

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-1 serial 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



Start
Information...
Settings...
System...
 Passwords
 Date & Time
 Network
 TAGD
 Options
Applications...
Clone
Web Tools...
Log Files
Reboot

Network Settings

DHCP:
Bonjour:
Hostname:
DynDNS username:
DynDNS password:
DynDNS hostname:

Values below are used when DHCP is off or no DHCP server is available.

IP address:
Netmask:
Gateway:
Primary DNS:
Secondary DNS:

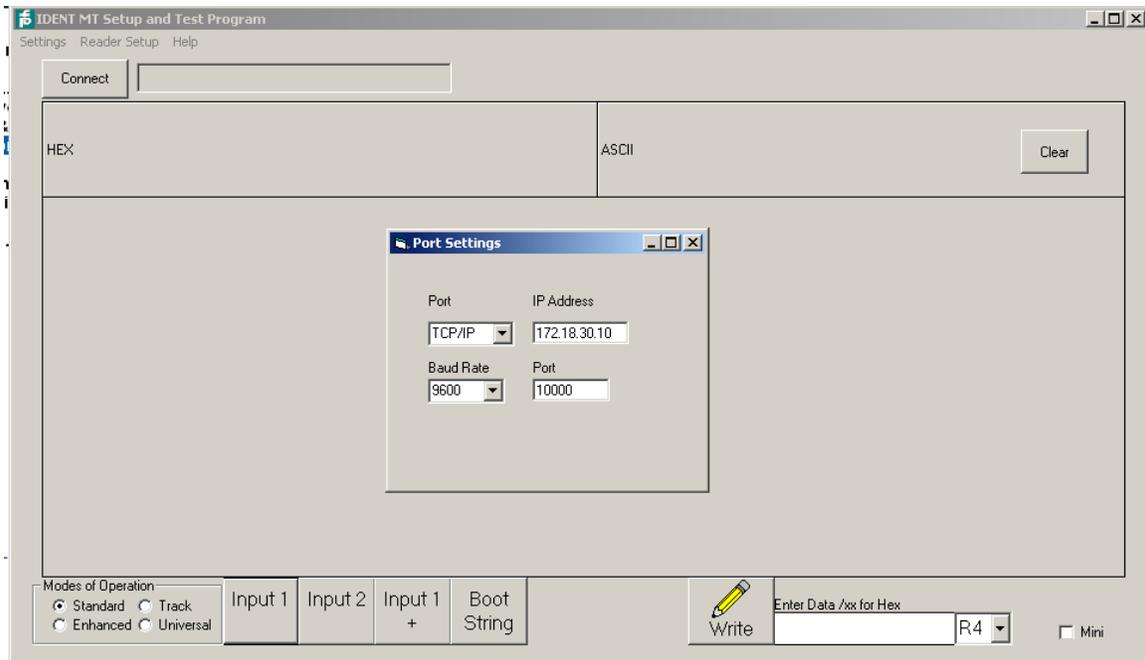
Note: A reboot is required for these settings to take effect!

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.

