

Modbus Configuration Supplement
12/29/2006

Purpose:

This paper is to help users in the setup and implementation of the Modbus communications on the PLC On a Chip Development package. All of the settings discussed in the paper are described in further detailed in the EZ Ladder manual.

Register Assignments: (For PLC On a Chip VS. Modbus Tester Beta Ver3.0)

| | PLC On a Chip | Modbus Tester |
|-------------------|---------------|---------------|
| Holding registers | 40001 | 40001 |
| Input registers | 30001 | 30001 |
| Inputs | 10001 | 10001 |
| Coils | 20001 | 00001 |

Equipment needed:

For RS232 communication you will need the following:

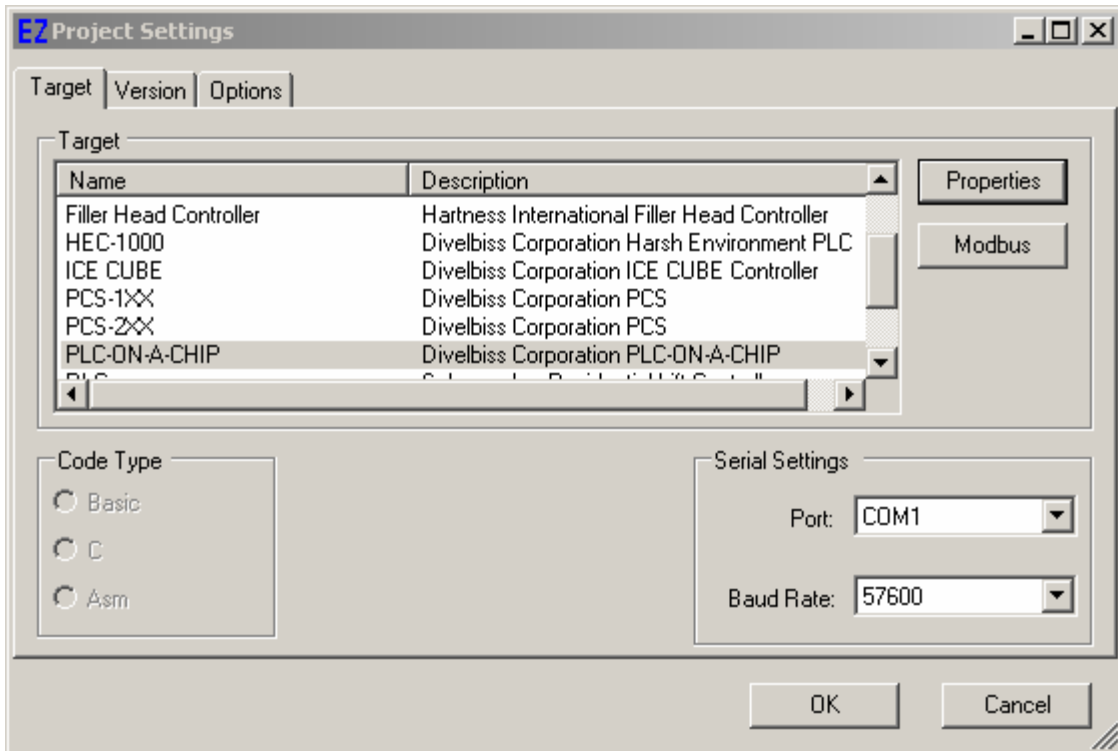
- PLC On a Chip Development kit
- EZ Ladder installed on a computer
- 2 RS232 null modem serial cables (1 is supplied in the development kit the other can be purchased from us or radio shack)
- Development kit RS232 serial port adapter (purchased separately)
- Modbus scanning software. (We will be using Modbus Tester Beta 3.0 it can be downloaded at www.modbus.pl)

For RS485/RS422 communication you will need the following:

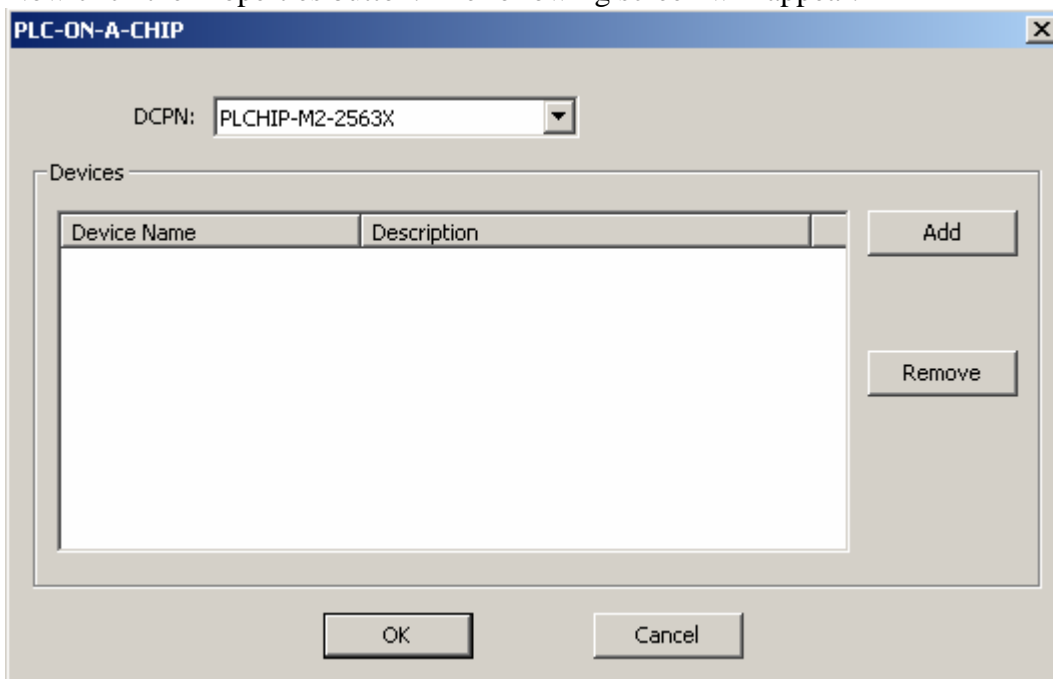
- PLC On a Chip Development kit
- EZ Ladder installed on a computer
- RS232 null modem serial cable (supplied in the development kit)
- Development kit RS422 or RS485 serial port adapter (purchased separately)
- Modbus scanning software. (We will be using Modbus Tester Beta 3.0 it can be downloaded at www.modbus.pl)
- RS422/RS485 to RS232 converter. (We will be using B&B Electronics Model# 4WSD9R. It can be purchased from www.bb-elec.com)
- You will need to fabricate a cable to go from the development kit to the RS485/422 converter. See the attached drawings for this information.

RS232 Setup:

1. Connect the power adapter to the dev. kit.
2. Connect the RS232 serial cable to the dev. kit and to the PC serial port.
3. Connect the RS232 serial cable from a second serial port to the development kit Rs232 module.
4. Start the EZ Ladder program.
5. Now click on the PROJECTS then the SETTINGS button. The following screen will appear.

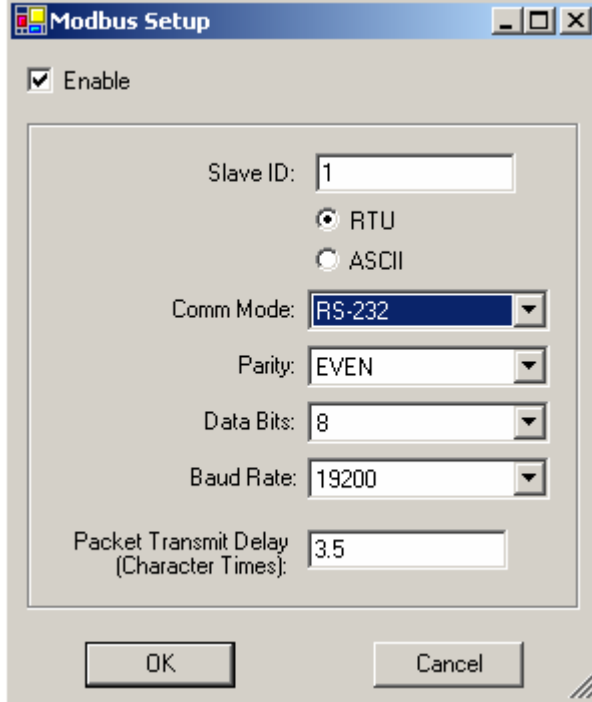


6. Select the PLC-ON-A-Chip option.
7. Make sure the Port matches the COM Port that you plugged the serial cable into earlier.
8. Leave the Baud Rate set where it is at. It will only work at the 57600 setting at this time.
9. Now click the Properties button. The following screen will appear.

