# QUCM SNMP POLLER
Installation and Programming Manual

This Manual describes the QUCM application for interfacing SNMP devices to a POWERLOGIC system.

Effective: 06 January, 2004

NR&D
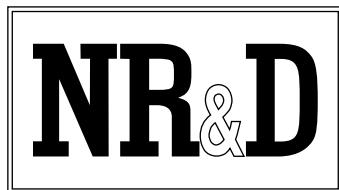
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Introduction

The Niobrara QUCM is a TSX Quantum® compatible module that is capable of running multiple applications for performing communication translations between serial protocols. This document covers an application that places Simple Network Management Protocol (SNMP) devices such as a UPS on a Square D POWERLOGIC® network as Modbus/TCP compatible devices. This setup allows existing Liebert and APC UPS and generic RFC-1628 UPS equipment to be integrated into the POWERLOGIC System Manager Software system via Modbus/TCP Ethernet.

Two applications are required to be loaded into the QUCM: app1.qcm is the SNMP ethernet driver and Modbus/TCP server, app2.qcm is the web server used for configuration and data display. Both of these applications must be running for the system to properly perform.

The two serial ports of the QUCM are typically not used for this application. Usually, the UPS has an Ethernet connection or an external device to provide the Ethernet SNMP connection.

Up to 8 SNMP devices may be configured within the QUCM.   The QUCM supports Liebert Model 300 UPS, Liebert PMP, Liebert 600 UPS, Liebert 600 Control Module, APC UPS, APC DC Power Plant, generic RFC-1628 UPSs such as the Powerware ConnectUPS, Eltek Power Conversion Products TCP/IP Gate, and Invensys SM50. The QUCM generates SNMP queries to gather the data from each UPS and stores the data for access via Modbus/TCP. These devices are accessed via Modbus/TCP by selecting the Destination Index assigned to each slave (1-8).

The Niobrara QXPB-001 single-slot rack with built in power supply is needed for stand-alone applications. A Modicon two (or more) slot Quantum rack and appropriate Quantum power supply may be used for mounting multiple QUCMs.

The SMS server is connected to the QUCM via Modbus/TCP Ethernet. The QUCM-SE will support up to 6 simultaneous Modbus/TCP clients for access to the SNMP data and PowerLogic/Modbus data.

<div align="right">

2
Installation

</div>

Module Installation

1   Mount the QUCM in an available slot in the register rack. Secure the screw at the bottom of the module.

Software Installation

The application files for the QUCM are included in the SNMP.ZIP file. This file must be unzipped using PKUNZIP.EXE. A copy of PKUNZIP is included on the standard NR&D software disk and is also available at www.niobrara.com. The latest version of the LIEBERT.ZIP file is located at

> http://www.niobrara.com/ftp/qucm/liebert/liebert.zip

The latest version of this document in pdf format is located at:

> http://www.niobrara.com/ftp/qucm/liebert/liebert.pdf

Serial Connections to the QUCM-LE

Port 2 to the Personal Computer

A physical connection must be made from the personal computer to the QUCM in order to download the applications. This link may be a serial connection from a COM port on the personal computer to the RS-232 port on the QUCM-LE.   The Niobrara MM1 cable may be used for this connection. This cable is shown in Figure 2-1. The mode control switch for Port 1 must be set to RS-232.

```
        RJ45                                              DE9S (female)
          3 ─────────────────────────────────────────── 2
          4 ─────────────────────────────────────────── 3
          5 ─────────────────────────────────────────── 5
          6 ─┐                                       ┌─ 4
          7 ─┘                                       └─ 6
                                                     ┌─ 7
                                                     └─ 8
```
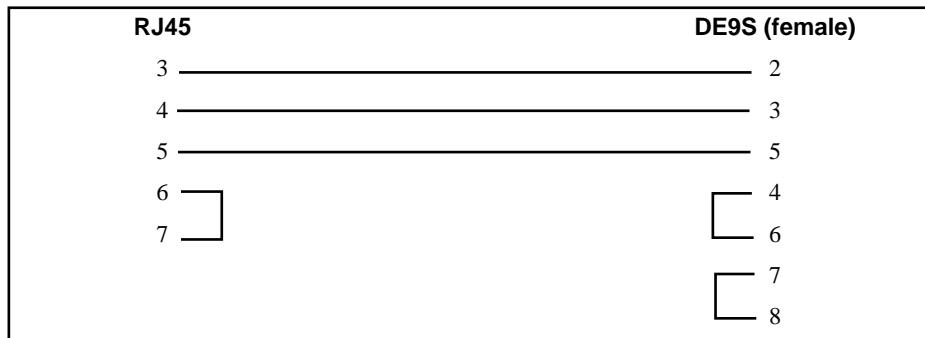
Figure 2-1 QUCM-SE to RS-232 PC DCE Port (9-pin) (MM1 Cable)

Loading the Applications into the QUCM

The QUCM is rapidly evolving so be sure to upgrade the firmware in the module before loading the latest version of APP1.QCC. Most likely the QCOMPILE.EXE has been updated so be sure to use the newest version. Firmware upload is as follows:

1   Remove the module form the rack.

2   Move the RUN/LOAD switch on the back of the module to LOAD.

3   Replace the module in the rack and apply power.

4   Only the 3 light should be on. (The Link and RX E-net lights may be on if the E-net port is connected and there is traffic.)

5   Connect the PC to QUCM Port 1 with a MM1 cable.

6   From the command line enter
        > ntload qucmtcpl.fwl com1:
    Be sure to have the colon after the PC's com port name. The download will only take a few minutes and will inform when finished.

7   Remove the module from the rack and change the switch back to RUN.

8   It is a good idea to press the RESET button after a firmware change.

It is recommended to use the Ethernet capabilities of QLOAD to load APP1.QCC and APP2.QCC into the QUCM. Set up the IP parameters of the module by the following method:

1   Move Switch 1 to Halt.

2   Connect the PC to QUCM Port 1 with a MM1 cable.

3   From the command line enter
        >zapreg32 com1:9600,e,8,1 255 -b
    This will start zapreg32 in Modbus RTU mode to slave address 255. Use the arrow and Page Up/Down keys to move to register 46. The IP parameters are shown below for a unit with the IP = 206.223.51.150 subnet Mask = 255.255.255.0, Default Gate = 206.223.51.1, Modbus/TCP port number = 503, Internal Web Port number = 8080:

Register	Description	Example (decimal)
46	IP MSByte	206
47	IP	223
48	IP	51
49	IP LSByte	150
50	SN Mask	255
51	SN Mask	255
52	SN Mask	255
53	SN Mask	0
54	Def. Gate	206
55	Def. Gate	223
56	Def. Gate	51
57	Def. Gate	1
58	TCP Control	7 (leave this at 7)
59	Reserved	0
60	Reserved	0
61	Reserved	0
62	TCP backstep	100 (leave this at 100)
63	Internal Modbus Port	503 (this defaults to 502)
64	Internal Web Port	8080 (this defaults to 80)
65	Quiet Timer	900 (leave this at 900)
66	Clients	-1 (leave this at -1)

4   After entering the IP parameters, attempt to ping the module to verify the settings.
> ping 206.223.51.150

5   Verify a connection to the internal Modbus/TCP server with zapreg32.
> zapreg32 206.223.51.150:503 255
Should connect to the QUCM on port 503 with Destination index 255.

