

Modbus TCP Parameters for Powercast Wireless Sensor System

Network Information for Demonstration

IP Address: 70.89.109.165
 Port: 502
 Device ID: 1
 Location: Powercast office (Pittsburgh, PA)

Modbus TCP Registers

Array	Starting Address	Length	Type	Description
TXID	30001	100	Integer	Transmitter ID (only used for RF-powered nodes, not used for this demonstration)
PWR	30101	100	Integer	Battery voltage, displayed as 2-digit integer (e.g. 3.6V = 36, 5.4V = 54) or RSSI (1-5) or received RF-power.
SECS	30201	100	Integer	Time (seconds) since last update. This is refreshed at 10 second intervals in groups of 10 (e.g. 1-10, 11-20, 21-30, etc).
S1	30301	100	Integer	Sensor input 1, scaled up 10x
S2	30401	100	Integer	Sensor input 2, scaled up 10x
S3	30501	100	Integer	Sensor input 3, scaled up 10x
S4	30601	100	Integer	Sensor input 4, scaled up 10x
S5	30701	100	Integer	Sensor input 5, scaled up 10x
S6	30801	100	Integer	Sensor input 6, scaled up 10x
S7	30901	100	Integer	Sensor input 7, scaled up 10x
S8	31001	100	Integer	Sensor input 8, scaled up 10x
STATUS	31101	10	Integer	Gateway Status Parameters, not used in this demo

Note: Modbus TCP only allows integer values

Note: Up to 100 sensors can be configured per gateway.

Note: S2 – S8 are not used on all devices.

Node Assignment

The wireless sensor devices sending data to Powercast’s Modbus TCP gateway are listed below.

Node	Sensor Part Number	Type	S1-S8
1	WSN-1101-TH	Temp / Humidity	S1=T (°F), S2=H (%)
2	WSN-1101-TH	Temp / Humidity	S1=T (°F), S2=H (%)
3	WSN-1101-TH	Temp / Humidity	S1=T (°F), S2=H (%)
4	WSN-1101-TH	Temp / Humidity	S1=T (°F), S2=H (%)
5	WSN-1101-L	Light	S1=L (lux)
6	WSN-1101-T2XT	Temp + 2 External	S1=T (°F), S2=mV, S3=mV
7	WSN-1102-CO2	CO2	S1=CO2 (ppm)

Note: The external inputs available through S2 and S3 for Node 6 (WSN-1101-T2XT) are millivolt readings from 10K RTDs.

Testing with Modscan

Modscan is a Modbus MASTER device for accessing Modbus data points. The “free” unregistered version allows for connections with a time limit of 3 minutes.

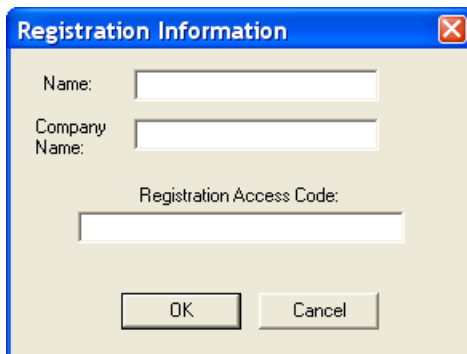
Description

<http://www.win-tech.com/html/modscan32.htm>

Download page

<http://www.win-tech.com/html/demos.htm>

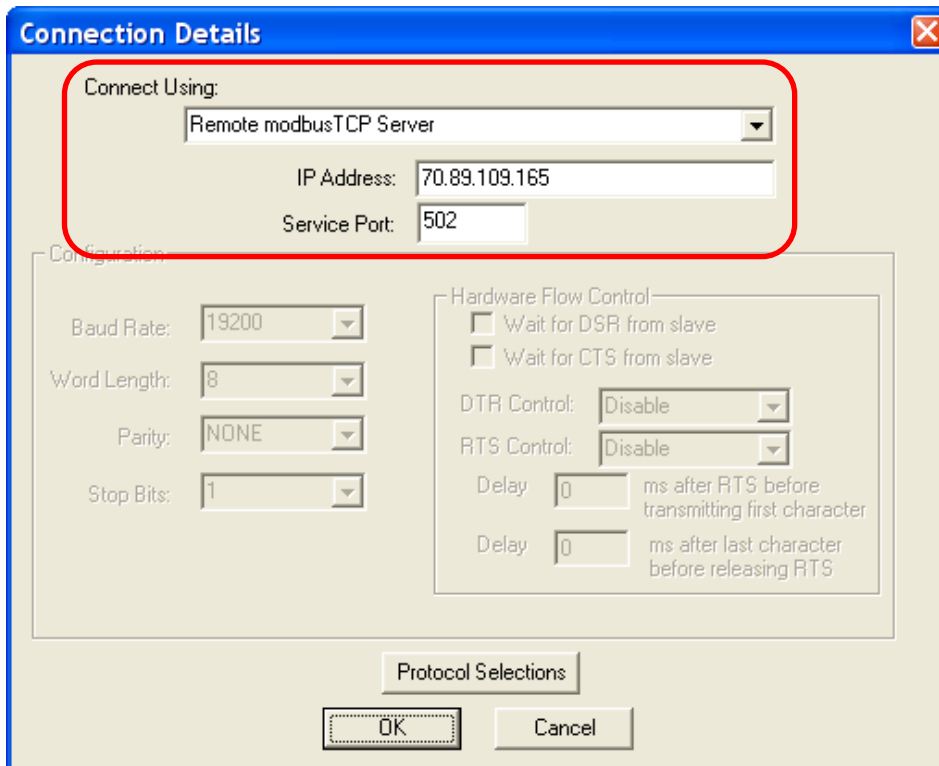
For Modscan32, no installation is needed, just unzip the files into a directory and run the application.