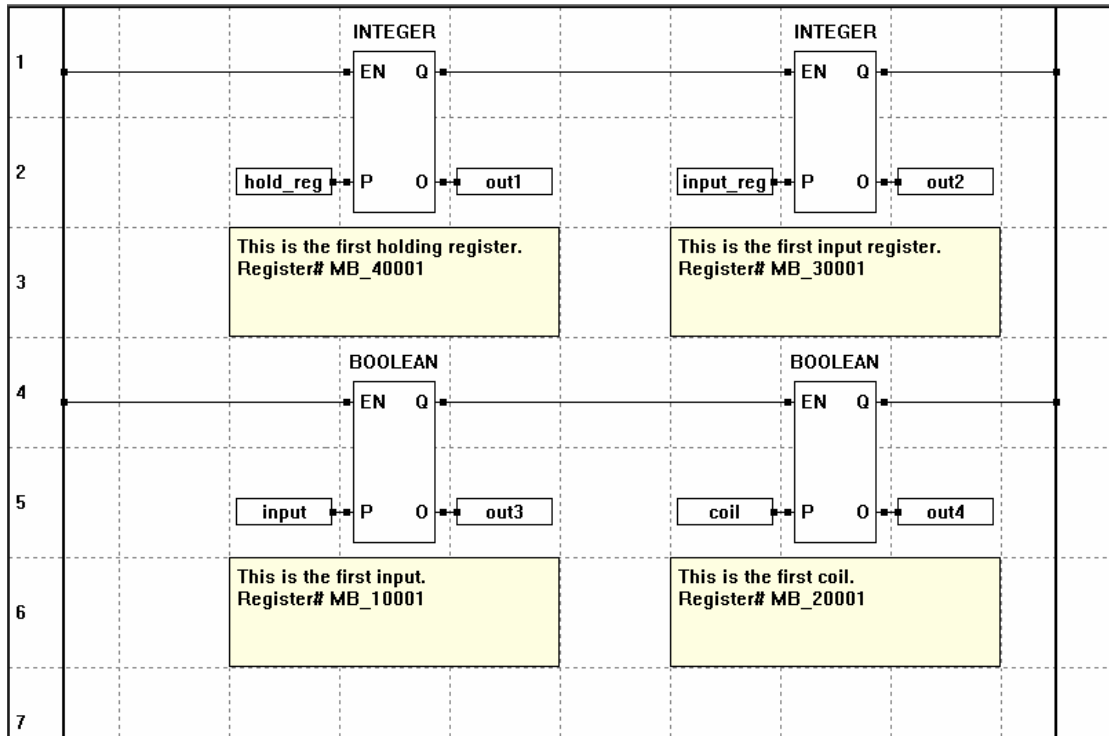


10. Select The DCPN number as shown above and then click the OK button.

11. Now that screen will go away. Now on the Projects Settings screen click on the Modbus button. The following screen will appear.



12. Click the Enable check box. Make sure the slave ID is 1. (This can be set to any number from 1 to 249 as long as you match the same number in the Modbus Tester software.)
13. Leave the type set to RTU
14. Select the Comm Mode you will be using.
15. Parity can be set to ODD, EVEN or NONE as long as it is matched in the Modbus Tester software.
16. Leave the Data Bits set to 8
17. The Baud Rate can be set to any of the available setting as long as it is matched in the Modbus Tester software. (However if the communications is too fast it will cause problems and may need to be slowed down.)
18. Leave the Packet Transmit Delay set to 3.5. (Further explanation of this feature can be found in the EZ Ladder manual.)
19. Once all the settings are set click on the OK button. On the Projects Settings screen click the OK button.
20. Now we are ready to create the Modbus Program. For this program we will create a simple program with one input, one coil, one holding register and one input register.
21. Input the following program: (We can e-mail you this program if you have trouble.)

