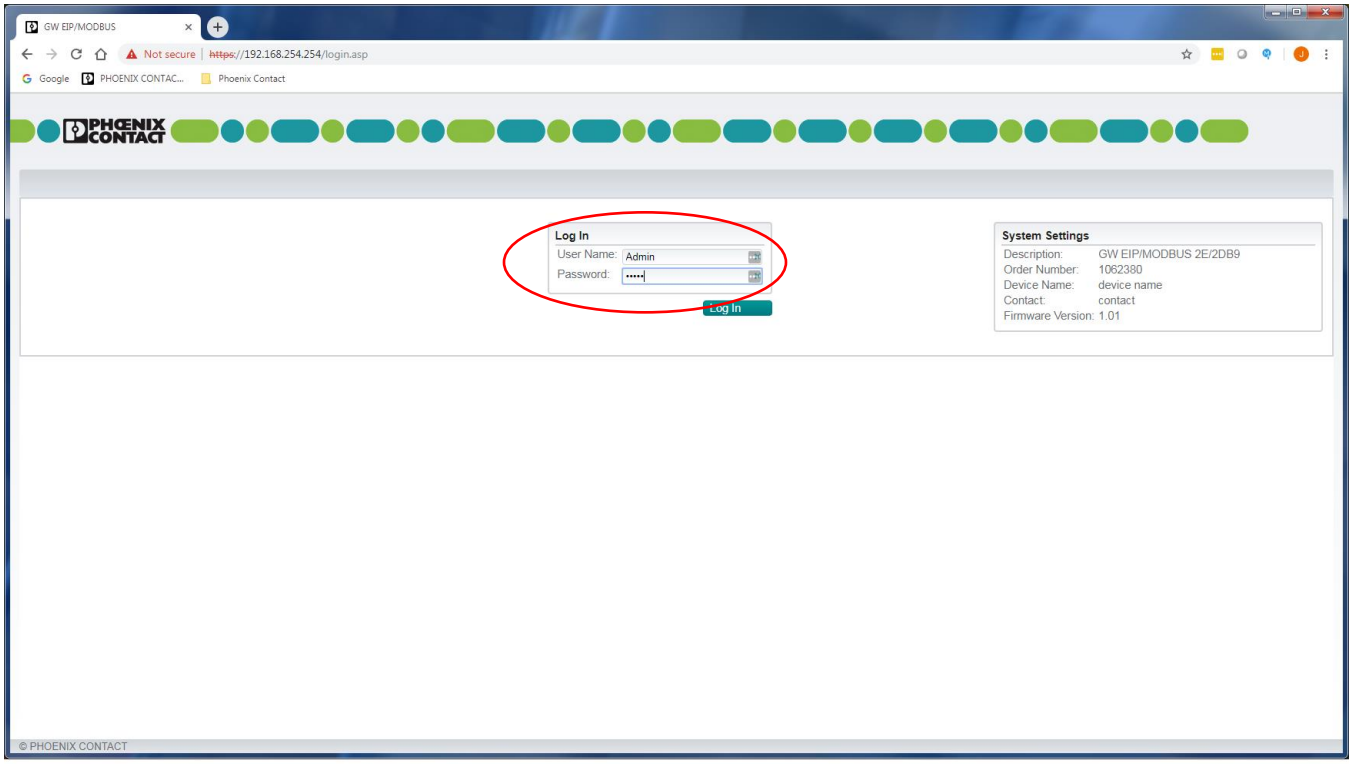
Configuring the GW EIP/MODBUS 1E/1DB9 module for Modbus RTU to EtherNet/IP communication using the EDS file (implicit messaging).

1. The GW EIP/MODBUS 1E/1DB9 comes with a default IP address of 192.168.254.254. Set your computer's IP address in the same network as the GW EIP/MODBUS 1E/1DB9 (192.168.254.XXX). Reference the data sheet for power connections and apply power to the GW EIP/MODBUS 1E/1DB9.
2. Log into the GW EIP/MODBUS 1E/1DB9 by browsing to the default IP address of 192.168.254.254 (accept any warnings that may pop up in your browser) and using the default User Name and Password
    a. User Name: Admin
    b. Password: admin



