

## **Hooking up 3 Zink Serial Modems (ZP24D-192RM-MR) with 3 IDEC Plc's (FC5A-D16RK1) via a 485 port (FC4A-HPC3)**

### Parts

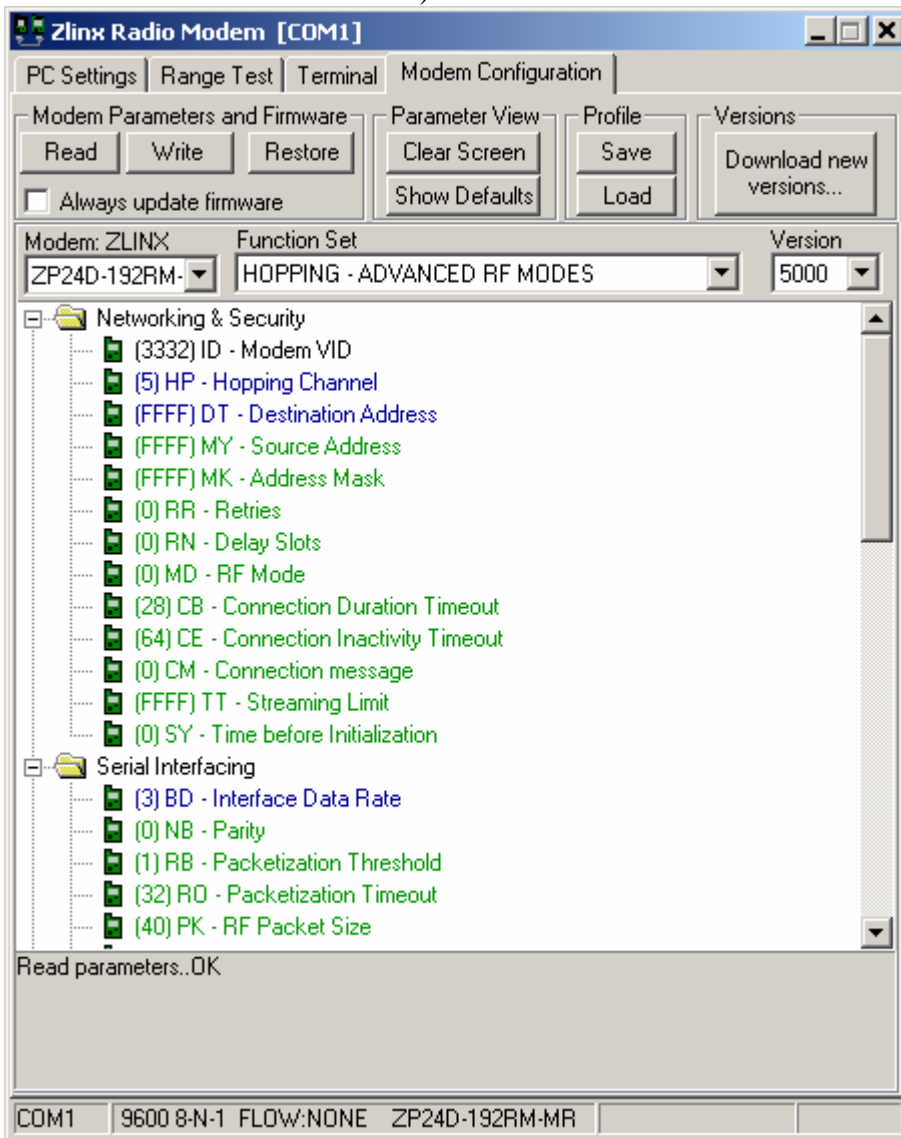
- 3—ZP24D-192RM-MR
- 2—DR-45-24
- 3—FC5A-D16RK1
- 3—FC4A-HPC3
- 2—SPDT Toggle switches, we do not carry these
- 2—781XAXML-24D
- 2— 70-781D-1
- 1—FC4A-KC4CA

