

Application Note

Testing Modbus Communication on the RDE300



Modbus TCP (Ethernet)

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1 Overview

This application note provides a guide on testing your RDE300 to verify Modbus TCP (Ethernet) communication using third-party PC-based Modbus software. The instructions are intended to help you confirm proper Modbus communication settings prior to setting up communication to your own datalogger or SCADA system. These steps are optional and are provided as a tutorial.

Several third-party tools are available for testing Modbus communication via a PC. A popular choice is Modbus Poll from Witte Software, for which we provide instructions here. You could also adapt these instructions to use other third-party software. These instructions will help you identify common setup issues.

To follow this guide, you will need an RDE300 series unit, a power supply appropriate for your RDE300 part number, and a PC with an Ethernet port. In addition, you will need Modbus Poll software, available here: [Modbus Poll](#).

2 Connect with RDE300 Engineering Client

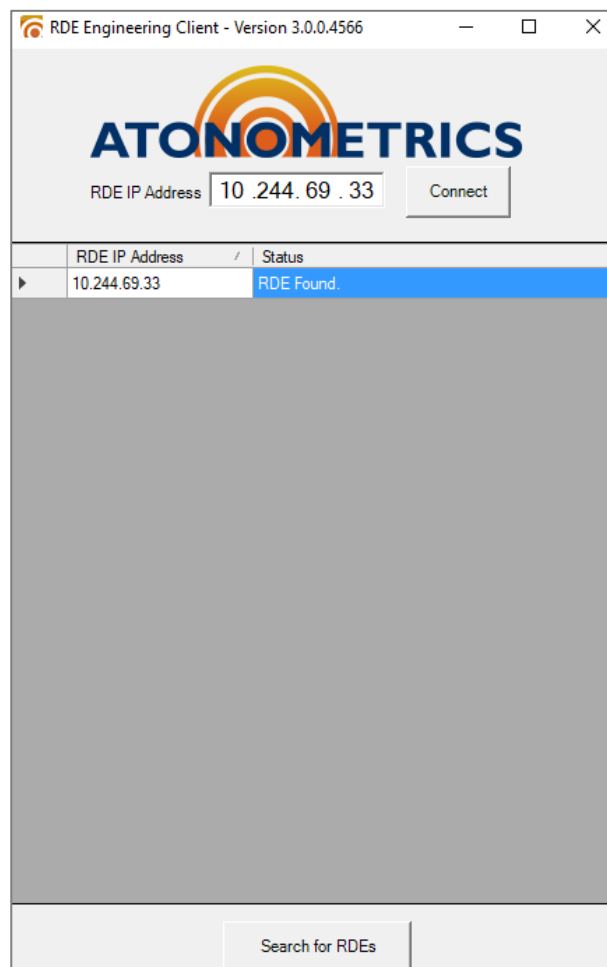
Before testing the RDE300 with Modbus Poll, we will connect to it using the Atonometrics RDE300 Engineering Client to confirm the device is working and ensure all communication settings are known.

Power your RDE300 with an appropriate power supply, following requirements for your RDE300 part number in the [RDE300 User Guide](#). Then connect your RDE300 to the PC via Ethernet port. See the section of the RDE300 User Guide titled “Hardware” and follow the instructions there.

Note: Configure your PC’s Ethernet adapter so that your PC’s subnet matches the subnet of the RDE300. See the RDE300 User Guide for more info. You may also need to consult Windows documentation for help on changing your Ethernet adapter subnet.

Following the instructions from the RDE300 User Guide, open the RDE300 Engineering Client.

If the RDE300 is set up and connected to the PC properly per the instructions of the user guide, the screen should look like this:



As shown here, an RDE was successfully found at 10.244.69.33, the default IP address for the RDE. Once the RDE is found, press “Connect.”

Note: Automatic discovery of your RDE300 unit may be blocked by firewall software on your computer. See the RDE300 User Guide for information on which ports to allow through your firewall. Or disable your firewall temporarily. If your unit does not appear in the unit list shown on the connection screen and you are not able to disable your PC firewall, you must directly enter the known IP address of the unit.

