

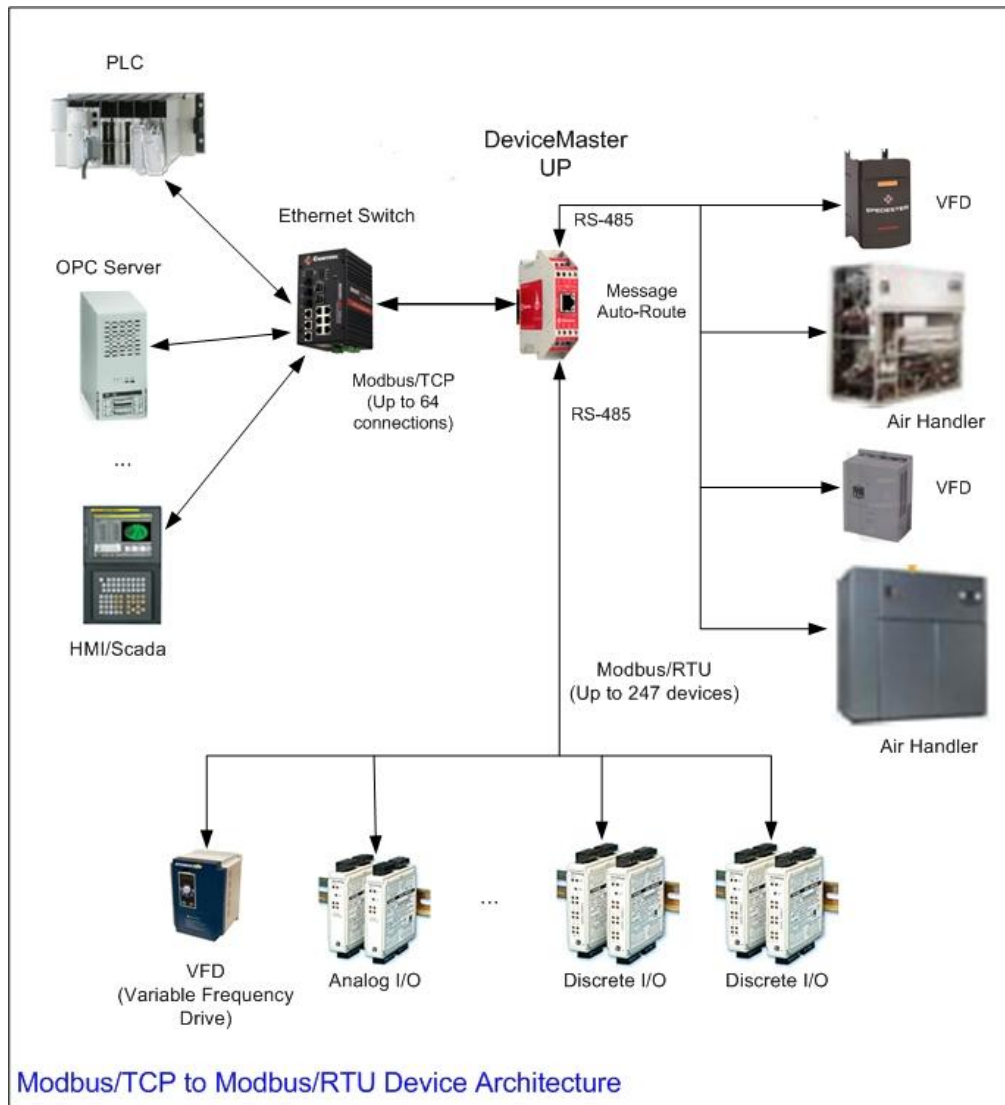
DeviceMaster® UP Modbus/TCP Technology



Modbus/TCP To Modbus/RTU Functionality

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1 Overview of Modbus/RTU Device Connectivity



- Simple configuration via embedded web pages.
- A maximum of 64 Modbus/TCP connections per gateway (slave and/or master).
- Advanced Modbus/TCP Master to Modbus/RTU slave functionality. Up to 247 Modbus/RTU devices per gateway with no limit on each serial port.
- Detailed status, diagnostic, and statistics web pages help monitor devices and diagnose problems.
- Automatically locates devices and routes messages.
- Can automatically re-locate lost devices due to re-cabling.
- Configurable response timeouts.
- PortVision Plus save/restore configuration to file capabilities.