### **Configure the ZP24 radios**

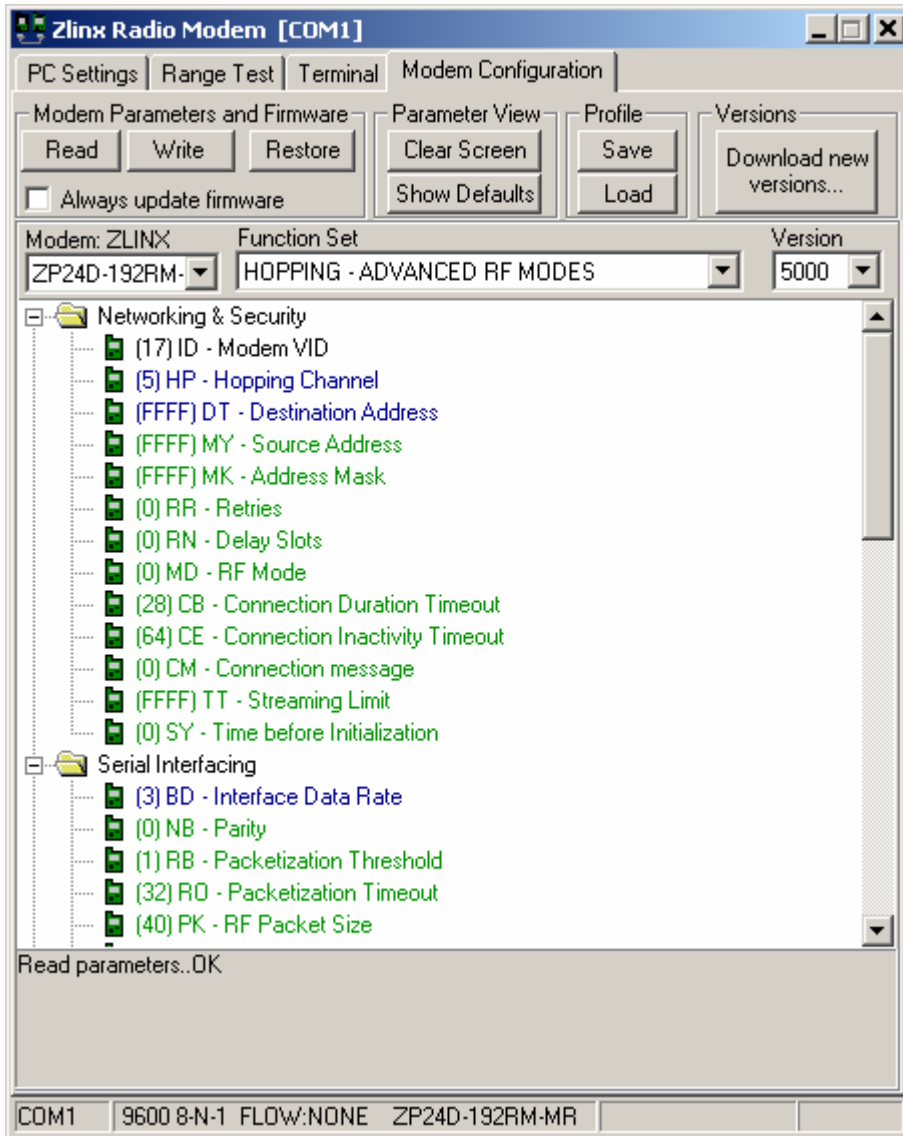
1. Change the switches on all 3 radio modems for 485 2-wire  
Note: Pop off black cover on serial radio modem with a screw driver. Switch settings are 1-On 2- On 3- Off 4- On (On is up Off is down) put cover back on.
2. Do a test/query of the ZP radio with software settings: 19200-8-none-1 for com port, Click OK
3. Go to Modem Configuration tab do a Read
4. Change function set to Hopping—Advanced RF Modes
5. We are going to set 4 fields
  - a. Hopping Channel = 5
  - b. Destination Address = FFFF
  - c. Interface Data Rate = 9600
  - d. Parity = 1-8-NNote: Hopping Channel can only be 0-6 (the I/O modem is 0-9 but the serial modem is only 0-6), we are using 5 for this setup. FFFF is sets the modem to broadcast. We are going to be speaking Modbus RTU so I am using 9600 8, none, 1 for the baud rate.
6. Do a Write
7. An Error comes up



8. Click OK
9. Go to PC Settings tab and change Baud to 9600, 8, none, 1
10. Click on Modem Configuration tab.
11. Do a Read—Your screen should look like this: (Make sure Hopping – Advanced RF Modes is in Function Set)



12. You now need to assign a Modem VID
13. Click on Terminal tab
14. Type +++ (You will see an OK)
15. Type ATID## **\*\*Note: ## = Hex character of radio ID.**  
We will use 17 for this setup so type ATID17, hit enter, you will see an OK
16. Type ATWR (This writes it to the radio modem—you will see an OK)
17. Go to the Modem Configuration tab and do a Read screen should look like below:



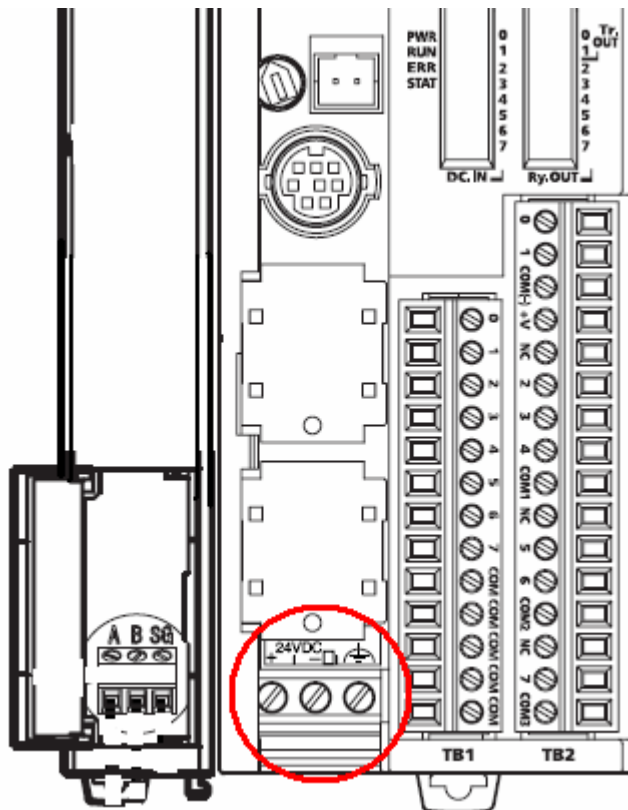
18. Repeat step 1-17 for all 3 serial radio Modems

## **Test Serial Radio modems to make sure they are communicating**


1. Hook up to the 232 port on one of the radios to a com port on a PC and power up the radio.
2. Jump 2 and 3 on the 232 ports of the 2 other radios, but only power on one of these radios.
3. Open HyperTerminal on your computer or use Range test tab on Zlinx software.
4. Set baud rate to 9600 8 none 1
5. Do a loop back to test verify connection
6. Power up the other radio and power down the other one and repeat loopback test.

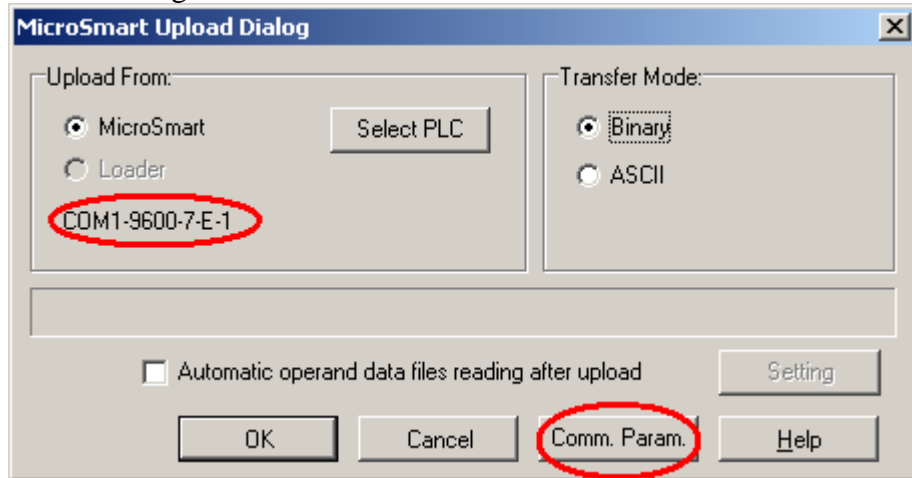
## Set up the 3 PLC's (FC5A-D16RS1)

1. Use a screw driver to remove the Grey tab on the side of the PLC's
2. Snap 485 expansion's (FC4A-HPC3) to side of PLC's
3. Place removable terminal block on all PLC's
4. Power up one of the PLC's

