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Using IDENT M System T with Modbus/TCP

Introduction

The Pepperl+Fuchs IDENT M System T consists of two models MTT3000-F180-B12-V45-MON, which is a read only unit and the MTT6000-F120-B12-V45 which is a read/write unit. Tags that can be used are MTO-xx which have an 8 byte read only number on them and the MTM-C2 which have an 8 byte read only number and 71 bytes of read/write data.

Mdbus/TCP

The IDENT M System T has RS232, RS485 and Ethernet TCP/IP ports. It does not however directly support Modbus/TCP. In order to talk Modbus/TCP use the converter RTS-UP-1 unit to either convert the TCP/IP or serial data to Modbus/TCP.

RTS-UP-1 – Converts one serial and one Ethernet device to Modbus/TCP
RTS-UP-4 – Converts four serial and four Ethernet devices to Modbus/TCP

This document will show you step by step how to read and write to the MTT devices using Modbus/TCP. The serial port data will be converted to Modbus/TCP data. The Ethernet data could also be converted to Modbus/TCP data as well but that configuration isn't described here.

Wire the RTS-UP-1serial port to the MTT serial port

RTS-UP-1		MTT unit
2 Rxd	>	J42 TX, pin 1
3 Txd	>	J42 RX, pin 2
5 Txd	>	J42 GND

Make all other connections

Wire 24V to MTT reader
Wire 24V to RTS-UP-1
Connect Ethernet to RTS-UP-1

Configure the MTT… devices

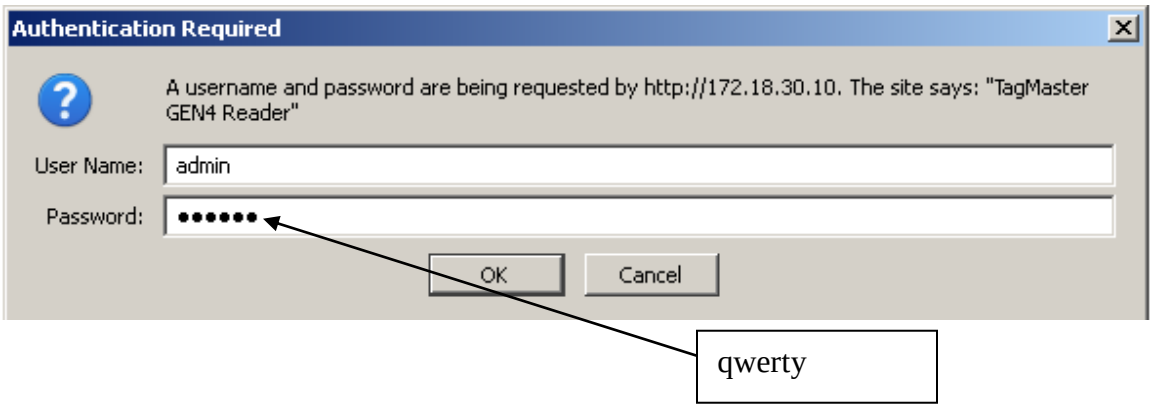
The reader can be configured from the Ethernet port or the RS232 port. This secion describes how to set the IP address of the MTT… reader. If this isn't desired the reader can be connected to by RS232 at the default baud rate of 9600bps. Other serial settings are 8databits, 1 stop bit and no flow control.

Set IP Address

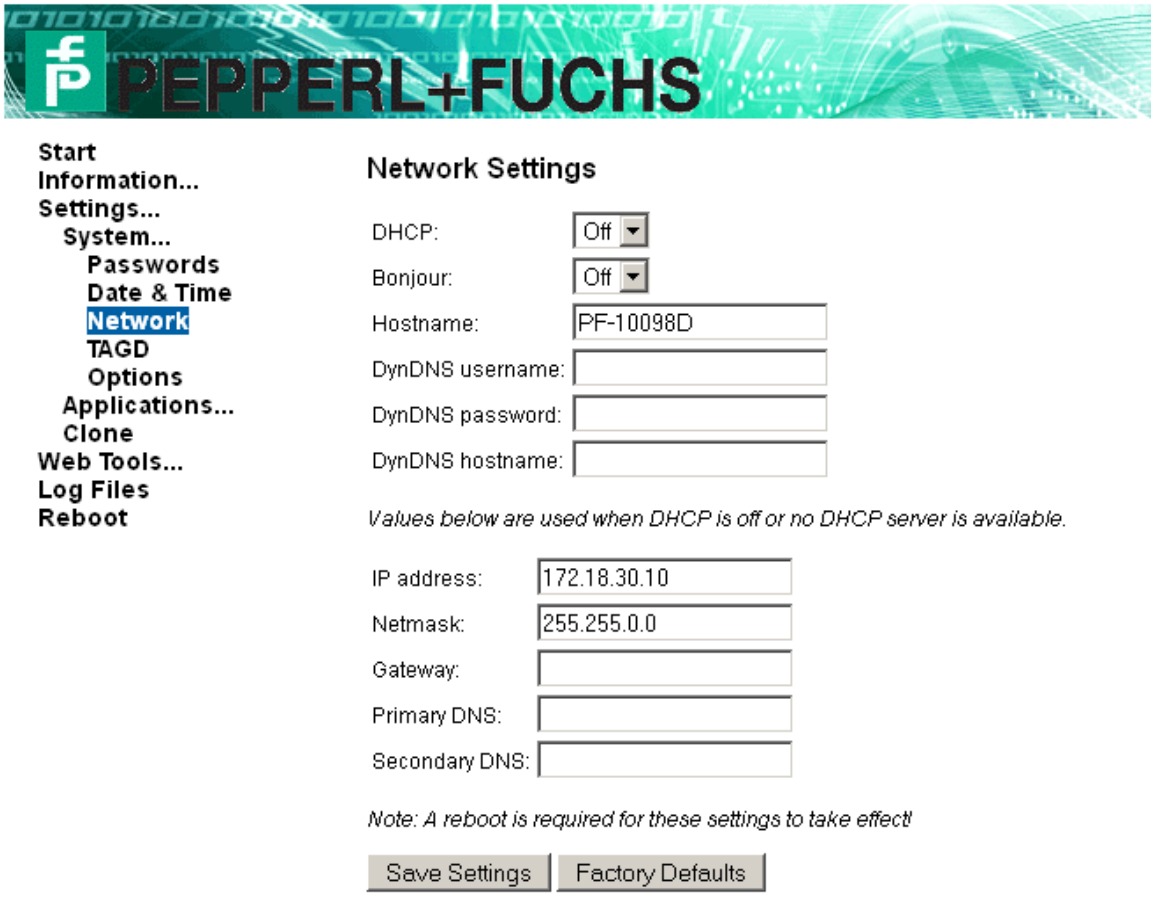
The first thing to do is to configure the Ethernet settings of your RFID system. This example will actually be converting the RS232 data to Modbus/TCP data and the Ethernet port can be used to configure the serial interface. Here are the default Ethernet parameters.