2 Configuring the Serial Port to Modbus/RTU Mode

Each serial port must be configured to Modbus/RTU mode. Complete the following steps to configure a serial port for Modbus/RTU:

Open the home web page of the DeviceMaster UP by either:

1. Opening a web browser and typing in the DeviceMaster UP.
2. Using PortVision Plus, scan for DeviceMaster UP modules. Right click on the desired DeviceMaster UP and select Web manager.



3. Click on the [Serial Device Configuration](#) web page link. The following page will appear:

The screenshot shows a Microsoft Internet Explorer browser window displaying the 'Serial Device Configuration' page. The address bar shows 'http://10.0.0.103/homeSerial.asp?'. The page features the Control Corporation logo and a list of navigation links: [Server Configuration Home](#), [Ethernet Device Configuration](#), [Communication Statistics](#), [PLC Interface Diagnostics](#), and [Display Serial Logs](#).

The main content area contains three configuration tables:

	Port 1	Port 2
Serial Port Settings		
Mode:	RS-232	RS-232
Baud:	9600	9600
Parity:	none	none
Data Bits:	8	8
Stop Bits:	1	1
Flow:	none	none
DTR:	off	off
Rx Timeout Between Packets:	200	200
General Protocol Settings		
Serial Port Protocol:	Raw-Data	Raw-Data
Discard Rx Pkts With Errors:	yes	yes
Modbus/RTU Protocol Settings		
Response Timeout (ms):	N/A	N/A
Lost Device Search Enable:	N/A	N/A
Display Devices (all)		
Serial Packet ID Settings (Raw-Data Only)		

4. Click on the Port N web page link. The following page will appear:

Control Corporation - DeviceMaster UP Modbus/TCP 4.08 - Microsoft Internet Explorer

Address: <http://10.0.0.103/editPort.asp?portNum=0>

CONTROL
Network Enabling Devices

Edit Port 1 Configuration

Serial Configuration

Mode: RS-232

Baud: 9600

Parity: none

Data Bits: 8

Stop Bits: 1

Flow: none

DTR: off

Rx Timeout Between Packets: 200 (ms)

General Protocol Settings

Serial Port Protocol: Raw-Data

Discard Rx Packets With Errors:

Modbus/RTU Protocol Settings

Device Response Timeout: 250 (ms)

Lost Device Search Enable:

5. Set up the **Serial Configuration** for your environment.
 - a. Select the applicable *Mode*, *Baud Rate*, *Parity*, *Data Bits*, *Stop Bits*, *Flow Control*, and *DTR*.
 - b. The default *Rx Timeout Between Packets* of 200 msec should be adequate for most systems.
6. Under **General Protocol Settings**:
 - a. Set the *Serial Port Protocol* to **Modbus/RTU**.
 - b. Select the *Discard Rx Packets With Errors* option to monitor hardware related errors such as incorrect parity and overflow errors.
7. Under **Modbus/RTU Protocol Settings**:
 - a. Set the *Device Response Timeout* to at least the maximum response time of your Modbus/RTU devices. (The Modbus/RTU device response times can be monitored with the Known Modbus/RTU Device List web page.)

- b. For DeviceMaster UP units with multiple ports configured as Modbus/RTU only: Select the *Lost Device Search Enable* only if you want the DeviceMaster to attempt to relocate inactive Modbus/RTU devices. This setting is recommended only if there is a possibility of cables being moved between the serial ports.
8. The rest of the settings on the Edit Port page are not applicable for Modbus/RTU.
 - a. Verify that the **Application TCP Connection Configuration** is disabled. (The *Enable* option should not be selected.)