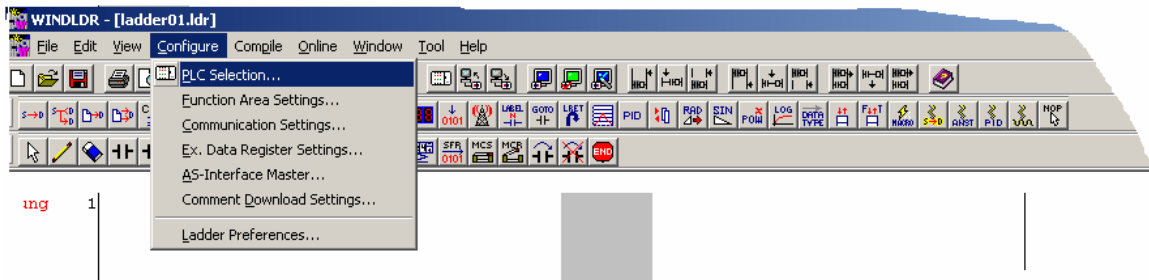


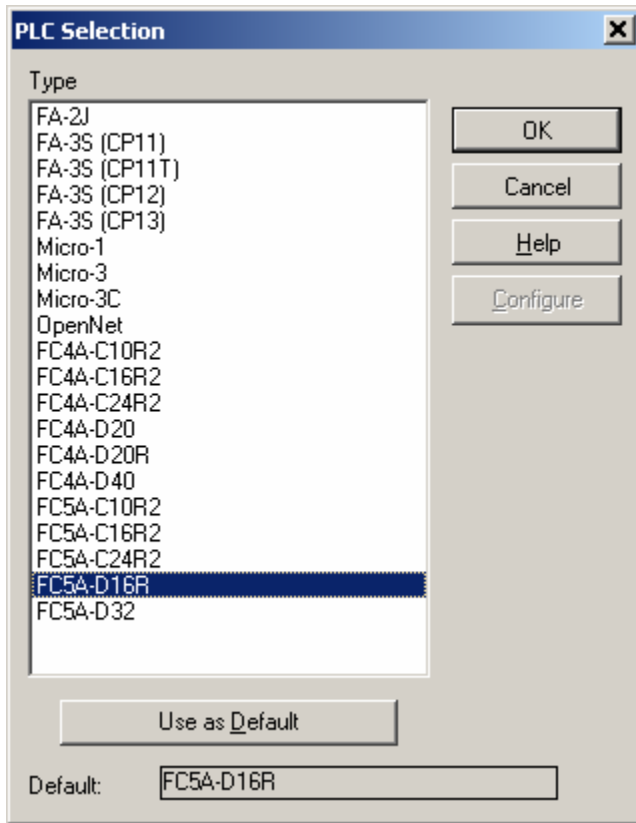
## Set up the Master PLC

1. Connect Configuration cable from PC to PLC. Make sure switch on configuration cable is set to A.
2. Open WindLDR software click Upload Icon 
3. Make sure the Com 1 settings are 9600 7, E, 1 If not click on the Comm Param. and change it.