Default Ethernet Settings:	IP Address:	192.168.0.2
	Subnet Mask:	255.255.255.0

Put this IP address into your web browser and logon to the MTT… device. Make sure the IP address of your PC is close. For example set it to 192.168.0.1.



Go to the Settings > System > Network tab and set the network parameters correctly as required by your network administrator.

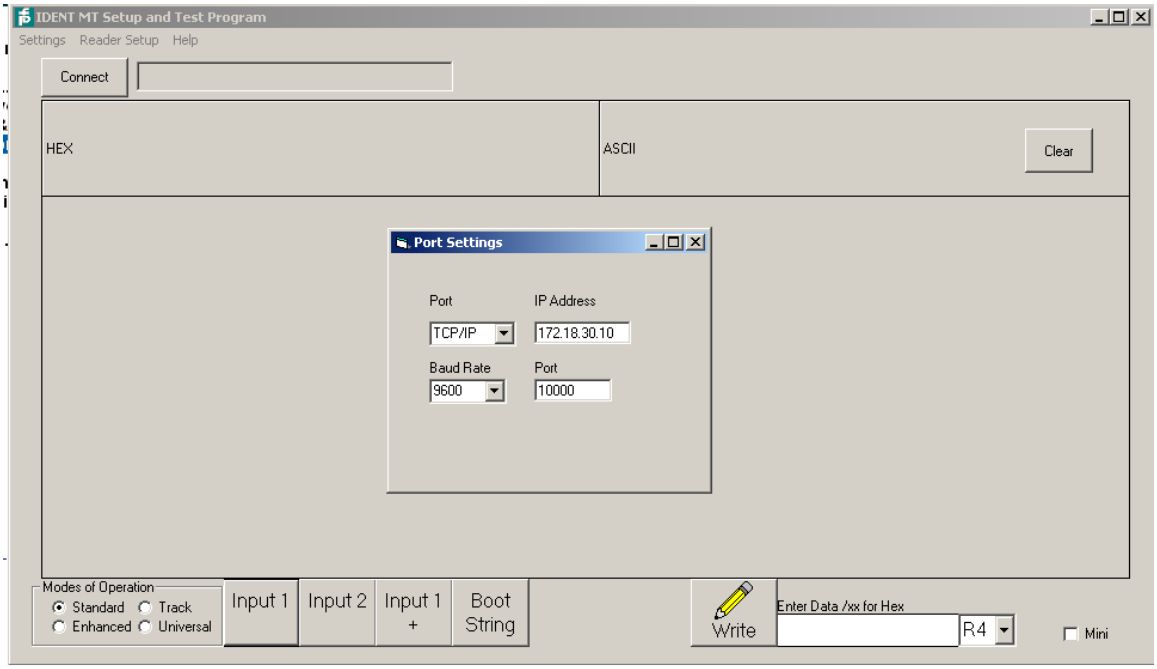


Network configuration screen for the MTT…

After you change the IP address reboot the hardware so the settings will take affect. Reset the IP address of your PC to reconnect to it.

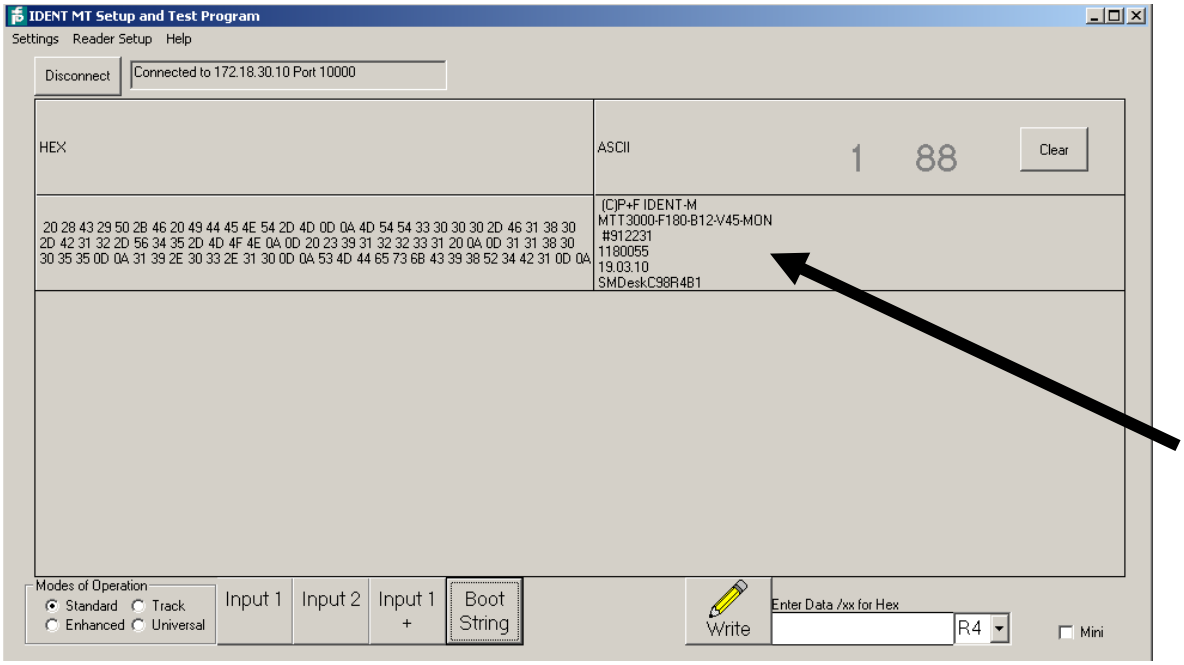
Configure reader

Download the Configuration and diagnostic software from the web site. This software will connect to the serial or Ethernet ports so that a configuration can be made. Put your new Ethernet parameters into the Settings > Port settings menu option.