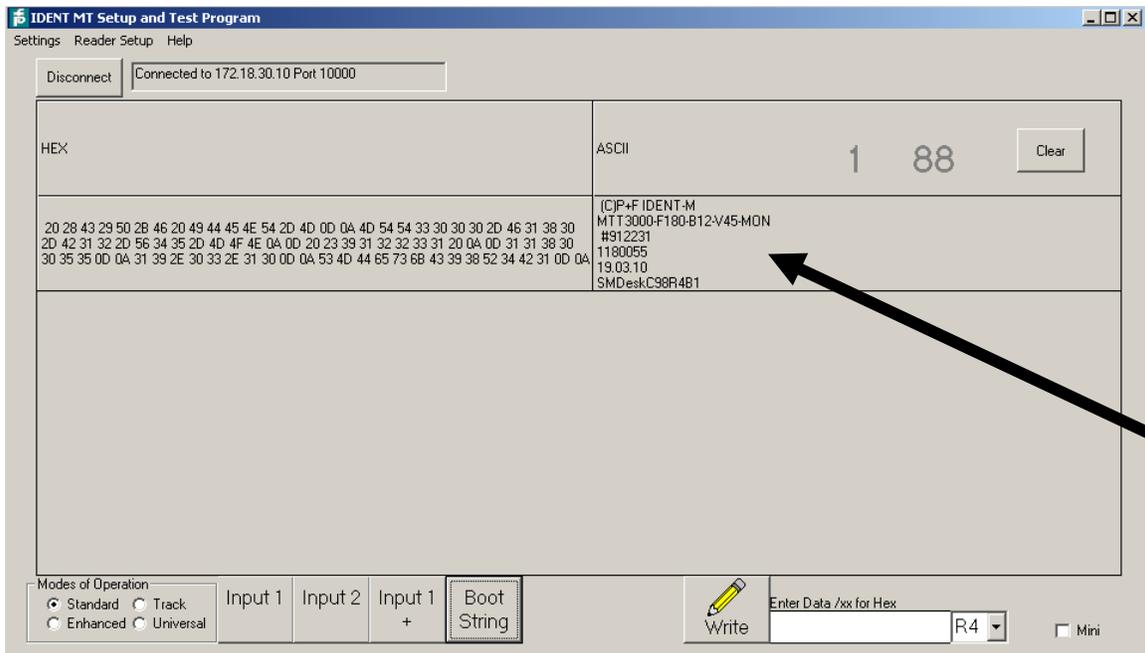
Configure reader

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

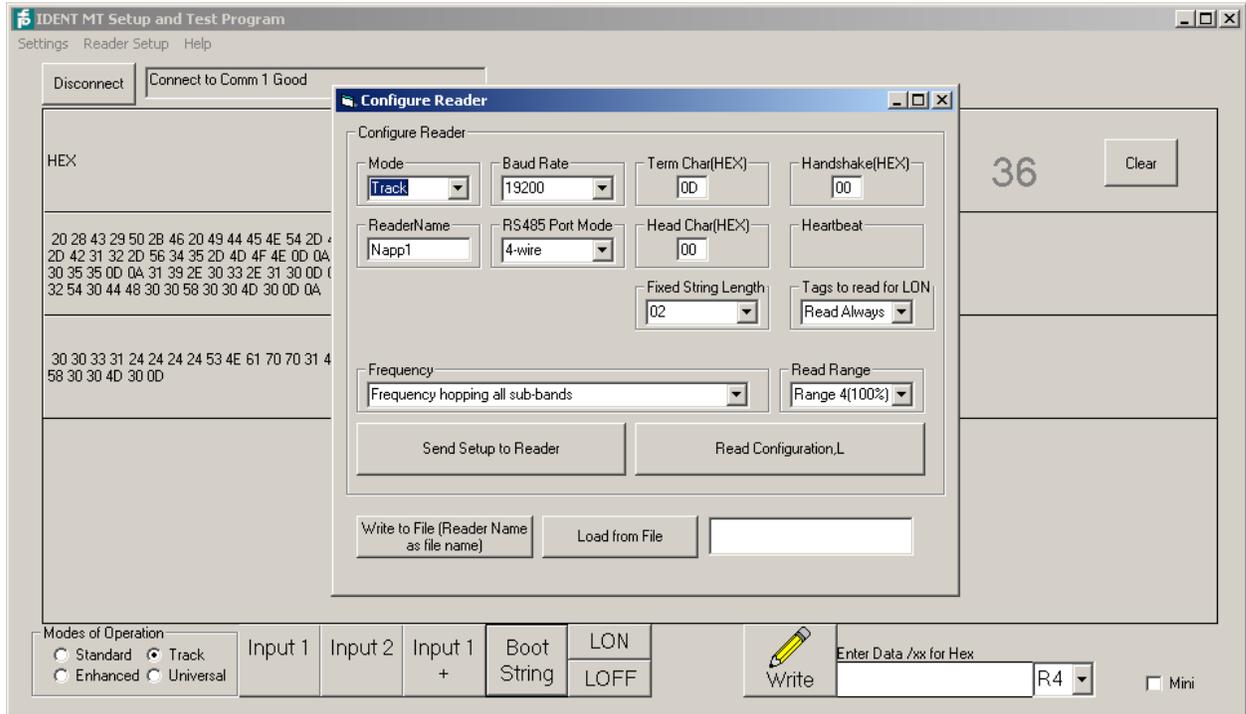
Close the port settings dialog box and press connect. It should say connected at the top. Press the Boot String button at bottom to verify that you have a Pepperl+Fuchs ID system connected.