6   Load the APP1 file with qload.
> qload 1 app1 206.223.51.150:503 -a
Will load the file into application 1's flash and set the program to automatically start on power-up.

7   Load the APP2 file with qload.
> qload 2 app2 206.223.51.150:503 -a
Will load the file into application 2's flash and set the program to automatically start on power-up.

8   Place Switch 1 in RUN. The RN1 light should come on and light 1 will probably blink rapidly.

9   Place Switch 2 in RUN. The RN2 light should come on.

Configure the application by connecting a web broswer to the IP address of the QUCM-LE

SNMP Device Register Lists

The data from the SNMP devices is presented as Modbus Holding Registers (4x). Modbus function codes 03, 100, 06, and 16 are supported for reading and writing this data.

Data is presented as signed 16-bit integers and signed 32-bit integers. Values with two holding registers are 32-bit integers where the first register is bits 0-15 and the second register is bits 16-31.

Power Factor is stored in standard POWERLOGIC format with an implied 3 decimal places and the sign bit signaling the leading/lagging.

Liebert 300

Table 2-1   Liebert 300 UPS Inputs Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	0 = Liebert 300
4	Minutes of Battery Time Remaining	0...65535
5	Battery Voltage (V)	-32768...32767
6	Battery Current (A)	-32768...32767
7	Input Frequency (HZ)	0...65535
8,9	Input Brown-Out Counter	0...2147483647
10,11	Input Black-Out Counter	0...2147483647
12,13	Input Transient Counter	0...2147483647
14	Number of Input Lines	1...3
15	Input Line Voltage Line 1 (V)	0...65535
16	Input Line Voltage Line 2 (V)	0...65535
17	Input Line Voltage Line 3 (V)	0...65535
18	Input Current Line 1 (A)	0...65535
19	Input Current Line 2 (A)	0...65535
20	Input Current Line 3 (A)	0...65535
21,22	Input Power Line 1 (VA)	0...2147483647
23,24	Input Power Line 2 (VA)	0...2147483647
25,26	Input Power Line 3 (VA)	0...2147483647

Table 2-2   Liebert 300 UPS Outputs Register List

Modbus/TCP Register	Description	Notes
27	Output Frequency (Hz)	0...65535
28	Output % Load	0...100
29	Number of Output Lines	1...3
30	Output Voltage Line 1 (V)	0...65535
31	Output Voltage Line 2 (V)	0...65535
32	Output Voltage Line 3 (V)	0...65535
33	Output Current Line 1 (A)	0...65535
34	Output Current Line 2 (A)	0...65535
35	Output Current Line 3 (A)	0...65535
36,37	Output Power Line 1 (VA)	0...2147483647
38,39	Output Power Line 2 (VA)	0...2147483647
40,41	Output Power Line 3 (VA)	0...2147483647
42	Inverter Status (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = ON bit 3 = Off
43	Inverter Temperature (C)	-32768...32767

Table 2-3   Liebert 300 UPS Bypass Register List

Modbus/TCP Register	Description	Notes
44	Bypass Installed (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Yes bit 3 = No
45	UPS on Bypass (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Yes bit 3 = No
46	Bypass Frequency (Hz)	0...65535
47	Number of Bypass Lines	1...3
48	Bypass Voltage Line 1 (V)	0...65535
49	Bypass Voltage Line 2 (V)	0...65535
50	Bypass Voltage Line 3 (V)	0...65535
51	Bypass Current Line 1 (A)	0...65535
52	Bypass Current Line 2 (A)	0...65535
53	Bypass Current Line 3 (A)	0...65535
54	Alarm Bitmap	0 = Low Battery Warning 1 = Low Battery Shutdown 2 = Input Line Lost Power 3 = Over Temperature Warning 4 = Overload Warning 5 = Input Over-voltage 6 = Bad Battery 7 = On Battery 8 = UPS Off 9-15 = Reserved
55	Number of bytes in Manufacture Id	0..60
56-85	Manufacture Id	Packed ASCII
86	Number of bytes in Model Identification	0..60
87-116	Model Identification	Packed ASCII
117	Number of bytes in Agent Software Version	0..60
118-147	Agent Software Version	Packed ASCII
148	Number of bytes in Firmware Version	0..60
149-178	Firmware Version	Packed ASCII
179	Alarm Count	
180	Test Battery Status (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Passed bit 3 = Failed bit 4 = In Progress bit 5 = Sys Failure bit 6 = Not Supported bit 7 = Inhibited

179	Test Diag. Status (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Passed bit 3 = Failed bit 4 = In Progress bit 5 = Sys Failure bit 6 = Not Supported bit 7 = Inhibited

Table 2-4   Liebert 300 Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

Liebert 600 UPS

Table 2-5   Liebert 600 UPS Inputs Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	4 = Liebert 600
4	Minutes of Battery Time Remaining	0...65535
5	Battery Temperature (C)	-32768...32767
6	Battery Voltage (V)	-32768...32767
7	Battery Current (A)	-32768...32767
8	Battery % Capacity Remaining	-32768...32767
9,10	Battery Discharge Counter	0...2147483647
11,12	Battery Total Discharge Time (s)	0...2147483647
13,14	Battery Total Amp Hours	0...2147483647
15,16	Battery Total KW Hours	0...2147483647
17,18	Battery Total Watt Hours	0...2147483647
19	Number of Input Lines	1...3
20	Input Line Voltage Line 1 (V)	0...65535
21	Input Line Voltage Line 2 (V)	0...65535
22	Input Line Voltage Line 3 (V)	0...65535
23	Input Current Line 1 (A)	0...65535
24	Input Current Line 2 (A)	0...65535
25	Input Current Line 3 (A)	0...65535

Table 2-6   Liebert 600 UPS Outputs Register List

Modbus/TCP Register	Description	Notes
26	Output Frequency (Hz)	0...65535
27	Output % Load	0...100
28	Number of Output Lines	1...3
29	Output Voltage Line 1 (V)	0...65535
30	Output Voltage Line 2 (V)	0...65535
31	Output Voltage Line 3 (V)	0...65535
32	Output Current Line 1 (A)	0...65535
33	Output Current Line 2 (A)	0...65535
34	Output Current Line 3 (A)	0...65535
35,36	Output Power (W)	0...2147483647
37	Inverter Status (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = ON bit 3 = Off