Setting the Network parameters to connect to an MTT… device

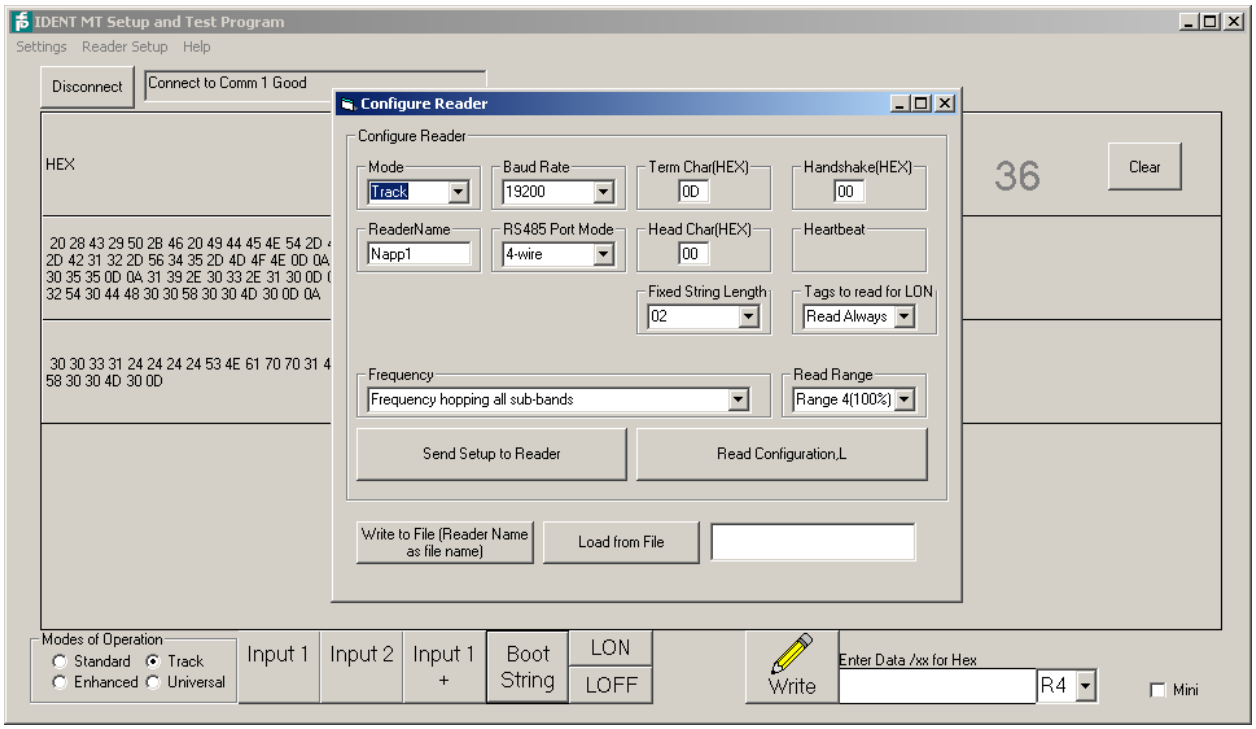
Close the port settings dialog box and press connect. It should say connected at the top. Press the Boot String button at bottom to verify that you have a Pepperl+Fuchs ID system connected.



Reading the version information of an MTT… reader

Go to the Reader Setup > Configure Reader menu option. Configure the reader like I have suggested. Many other options are possible. Press "**Send Setup to Reader**" and

look for a 0 on the previous screen. Close the window and reconnect to the reader and verify the configuration.



Configuring an MTT… reader

This example will show you how to read and write two byte to and from the MTT readers.

Make the following changes

1. Change mode to Track
2. Change Baudrate to 19200 (Not necessarily required, but it must match the RTS-UP configuration of serial port 1)
3. Term Char(Hex) = 0D, Head Char(HEX) = 00
4. Handshake(hex) = 00
5. Tags to read for LON = Read Always
6. Read Range = User specified
7. Fixed string length = 2

Press the button “Send Configuration to reader” and wait for the reader to reboot.

Configure RTS-UP-… Modbus/TCP adapter

Load Modbus/TCP firmware

The RTS-UP unit comes with socket server firmware. If you want other firmware for industrial busses like Ethernet/IP, PROFINET, or Modbus/TCP then download this firmware from out web site and send the firmware to the unit using PortVision.