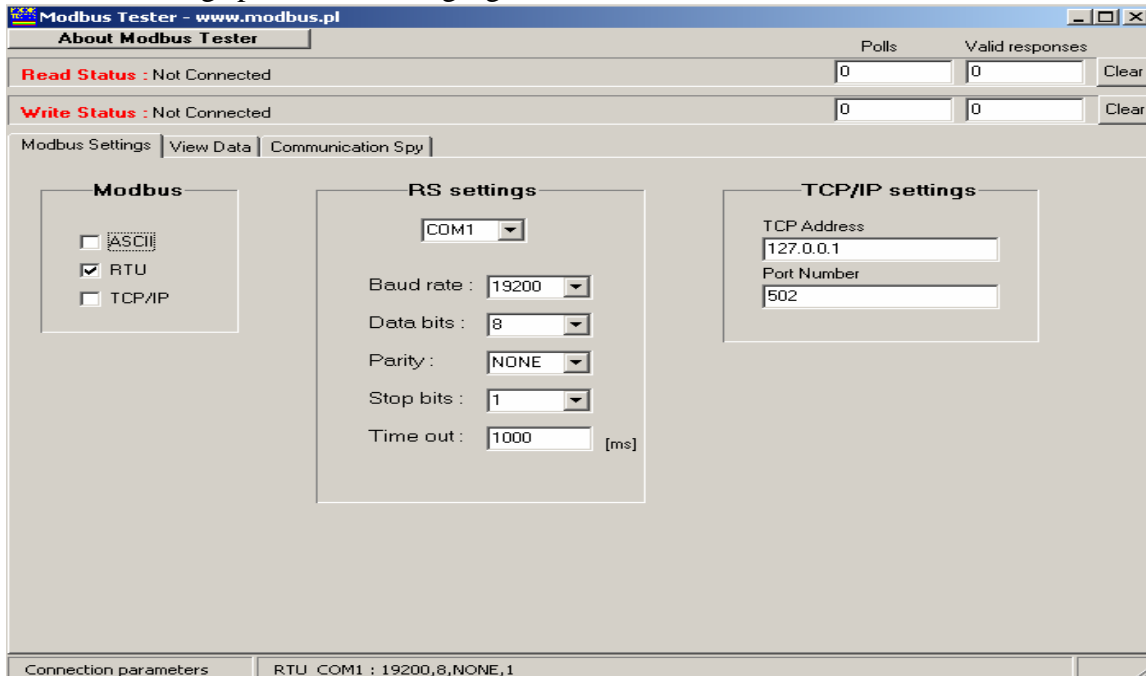


NETORK ADDRESS/REGISTER

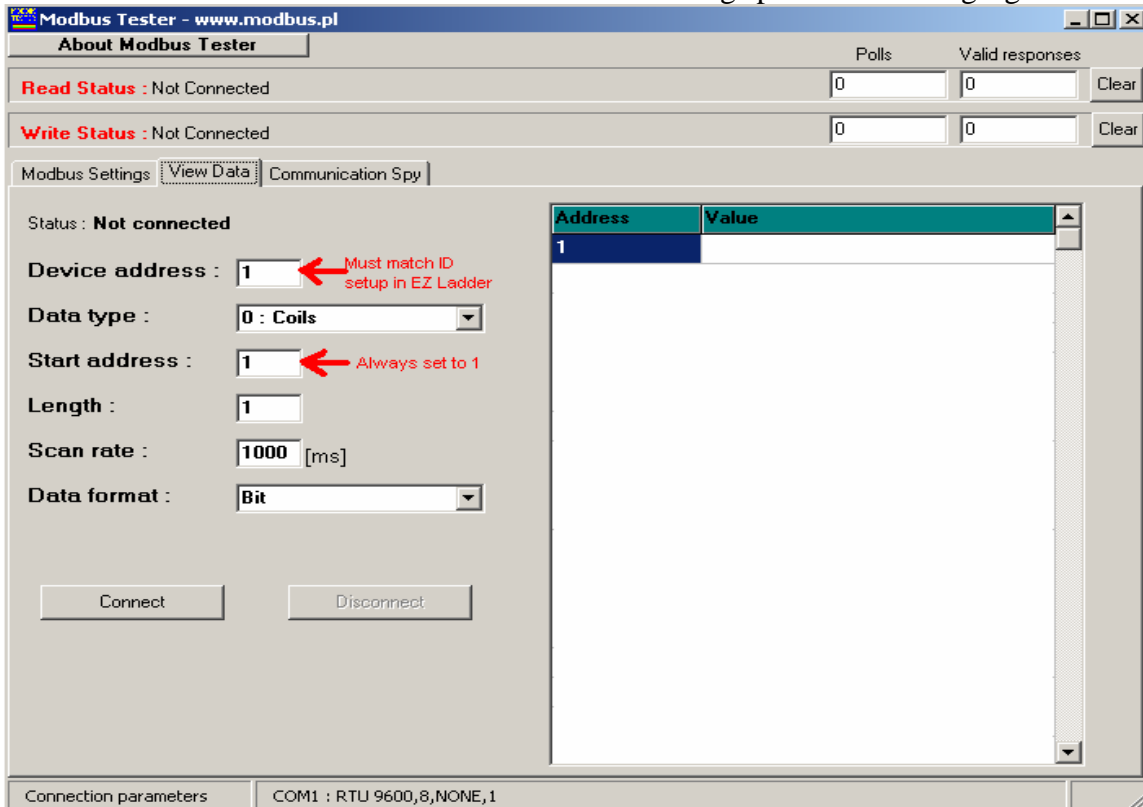
| Name | Type | Address / Register |
|-----------|---------|--------------------|
| coil | BOOLEAN | mb_20001 |
| hold_reg | INTEGER | mb_40001 |
| input | BOOLEAN | mb_10001 |
| input_reg | INTEGER | mb_30001 |