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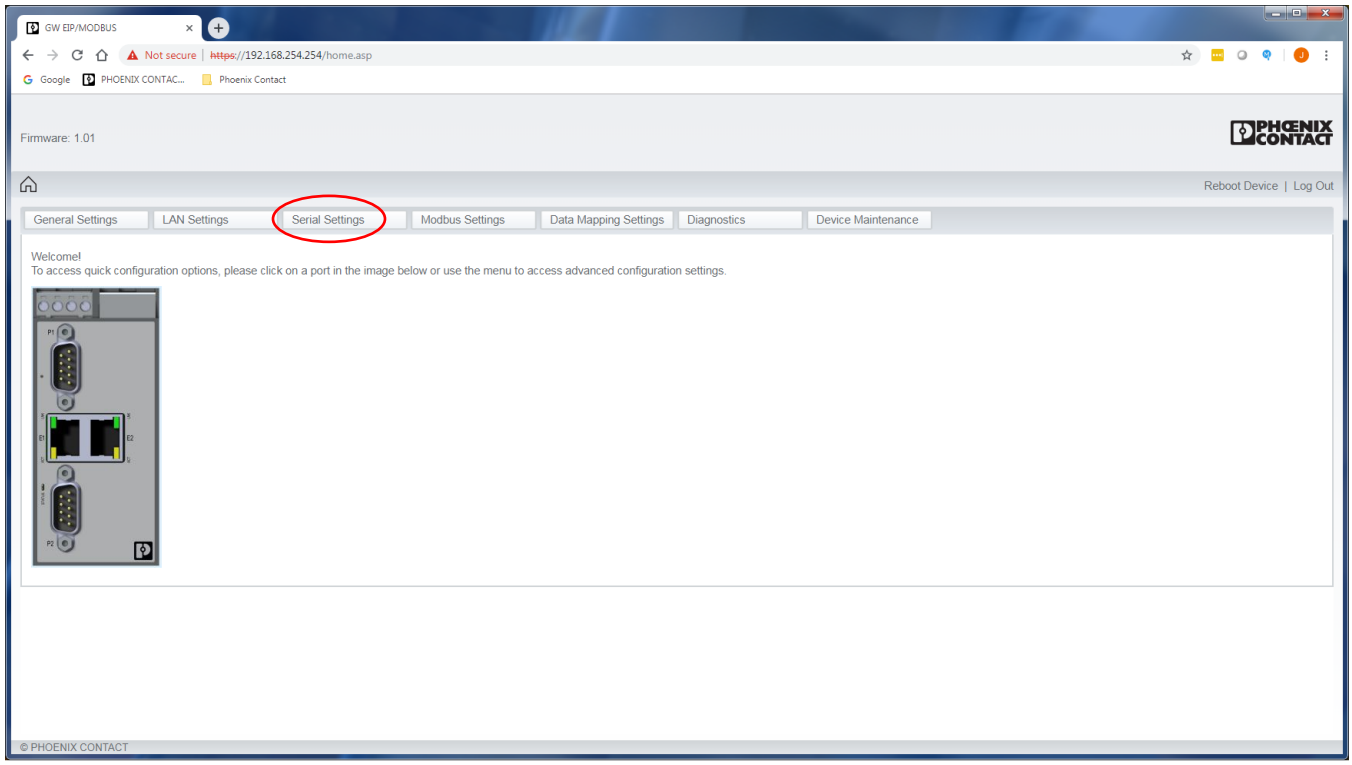
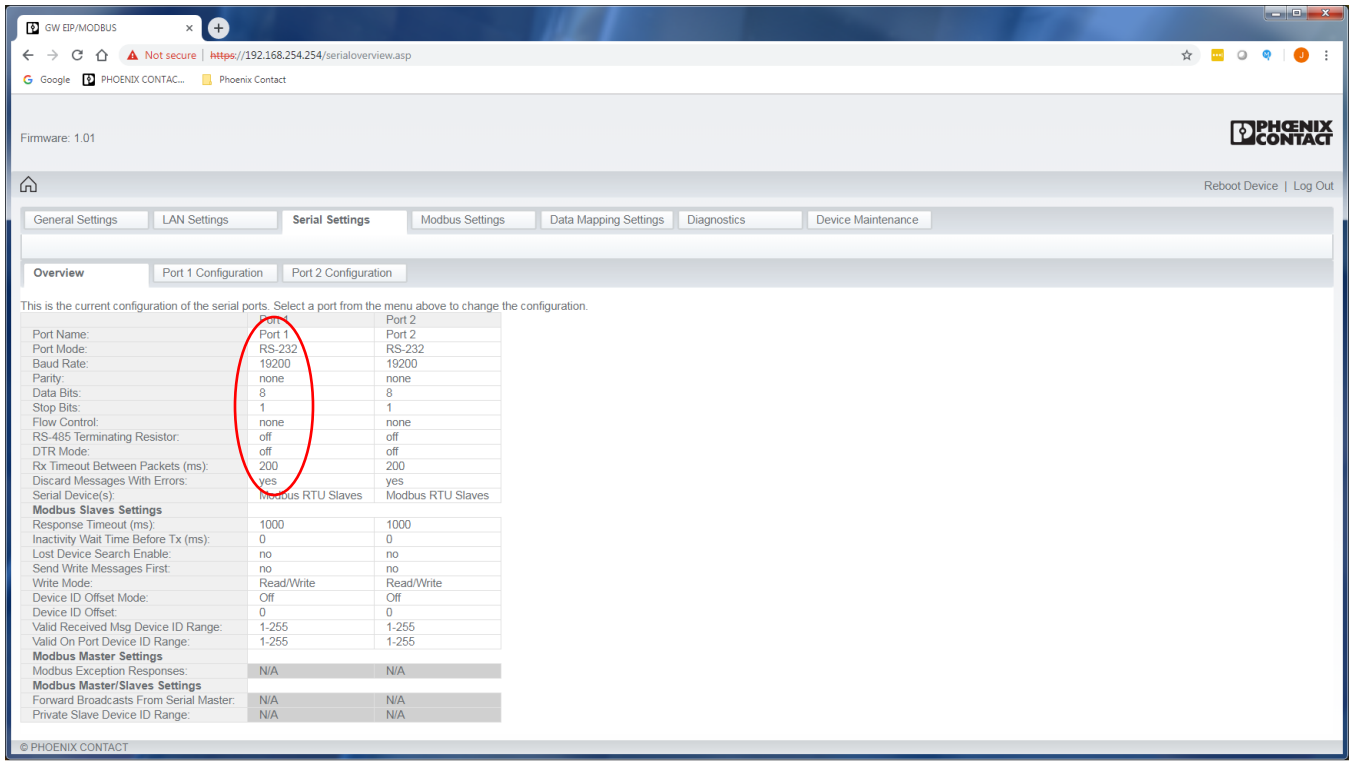
3. Verify the serial port settings of the gateway match the serial port settings of the master Radioline unit (the default serial settings of the gateway should match the Radioline settings, but double check to make sure.) Click on the ‘Serial Settings’ tab. The next screen will show you the settings, verify Port 1 is set to RS-232, 19200, 8, none, 1