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 our web site and send the firmware to the unit using PortVision.

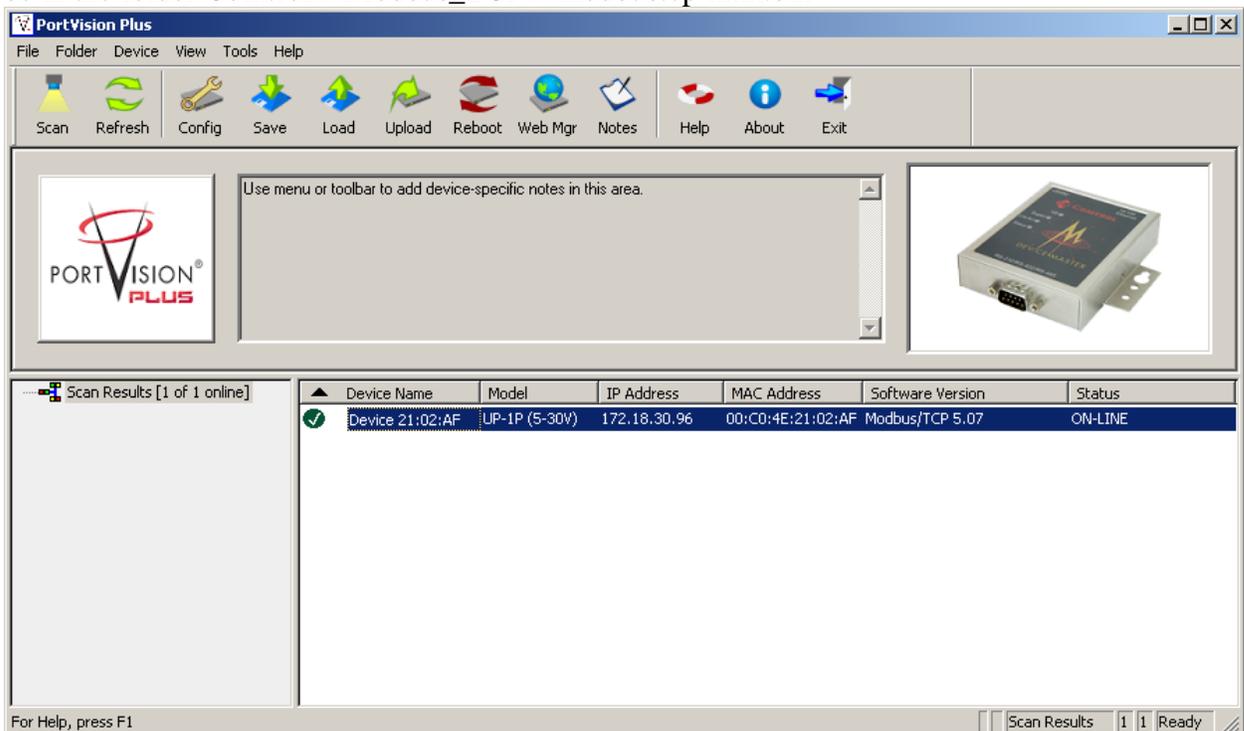
[Download and install Portvision](#)