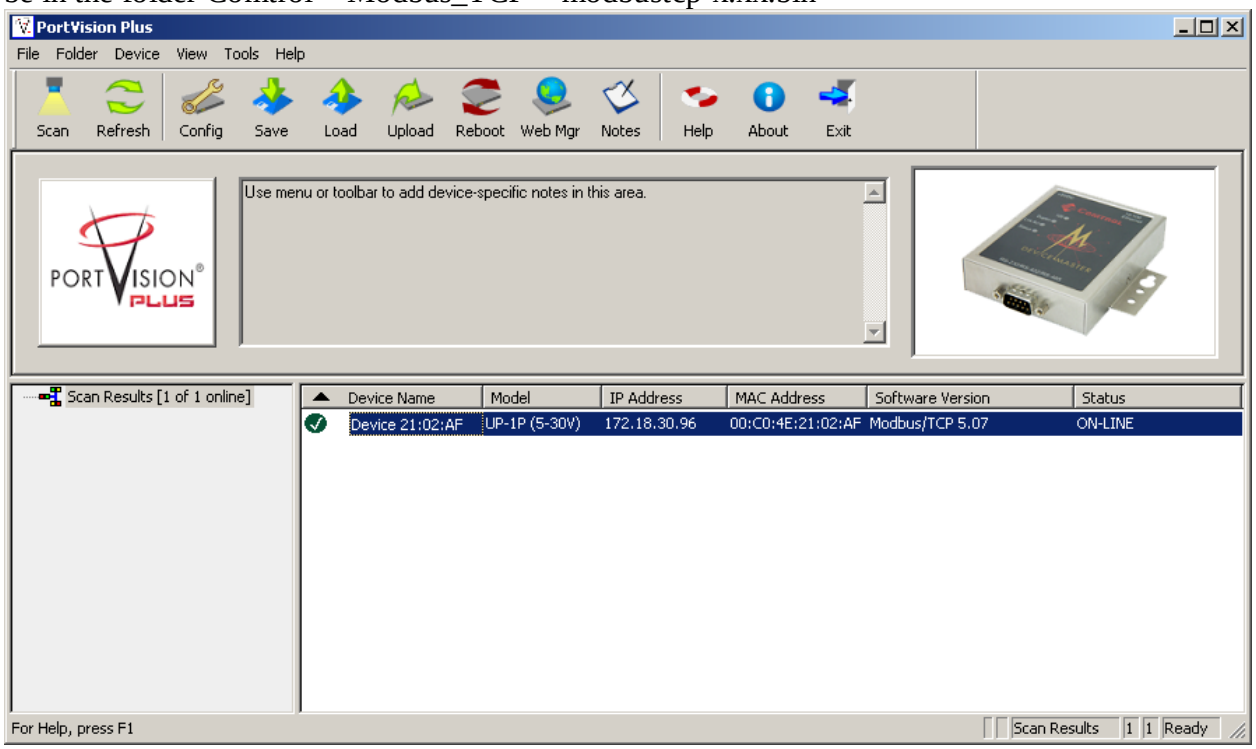
Download and install Portvision

You may have to reboot your PC to see the RTS unit. Click "Scan".

Scanning for RTS-UP… devices and downloading firmware

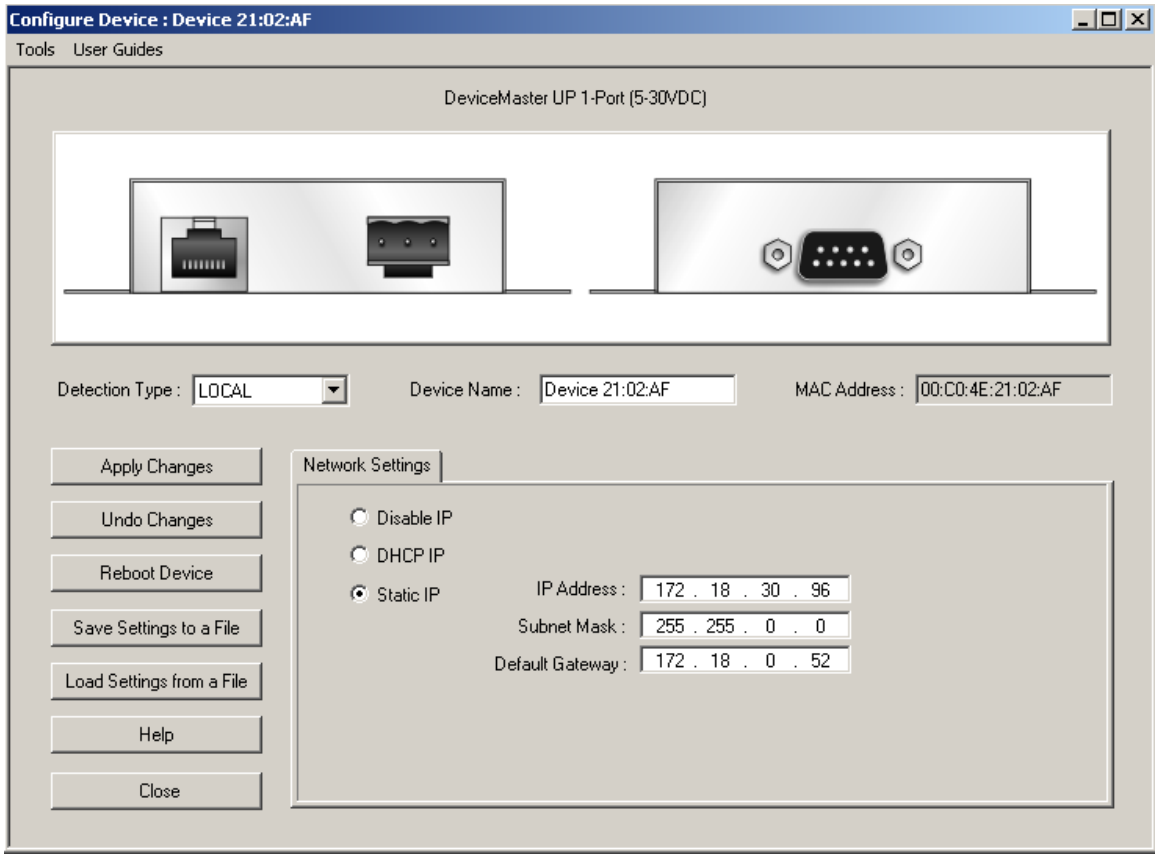
Download the Modbus/TCP firmware

If the Scan Results do not show a device with Modbus/TCP firmware; then highlight the device and go to the menu "Device > Upload Firmware" and update the RTS unit with the right firmware. When you install the Modbus/TCP firmware above the .bin file will be in the folder Comtrol > Modbus_TCP > modbustcp-x.xx.bin



