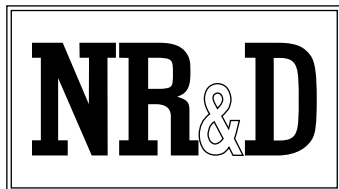


QUCM IMPACC

Installation and Programming Manual

This Manual describes the QUCM application for interfacing Square D PowerLogic meters into a Cutler-Hammer IMPACC system.

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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 allows data from Square D PowerLogic meters to be displayed in a Cutler-Hammer IMPACC system. The PowerLogic equipment may be directly connected to a serial port on the QUCM or over Ethernet via Modbus/TCP. The following device types are supported:

- CM100/200 series
- CM2000 series
- CM3000/4000 series
- PM600 series
- PM800 series
- Enercept
- MicroLogic P-Type

Each configured PowerLogic meter is continuously polled by the QUCM and the polled data is presented as a virtual IQ Data Plus II meter in the IMPACC system. The connection to the IMPACC system may be made by three possible connections:

- Direct RS-232 from the PC where the QUCM emulates a standard MINT II.
- Direct Ethernet connection from the PC where the QUCM emulates an EMINT. (This only works for IMPACC software that supports EMINTs.)
- Direct RS-232 connection to a MINT II with the MINT acting as a slave on the INCOM network. The PC Master is connected to the INCOM network via a CONI or another MINT. This solution is not preferred because of message buffering limits in the MINT.

A web server in the QUCM is used to configure the devices to be polled and set the serial port parameters.

The Niobrara QXBP-001 single slot rack with built-in power supply is used for mounting the QUCM-OE. A two (or more) slot Quantum rack and appropriate Quantum power supply may also be used for mounting the QUCM-OE.

Installation

QUCM 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 QUCM_IMPACC_SETUP.EXE file. If not already installed, the QUCM_SETUP.EXE file should also be ran to properly install the FWLOAD, QLOAD, ZAPREG32, and QCOMPILE applications.

Serial Connections to the QUCM-OE

Port 1 (or Port 2) to DDC2I to 4-wire PowerLogic Meters

The serial ports of the QUCM-OE must be switched to RS-232. The Niobrara cable MM0 is used to connect to the DDC2I. This cable is included with the DDC2I

DDC2I Green Connector		Meter		Meter
TX+	_____	IN+	_____	IN+
TX-	_____	IN-	_____	IN-
RX+	_____	OUT+	_____	OUT+
RX-	_____	OUT-	_____	OUT-
Shield	_____	Shield	_____	Shield

Figure 2-1 DDC2I to PowerLogic RS-485 4-wire cable

The DDC2I DIP switches must be configured for 4-wire Master with Termination and Bias.

Table 2-1 DDC2I DIP Switch Settings for 4-wire

Switch	Description	Position
1	4/2 wire	OFF
2	4/2 wire	OFF
3	4/2 wire	OFF
4	Master/Slave	OFF
5	Termination	ON
6	Bias	ON

Port 1 (or Port 2) to BB85 to 4-wire PowerLogic Meters

The serial ports of the QUCM-OE must be switched to RS-485. The Niobrara cable MM0 is used to connect to the BB85. This cable is included with the BB85

Figure 2-2 BB85 to PowerLogic RS-485 4-wire cable

BB85 Green Connector		Meter		Meter
TX+	_____	IN+	_____	IN+
TX-	_____	IN-	_____	IN-
RX+	_____	OUT+	_____	OUT+
RX-	_____	OUT-	_____	OUT-
Shield	_____	Shield	_____	Shield

Port 1 (or Port 2) to DDC2I to 2-wire PowerLogic Meters

The serial ports of the QUCM-OE must be switched to RS-232. The Niobrara cable MM0 is used to connect to the DDC2I. This cable is included with the DDC2I

DDC2I Green Connector		Meter		Meter
TX+	_____	+	_____	+
TX-	_____	-	_____	-
RX+				
RX-				
Shield	_____	Shield	_____	Shield

Figure 2-3 DDC2I to PowerLogic RS-485 4-wire cable

The DDC2I DIP switches must be configured for 2-wire Slave with Termination and Bias.