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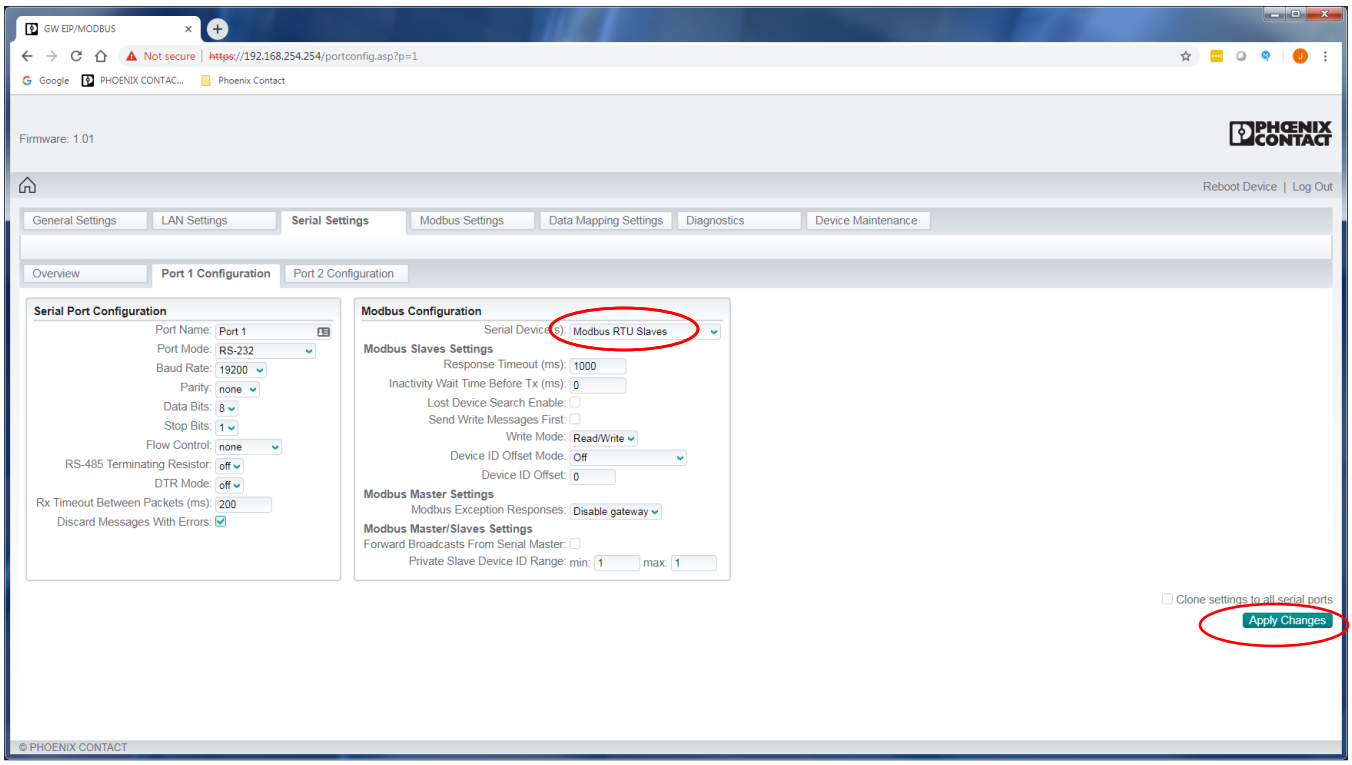
4. Click on the ‘Port 1 Configuration’ tab and set the ‘Serial Device(s)’ drop down to ‘Modbus RTU Slaves’. This tells the gateway it will be talking to a Modbus slave device. Click ‘Apply Changes’.