Loading the Modbus/TCP firmware into the RTS-UP…

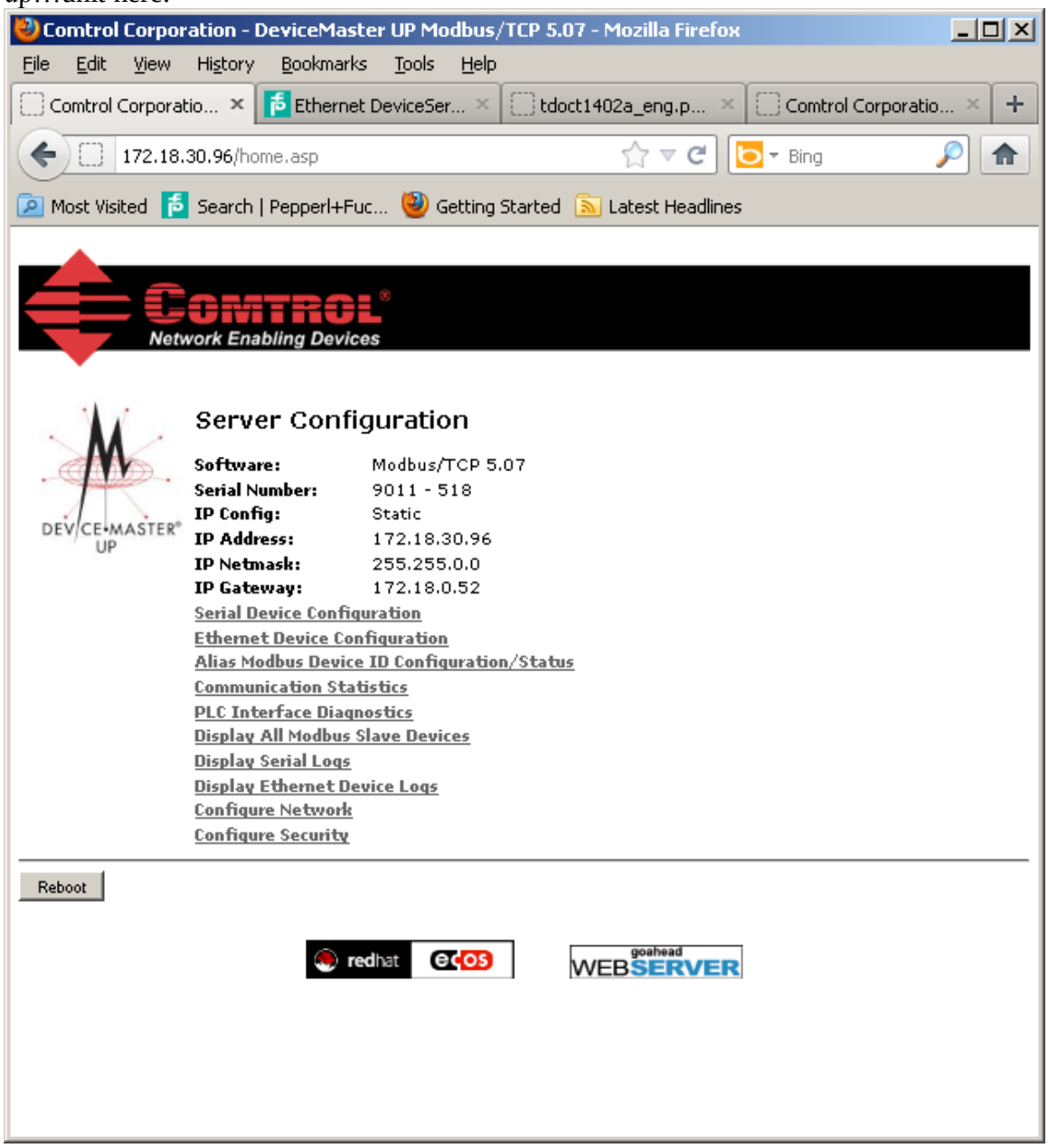
Using PortVision you can also double click on the scanned unit and configure the IP Address, subnet mask, and gateway.



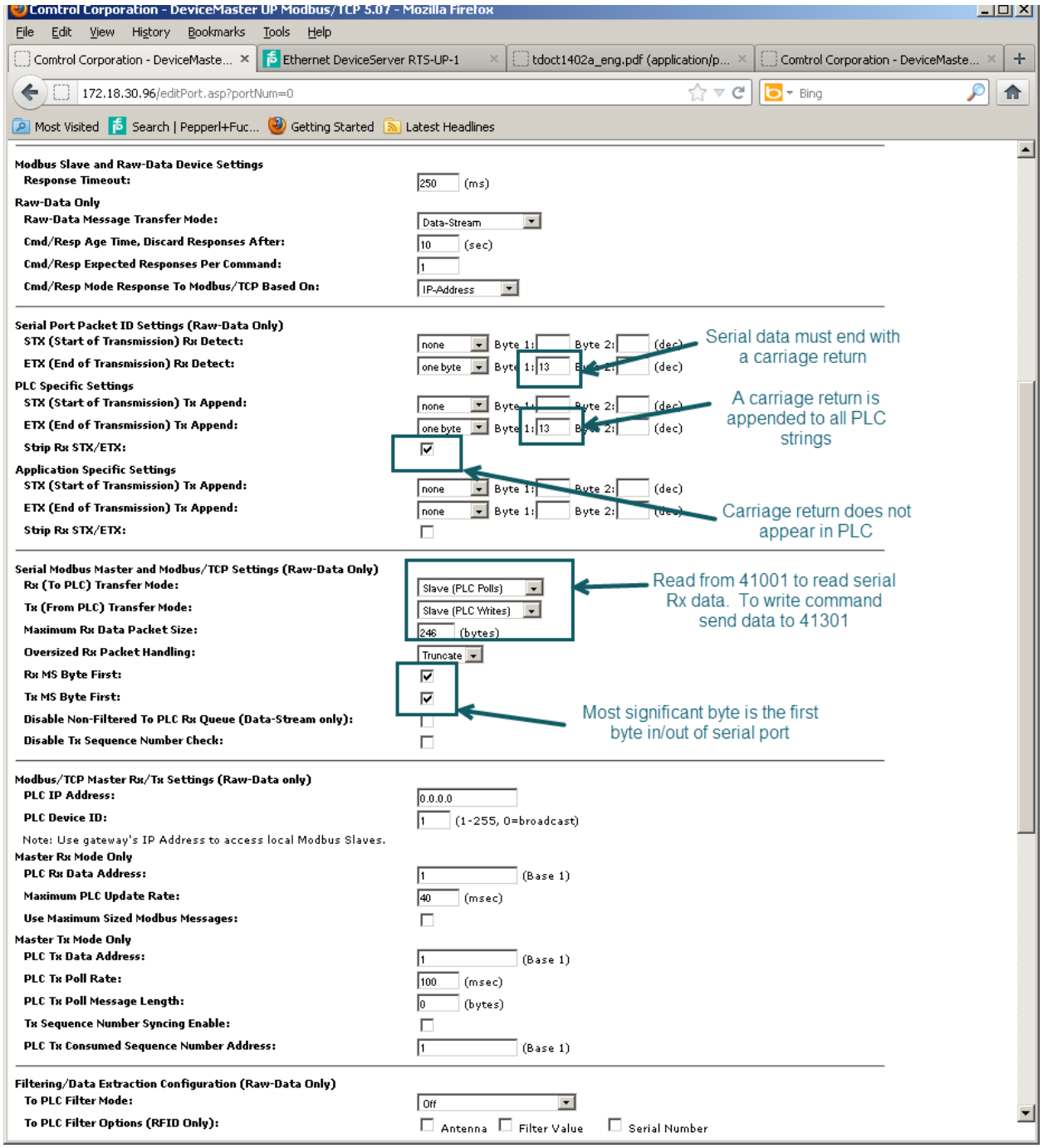
IP address configuration screen for RTS-UP…