Table 2-7   Liebert 600 UPS Bypass Register List

Modbus/TCP Register	Description	Notes
38	Bypass Installed (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Yes bit 3 = No bit 4 = Dual Input
39	UPS on Bypass (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Yes bit 3 = No bit 4 = Maintenance
40	Bypass Frequency (Hz)	0...65535
41	Number of Bypass Lines	1...3
42	Bypass Voltage Line 1 (V)	0...65535
43	Bypass Voltage Line 2 (V)	0...65535
44	Bypass Voltage Line 3 (V)	0...65535
45	Bypass Current Line 1 (A)	0...65535
46	Bypass Current Line 2 (A)	0...65535
47	Bypass Current Line 3 (A)	0...65535
54	Alarm Bitmap	0 = Low Battery Warning 1 = Low Battery Shutdown 2 = Input Line Lost Power 3 = Over Temperature Warning 4 = Overload Warning 5 = Input Over-voltage 6 = Bad Battery 7 = On Battery 8 = UPS Off 9-15 = Reserved
55	Number of bytes in Manufacture Id	0..60
56-85	Manufacture Id	Packed ASCII
86	Number of bytes in Model Identification	0..60
87-116	Model Identification	Packed ASCII
117	Number of bytes in Agent Software Version	0..60
118-147	Agent Software Version	Packed ASCII
148	Number of bytes in Firmware Version	0..60
149-178	Firmware Version	Packed ASCII
179	Alarm Count	

Table 2-8   Liebert 600 Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

Liebert 600 Control Module

The Liebert 600 Control Module is a subset of the standard Liebert 600 UPS. The QUCM application automatically determines if the target is a standard 600 or Control Module.

Table 2-9   Liebert 600 Control Inputs Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	4 = Liebert 600
19	Number of Input Lines	1...3
20	Input Line Voltage Line 1 (V)	0...65535
21	Input Line Voltage Line 2 (V)	0...65535
22	Input Line Voltage Line 3 (V)	0...65535
23	Input Current Line 1 (A)	0...65535
24	Input Current Line 2 (A)	0...65535
25	Input Current Line 3 (A)	0...65535

Table 2-10 Liebert 600 Control Outputs Register List

Modbus/TCP Register	Description	Notes
26	Output Frequency (Hz)	0...65535
27	Output % Load	0...100
28	Number of Output Lines	1...3
29	Output Voltage Line 1 (V)	0...65535
30	Output Voltage Line 2 (V)	0...65535
31	Output Voltage Line 3 (V)	0...65535
32	Output Current Line 1 (A)	0...65535
33	Output Current Line 2 (A)	0...65535
34	Output Current Line 3 (A)	0...65535
35,36	Output Power (W)	0...2147483647

Table 2-11 Liebert 600 Control Bypass Register List

Modbus/TCP Register	Description	Notes
38	Bypass Installed (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Yes bit 3 = No 4 = Dual Input
39	UPS on Bypass (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Yes bit 3 = No bit 4 = Maintenance
40	Bypass Frequency (Hz)	0...65535
41	Number of Bypass Lines	1...3
42	Bypass Voltage Line 1 (V)	0...65535
43	Bypass Voltage Line 2 (V)	0...65535
44	Bypass Voltage Line 3 (V)	0...65535
45	Bypass Current Line 1 (A)	0...65535
46	Bypass Current Line 2 (A)	0...65535
47	Bypass Current Line 3 (A)	0...65535
54	Alarm Bitmap	0 = Low Battery Warning 1 = Low Battery Shutdown 2 = Input Line Lost Power 3 = Over Temperature Warning 4 = Overload Warning 5 = Input Over-voltage 6 = Bad Battery 7 = On Battery 8 = UPS Off 9-15 = Reserved
55	Number of bytes in Manufacture Id	0..60
56-85	Manufacture Id	Packed ASCII
86	Number of bytes in Model Identification	0..60
87-116	Model Identification	Packed ASCII
117	Number of bytes in Agent Software Version	0..60
118-147	Agent Software Version	Packed ASCII
148	Number of bytes in Firmware Version	0..60
149-178	Firmware Version	Packed ASCII
179	Alarm Count	

Table 2-12 Liebert 600 Control Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

Liebert PMP Registers

Table 2-13 Liebert PMP Register List

Modbus/TCP Register	Description	Notes	Unsupported Status Bit (Set if not supported in UPS)
1	IP Address (High)		
2	IP Address (Low)		
3	Device Type	3 = Liebert PMP	
4	Number of Input Lines	1...3	400.1
5	Input Line Voltage Line 1 (V)	0...65535	400.2
6	Input Line Voltage Line 2 (V)	0...65535	400.3
7	Input Line Voltage Line 3 (V)	0...65535	400.4
8	Output Frequency (Hz)	0...65535	400.5
9	Output % Load	0...100	400.6
10	Number of Output Lines	1...3	400.7
11	Output Voltage Line 1 (V)	0...65535	400.8
12	Output Voltage Line 2 (V)	0...65535	400.9
13	Output Voltage Line 3 (V)	0...65535	400.10
14	Output Current Line 1 (A)	0...65535	400.11
15	Output Current Line 2 (A)	0...65535	400.12
16	Output Current Line 3 (A)	0...65535	400.13
17,18	Output Power Line 1 (KVA)	0...2147483647	400.14
19,20	Output Power Line 2 (KVA)	0...2147483647	400.15
21,22	Output Power Line 3 (KVA)	0...2147483647	401.0
23	Alarm Bitmap	0 = Summary Alarm 1 = Over Temperature 2 = Overload Warning 3-15 = Reserved	401.1
55	Number of bytes in Manufacture Id	0..60	401.2
56-85	Manufacture Id	Packed ASCII	401.3
86	Number of bytes in Model Identification	0..60	401.4
87-116	Model Identification	Packed ASCII	
117	Number of bytes in Agent Software Version	0..60	
118-147	Agent Software Version	Packed ASCII	
148	Number of bytes in Firmware Version	0..60	
149-178	Firmware Version	Packed ASCII	
179	Alarm Count		

Table 2-14 Liebert PMP Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

RFC 1628 UPS

Table 2-15 RFC 1628 UPS Inputs Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	1 = RFC 1628 UPS
4,5	upsBatteryStatus (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Battery Normal bit 3 = Battery Low bit 4 = Battery Depleted
6,7	upsSecondsOnBattery	
8,9	upsEstimatedMinutesRemaining	
10,11	upsEstimatedChargeRemaining (%)	
12,13	upsBatteryVoltage (V)	
14,15	upsBatteryCurrent (A)	
16,17	upsBatteryTemperature (C)	
18,19	upsInputLineBads	
20,21	upsInputNumLines	
22,23	upsInputFrequency 1 (0.1 Hz)	
24,25	upsInputFrequency 2 (0.1 Hz)	
26,27	upsInputFrequency 3 (0.1 Hz)	
28,29	upsInputVoltage 1 (V)	
30,31	upsInputVoltage 2 (V)	
32,33	upsInputVoltage 3 (V)	
34,35	upsInputCurrent 1 (0.1 A)	
36,37	upsInputCurrent 2 (0.1 A)	
38,39	upsInputCurrent 3 (0.1 A)	
40,41	upsInputTruePower 1 (VA)	
42,43	upsInputTruePower 2 (VA)	
44,45	upsInputTruePower 3 (VA)	