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

Scanning for RTS-UP... devices and downloading firmware

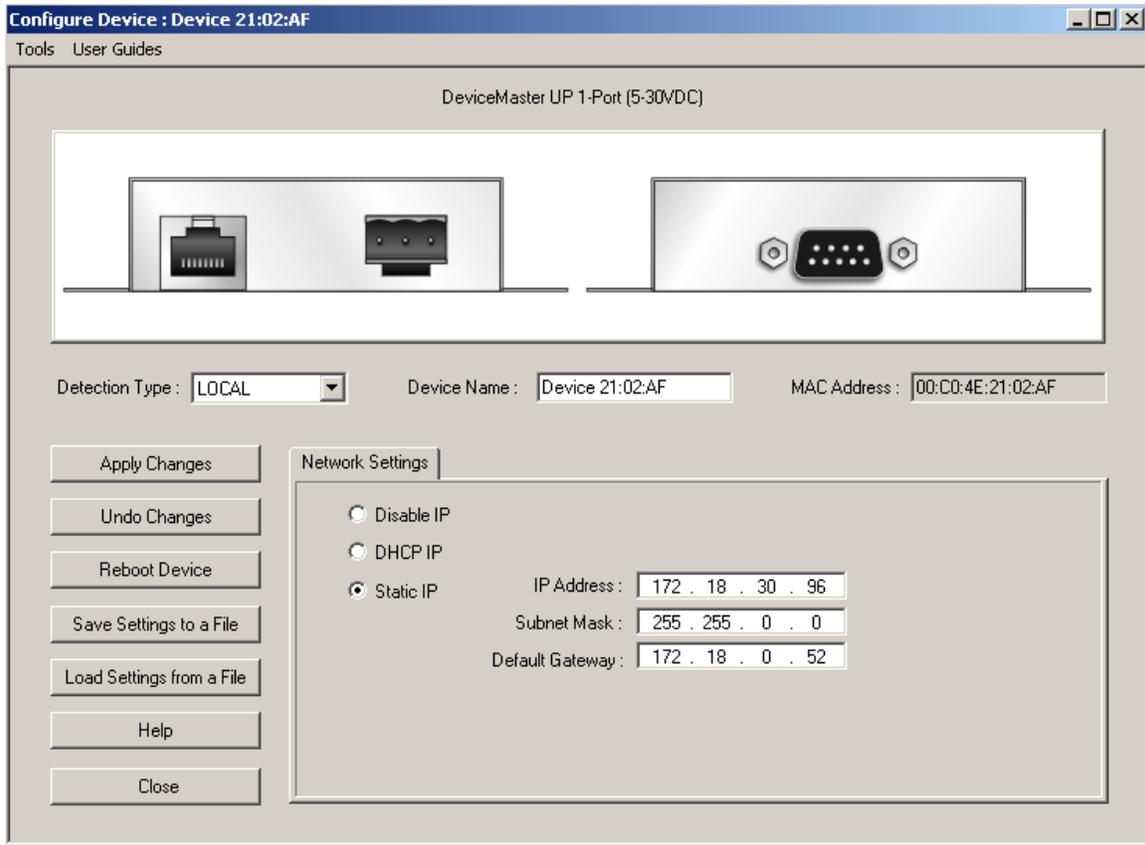
[Download the Modbus/TCP firmware](#)

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 Control > Modbus_TCP > modbustcp-x.xx.bin