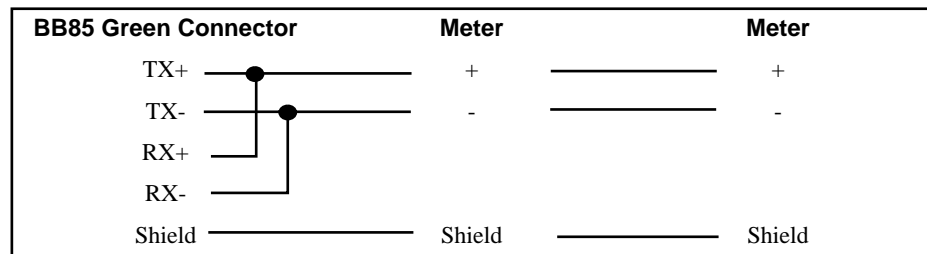
Table 2-2 DDC2I DIP Switch Settings for 4-wire

Switch	Description	Position
1	4/2 wire	ON
2	4/2 wire	ON
3	4/2 wire	ON
4	Master/Slave	ON
5	Termination	ON
6	Bias	ON

Port 1 (or Port 2) to BB85 to 4-wire PowerLogic Meters

The serial ports of the QUCM-OE must be switched to RS-485. Jumpers must be installed between the TX+ and RX+ on the BB85 as well as the TX- and RX-. The Niobrara cable MM0 is used to connect to the BB85. This cable is included with the BB85

Figure 2-4 BB85 to PowerLogic RS-485 4-wire cable



Port 1 to the Personal Computer

If the IMPACC connection is RS-232 from the PC to the QUCM then the MM1 cable should be used. Also, a physical connection must be made from the personal computer to the QUCM in order to configure the Ethernet parameters of the QUCM-OE. This link may be a serial connection from a COM port on the personal computer to the RS-232 port on the QUCM-OE. The Niobrara MM1 cable may be used for this connection. This cable pinout is shown in Figure 2-6.

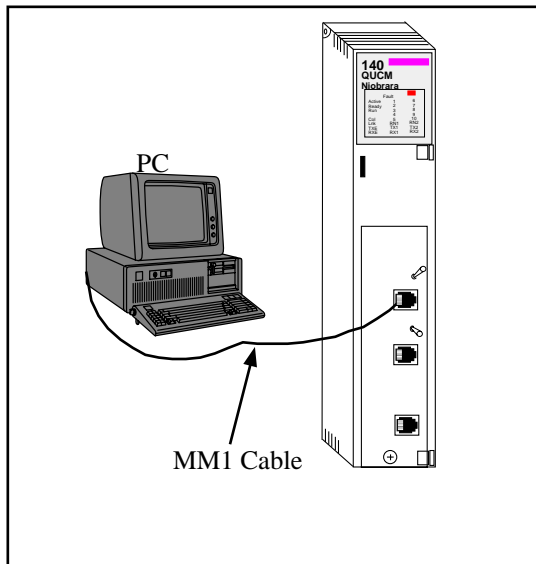


Figure 2-5 PC Connection to QUCM-OE serial port

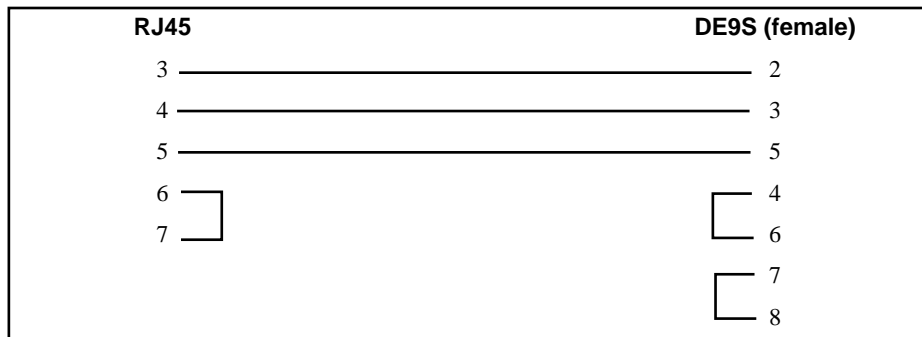


Figure 2-6 QUCM-OE to RS-232 PC Port (9-pin) (MM1 Cable)

Port 1 to Direct to MINT II

The serial port of the QUCM-OE must be set to RS-232. The Niobrara cable MM4 is ideal for this connection since it includes an RJ45 RS-232 connection for the QUCM-