Configure the RTS and MTT to work together

Put the IP address of the RTS-UP… unit in a web browser. You will configure the rts-up…unit here.



Go to Serial device configuration and open up port 1. Make the configuration changes you see below.

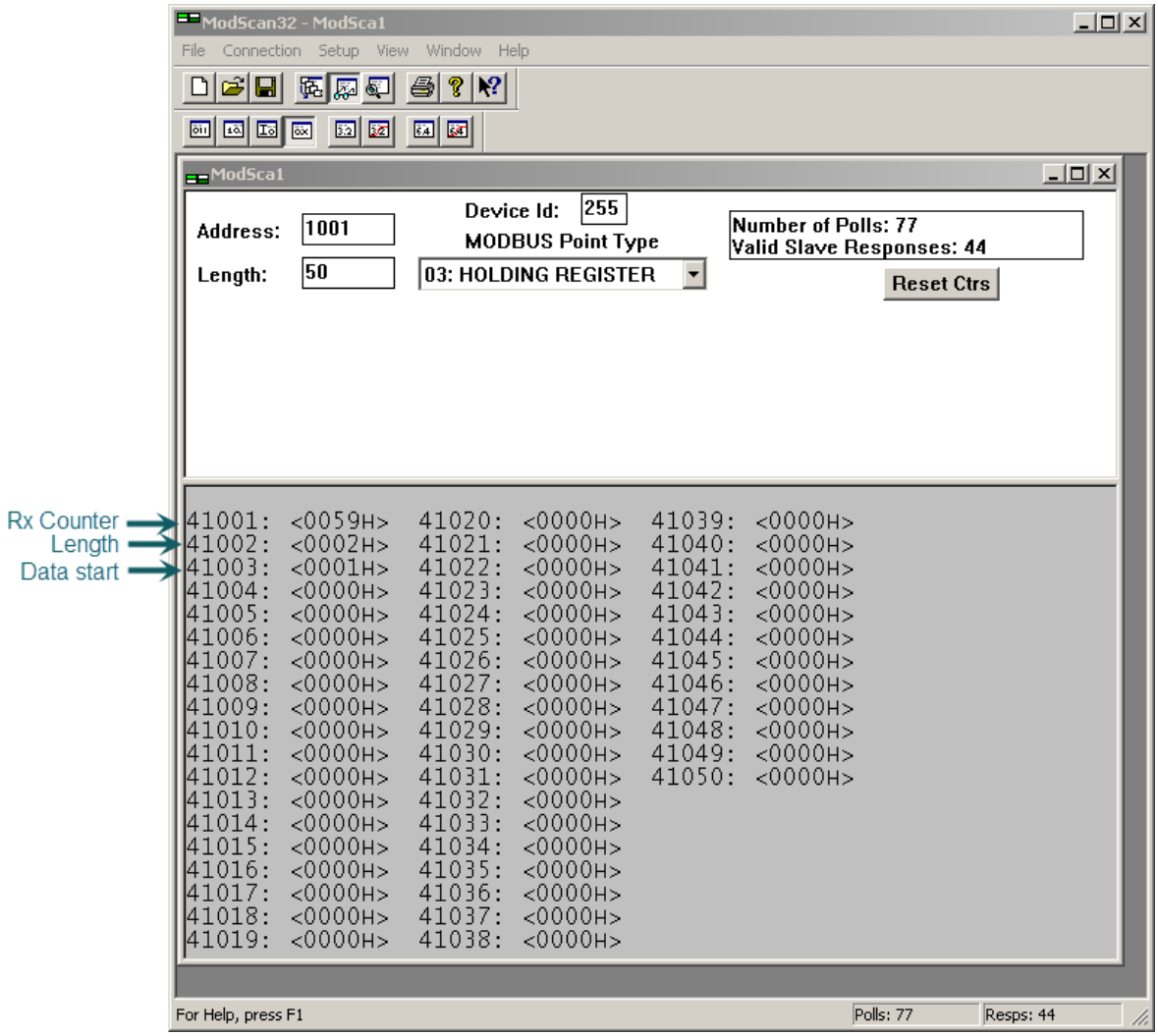


RTS-UP-1 serial port 1 configuration

Setup the PLC to talk to the RTS-UP… unit.