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

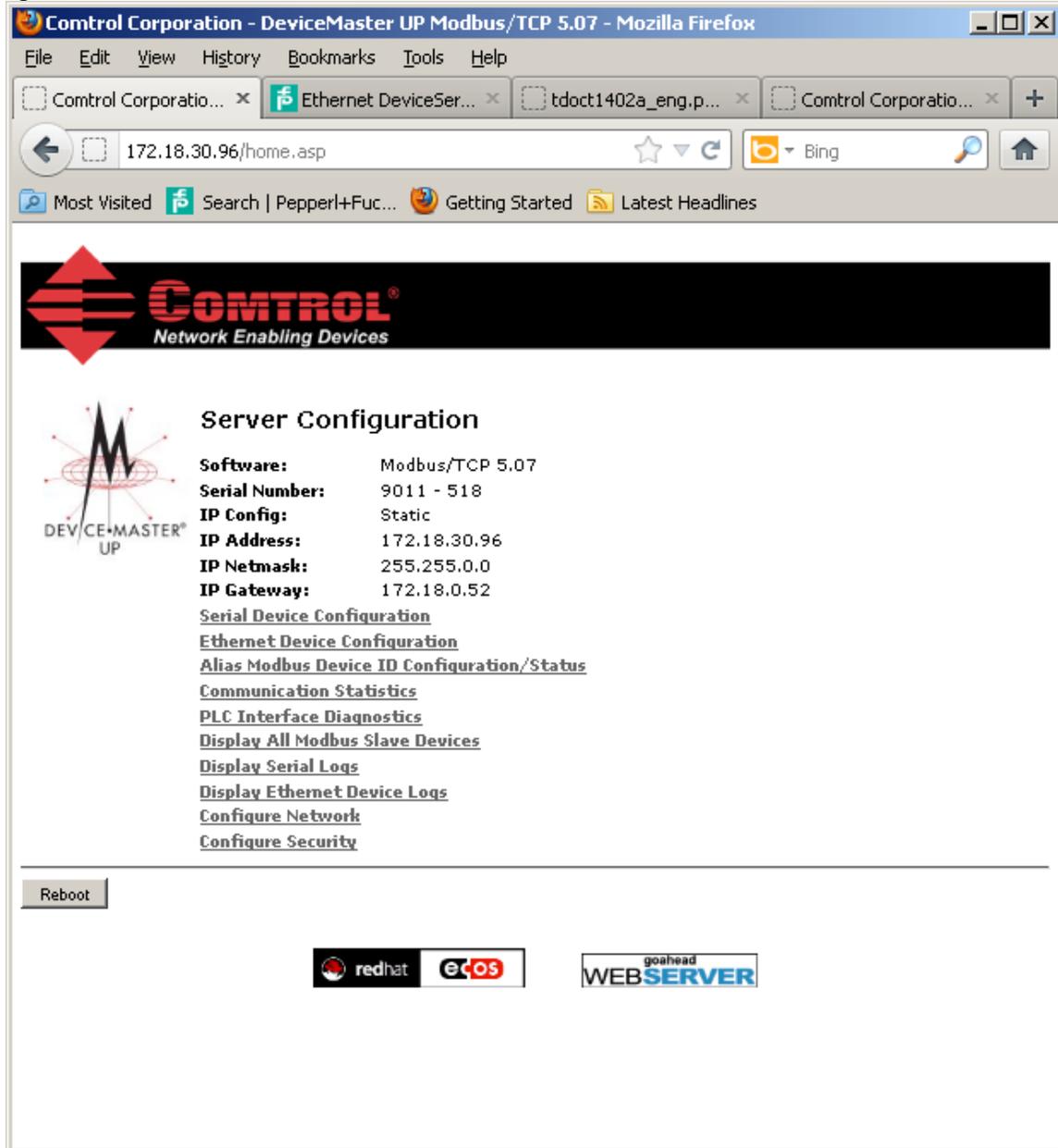
Using PortVision you can also double click on the scanned unit and configure the IP Address, subnet mask, and gateway.



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.



The screenshot shows a Mozilla Firefox browser window with the address bar displaying `172.18.30.96/home.asp`. The page title is "Control Corporation - DeviceMaster UP Modbus/TCP 5.07 - Mozilla Firefox". The browser's address bar includes a search engine (Bing) and a home button. The page content features the Control Corporation logo at the top, followed by a "Server Configuration" section. This section includes a "DEV/CE+MASTER UP" logo and a list of configuration parameters: Software (Modbus/TCP 5.07), Serial Number (9011 - 518), IP Config (Static), IP Address (172.18.30.96), IP Netmask (255.255.0.0), and IP Gateway (172.18.0.52). Below these parameters are several navigation links: [Serial Device Configuration](#), [Ethernet Device Configuration](#), [Alias Modbus Device ID Configuration/Status](#), [Communication Statistics](#), [PLC Interface Diagnostics](#), [Display All Modbus Slave Devices](#), [Display Serial Logs](#), [Display Ethernet Device Logs](#), [Configure Network](#), and [Configure Security](#). At the bottom of the page, there is a "Reboot" button and logos for Red Hat, eCos, and goahead WEB SERVER.