22. Compile and download This Program.

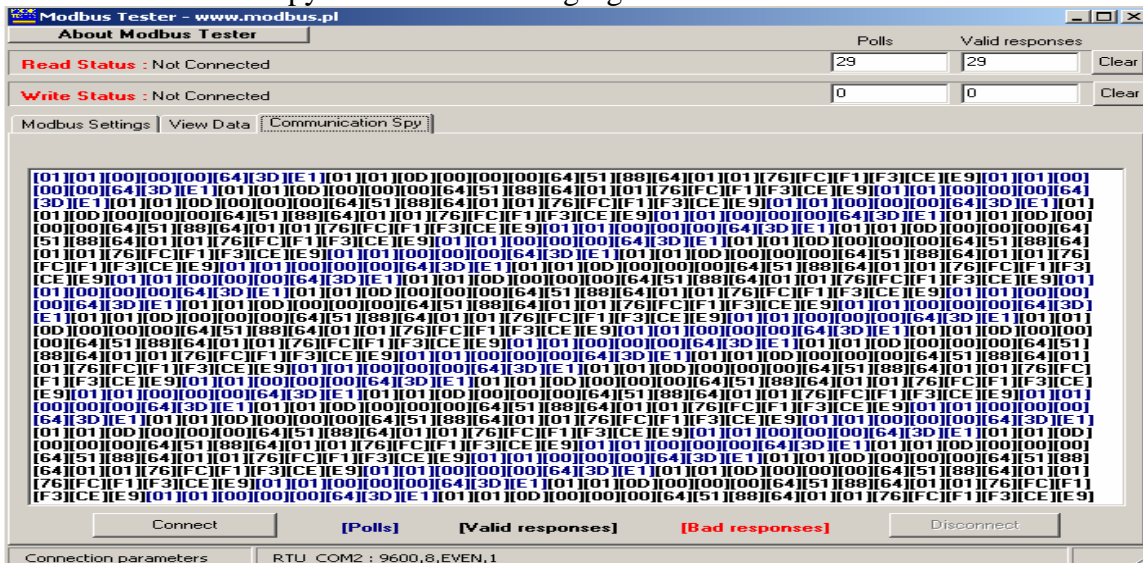
23. Now open the Modbus Tester software. Click on the “Modbus Settings” tab. Set all the settings per the following figure:



24. Now click on the “View Data” tab. Set the settings per the following figure:

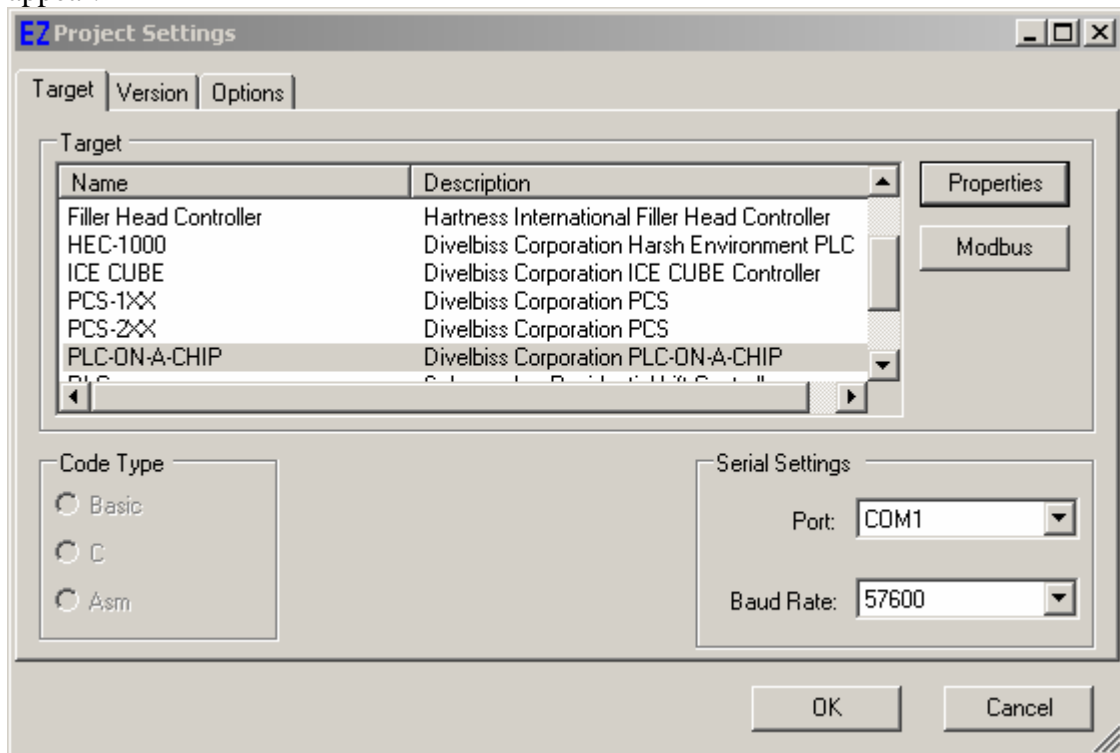


25. If you set the “Length” for more than the number of register set up in EZ ladder you will get a communication error.
26. Now you can click the “Connect” button. The unit should now be communicating.
27. You can select any of the 4 types in the “Data type :” drop down box to see the different types of registers.
28. You can change the values either by double clicking in the value field of the Modbus Tester software or by double clicking the variable in EZ Ladder.
29. If you wish to see the actual Data being sent back and fourth you can click on the “Communication Spy” tab. The following figure shows what the data should look like:

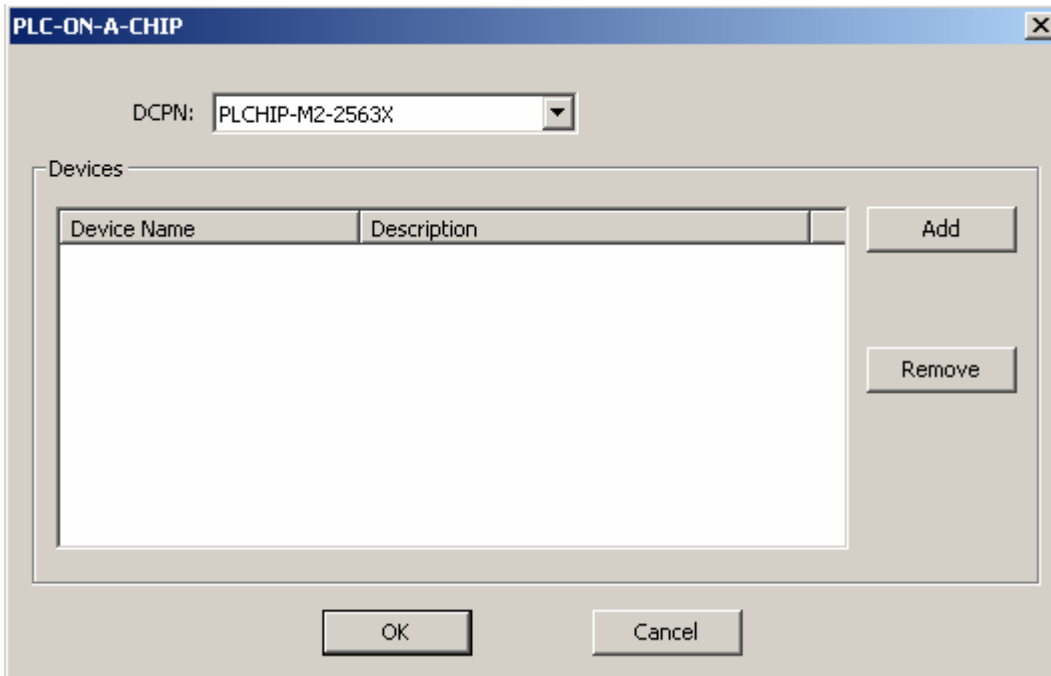


RS422/RS485 Setup:

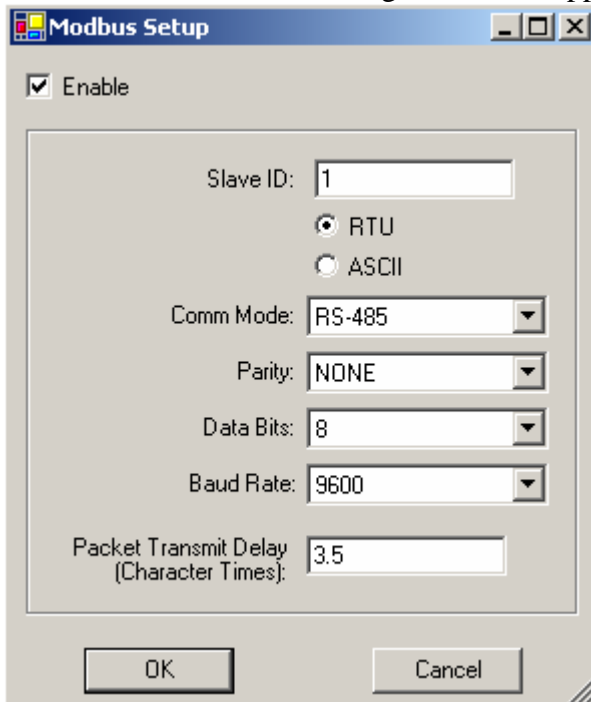
1. Connect the power adapter to the dev. kit.
2. Connect the RS232 serial cable to the dev. kit and to the PC serial port..
3. Connect the RS232 serial cable from a second serial port to the RS422/RS485 to RS232 converter.
4. Connect the fabricated RS422 or RS485 cable to the RS422/RS485 to RS232 converter.
5. Set the selector switches to the correct positions for either RS422 or RS482 communication. Set the echo to off. If you are using RS485 set I to 2 wire mode. If you are using RS422 set it to 4 wire mode.
6. Start the EZ Ladder program
7. Now click on the PROJECTS then the SETTINGS button. The following screen will appear.