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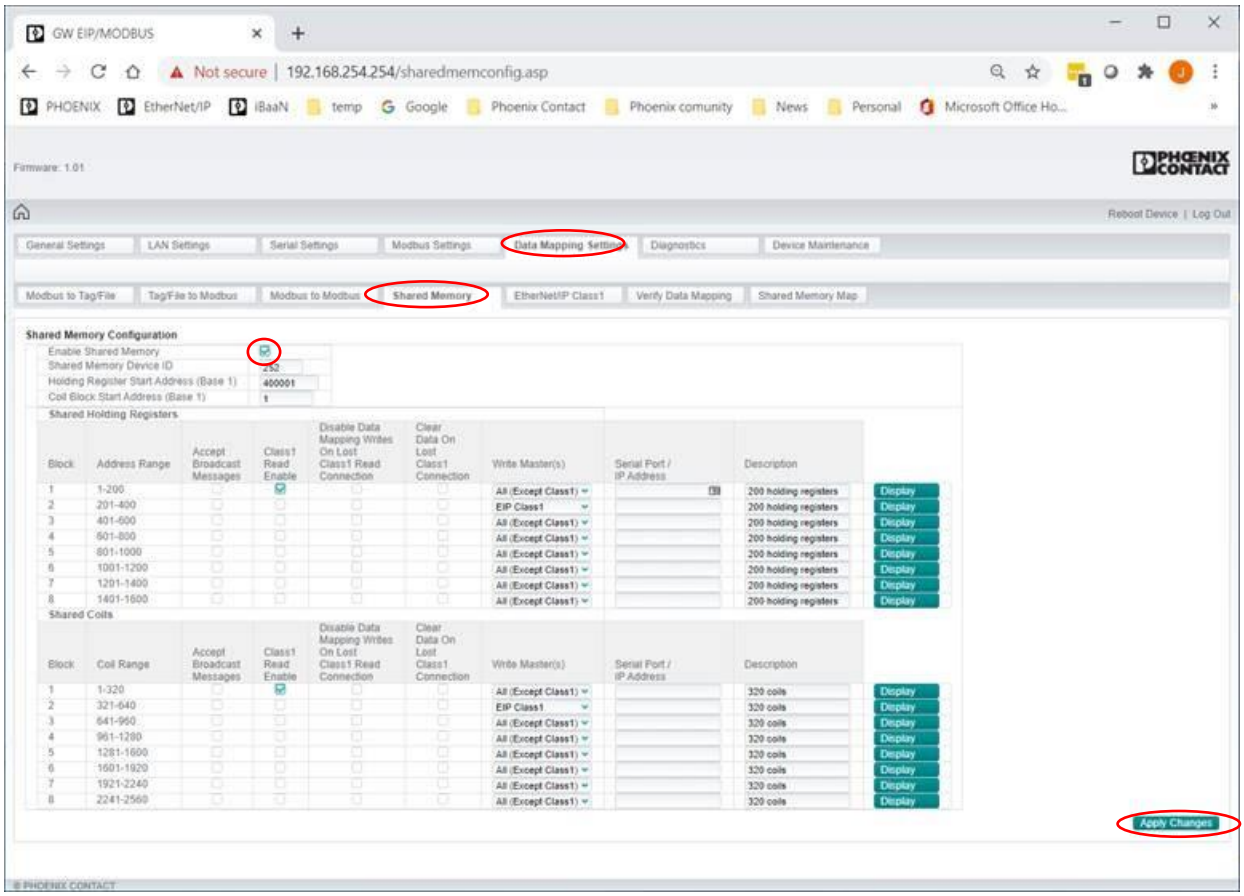
5. Click on the ‘Data Mapping Settings’ tab and then the ‘Shared Memory’ tab. In this section we will enable shared memory. By default, this enables the 200 input and output registers of internal memory associated to ID 252. This data area can be directly accessed when using the EDS file for the gateway in RSlogix.



This shared memory ID will be referenced in the next step.

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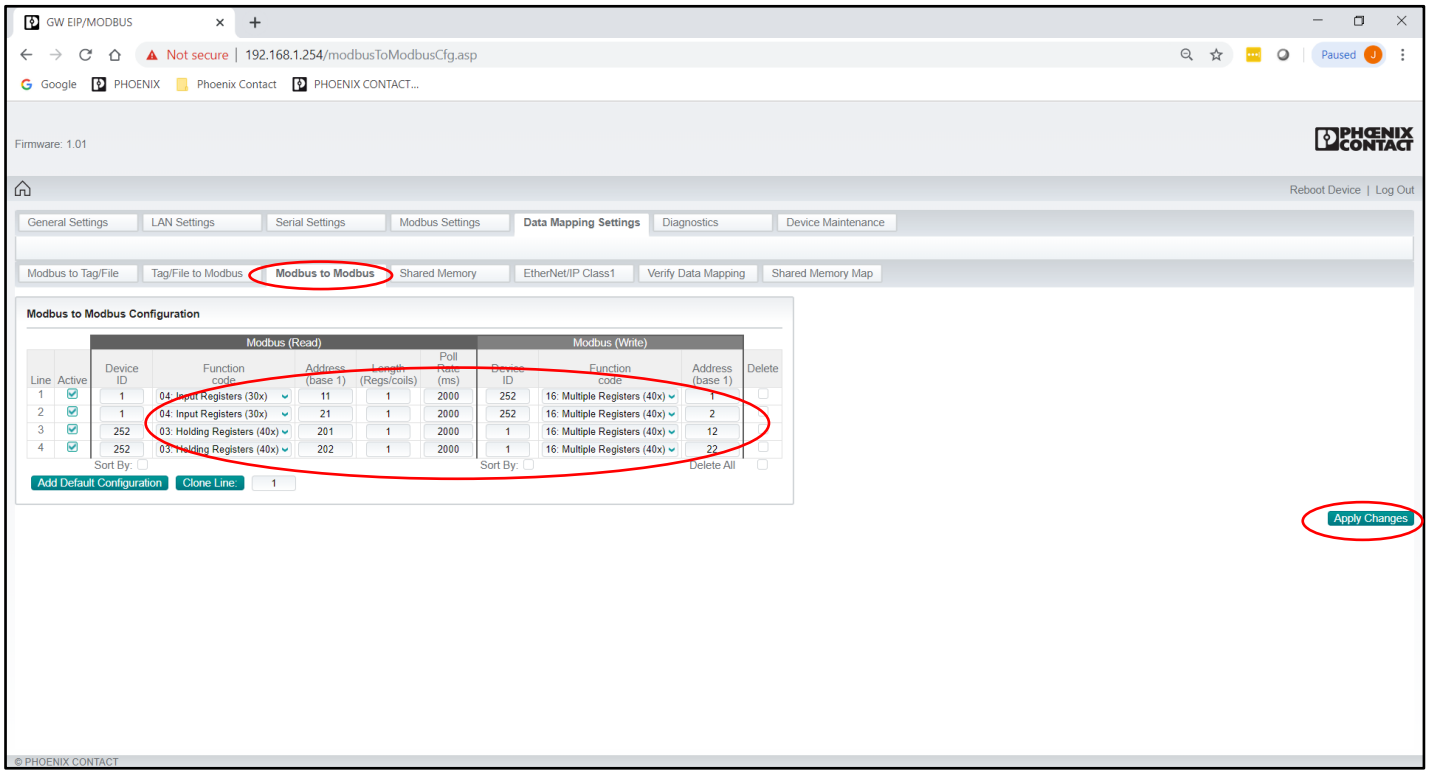
6. To move data in and out of the shared memory you need to use the Modbus to Modbus tab. The Modbus communication from the Radioline wireless network to the EtherNet/IP master (Modbus to EtherNet/IP). In the example below, we are reading from Modbus ID 1, the 30012 and 30022 registers and pointing them to the internal/shared memory of the gateway at ID 252 (from previous configuration step).