OE and a 25-pin male RS-232 modem pinout for the MINT II. This cable pinout is described in Figure 2-7

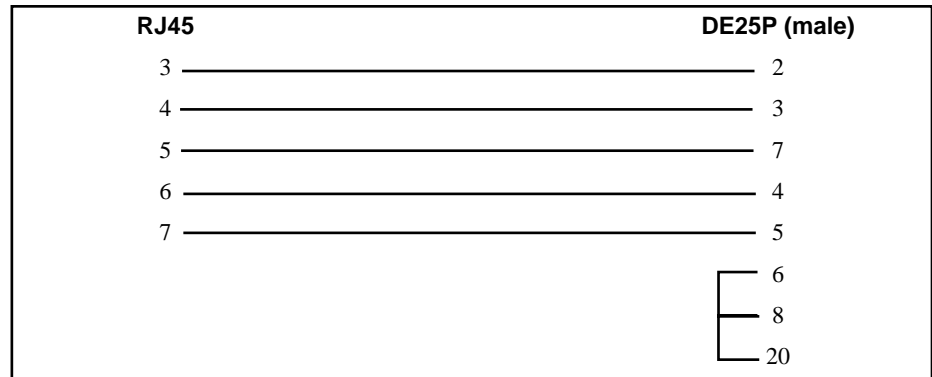


Figure 2-7 QUCM-OE to RS-232 DTE Port (25-pin) (MM4 Cable)

The MINT II must be configured to match the serial settings of the QUCM Port 1. 19200 baud is required for the system to work well. The INCOM network must be set for 9600 baud. The DIP switches on the front of the MINT II must be set for the following:

- RS-232 Baud: 19200 (OFF, OFF)
- INCOM Baud: 9600 baud (OFF)
- STOP BITS: 1 (OFF)
- MODEM CONTROL: NO RTS/CTS (ON)
- ACK/NAK BYTE: SENT (OFF)
- HANDSHAKE BYTE: NOT SENT (OFF)
- SWITCH 8 (not used) (OFF)

The switches for the above configuration will be:

OFF, OFF, OFF, OFF, ON, OFF, OFF, OFF.

Loading the Applications into the QUCM

The QUCM-OE must use the qucmtcppl.fwl or qucmtcppl.qrc firmware included in the c:\Niobrara\Firmware folder after running the QUCM_SETUP.EXE file. There are two ways to upgrade the firmware of the QUCM-OE: QLOAD and FWLOAD.

Using ZAPREG32.EXE to set the IP Address

It is recommended to use the Ethernet capabilities of QLOAD to load the firmware, qucm_impacc_app1.qcc and qucm_impacc_app2.qcc into the QUCM. Set up the IP parameters of the module by the following method:

```

Command Prompt - zapreg32 com1: 255 -b
Niobrara R&D                                SY/MAX Register Viewer                                05Oct2004
                                                QUCMTCPL 20JUN2005
REGSTR  HEX    UNSIGN  SIGNED  STAT
46  00CE    206    206    0000
47  00DF    223    223    0000
48  0033    51     51    0000
49  00A8    168    168    0000
50  00FF    255    255    0000
51  00FF    255    255    0000
52  00FF    255    255    0000
53  0000     0     0    0000
54  00CE    206    206    0000
55  00DF    223    223    0000
56  0033    51     51    0000
57  0001     1     1    0000
58  0037    55     55    0000
59  0000     0     0    0000
60  0514   1300   1300   0000
61  0000     0     0    0000
62  0064    100    100   0000
63  01F7    503    503   0000
64  0018    24     24   0000
65  0384    900    900   0000

Sy/Max Register Viewer
Up and Down arrows to select register,
Page Up and Page Down to change by 10,
Left and Right arrows to select mode,
0..9, A..F to enter new value,
Up/Down Arrow to build block write,
Enter to update without moving,
F10 to acknowledge error,
Escape to exit.
  