Table 2-16   RFC 1628 UPS Outputs Register List

Modbus/TCP Register	Description	Notes
46,47	upsOutputSource (bit map)	bit 0 = Reserved bit 1 = Other bit 2 = None bit 3 = Normal bit 4 = Bypass bit 5 = Battery bit 6 = Booster biot 7 = Reducer
48,49	upsOutputFrequency (0.1 Hz)	
50,51	upsOutputNumLines	
52,53	upsOutputLineVoltage 1 (V)	
54,55	upsOutputLineVoltage 2 (V)	
56,57	upsOutputLineVoltage 3 (V)	
58,59	upsOutputLineCurrent 1(A)	
60,61	upsOutputLineCurrent 2 (A)	
62,63	upsOutputLineCurrent 3 (A)	
64,65	upsOutputLinePower 1 (VA)	
66,67	upsOutputLinePower 2 (VA)	
68,69	upsOutputLinePower 3 (VA)	
70,71	upsOutputLinePercentLoad 1 (%)	
72,73	upsOutputLinePercentLoad 2 (%)	
74,75	upsOutputLinePercentLoad 3 (%)	

Table 2-17   RFC1628 UPS Bypass Register List

Modbus/TCP Register	Description	Notes
76,77	upsBypassFrequency (0.1 Hz)	
78,79	upsBypassNumLines	
80,81	upsBypassVoltage 1 (V)	
82,83	upsBypassVoltage 2 (V)	
84,85	upsBypassVoltage 3 (V)	
86,87	upsBypassCurrent 1 (V)	
88,89	upsBypassCurrent 3 (A)	
90,91	upsBypassCurrent 3 (A)	
92,93	upsBypassPower 1 (VA)	
94,95	upsBypassPower 2 (VA)	
96,97	upsBypassPower 3 (VA)	
98	Alarm Bitmap	0 = Battery Bad 1 = On Battery 2 = Low Battery 3 = Depleted Battery 4 = Bad Temperature 5 = Bad Input 6 = Bad Output 7 = Output Overload 8 = On Bypass 9 = Bad Bypass 10 = Output Off as Requested 11 = UPS Off as Requested
99	Number of bytes in Manufacture Id	0..60
100 - 116	Manufacture Id	Packed ASCII
117	Number of bytes in Model Identification	0..60
118-134	Model Identification	Packed ASCII
135	Number of bytes in Agent Software Version	0..60
136-152	Agent Software Version	Packed ASCII
153	Number of bytes in Firmware Version	0..60
154-178	Firmware Version	Packed ASCII
179	Alarm Count	

Table 2-18 RFC1628 Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

APC UPS Registers

Table 2-19 APC UPS Basic Inputs Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	4 = APC UPS
4	Battery Status (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = Battery Normal bit 3 = Battery Low
5,6	Time on Battery (Sec)	
7	Battery Capacity Remaining (%)	
8	Battery Temperature (C)	
9,10	Battery Run Time Remaining (Min)	
11	Battery Replace Indicator (bit map)	bit 0 = Reserved bit 1 = No Battery Needs Replacing bit 2 = Battery Needs Replacing
12	Number of External Battery Packs	
13	Number of Bad External Battery Packs	
14	Input Phase	
15	Input Line Voltage (V)	
16	Input Line Min. Voltage (V)	Within the last 1 minute
17	Input Line Max. Voltage (V)	Within the last 1 minute
18	Input Frequency (Hz)	
19	Input Line Fail Cause (bit map)	bit 0 = Reserved bit 1 = No Transfer bit 2 = High Line Voltage bit 3 = Brown Out bit 4 = Black Out bit 5 = Small Momentary Sag bit 6 = Deep Momentary Sag bit 7 = Small Momentary Spike bit 8 = Large Momentary Spike bit 9 = Self Test bit 10 = Rate of Voltage Change

Table 2-20 APC UPS Basic Outputs Register List

Modbus/TCP Register	Description	Notes
20	Output Status (bit map)	bit 0 = Reserved bit 1 = Unknown bit 2 = On Line bit 3 = On Battery bit 4 = On Smart Boost bit 5 = Timed Sleeping bit 6 = Software Bypass bit 7 = Off bit 8 = Rebooting bit 9 = Switched Bypass bit 10 = Hardware Failure Bypass bit 11 = Sleeping Until Power Return bit 12 = On Smart Trim
21	Output Phase	
22	Output Voltage (V)	
23	Output Frequency (Hz)	
24	Output Load (%)	
25	Output Current (A)	
155	Number of bytes in Manufacture Id	0..60
156-185	Manufacture Id	Packed ASCII
186	Number of bytes in Model Identification	0..60
187-216	Model Identification	Packed ASCII
248	Number of bytes in Firmware Version	0..60
249-278	Firmware Version	Packed ASCII
299	UPS Internal Communication Status (bit map)	bit 0 = Reserved bit 1 = Ok bit 2 = No Communication
398, 399	sysUpTime (0.01sec)	

Table 2-21 APC UPS Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

The Optional Input and Output registers may not be supported on all APC UPSs.

Table 2-22 APC UPS Optional Inputs Register List

Modbus /TCP Register	Description	Notes
26	Number of Inputs	
27	Input Voltage Orientation 1 (bit map)	bit 0 = Reserved
28	Input Voltage Orientation 2	bit 1 = Unknown
29	Input Voltage Orientation 3	bit 2 = Single Phase bit 3 = Split Phase, 1-N, 2-N, 1-2 bit 4 = 1-N, 2-N, 3-N bit 5 = 1-2. 2-3, 3-1
30	Input Frequency 1 (0.1Hz)	
31	Input Frequency 2 (0.1Hz)	
32	Input Frequency 3 (0.1Hz)	
33	Input Line Type 1 (bit map)	bit 0 = Reserved
34	Input Line Type 2	bit 1 = Unknown
35	Input Line Type 3	bit 2 = Main bit 3 = Bypass
36	Input Voltage 1 (V)	
37	Input Voltage 2 (V)	
38	Input Voltage 3 (V)	
39	Input Current 1 (0.1A)	
40	Input Current 2 (0.1A)	
41	Input Current 3 (0.1A)	
42,43	Input Power 1 (W)	
44,45	Input Power 2 (W)	
46,47	Input Power 3 (W)	

Table 2-23   APC UPS Optional Outputs Register List

Modbus/TCP Register	Description	Notes
48	Number of Output Lines	
49	Output Voltage Orientation 1 (bit map)	bit 0 = Reserved
50	Output Voltage Orientation 2	bit 1 = Unknown
51	Output Voltage Orientation 3	bit 2 = Single Phase bit 3 = Split Phase, 1-N, 2-N, 1-2 bit 4 = 1-N, 2-N, 3-N bit 5 = 1-2. 2-3, 3-1
52	Output Frequency 1 (0.1Hz)	
53	Output Frequency 2 (0.1Hz)	
54	Output Frequency 3 (0.1Hz)	
55	Output Voltage 1(V)	
56	Output Voltage 2 (V)	
57	Output Voltage 3 (V)	
58	Output Current 1 (0.1A)	
59	Output Current 2 (0.1A)	
60	Output Current 3 (0.1A)	
61,62	Output Load 1 (VA)	
63,64	Output Load 2 (VA)	
65,66	Output Load 3 (VA)	
67	Output Percent Load 1(%)	
68	Output Percent Load 2(%)	
69	Output Percent Load 3(%)	
70,71	Output Power 1 (W)	
72,73	Output Power 2 (W)	
74,75	Output Power 3 (W)	
76	Output Percent Power 1 (%)	
77	Output Percent Power 2 (%)	
78	Output Percent Power 3 (%)	