8. Select the PLC-ON-A-Chip option.
9. Make sure the Port matches the COM Port that you plugged the serial cable into earlier.
10. Leave the Baud Rate set where it is at. It will only work at the 57600 setting at this time.
11. Now click the Properties button. The following screen will appear.



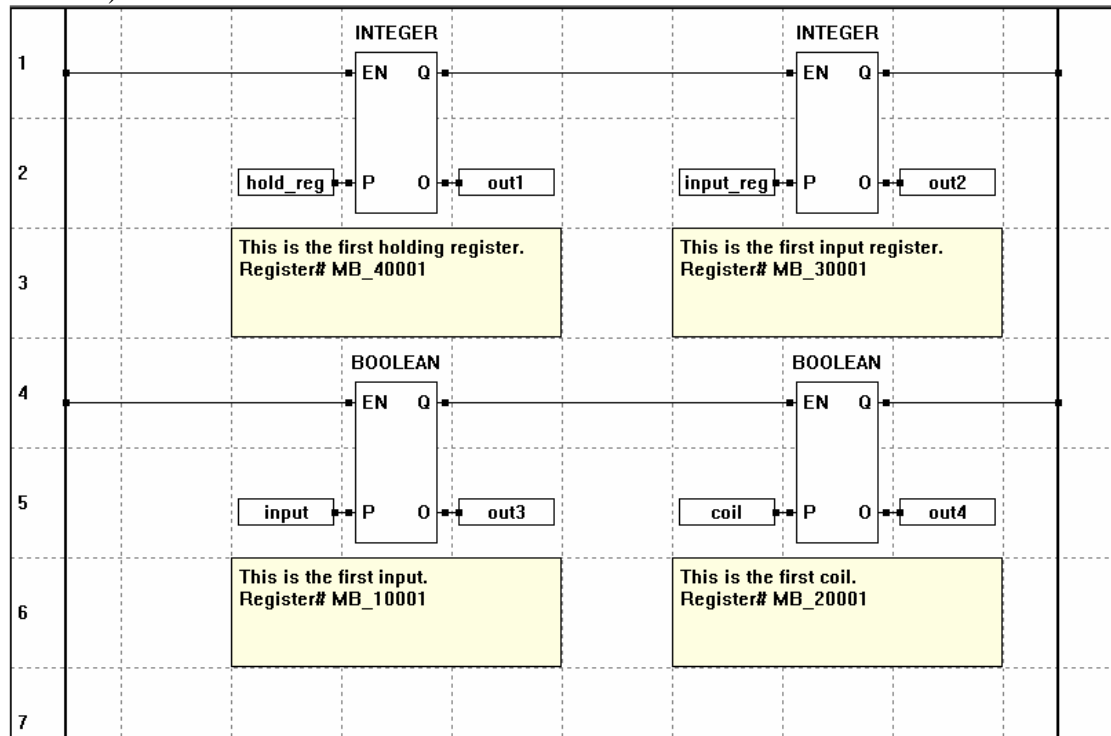
12. Select The DCPN number as shown above and then click the OK button.
13. Now that screen will go away. Now on the Projects Settings screen click on the Modbus button. The following screen will appear.



14. Click the Enable check box. Make sure the slave ID is 1. (This can be set to any number from 1 to 249 as long as you match the same number in the Modbus Tester software.)
15. Leave the type set to RTU
16. Select the Comm Mode you will be using. RS422 or RS485
17. Parity can be set to ODD, EVEN or NONE as long as it is matched in the Modbus

Tester software.