Configure the PLC to read data from 41001. The length can be longer than required. I suggest a length of 50 even though it is way more than you need. The unit identifier(Slave address) must be 255 to read data from a serial port.
Read address 41001, Length 50

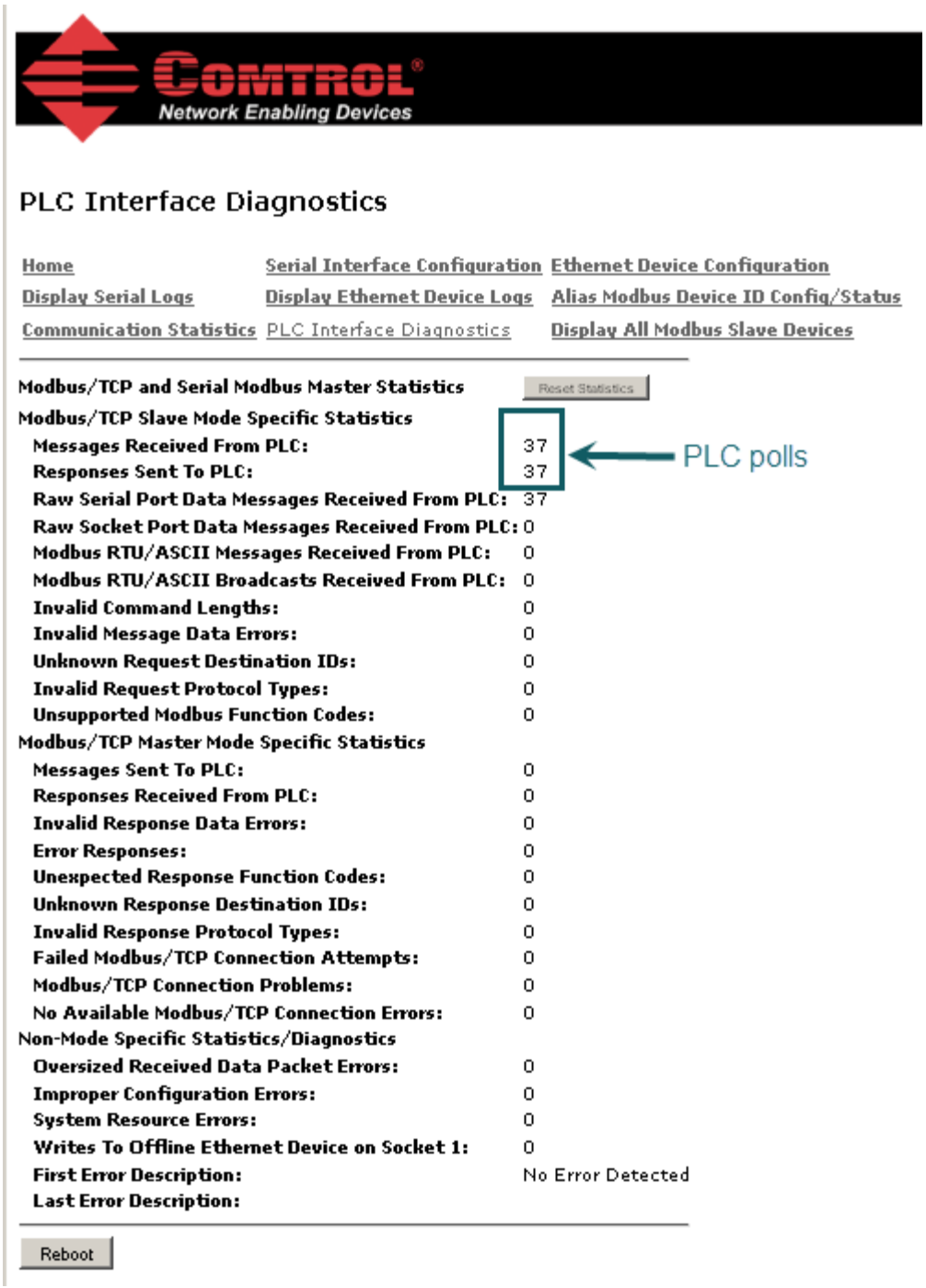
Write address 41301, Length 50
Device ID = 255



Read serial data for MTT reader

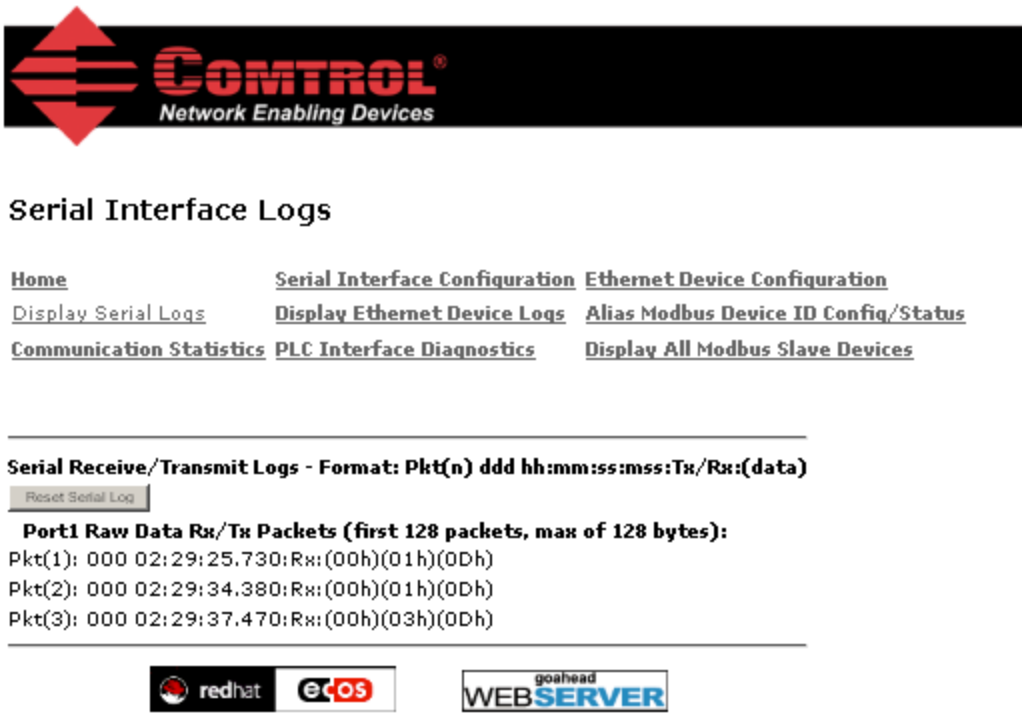
How will you know it is working?