DeviceMaster UP Modbus/TCP to Modbus/RTU Functionality – Version 0.01

Serial Packet ID Settings (Raw-Data Only)
STX (Start of Transmission) Rx Detect: Byte 1: Byte 2: (dec)
ETX (End of Transmission) Rx Detect: Byte 1: Byte 2: (dec)

PLC Specific Settings
STX (Start of Transmission) Tx Append: Byte 1: Byte 2: (dec)
ETX (End of Transmission) Tx Append: Byte 1: Byte 2: (dec)
Strip Rx STX/ETX:

Application Specific Settings
STX (Start of Transmission) Tx Append: Byte 1: Byte 2: (dec)
ETX (End of Transmission) Tx Append: Byte 1: Byte 2: (dec)
Strip Rx STX/ETX:

Modbus/TCP Settings (Raw-Data Only)
Rx (To PLC) Transfer Mode:
Tx (From PLC) Transfer Mode:
Maximum Rx Data Packet Size: (bytes)
Oversized Rx Packet Handling:
Rx MS Byte First:
Tx MS Byte First:
Disable Non-Filtered To PLC Rx Queue:

Master Rx/Tx Modes
PLC IP Address:
PLC Device ID: (1-255, 0=broadcast)

Master Rx Mode Only
PLC Rx Data Address: (Base 1)
Maximum PLC Update Rate: (msec)

Master Tx Mode Only
PLC Tx Data Address: (Base 1)
PLC Tx Poll Rate: (msec)
PLC Tx Poll Message Length: (bytes)
Tx Sequence Number Syncing Enable:
PLC Tx Consumed Sequence Number Address: (Base 1)

Filtering/Data Extraction Configuration (Raw-Data Only)
To PLC Filter Mode:
To PLC Filter Options (RFID Only): Antenna Filter Value Serial Number
To PLC Filter Options (RFID/Barcode): Company Product/Location Encoding/Numbering
To Application Filter Mode:
To Application Filter Options (RFID Only): Antenna Filter Value Serial Number
To Application Filter Options (RFID/Barcode): Company Product/Location Encoding/Numbering
RFID Antenna Grouping:
RFID Reader Interface Type:
Barcode UPC/EAN Standard 12-14 Digit Format:
Barcode UPC/EAN Eight Digit Format:
Filter Age Time (Time filtered after last read): (min) (sec) (msec)
Discard Unrecognized Data (RFID/Barcode):

Application TCP Connection Configuration (Raw-Data Only)
Enable:
Listen:
Listen Port:
Connect To Mode:
Connect Port:
Connect IP Address:
Disconnect Mode:
Idle Timer: (msec)

Reset Statistics Reset Port Save in Flash

9. Verify that *Reset* and *Save in Flash* are selected and click on **Submit**.

10. Open the Ethernet Device Configuration web page.
 - a. These settings are not used for Modbus/RTU connectivity.
 - b. Unless if Ethernet TCP/IP raw data communication is required, verify that all Socket connections are disabled. All **Device TCP Connection** and **Application TCP Connection** configuration should be disabled (not *Enabled*).

CONTROL
Network Enabling Devices

Ethernet Device Configuration (Raw-Data Only)