```

Figure 2-8 ZAPREG32 COM1:9600,E,8,1 255 -B

- 1 Move Switch 1 and Switch 2 to Halt.
- 2 Connect the PC to QUCM Port 1 with a MM1 cable.
- 3 From the command line enter

```
>zapreg32 com1: 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 = 206.223.51.168 subnet Mask = 255.255.255.0, Default Gate = 206.223.51.1, Modbus/TCP port number = 503:

Register	Description	Example (decimal)
46	IP MSByte	206
47	IP	223
48	IP	51
49	IP LSByte	168
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	(leave this alone)	
59	(leave this alone)	
60	(leave this alone)	

- 61 (leave this alone)
- 62 (leave this alone)
- 63 Modbus Port 503 (this defaults to 502)

- 4 After entering the IP parameters, attempt to ping the module to verify the settings.
> ping 206.223.51.168
- 5 Verify a connection to the internal Modbus/TCP server with zapreg32.
> zapreg32 206.223.51.168:503 255
Should connect to the QUCM on port 503 with Destination index 255.

QLOAD QUCM Firmware Update

QLOAD is a convenient method for upgrading the firmware of a QUCM, especially if the QUCM already has an IP Address. A direct serial connection to the module is not required, the module does not need to be powered down, and the entire process may be done remotely across the Ethernet.

- 1 Application 1 Switch will usually be in RUN unless this is the first time to run QLOAD to load the firmware. If this is the case then place switch 1 in Halt before loading the file. After loading the file, switch Switch 1 to run to allow the update to complete.
- 2 Start QLOAD.EXE by selecting "Start, Programs, Niobrara, QUCM, QLOAD QUCM Firmware".
- 3 The file to load should be c:\Niobrara\Firmware\qucmtcp1.qrc. If not, click on the Browse button and select the file qucmtcp1.qrc.
- 4 Verify the following:
 - a. The Application 1 Radio Button is selected.
 - b. The Modbus/TCP tab is selected.
 - (1) The IP Address of the QUCM is entered correctly.
 - (2) The TCP Port number is set to 503.
 - (3) The Modbus Drop is set to 255.
- 5 Press the Start Download button. QLOAD will open a progress window to show the status of the download. If Switch 1 is in Halt then move it to Run, otherwise, wait approximately 20 seconds for the upgrade to finish after the download is complete. The unit should be ready to received the new versions of qucm_impacc_app1.qcc and qucm_impacc_app2.qcc.

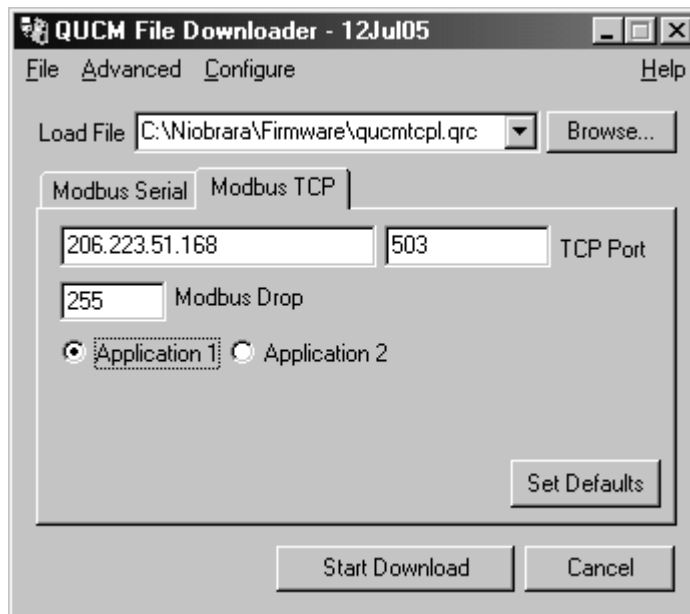