APC DC Power Plant Registers

Table 2-24   APC DC Basic Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	7 = APC DM6 Plant
4	System Current (0.1 A)	
5	Load Current (0.1 A)	
6	Battery Current (0.1 A)	
7	Ambient Temperature (0.1 C)	
8	Battery Temperature (0.1 C)	
9	System Bus Voltage (0.1 V)	
10	Alarm Table Size	1 - 25
11	Alarms 1-16 Status bit 0=alarm 1, bit 15 = alarm 16	0=No alarm, 1=alarm
12	Alarms 17-35 Status bit 0=alarm 17, bit 8 = alarm 25	0=No alarm, 1=alarm
13...27	Alarms 1-25 Data	
38...293	Alarms 1..17 Description	Packed ASCII, 32 chars per alarm
294	System Relative Humidity (%)	
320...383	Alarms 18..21 Description	Packed ASCII, 32 chars per alarm
384	Agent Software Version Major	
385	Agent Software Version Minor	
386	Device Version Major	
387	Device Version Minor	
397	Update Time (0.1sec)	
398, 399	sysUpTime (0.01sec)	
404...419	Manufacturer Identification	Packed ASCII
420...435	Model Identification	Packed ASCII
436...499	Alarms 22..25 Description	Packed ASCII, 32 chars per alarm

Table 2-25   APC DC PLANT Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

Power Conversion Products

Table 2-26 PCP Basic Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	8 = PCP Monitor
4	Number of Monitored Devices	
5	System Current of the Frame (A)	Optional.
6	System Voltage of the Frame (10mV)	Optional
155	Number of bytes in Manufacture Id	0..60
156-185	Manufacture Id	Packed ASCII
186	Number of bytes in Model Identification	0..60
187-216	Model Identification	Packed ASCII
217	Number of bytes in Agent Software Version	0..60
218-247	Agent Software Version	Packed ASCII
248	Number of bytes in Firmware Version	0..60
249-278	Firmware Version	Packed ASCII

Table 2-27 PCP Battery Monitor 1 Register List

Modbus/TCP Register	Description	Notes
7	Alarms bit map bit 0 = Summary Alarm bit 1 = No Voltage Alarm bit 2 = Minor Voltage Alarm bit 3 = Major Voltage Alarm bit 4 = Major and Minor Voltage Alarm bit 5 = No Temperature Alarm bit 6 = Minor Temperature Alarm bit 7 = Major Temperature Alarm bit 8 = Major and Minor Temperature Alarm bit 9 = No Current Alarm bit 10 = Minor Current Alarm bit 11 = Major Current Alarm bit 12 = Major and Minor Alarm bit 13 = Discharge Alarm bit 14 = Recharge Alarm	0 = no alarm 1 = alarm
8	Voltage Monitor Enabled 1 through 16 bit map bit 0 = channel 1, bit 15 = channel 16	0 = not monitored 1 = monitored
9	Voltage Monitor Enabled 17 through 20 bit map bit 0 = channel 17, bit 3 = channel 20	0 = not monitored 1 = monitored
10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48	Voltage Channels 1 through 20 (10mV)	
11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49	Temperature Channels 1 through 20 (C)	
50...59	Channel Alarms 1, 2 through 19,12 bit 0 = No Voltage Alarm 1 bit 1 = Minor Voltage Alarm 1 bit 2 = Major Voltage Alarm 1 bit 3 = Major and Minor Voltage Alarm 1 bit 4 = No Temperature Alarm 1 bit 5 = Minor Temperature Alarm 1 bit 6 = Major Temperature Alarm 1 bit 7 = Major and Minor Temperature Alarm 1 bit 8 = No Voltage Alarm 2 bit 9 = Minor Voltage Alarm 2 bit 10 = Major Voltage Alarm 2 bit 11 = Major and Minor Voltage Alarm 2 bit 12 = No Temperature Alarm 2 bit 13 = Minor Temperature Alarm 2 bit 14 = Major Temperature Alarm 2 bit 15 - Major and Minor Temperature Alarm 2	
60	String Current Bit Map bit 0 = String 1 enabled bit 1 = String 2 enabled bit 2 = String 3 enabled bit 3 = String 4 enabled bit 4 = String 5 enabled	
61..65	String Current 1 through 5 (mA)	
63..70	String Alarms 1 through 5 bit 0 = No Current Alarm bit 1 = Minor Current Alarm bit 2 = Major Current Alarm bit 3 = Major and Minor Alarm	

Table 2-28 PCP Frame Monitor 1 Register List

Modbus/TCP Register	Description	Notes
71	Alarms bit map bit 0 = Summary Alarm bit 1 = High Voltage Alarm bit 2 = Low Voltage Alarm bit 3 = Very Low Voltage Alarm bit 4 = Rectifier Fail Alarm bit 5 = Converter Fail Alarm bit 6 = AC Fail Alarm bit 7 = LVD1 Alarm bit 8 = LVD2 Alarm bit 9 = Distribution Breaker Alarm bit 10 = Battery Disconnect Alarm bit 11 = Fuse Alarm	0 = no alarm 1 = alarm
72	System Voltage (10mV)	
73	Converter Voltage (10mV)	
74	System Current (A)	
75	Converter Current (A)	
76	Aux. 1 Current (A)	
77	Aux. 2 Current (A)	
78	Hottest Battery Temperature (C)	
79	Internal SSD Temperature (C)	
80	Equalize Timer Time Left (Hr)	
81	Hold Time Left (Hr)	
82	Various States bit 0 = Rectifier 1 Shutdown State bit 1 = Rectifier 2 Shutdown State bit 2 = Rectifier 3 Shutdown State bit 3 = Rectifier 4 Shutdown State bit 4 = Split Low Voltage Disconnect State bit 5 = High Voltage Shutdown Reset State bit 6 = Audio Alarm Enabled bit 7 = Equalize Permission Allowed bit 8 = Equalized State bit 9 = Automatic Equalization Allowed bit 10 = Automatic Equalization State bit 11 = Local Equalize Permission bit 12 = Thermal Compensation Permission bit 13 = Thermal Compensation State	
60	User Input Bit Map bit 0 = User Input 1 bit 1 = User Input 2 bit 2 = User Input 3 bit 3 = User Input 4 bit 4 = User Input 5 bit 5 = User Input 6 bit 6 = User Input 7 bit 7 = User Input 8	

Table 2-29 PCP Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

Invensys SM50

The SNMP support by the SM50 system only provides trap data so the QUCM uses the S3P protocol to gather the information. Typical installations use a Lantronix terminal server to connect the SM50's RS-232 port to the Ethernet network. The QUCM must be configured for the IP Address of the Lantronix server and the TCP port number that the server is listening for connections; typically 14001.