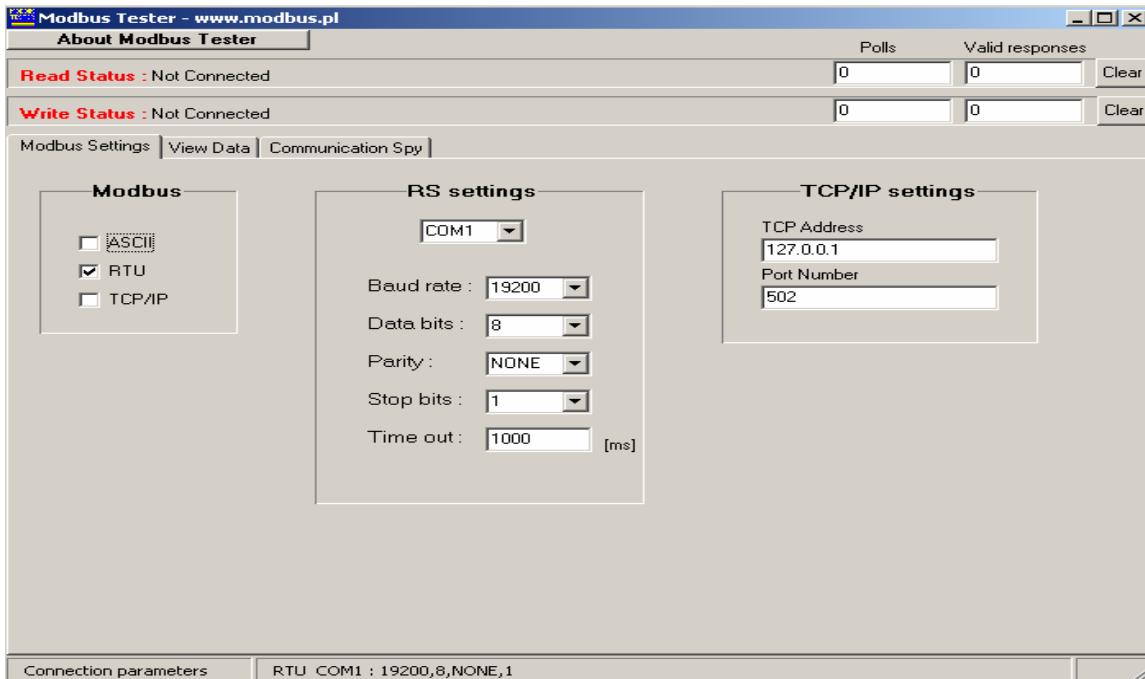
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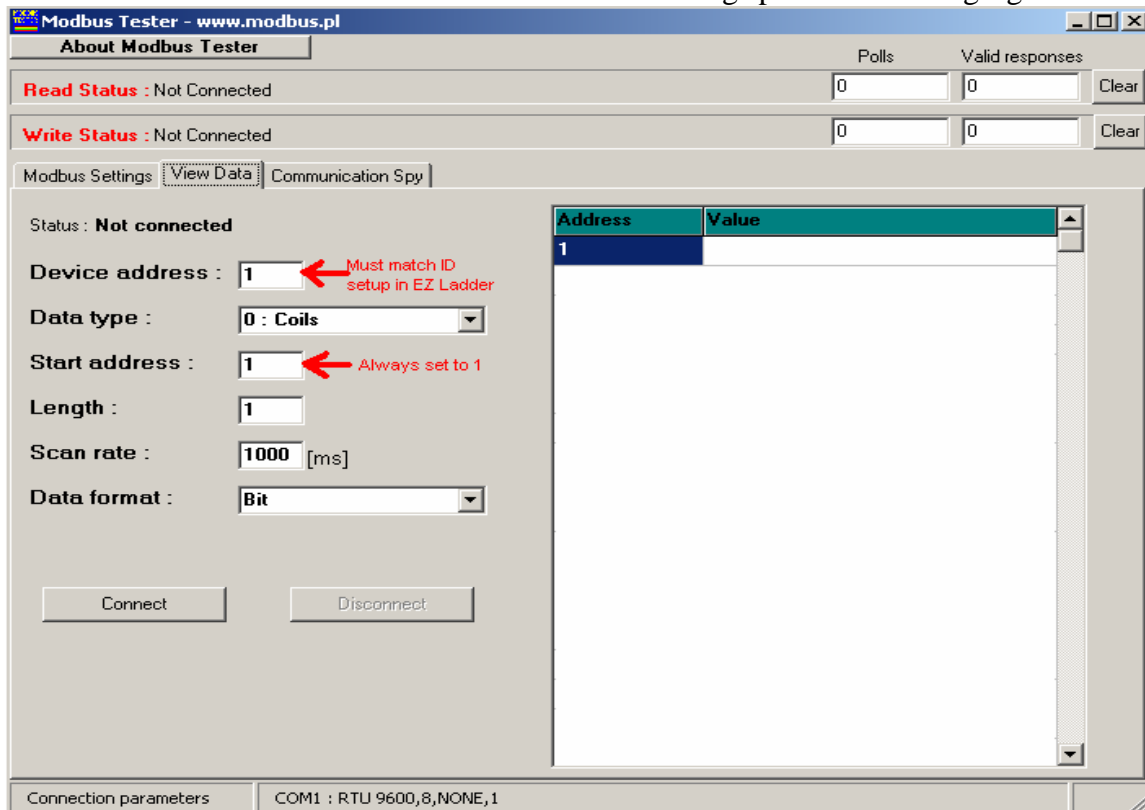
NETORK ADDRESS/REGISTER

| Name | Type | Address / Register |
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| coil | BOOLEAN | mb_20001 |
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26. Now click on the “View Data” tab. Set the settings per the following figure:



27. Now you can click the “Connect” button. The unit should now be communicating.

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