   .



First two are to shared memory, second to are from shared memory to Radioline network

Click ‘Apply Changes’ once you have entered all of the information

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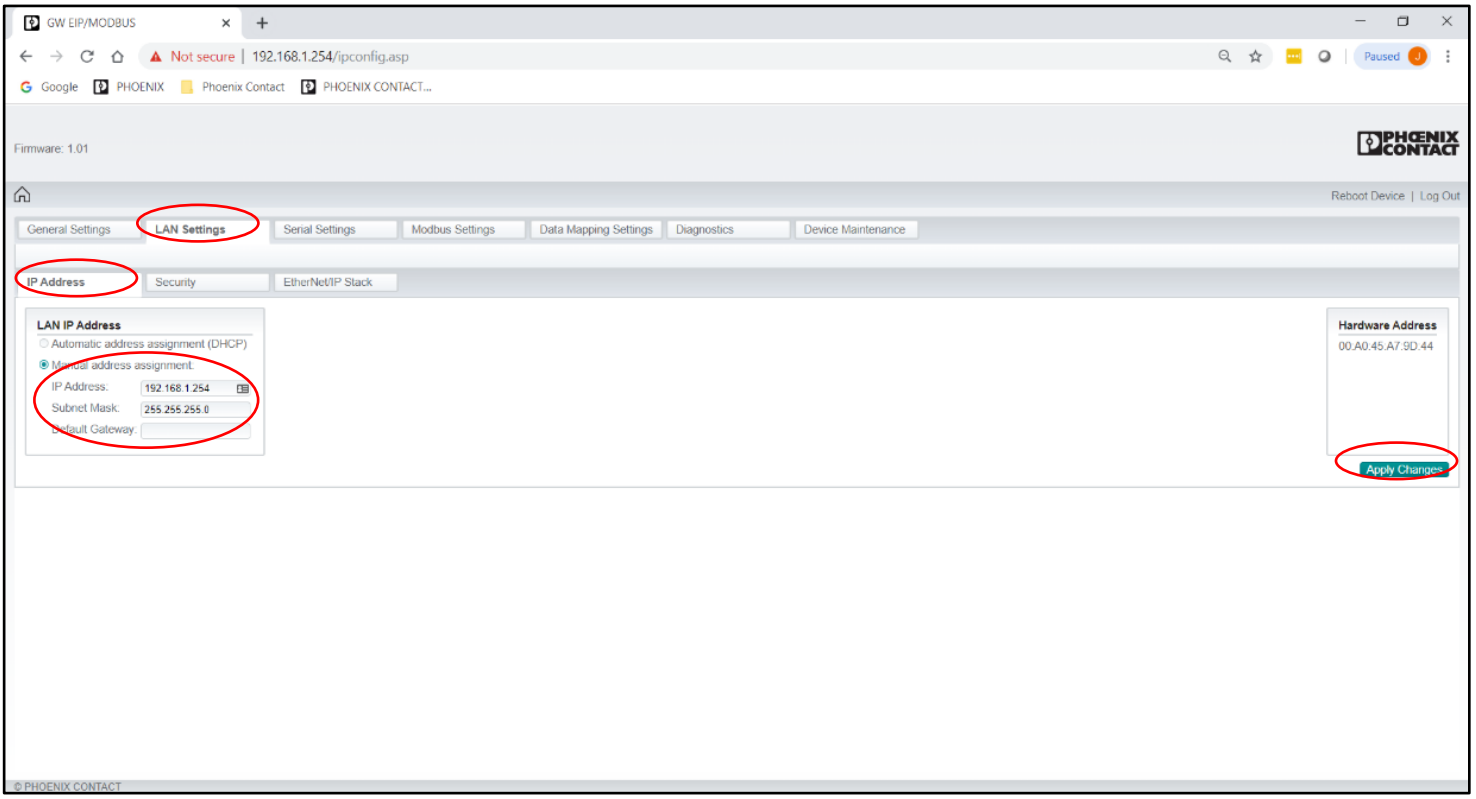
7. Change IP address by clicking the “LAN Settings’ tab and then the “IP Address’ tab. Change the IP address to 192.168.1.254 (for this guide’s purposes) and click ‘Apply Changes’.



The configuration for the GW EIP/MODBUS 1E/1DB9 is now complete.