Table 2-30   SM50 Basic Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	7 = SM50
4	TCP Port Number	Default = 14001
5	Slave Address	Default = 0
6	LVD Status (bit map)	bit 0 = Disabled bit 1 = Inactive bit 2 = Active (disconnected)
7,8	System Voltage	float32 - 2 decimal places
9,10	Load Current	float32 - 0 decimal places
11,12	Battery Current	float32 - 0 decimal places
13,14	Battery Temperature	float32 - 2 decimal places
15,16	Internal Value 1	float32
17,18	Internal Value 2	float32
19,20	Internal Value 3	float32
21,22	Internal Value 4	float32
23,24	Internal Value 5	float32
25,26	Internal Value 6	float32
27,28	Internal Value 7	float32
29,30	Internal Value 8	float32
31,32	Internal Value 9	float32
33,34	Internal Value 10	float32
35	Urgent Alarm	bit 0=active, 1=inactive
36	Non Urgent Alarm	bit 0=active, 1=inactive
145	S3P Slave Type	2=SM50
146	SM50 Interface Version	
155	Number of bytes in Manufacture Id	0..60
156-185	Manufacture Id	Packed ASCII
186	Number of bytes in Model Identification	0..60
187-216	Model Identification	Packed ASCII
217	Number of bytes in Agent Software Version	0..60
218-247	Agent Software Version	Packed ASCII
248	Number of bytes in Firmware Version	0..60
249-278	Firmware Version	Packed ASCII

Table 2-31   SM50 Digital Input Register List

Modbus/TCP Register	Description	Notes
37	Digital Input 1	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
38	Digital Input 2	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
39	Digital Input 3	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
40	Digital Input 4	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
41	Digital Input 5	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
42	Digital Input 6	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
43	Digital Input 7	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
44	Digital Input 8	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
45	Digital Input 9	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
46	Digital Input 10	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
47	Digital Input 11	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
48	Digital Input 12	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
49	Digital Input 13	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
50	Digital Input 14	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled

Table 2-32   SM50 Relay Output Register List

Modbus/TCP Register	Description	Notes
51	Relay Output 1	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
52	Relay Output 1	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
53	Relay Output 3	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
54	Relay Output 4	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
55	Relay Output 5	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
56	Relay Output 6	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
57	Relay Output 7	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
58	Relay Output 8	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
59	Relay Output 9	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
60	Relay Output 10	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
61	Relay Output 11	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
62	Relay Output 12	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
63	Relay Output 13	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled
64	Relay Output 14	bit 0 = active, 1=inactive, 2=indeterminate, 3=disabled

Table 2-33   SM50 Alarm Register List

Modbus/TCP Register	Description	Notes
65...144	Alarm 1..80	bit 0 = active, 1=inactive, 2=reserved, 3=disabled

Table 2-34 Internal Value Configuration Register List

Modbus/TCP Register	Description	Notes
300	Config bit-map bit 0 = Input 1 bit 9 = Input 10	1 = active
301	Internal Value 1 Unit	bit 0 = mV bit 1 = V bit 2 = mA bit 3 = A bit 4 = KA bit 5 = C bit 6 = m bit 7 = AH bit 8 = none bit 9 = KW bit 10 = %
302	Internal Value 2 Unit	
303	Internal Value 3 Unit	
304	Internal Value 4 Unit	
305	Internal Value 5 Unit	
306	Internal Value 6 Unit	
307	Internal Value 7 Unit	
308	Internal Value 8 Unit	
309	Internal Value 9 Unit	
310	Internal Value 10 Unit	
311	1 Display Resolution	bit 0 = nn.nnn bit 1 = nnn.nn bit 2 = nnnn.n bit 3 = nnnnn
312	2 Display Resolution	
313	3 Display Resolution	
314	4 Display Resolution	
315	5 Display Resolution	
316	6 Display Resolution	
317	7 Display Resolution	
318	8 Display Resolution	
319	9 Display Resolution	
320	10 Display Resolution	

Liebert Environmental

Table 2-35 Liebert Environmental Register List

Modbus/TCP Register	Description	Notes
1	IP Address (High)	
2	IP Address (Low)	
3	Device Type	11 = Liebert Env.
4	Temperature Setting	F
5	Temperature Tollerance	0.1 F
6	Temperature Measurement	F
7	Temperature Alarm High Value	F
8	Temperature Alarm Low Value	F
9	Relative Humidity Setting	%
10	Relative Humidity Tollerance	%
11	Relative Humidity Measurement	%
12	Relative Humidity Alarm High Value	%
13	Relative Humidity Alarm Low Value	%
14	Status Bitmap	0-System ON 1-Cooling ON 2-Heating ON 3-Humidifying ON 4-Dehumidifying ON 5-Econo Cycle ON 6-Fan ON 7-General Alarm Output ON 8-Audible Alarm ON 9-Compressor 1 ON 10-Compressor 2 ON 11-Heater 1 ON 12-Heater 2 ON
15	Cooling Capacity	%
16	Heating Capacity	%

Table 2-36 Liebert Environmental Alarms Register List

Modbus/TCP Register	Description	Notes
17	Number of Alarms Present	Also in register 171
18	Alarm Bitmap 1	0-Loss of Airflow 1-Comp. 1 Overload 2-Comp. 1 High Head Pressure 3-Comp. 2 Overload 4-Comp. 2 High Head Pressure 5-Short Cycle 6-Change Filter 7-High Humidity 8-Low Humidity 9-Humidifier Problem 10-Liquid Detected Under Floor 11-Custom Alarm 1 12-Custom Alarm 2 13-Custom Alarm 3 14-Custom Alarm 4 15-Main Fan Overload
19	Alarm Bitmap 2	0-Loss of Power 1-Standby Glycol Pump ON 2-Smoke Detected 3-Standby Unit ON 4-Low Suction Pressure 5-High Temperature 6-Low Temperature 7-Loss of Water Flow 8-15 - Reserved

Table 2-37 Liebert Environmental Hours Register List

Modbus/TCP Register	Description	Notes
29,30	Compressor 1 Run Time	32-bit Integer Hours
31,32	Compressor 2 Run Time	32-bit Integer Hours
33,34	Fan Run Time	32-bit Integer Hours
35,36	Humidifier Run Time	32-bit Integer Hours
37,38	Reheat 1 Run Time	32-bit Integer Hours
39,40	Reheat 2 Run Time	32-bit Integer Hours
41,42	Cooling Mode ON Time	32-bit Integer Hours
43,44	Heating Mode ON Time	32-bit Integer Hours
45,46	Humidification Mode ON Time	32-bit Integer Hours
47,48	Dehumidification Mode ON Time	32-bit Integer Hours
55	Number of bytes in Manufacture Id	0..60
56-85	Manufacture Id	Packed ASCII
86	Number of bytes in Model Identification	0..60
87-116	Model Identification	Packed ASCII
117	Number of bytes in Agent Software Version	0..60
118-147	Agent Software Version	Packed ASCII
148	Number of bytes in Firmware Version	0..60
149-178	Firmware Version	Packed ASCII
179	Alarm Count	

Table 2-38 Liebert Environmental Traps Register List

Modbus/TCP Register	Description	Notes
300	Latest Trap Number	
301	Latest Trap Sub-Number	
302,303	Latest Trap sysUpTime (0.01sec)	
304	Next Trap Number	
305	Next Trap Sub-Number	
306,307	Next Trap sysUpTime (0.01sec)	
308	Next Trap Number	
309	Next Trap Sub-Number	
310,311	Next Trap sysUpTime (0.01sec)	
312	Next Trap Number	
313	Next Trap Sub-Number	
314,315	Next Trap sysUpTime (0.01sec)	
316	Next Trap Number	
317	Next Trap Sub-Number	
318,319	Next Trap sysUpTime (0.01sec)	

3

Web Server

Main Page

The Main page displays a summary of the configured SNMP devices. The table will display the Modbus/TCP Destination Index, SNMP IP Address, Device Type, SNMP Device Manufacturer, SNMP Device ID, and Device Status. If a device is not responding to queries from the QUCM then the Status table entry will have a gray background and display the text "Offline". If the device is responding to queries then the cell will display "Online". The Online message is a hypertext link that will display the "Actual" data for that device.