On the new screen, some information about the RDE is shown, including the uptime (how long the RDE has been running). Press the Update button at the bottom a couple of times and make sure the uptime is increasing as expected.

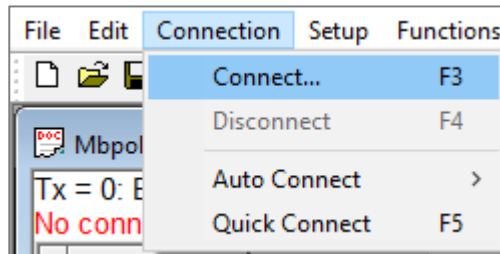
The screenshot shows the 'RDE Engineering Client' window. The title bar includes the RDE logo and the text 'RDE Engineering Client'. The main header area features the 'ATONOMETRICS' logo on the left and the text 'RDE Engineering Client Version 3.0.0.4566' with the website 'http://www.atonometrics.com' on the right. Below the header is a navigation bar with tabs: 'System', 'PV Channel 1', 'PV Channel 2', 'Device Information', 'RDE Settings', 'System Clock', 'Network Settings', 'Diagnostics', and 'Settings Import/Export'. The 'Device Information' tab is active, displaying the following data: 'Enclosure SN: TEST PECOS', 'PCBA PN: 710335-02', 'PCBA SN: 2662', 'Firmware Version: 3.0.0.4565', 'Uptime: 0 days, 2 hours, 44 minutes, 14 seconds' (with 'Uptime' highlighted in yellow), 'Current Mode: Automatic' (in a dropdown menu), and 'Event Code: 0'. At the bottom of the main content area are two buttons: 'Reconnect' and 'Reset RDE'. At the very bottom of the window are two more buttons: 'Refresh' and 'Update' (with 'Update' highlighted in yellow).

3 Test Using Modbus Poll

3.1 Setting Up

Open Modbus Poll.

From the Connection tab, press “Connect:”



If you have the free trial version, you may need to click through a registration dialog.

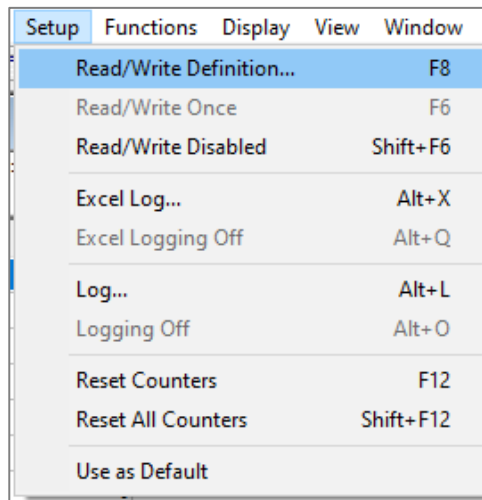
From the dropdown list, select Modbus TCP/IP, and enter the IP address of the RDE in the box below.

A screenshot of the 'Connection Setup' dialog box. The 'Connection' dropdown is open, showing options: 'Modbus TCP/IP' (selected), 'Serial Port', 'Modbus TCP/IP', 'Modbus UDP/IP', 'Modbus RTU/ASCII Over TCP/IP', and 'Modbus RTU/ASCII Over UDP/IP'. Other settings include: '9600 Baud', '8 Data bits', 'Even Parity', '1 Stop Bit', 'Advanced...' button, 'Mode' (RTU selected, ASCII unselected), 'Response Timeout' (1000 [ms]), 'Delay Between Polls' (20 [ms]), 'Remote Modbus Server' section with 'IP Address or Node Name' (10.244.69.33), 'Server Port' (502), 'Connect Timeout' (3000 [ms]), and 'IPv4' (selected) / 'IPv6' (unselected) radio buttons. 'OK' and 'Cancel' buttons are at the top right.

Press “OK.”