When you read address 41001 from the MTT RFID reader than you should get no slave exception error. Also when you put a tag in front of the reader the "Rx Counter" will increase by 1. The RTS-UP unit should be polled at regular intervals. If you are polling the RTS-up unit. These messages can be seen under PLC Interface Diagnostics" on the RTS-UP web page.



PLC polls as seen on the diagnostic interface

The serial logs will also help you figure out if the serial cable is wired from the MTT unit to the RTS unit properly. All serial strings are logged here. If the serial string does not have the proper terminator then the data will be followed by the words “DROPPED”. This probably means the MTT… has the wrong termination configured.



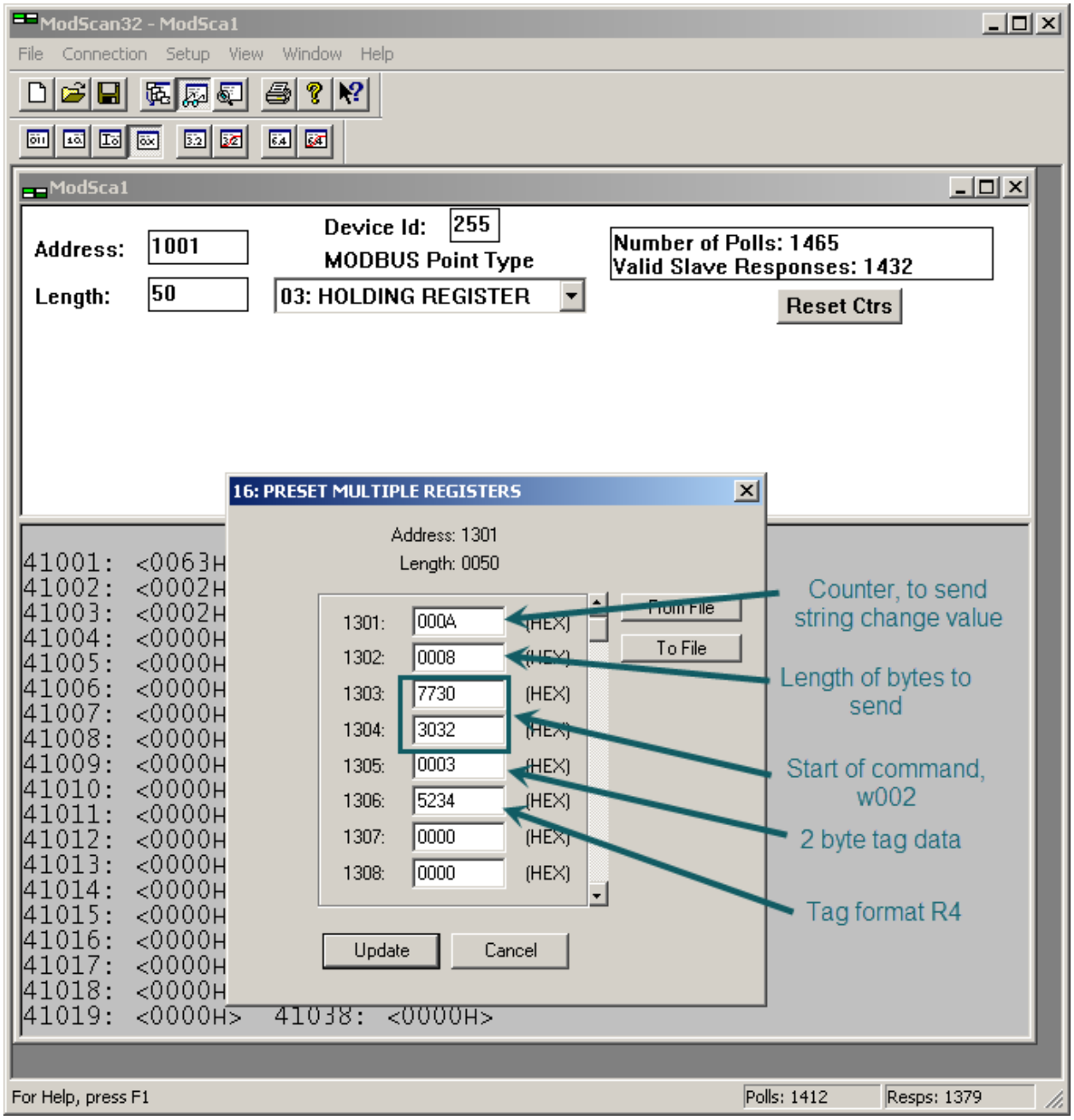
Serial port logs

Writing to tags

Reading the tags is automatic. If you want to send a command to the MTT unit or write data with the MTT6000-F120-B12-V45 unit, data must be written to Modbus port 41301.

A command to write two bytes of data to the MTM-C2 tag from the MTT6000 reader has this format. R4 is used here for the tag format. For other options see the MTT reader manual. The RTS-UP-1 has also been configured to append a carriage return(13d) to the end of the 8 byte string.

Command: w002/00/02R4<CR>
Response: 0<CR> good or 5<CR> no tag



Writing command to serial Port 1

Tag writing can take up to 15 seconds. Only the MTT6000 can perform the write. The write range is only .25m and the tag should be away from the front of the reader by 50mm. Only one tag is allowed in the read range during the write process.