Figure 3-1 shows an example page with an APC UPS online.

At the bottom of the Main page are links to the Trap log, Statistics on this QUCM, and a page for configuring this QUCM.
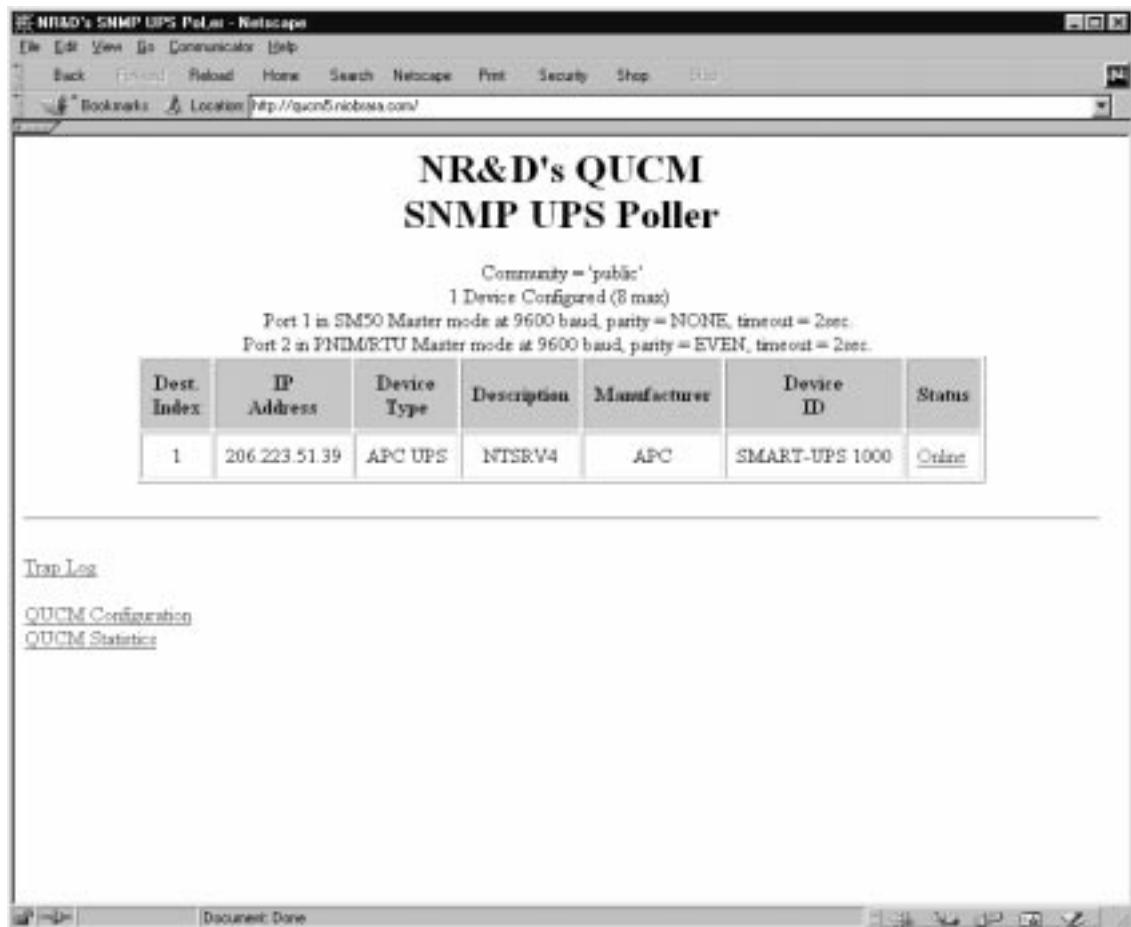
Figure 3-1   Main Web Page

Actual Data Page

Following one of the "Online" links will display a table of the metered data for the particular SNMP device. Figure 3-2 shows a table for a Liebert 300 UPS.
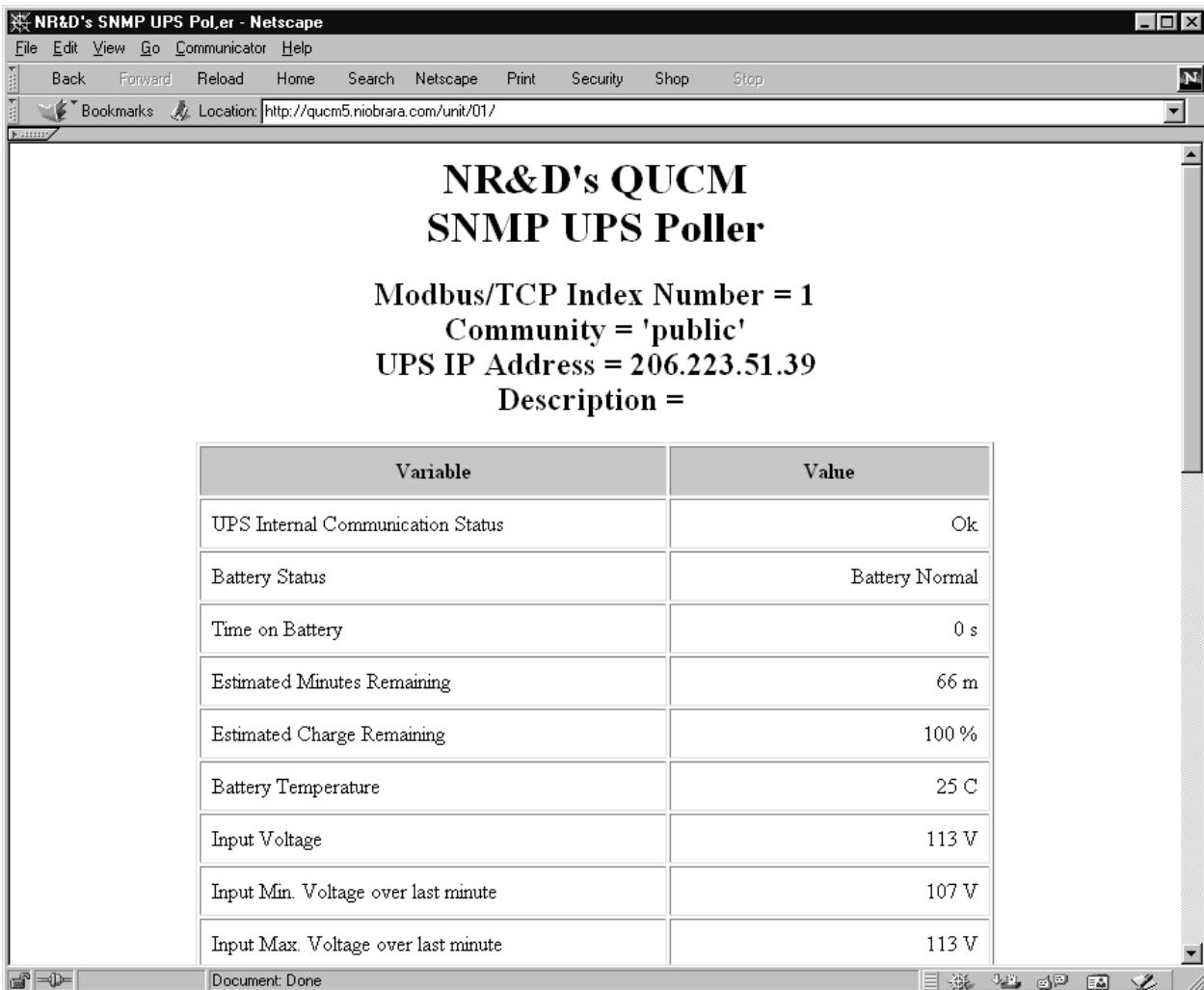
Figure 3-2   Web Server Actual Data Page