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

Modbus Slave and Raw-Data Device Settings
 Response Timeout: 250 (ms)
 Raw-Data Only
 Raw-Data Message Transfer Mode: Data-Stream
 Cmd/Resp Age Time, Discard Responses After: 10 (sec)
 Cmd/Resp Expected Responses Per Command: 1
 Cmd/Resp Mode Response To Modbus/TCP Based On: IP-Address

Serial Port Packet ID Settings (Raw-Data Only)
 STX (Start of Transmission) Rx Detect: none Byte 1: Byte 2: (dec)
 ETX (End of Transmission) Rx Detect: one byte Byte 1: 13 Byte 2: (dec)
 PLC Specific Settings
 STX (Start of Transmission) Tx Append: none Byte 1: Byte 2: (dec)
 ETX (End of Transmission) Tx Append: one byte Byte 1: 13 Byte 2: (dec)
 Strip Rx STX/ETX:
 Application Specific Settings
 STX (Start of Transmission) Tx Append: none Byte 1: Byte 2: (dec)
 ETX (End of Transmission) Tx Append: none Byte 1: Byte 2: (dec)
 Strip Rx STX/ETX:

Serial Modbus Master and Modbus/TCP Settings (Raw-Data Only)
 Rx (To PLC) Transfer Mode: Slave (PLC Polls)
 Tx (From PLC) Transfer Mode: Slave (PLC Writes)
 Maximum Rx Data Packet Size: 246 (bytes)
 Oversized Rx Packet Handling: Truncate
 Rx MS Byte First:
 Tx MS Byte First:
 Disable Non-Filtered To PLC Rx Queue (Data-Stream only):
 Disable Tx Sequence Number Check:

Modbus/TCP Master Rx/Tx Settings (Raw-Data only)
 PLC IP Address: 0.0.0.0
 PLC Device ID: 1 (1-255, 0=broadcast)
 Note: Use gateway's IP Address to access local Modbus Slaves.
 Master Rx Mode Only
 PLC Rx Data Address: 1 (Base 1)
 Maximum PLC Update Rate: 40 (msec)
 Use Maximum Sized Modbus Messages:
 Master Tx Mode Only
 PLC Tx Data Address: 1 (Base 1)
 PLC Tx Poll Rate: 100 (msec)
 PLC Tx Poll Message Length: 0 (bytes)
 Tx Sequence Number Syncing Enable:
 PLC Tx Consumed Sequence Number Address: 1 (Base 1)