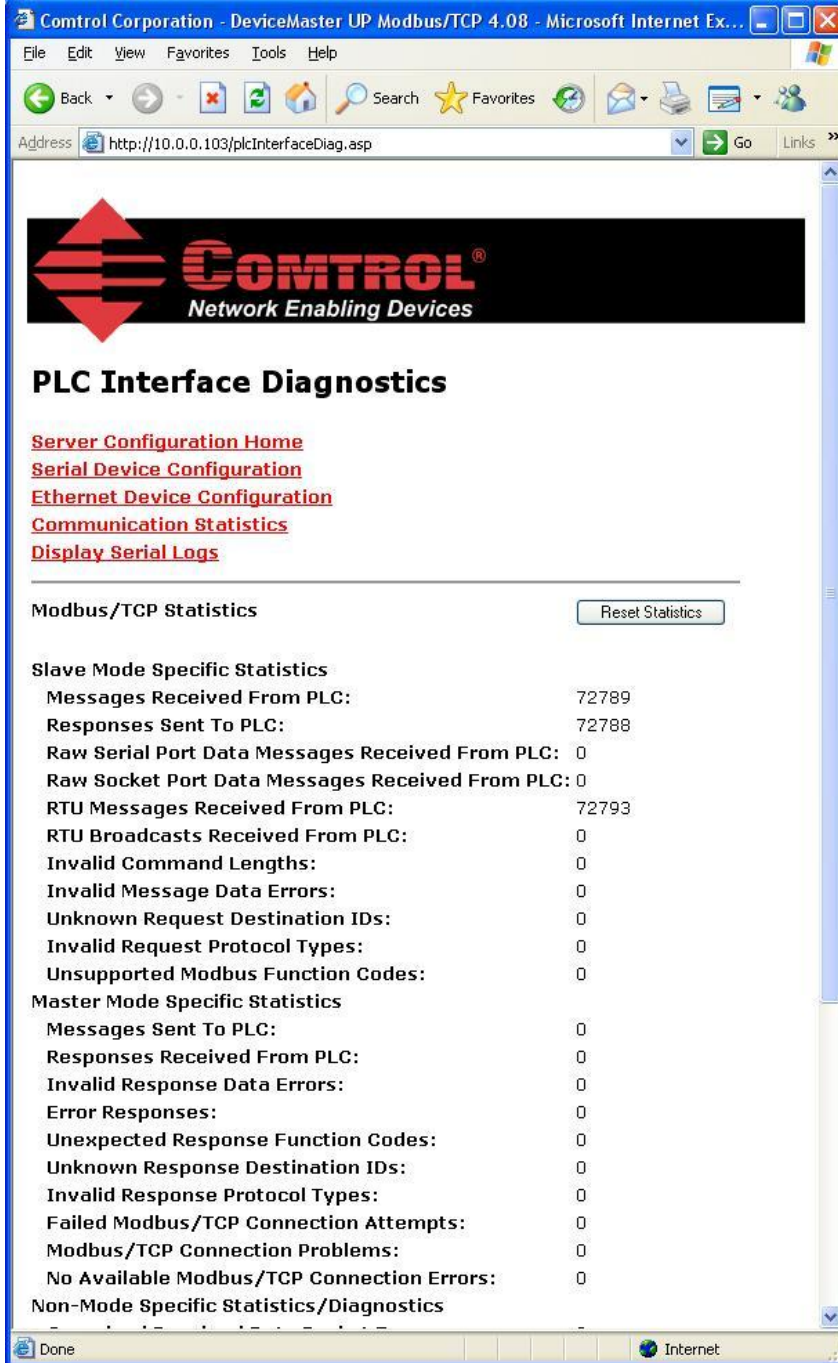
[Server Configuration Home](#)
[Serial Device Configuration](#)
[Communication Statistics](#)
[PLC Interface Diagnostics](#)
[Display Ethernet Device Logs](#)

	Socket 1	Socket 2	Socket 3	Socket 4
Device TCP Connection Configuration				
Enabled:	No	No	No	No
Listen:	No	No	No	No
Listen Port:	8000	8001	8002	8003
Connect To Mode:	Never	Never	Never	Never
Connect Port:	8010	8011	8012	8013
Connect IP Address:	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
Disconnect Mode:	Never	Never	Never	Never
Idle Timeout:	0	0	0	0
Device TCP Connection Status				
Remote Connection:	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0
Socket Packet ID Settings				
Rx Timeout Between Packets:	0	0	0	0
STX Rx Detect:	none	none	none	none
STX Rx:				
ETX Rx Detect:	none	none	none	none
ETX Rx:				
PLC Specific Settings				
STX Tx Append:	none	none	none	none
STX Tx:				
ETX Tx Append:	none	none	none	none
ETX Tx:				
Strip Rx STX/ETX Chars:	no	no	no	no

3 Informational Embedded Web Pages

3.1 PLC Interface Diagnostics page

- Provides statistics and error messages to monitor and help diagnose PLC interface problems.



3.2 Modbus/RTU device statistics page:

A comprehensive status/statistics page for all known Modbus/RTU devices. Provides active/inactive status, timeouts, response times, transmit and receive message statistics.