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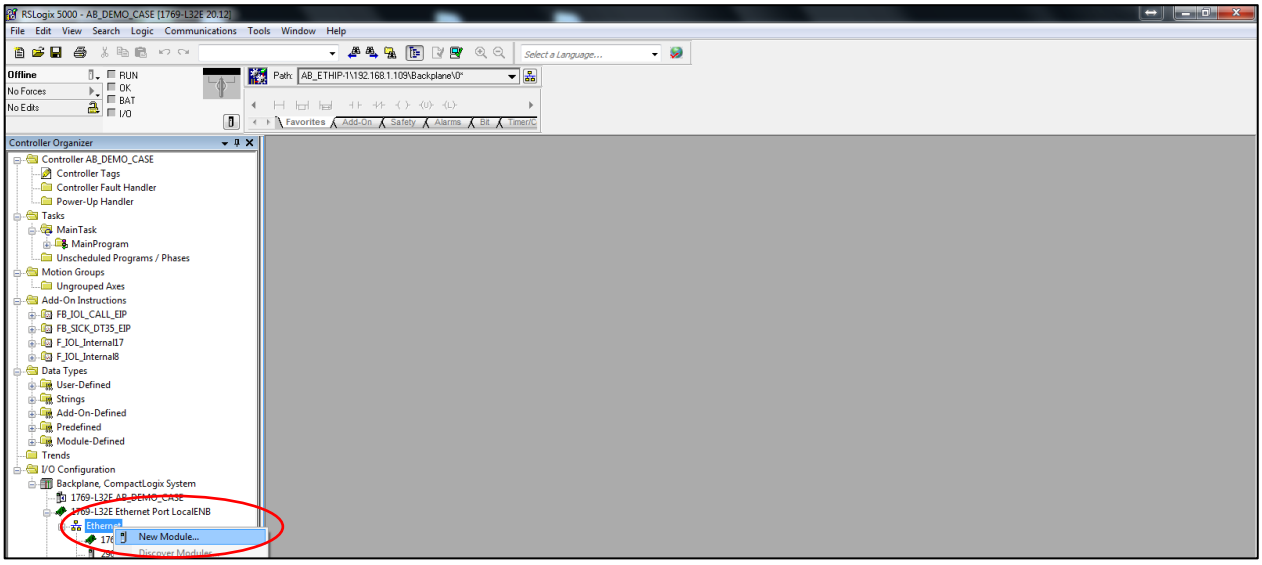
Configuring the Rockwell PLC

1. First download EDS file from Phoenix Contact website and install it into RSLOGIX using the EDS Hardware installation tool. The EDS file can be found on the downloads tab of the Gateway product page

Device Description

	Description	Language	Revision
☐	[zip, 12 KB] **Device Description** EDS file for project planning EDS_GW-EIP-MODBUS_1_02_20190805.zip	International	1.02

2. In the RSlogix project you will need add the gateway into your I/O Configuration. You can do this by right clicking on “Ethernet” and selecting New Module.



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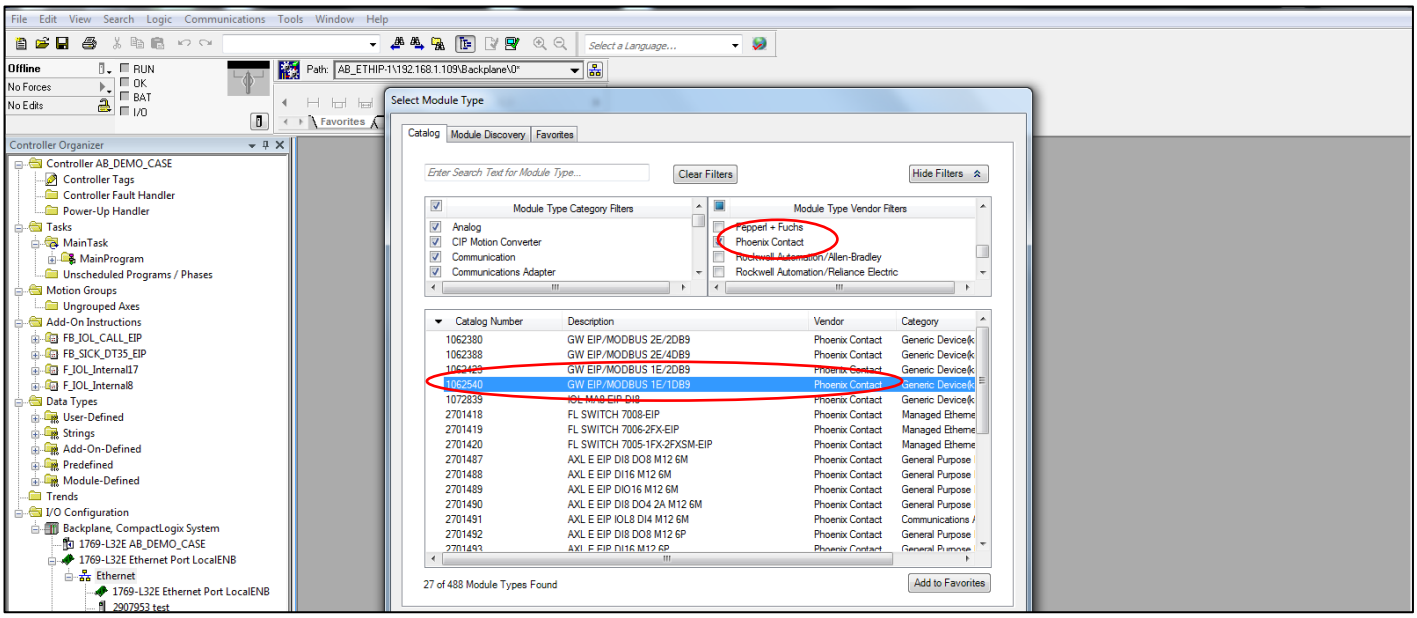
3. In the “Select Module Type” window you will want to filer to show only Phoenix Contact devices and select “GW EIP/MODBUS 1E/1DB9”