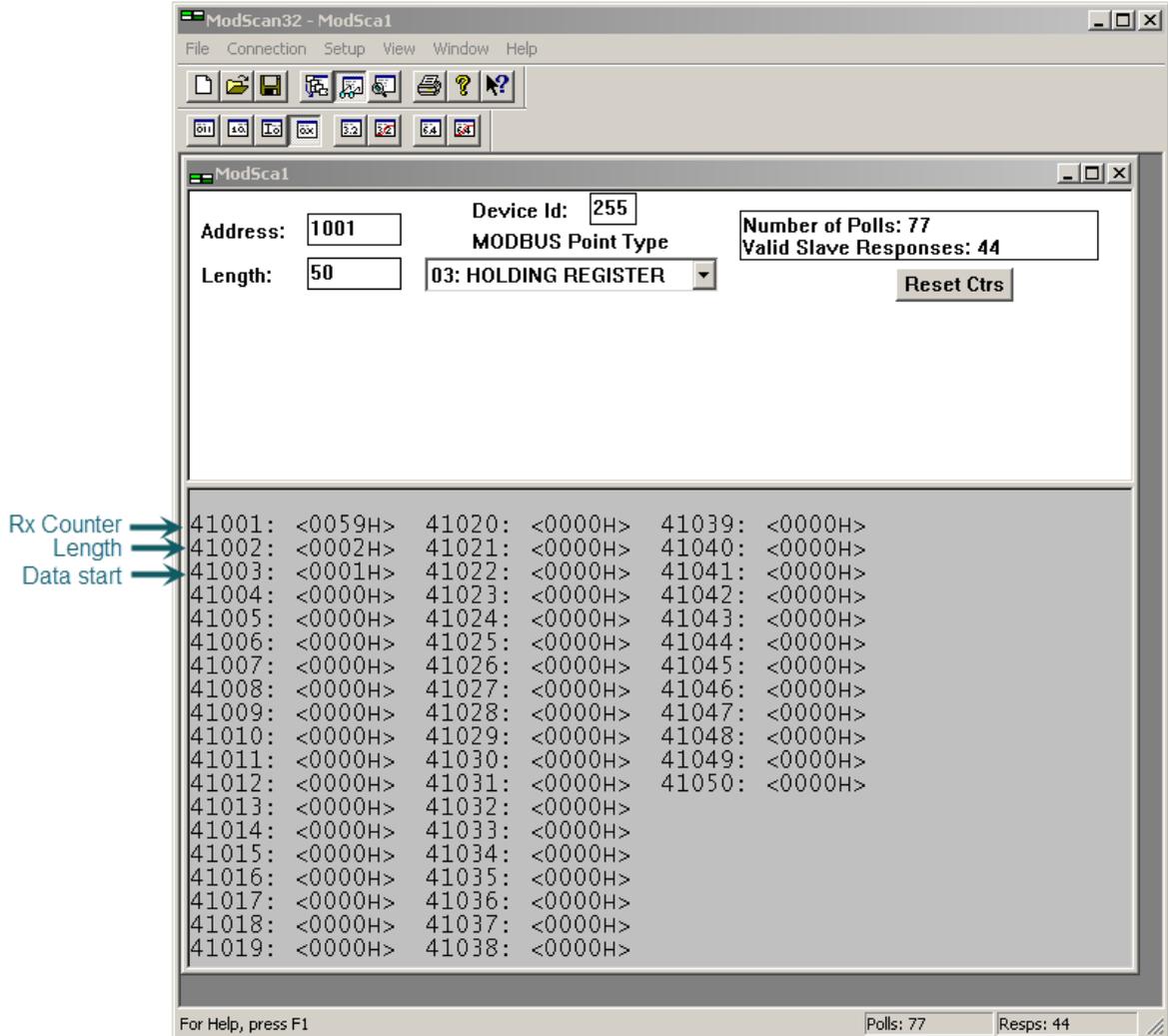
Filtering/Data Extraction Configuration (Raw-Data Only)
 To PLC Filter Mode: Off
 To PLC Filter Options (RFID Only): Antenna Filter Value Serial Number

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.