The "Registration Information" dialog box contains three text input fields: "Name:", "Company Name:", and "Registration Access Code:". At the bottom, there are two buttons: "OK" and "Cancel".

Click “Cancel” to proceed without registering.

Once the application is open select “Connection” from the menu bar, then select “Connect” from the drop down menu. Enter the IP address and port number.



The "Connection Details" dialog box features a "Connect Using:" dropdown menu with "Remote modbusTCP Server" selected. Below it are text boxes for "IP Address:" (70.89.109.165) and "Service Port:" (502). A "Configuration" section includes "Baud Rate:" (19200), "Word Length:" (8), "Parity:" (NONE), and "Stop Bits:" (1). A "Hardware Flow Control" section has checkboxes for "Wait for DSR from slave" and "Wait for CTS from slave", both unchecked. It also includes "DTR Control:" (Disable), "RTS Control:" (Disable), and two "Delay:" fields (both 0) with descriptive text. At the bottom, there is a "Protocol Selections" button and "OK" and "Cancel" buttons.

S1 Data Array

Enter and select the parameters as shown below to see the values of the S1 data array.

The screenshot shows the ModScan32 software interface. The main window is titled "ModSca1" and contains the following configuration fields:

- Address: 0301
- Length: 100
- Device Id: 1
- MODBUS Point Type: 04: INPUT REGISTER
- Number of Polls: 166
- Valid Slave Responses: 164
- Reset Ctrs button

The data array results are displayed in a table below the configuration fields. The first few rows are highlighted with a red box:

30301	<	70	>	30326	<	0	>	30351	<	0	>	30376	<	0	>
30302	<	73	>	30327	<	0	>	30352	<	0	>	30377	<	0	>
30303	<	69	>	30328	<	0	>	30353	<	0	>	30378	<	0	>
30304	<	73	>	30329	<	0	>	30354	<	0	>	30379	<	0	>
30305	<	79	>	30330	<	0	>	30355	<	0	>	30380	<	0	>
30306	<	69	>	30331	<	0	>	30356	<	0	>	30381	<	0	>
30307	<	535	>	30332	<	0	>	30357	<	0	>	30382	<	0	>
30308	<	0	>	30333	<	0	>	30358	<	0	>	30383	<	0	>
30309	<	0	>	30334	<	0	>	30359	<	0	>	30384	<	0	>
30310	<	0	>	30335	<	0	>	30360	<	0	>	30385	<	0	>
30311	<	0	>	30336	<	0	>	30361	<	0	>	30386	<	0	>
30312	<	0	>	30337	<	0	>	30362	<	0	>	30387	<	0	>
30313	<	0	>	30338	<	0	>	30363	<	0	>	30388	<	0	>
30314	<	0	>	30339	<	0	>	30364	<	0	>	30389	<	0	>
30315	<	0	>	30340	<	0	>	30365	<	0	>	30390	<	0	>
30316	<	0	>	30341	<	0	>	30366	<	0	>	30391	<	0	>
30317	<	0	>	30342	<	0	>	30367	<	0	>	30392	<	0	>
30318	<	0	>	30343	<	0	>	30368	<	0	>	30393	<	0	>
30319	<	0	>	30344	<	0	>	30369	<	0	>	30394	<	0	>
30320	<	0	>	30345	<	0	>	30370	<	0	>	30395	<	0	>
30321	<	0	>	30346	<	0	>	30371	<	0	>	30396	<	0	>
30322	<	0	>	30347	<	0	>	30372	<	0	>	30397	<	0	>
30323	<	0	>	30348	<	0	>	30373	<	0	>	30398	<	0	>
30324	<	0	>	30349	<	0	>	30374	<	0	>	30399	<	0	>
30325	<	0	>	30350	<	0	>	30375	<	0	>	30400	<	0	>

The status bar at the bottom of the window shows: ModScan32 - (70.89.109.165) Polls: 166 Resps: 164

Change the Address field to see different data arrays:

- 0101 Battery Voltage
- 0201 Time since last data received
- 0301 Sensor Input 1 (S1)
- 0401 Sensor Input 2 (S2)
- 0501 Sensor Input 3 (S3)