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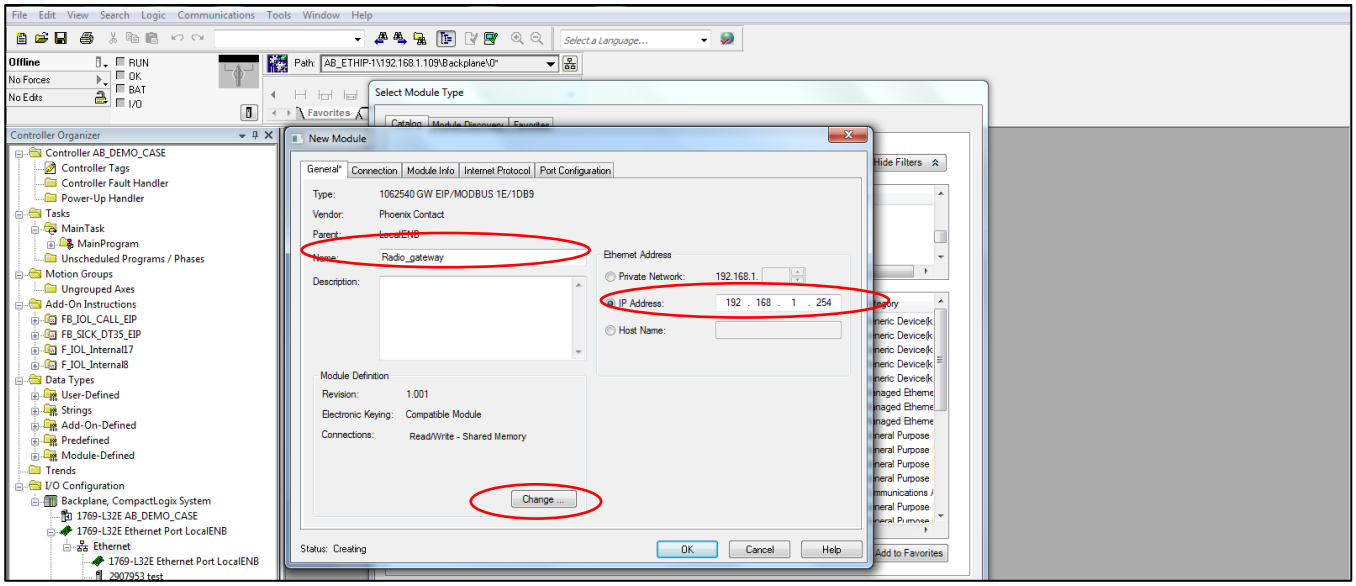
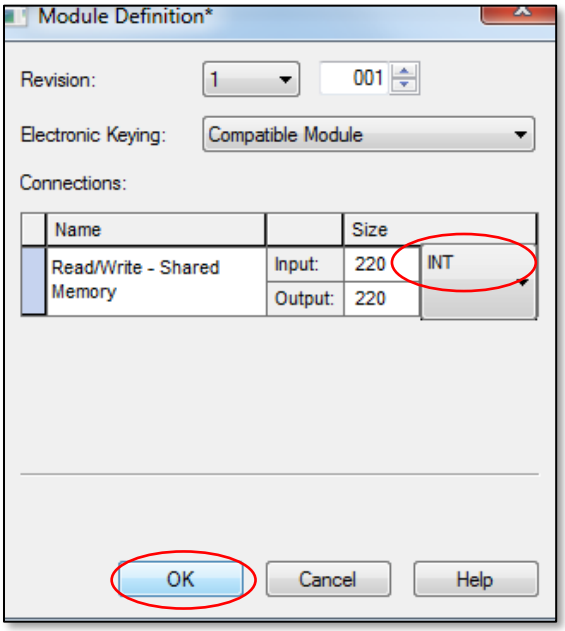
4. In the New Module window you will need to enter a name for you gateway and the IP address that you assigned to the gateway (IE 192.168.1.254 in this guide). Once those settings are made, click the ‘Change’ button



5. After clicking change button, the following screen will pop up. Change the definition the default SINT format to INT to better match the word-based Modbus formatting. Click ‘Okay’ on this screen and then ‘Okay’ on the New module screen.



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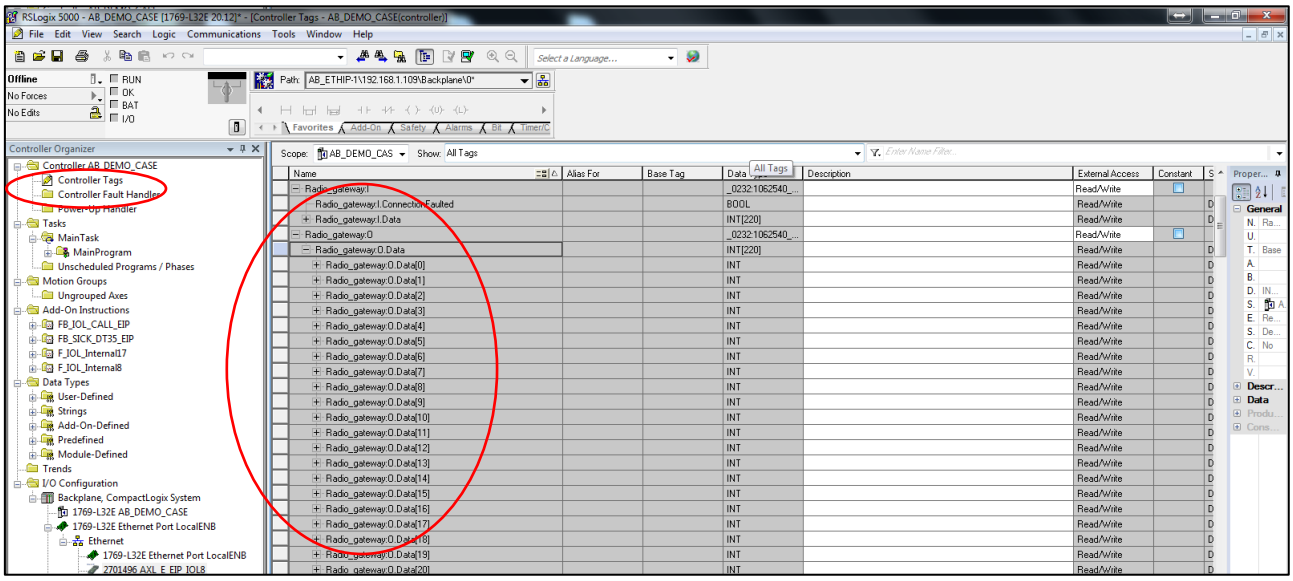
6. Now you are finished and can access the 220 words of Input and output data you activated in the shared memory of the gateway.