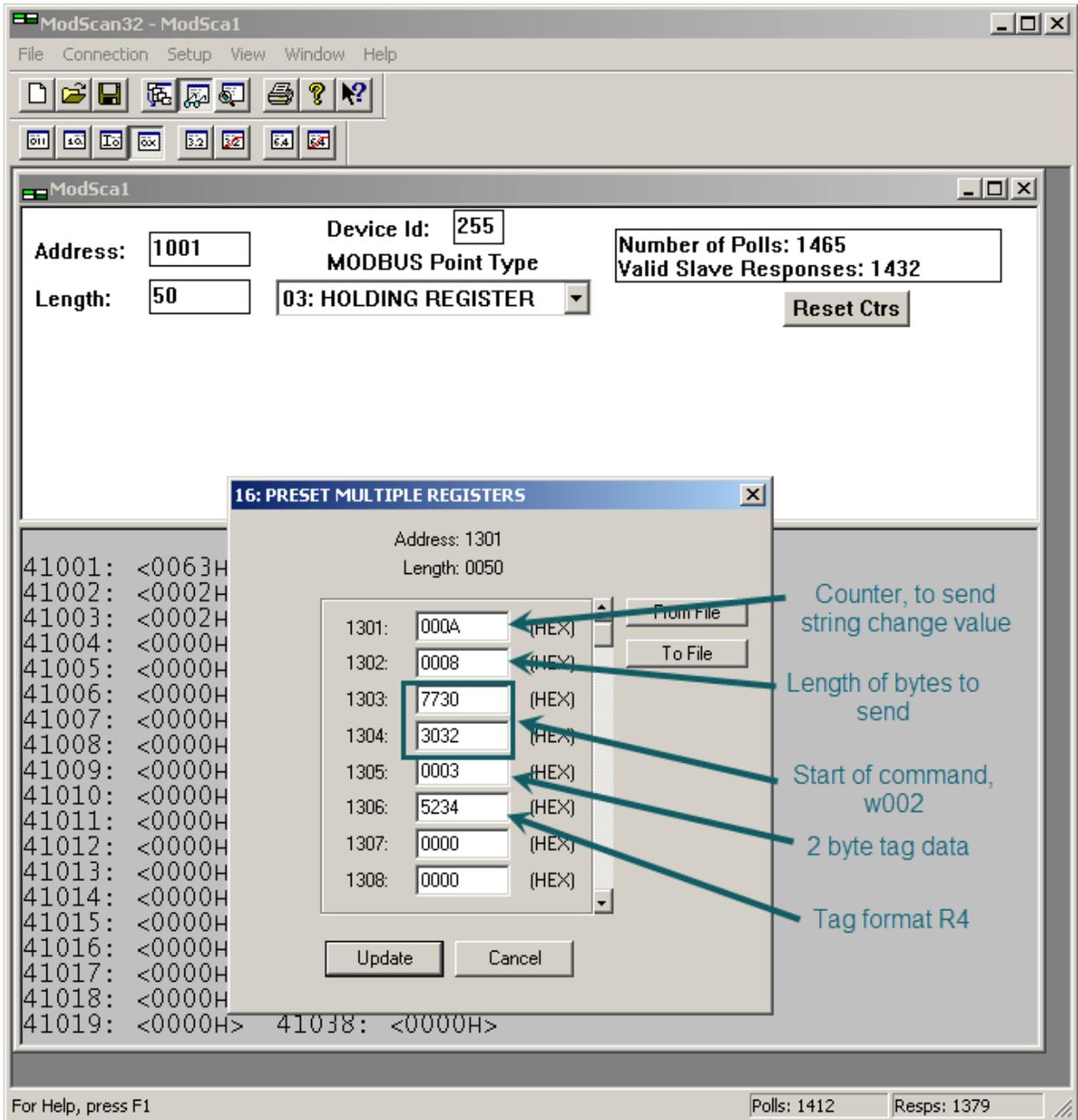
PLC Interface Diagnostics

- [Home](#) [Serial Interface Configuration](#) [Ethernet Device Configuration](#)
- [Display Serial Logs](#) [Display Ethernet Device Logs](#) [Alias Modbus Device ID Config/Status](#)
- [Communication Statistics](#) [PLC Interface Diagnostics](#) [Display All Modbus Slave Devices](#)

Modbus/TCP and Serial Modbus Master Statistics		<input type="button" value="Reset Statistics"/>
Modbus/TCP Slave Mode Specific Statistics		
Messages Received From PLC:	37	← PLC polls
Responses Sent To PLC:	37	
Raw Serial Port Data Messages Received From PLC:	37	
Raw Socket Port Data Messages Received From PLC:	0	
Modbus RTU/ASCII Messages Received From PLC:	0	
Modbus RTU/ASCII Broadcasts Received From PLC:	0	
Invalid Command Lengths:	0	
Invalid Message Data Errors:	0	
Unknown Request Destination IDs:	0	
Invalid Request Protocol Types:	0	
Unsupported Modbus Function Codes:	0	
Modbus/TCP Master Mode Specific Statistics		
Messages Sent To PLC:	0	
Responses Received From PLC:	0	
Invalid Response Data Errors:	0	
Error Responses:	0	
Unexpected Response Function Codes:	0	
Unknown Response Destination IDs:	0	
Invalid Response Protocol Types:	0	
Failed Modbus/TCP Connection Attempts:	0	
Modbus/TCP Connection Problems:	0	
No Available Modbus/TCP Connection Errors:	0	
Non-Mode Specific Statistics/Diagnostics		
Oversized Received Data Packet Errors:	0	
Improper Configuration Errors:	0	
System Resource Errors:	0	
Writes To Offline Ethernet Device on Socket 1:	0	
First Error Description:	No Error Detected	
Last Error Description:		
<input type="button" value="Reboot"/>		

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.



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.