4. Click OK
5. Click Configure—PLC Selection and choose FC5A-D16R

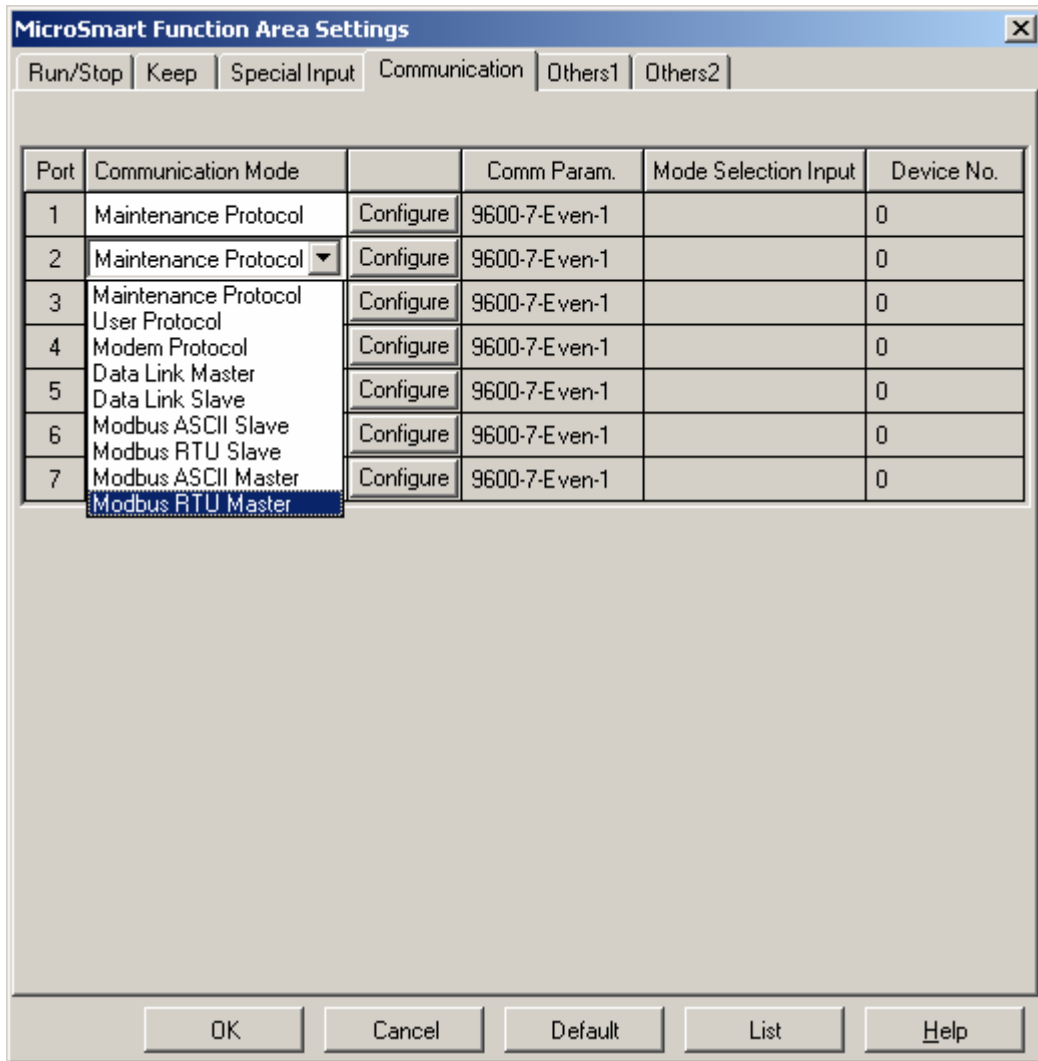




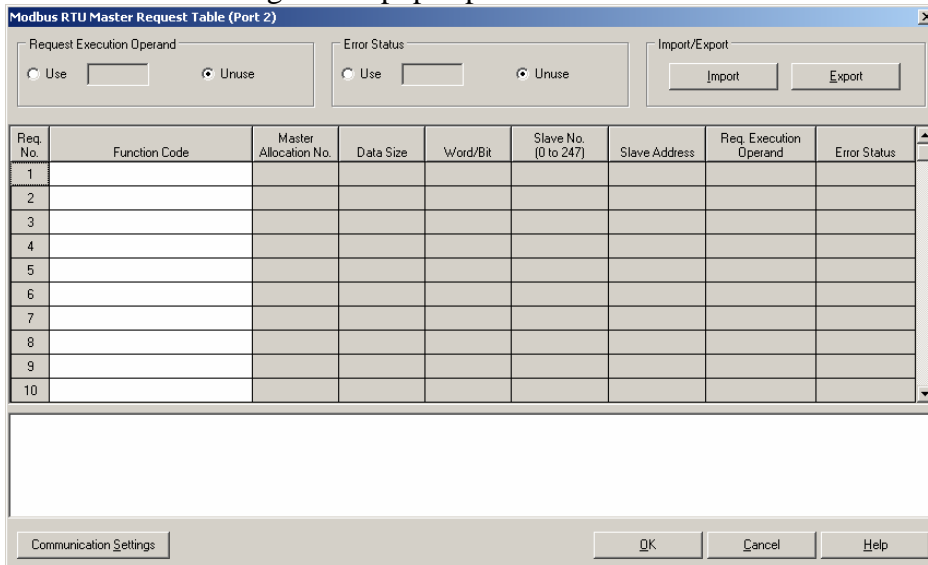
6. Click Use as Default
7. Click OK
8. Click Configure—Function Area Settings and click on Communication tab.



9. Click under Port 2 in the Communication Mode column and select Modbus RTU master.



10. The following screen pops up.



11. Set as shown below.

Req. No.	Function Code	Master Allocation No.	Data Size	Word/Bit	Slave No. (0 to 247)	Slave Address	Req. Execution Operand	Error Status
1	15 Force Multiple Coils	M0000	8	Bit	1	000001	M0100	
2	15 Force Multiple Coils	M0020	8	Bit	2	000001	M0101	
3								
4								
5								
6								
7								
8								
9								
10								