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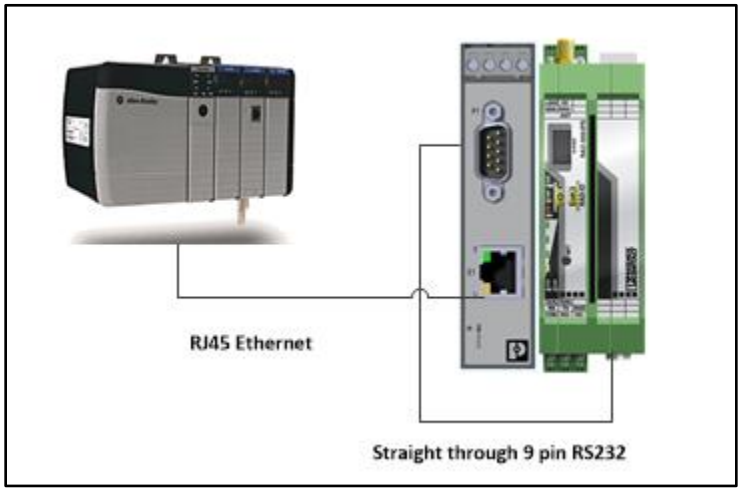
Making the physical connections

In this setup, there are three stations, the master station, slave station 1 and save station 2. Connect an antenna to each wireless module and make the physical connections for the data cables and I/O modules for each station shown below.

Host Station

1. Connect a RJ45 cable from the PLC to the GW EIP/MODBUS 1E/1DB9 with IP address 192.168.254.254.
2. Connect a Straight through RS232 cable from GW EIP/MODBUS 1E/1DB9 to RAD-900-IFS with yellow thumbwheel of '01'.



Remote Station 1

1. Verify the RAD-DAIO6-IFS module with thumbwheel setting 01 is connected to RAD-900-IFS module with yellow thumbwheel setting 02.

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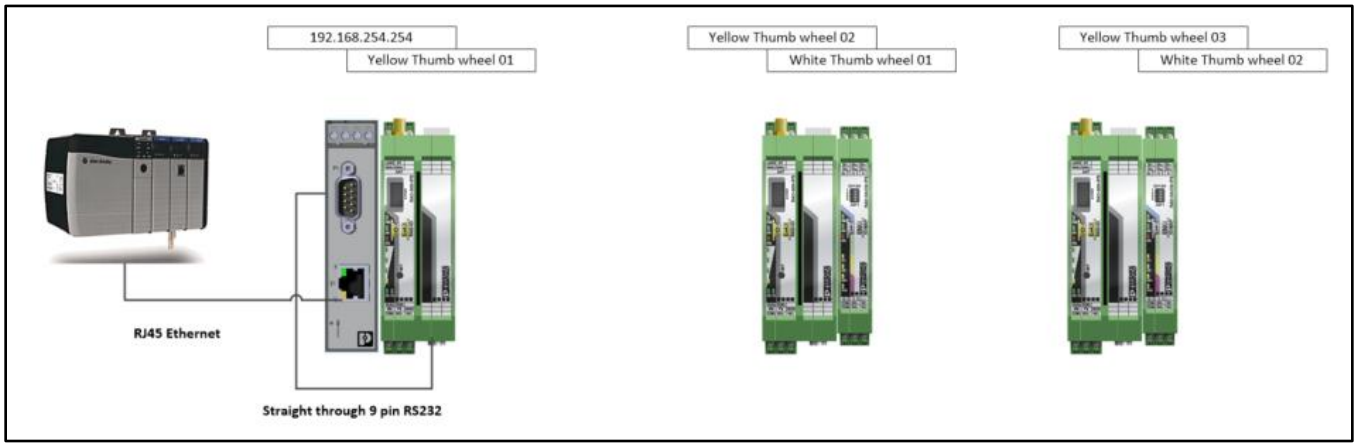
Remote Station 2

1. Verify the RAD-DAIO6-IFS module with thumbwheel setting 02 is connected to RAD-900-IFS module with yellow thumbwheel setting 03.

Your setup is complete, and you are ready to verify communication. Your network layout should match the drawing below.



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Disclaimers and notes

1. The purpose of this document is to provide basic configuration settings to show communication. Each application has different requirements and those need to be discussed before implementing any solution.
2. The setup described in this document uses a default PLC configuration. The PLC configuration will be different from application to application.
3. This setup was a point to multi-point setup in a bench test environment. The addition of repeaters and RF interference can cause added latency and should be expected. If there are concerns about these items a temporary installation should be tested.
4. The installation of these components in a real application is at the discretion of the user.ok

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