Configure QUCM

At the bottom of the Main page is a link to configure the QUCM. The password may need to be entered before access to this page is granted. The default password is "master" and is case sensitive. The password may be altered from the "Configure Serial Port" page. Light 9 will come on while the password timer is active.

A link is provided for altering the password. The current password must be verified before the new password is edited. The new password must be entered twice for verification. If it has been longer than three minutes since a password protected setting has been altered then the user will be prompted to enter the password.

NOTE: This password protection is not very secure and is only intended to prevent accidental modification to the QUCM configuration. The user should implement other more stringent protection such as firewalls and isolated networks to ensure the safety of the metered system.

NOTE: Once a password has been accepted by the QUCM, any connection is allowed to modify settings until the timer expires; not just the user who entered the password.

Figure 3-3   Enter Password Page

Each SNMP device configured is shown with a link to edit the device parameters or remove the device. Links below are given to add a new device, alter the SNMP Community Name, change the password, and save the configuration to FLASH.

Figure 3-4 Configuration Page

Add Device

The Add Device link is used to add a new SNMP device to the list. A screen like Figure 3-5 is displayed. There is a pull-down menu item for the Modbus/TCP Destination Index. This menu will only display unused values.

The IP Address is entered in dotted-decimal notation.

There is a pull down field for the Device Type.

There is a check box for "In Service". Clearing this check box keeps the device in the QUCM's configuration but prohibits the QUCM from actually polling it. This may be desirable if a particular device is to be powered off for extended periods of time because the QUCM will not waste bandwidth trying to poll a device that is not present.

The SM50 Slave Address entry used for the SM50 only. A single SM50 will always respond to address 0 so this value may be used if the actual address is unknown. If the SM50 is directly connected to the QUCM then use addresses 0-49 for devices connected to QUCM port 1 and 50-99 for devices connected to port 2. The QUCM will automatically subtract 50 from the port 2 addresses before transmitting the messages.

Also, for local SM50 support, enter 0.0.0.0 or the QUCM's IP Address in the IP Address field.

The Description field allows a 20 character text entry to describe the device or device's location.

Figure 3-5   Add Device Page

SNMP Community String

The Community String for all SNMP devices must be set the same. Configure the QUCM's Community String to match those of the target SNMP devices. By default, the Community String is set to "public".
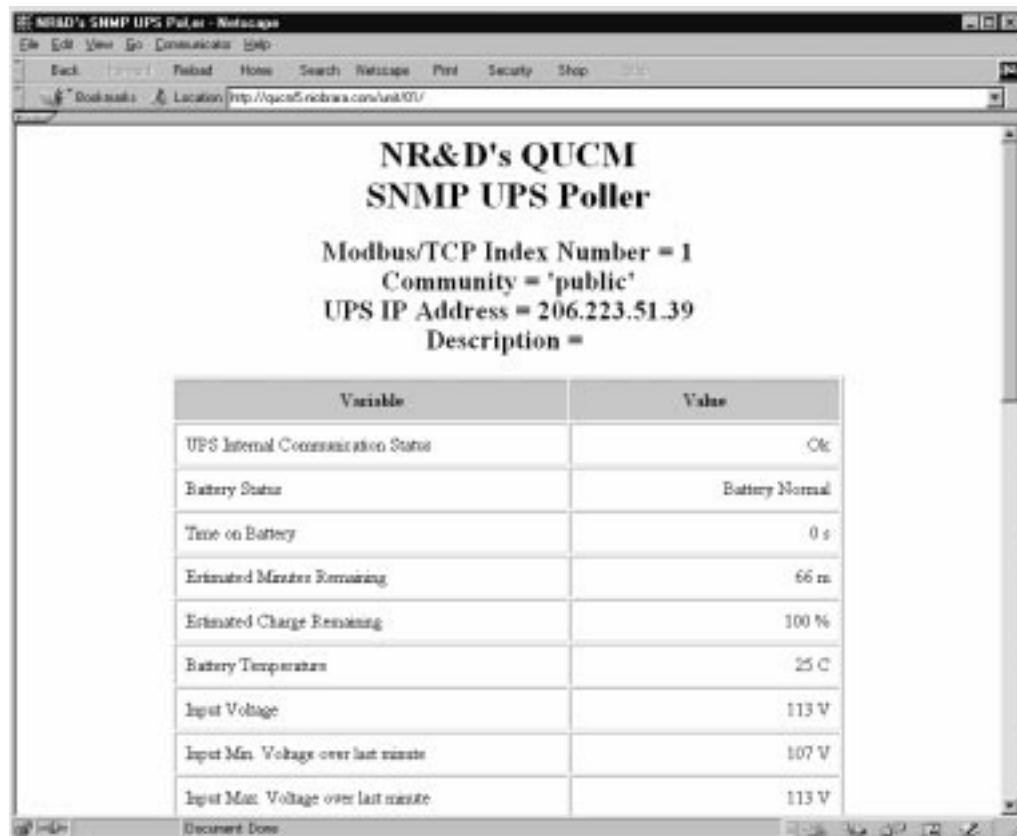
Figure 3-6　Edit Community Page

Save Settings to FLASH

After completion of the configuration, be sure to save the settings to flash. Otherwise the modifications will be lost on the next power cycle of the QUCM. Once the settings are saved to flash, the QUCM's configuration, including its IP settings, will be safe indefinitely.

Statistics Page

At the bottom of the Main page is a link to some statistical information about this QUCM. (See Figure 3-7)

Figure 3-7   Statistics Web Page