The screenshot shows the 'Known Modbus/RTU Device List' page in a Microsoft Internet Explorer browser. The page features the CONTROL logo and navigation links for 'Server Configuration Home', 'Serial Device Configuration', and 'Communication Statistics'. The data is organized into four sections: Port 1, Port 2, Port 3, and Port 4. Each section contains a table with columns for DeviceId, Active?, Tx Requests, Rx Responses, Timeouts, Last Rsp Time, Avg Rsp Time, Min Rsp Time, Max Rsp Time, Tx Broadcasts, and Invalid Responses.

Port 1 Devices:											
DeviceId	Active?	Tx Requests	Rx Responses	Timeouts	Last Rsp Time	Avg Rsp Time	Min Rsp Time	Max Rsp Time	Tx Broadcasts	Invalid Responses	
1	Yes	5472	5471	0	0.15 sec	0.15 sec	0.14 sec	0.19 sec	0	0	
2	Yes	5471	5471	0	0.15 sec	0.15 sec	0.14 sec	0.42 sec	0	0	
3	Yes	5472	5472	0	0.16 sec	0.16 sec	0.14 sec	0.31 sec	0	0	
Port 2 Devices:											
DeviceId	Active?	Tx Requests	Rx Responses	Timeouts	Last Rsp Time	Avg Rsp Time	Min Rsp Time	Max Rsp Time	Tx Broadcasts	Invalid Responses	
6	Yes	5471	5471	0	0.14 sec	0.15 sec	0.14 sec	0.39 sec	0	0	
7	Yes	5471	5471	0	0.15 sec	0.15 sec	0.14 sec	0.19 sec	0	0	
Port 3 Devices:											
DeviceId	Active?	Tx Requests	Rx Responses	Timeouts	Last Rsp Time	Avg Rsp Time	Min Rsp Time	Max Rsp Time	Tx Broadcasts	Invalid Responses	
4	Yes	5472	5472	0	0.14 sec	0.13 sec	0.05 sec	0.33 sec	0	0	
5	Yes	5472	5472	0	0.14 sec	0.14 sec	0.12 sec	0.17 sec	0	0	
75	Yes	878	878	0	0.14 sec	0.14 sec	0.05 sec	0.16 sec	0	0	
Port 4 Devices:											
DeviceId	Active?	Tx Requests	Rx Responses	Timeouts	Last Rsp Time	Avg Rsp Time	Min Rsp Time	Max Rsp Time	Tx Broadcasts	Invalid Responses	
8	Yes	1339	1339	0	0.14 sec	0.14 sec	0.12 sec	0.28 sec	0	0	

3.3 Serial/Ethernet Device Communication Statistics page:

A comprehensive statistics page for all serial and Ethernet device interfaces. This includes packet, byte, and error counts to the PLC(s).

Serial/Ethernet Device Communication Statistics

[Server Configuration Home](#)
[Serial Device Configuration](#)
[Ethernet Device Configuration](#)
[PLC Interface Diagnostics](#)
[Display All Modbus/RTU Devices](#)
[Display Serial Logs](#)
[Display Ethernet Device Logs](#)

Serial Device Interface Statistics

	Port-1	Port-2	Port-3	Port-4
TX Byte Count:	127632	85072	91904	298304
TX Pkt Count:	15954	10635	11489	37289
RX Byte Count:	398850	265850	287200	932225
RX Pkt Count:	15954	10635	11489	37290
Parity Error Count:	0	0	0	0
Framing Error Count:	0	0	0	0
Overrun Error Count:	0	0	0	0
To PLC Dropped Packet Count:	0	0	0	0
To PLC Truncated Packet Count:	N/A	N/A	N/A	N/A
Tx Unexpected Seq Errors:	N/A	N/A	N/A	N/A
Invalid RTU Device Responses:	0	0	0	0
RTU Device Timeouts:	0	0	0	0
Filtering Statistics				
Valid Data Items Sent to PLC Interface:	N/A	N/A	N/A	N/A
Valid Data Items Filtered From PLC:	N/A	N/A	N/A	N/A