Communication Settings

OK Cancel Help

12. Click on Communication Settings and set as shown on next page:

Communication Settings

Baud Rate (bps): 9600

Parity: None

Stop Bit: 1

Retry Cycle: 1

Receive Timeout (10ms): 50

OK Cancel Help

13. Click OK

14. Click OK again

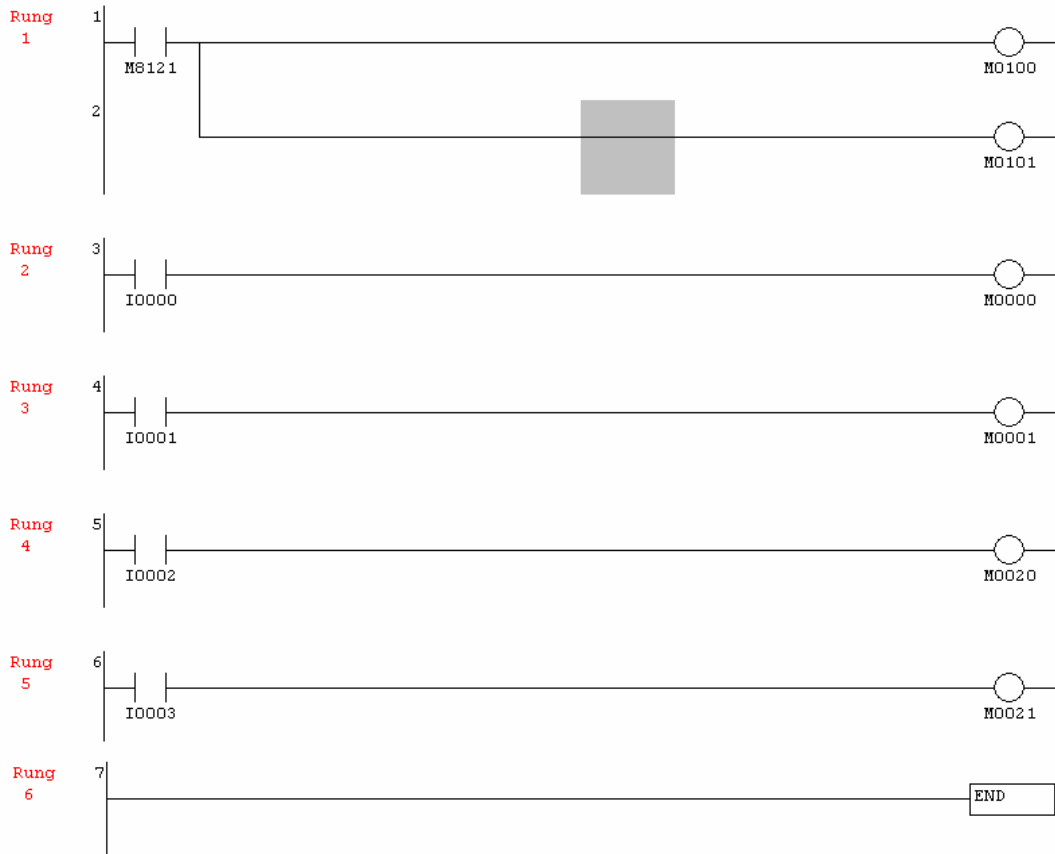
15. Click OK again

16. Here is the ladder logic program you enter into the Master PLC.

```
The Modbus RTU Master polls
3 Modbus RTU Slaves every second.

Modbus Master
I0 turns ON the first output in Slave1
I1 turns ON the second output in Slave1

I2 turns ON the first output in Slave2
I3 turns ON the second output in Slave2
```



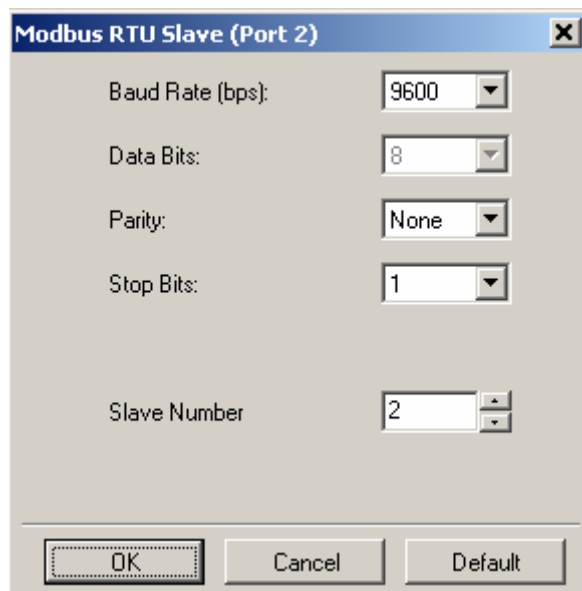
17. Click the download Icon 


Note: There are 2 baud rate settings,

- a. One is for the Configuration port that goes from the serial port on the PC to the 232 programming port on the PLC. This is used to upload and download ladder logic programs. They refer to it as the Communication Settings in the WindLDR software. The default is 9600, 7, even,
- b. The other is for the 485 port on the PLC which is speaking Modbus RTU, when you chose Modbus RTU master for Port 2 the baud rate is now set to 9600, 8, none, 1 for port 2. This is the baud rate you would set your Modbus software on your PC to in order to communicate to the radios. This can be changed but you have to make sure you change the baud rate on the Wireless Serial radio modems (ZP24D-192RM-MR) match.