3.2 Polling Temperature

From the Setup tab, press “Read/Write Definition:”



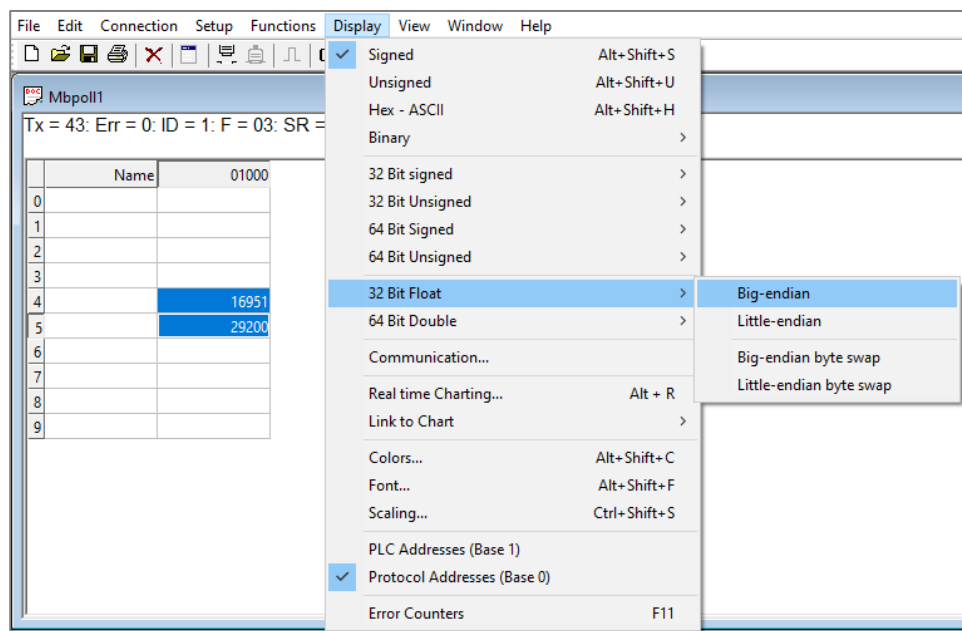
Per the RDE300 User Guide, the temperature is at address 1004 and is 2 registers of data, so type in 1004 to the address box and 2 to the quantity box:

A screenshot of the 'Read/Write Definition' dialog box. The 'Slave ID' is set to 1. The 'Function' is set to '03 Read Holding Registers (4x)'. The 'Address mode' is set to 'Dec'. The 'Address' is set to 1004, with a note 'PLC address = 41005'. The 'Quantity' is set to 2. The 'Scan Rate' is set to 1000 [ms]. There are checkboxes for 'Read/Write Disabled' and 'Disable on error', both of which are unchecked. There is a 'Read/Write Once' button. The 'View' section has radio buttons for 'Rows' (10, 20, 50, 100, Fit to Quantity) and checkboxes for 'Hide Name Columns', 'PLC Addresses (Base 1)', 'Address in Cell', and 'Enron/Daniel Mode'. The 'Request' section has text boxes for 'RTU' (01 03 03 EC 00 02 05 BA) and 'ASCII' (3A 30 31 30 33 30 33 45 43 30 30 32 30 42 0D 0A).

Note: Ensure that the box marked “PLC Addresses (Base 1)” is unchecked. If this box is checked, you must add 1 to the register addresses listed in the RDE300 User Guide.

Note: Note that some Modbus communication software uses Base 1 register offsets by default. In these cases, you must add 1 to the register addresses listed in the RDE300 User Guide.

Per the RDE300 User Guide, the temperature data is formatted as a 32-bit float with most significant bytes first. Therefore, select the data fields and then from the display tab choose “32 Bit Float” and “Big-endian.”



The temperature will be displayed. In this example, the temperature is approximately 46 degrees.

	Name	01000
0		
1		
2		
3		
4		46.0302
5		--
6		
7		
8		
9		

3.3 Polling Other Registers

Follow the example above to test other registers listed in the RDE300 User Guide.