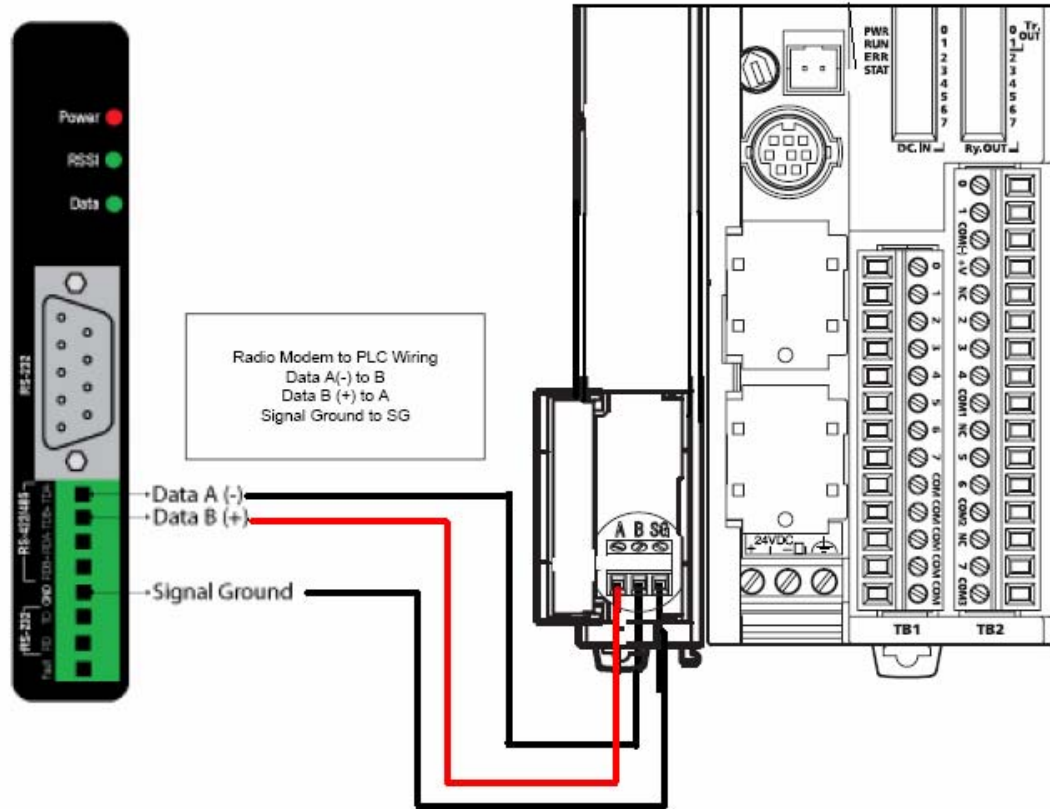
## Set up the 2 slave PLC's

1. The slave PLC's do not need a ladder logic program written to them for this particular application we are using. Ladder logic program can be added to allow the slave to do additional features such as reading and writing to the master PLC.
2. Power up one of the slave PLC's and connect the configuration cable.
3. In the WINDLDR software click Configure—PLC Selection and choose FC5A-D16R (it should already be set to this, but it is a good idea to double check.
4. Click OK
5. Click Configure—Function Area Settings and click on Communication tab.
6. Click under Port 2 in the Communication Mode column and select Modbus RTU slave. This window pops up, set as follows:

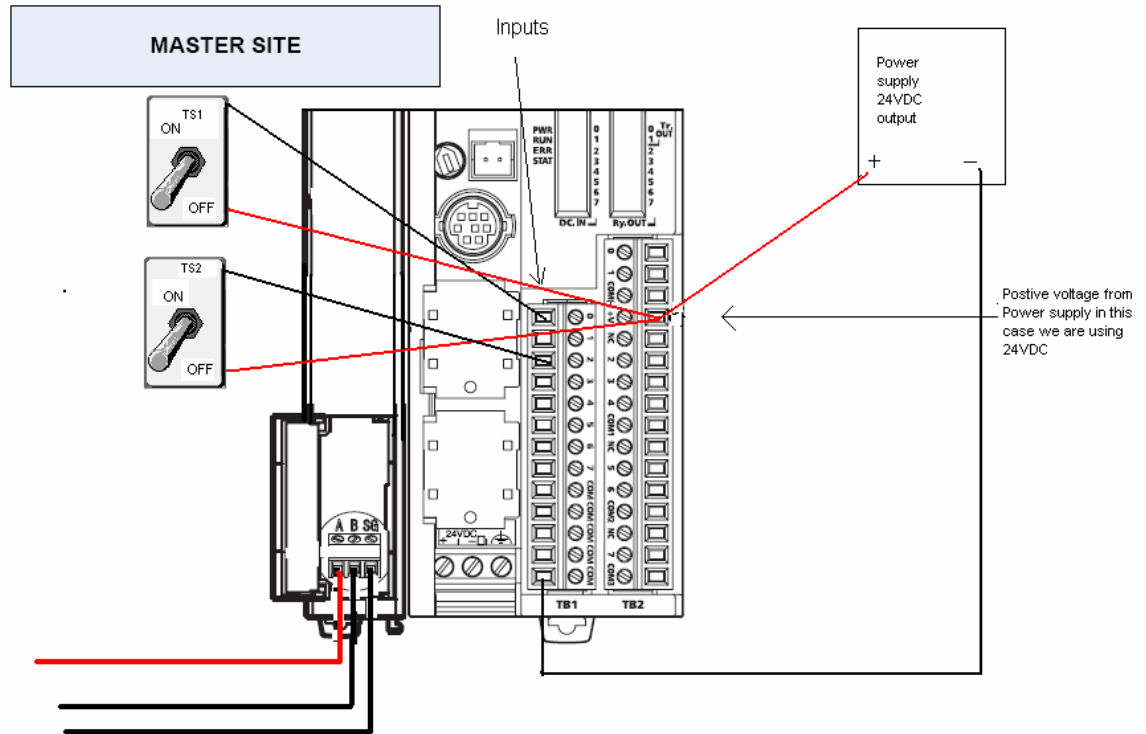


7. Click OK
8. Down load to the PLC 
9. Hook up the other PLC and repeat steps 1-8 above.

## Connect PLC's to Wireless Modems

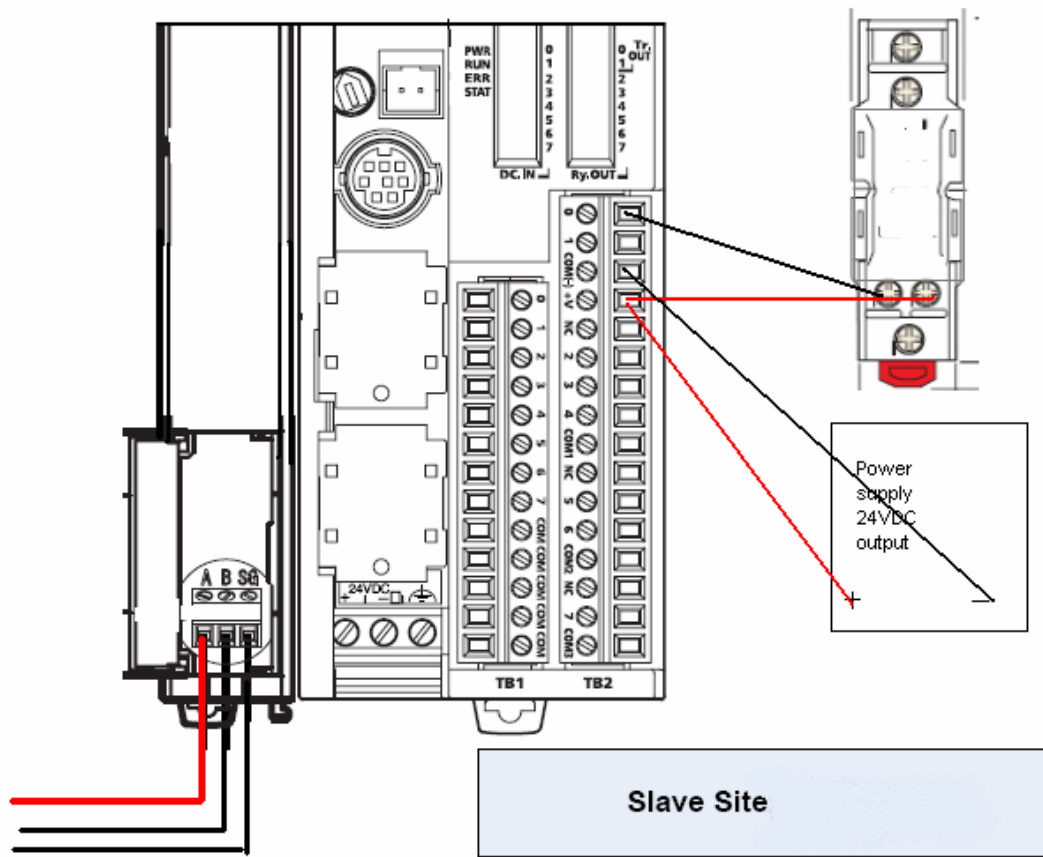


## Connect Toggle Switches to Inputs on Master PLC



The above is when you are using the FC5A-D16RK1 which has sinking inputs. If you are using the FC5A-D16RS1 which has sourcing inputs you would connect the off side of the toggle switch to a COM not a positive voltage.

## Connect Relay to the Slave Devices



This is when you are using the FC5A-D16RK1 which has sourcing outputs. If you are using the FC5A-D16RS1 which has sourcing outputs you would connect the relay to the COM not the positive voltage.