Figure 2-9 QLOAD of qucmtcpl.qrc

FWLOAD QUCM Firmware Update.

If the QUCM has corrupt firmware or completely non-responsive then the old method of using FWLOAD may be required.

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. Make sure that Port 1 is set to RS-232 mode with the slide switch below the port.
- 6 Start FWLOAD by selecting "Start, Programs, Niobrara, QUCM, FWLOAD QUCM Firmware.
- 7 Verify the following:
 - a. The file to load is c:\Niobrara\Firmware\qucmtcpl.fwl.
 - b. The proper PC serial port is selected.
- 8 Press the "Query" button to verify that the firmware to be loaded is newer than the firmware in the module.
- 9 Press the "Start Download" button to update the firmware. The download should take a couple of minutes to complete.
- 10 Remove the module from the rack and change the switch back to RUN.



Figure 2-10 FWOAD of qumtcpl.fwl

QLOAD Applications 1 and 2

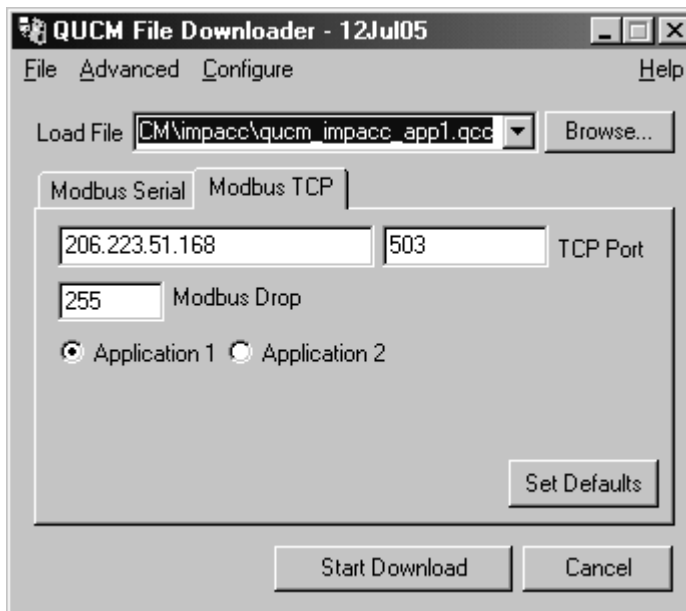


Figure 2-11 QLOAD of qum_impacc_app1.qcc

- 1 Application 1 and 2 Switches must be in RUN.
- 2 Start QLOAD by selecting "Start, Programs, Niobrara, QUCM, Apps, IMPACC, QLOAD IMPACC Application 1.
- 3 Verify the following:
 - a. Application 1 radio button is selected.

- b. The Modbus/TCP tab is selected.
 - (1) The IP Address of the QUCM is entered correctly.
 - (2) The TCP Port number is set to 503.
 - (3) The Modbus Drop is set to 255.
- 4 Press the Start Download button. QLOAD will open a progress window to show the status of the download.
- 5 Click on the Browse button and select the file qucm_impacc_app2.qcc.
- 6 Select the Application 2 Radio Button.
- 7 Press the Start Download button. QLOAD will open a progress window to show the status of the download.

After downloading both applications, the RN1 and RN2 lights should be on. Open a web browser and point it to the IP Address of the QUCM for configuration.

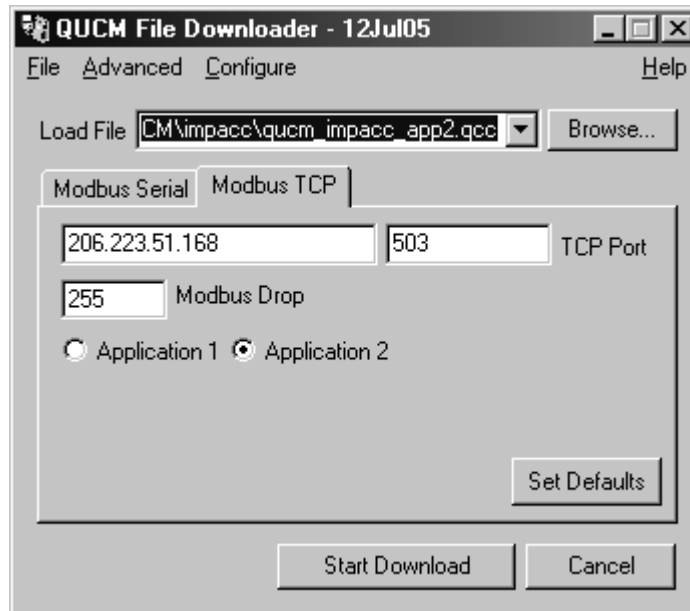


Figure 2-12 QLOAD of qucm_impacc_app2.qcc

IQ Data Plus II Supported Values

The QUCM polls the PowerLogic meters for the following data to be presented to the IMPACC system as an IQ Data Plus II. The Breaker Status is valid for the MicroLogic meter only. Commands from the IMPACC system are not supported. Trip Logs from the MicroLogic are not supported. The Energy values roll over at 10,000,000 KWH.

Table 2-3 PowerLogic data presented to IMPACC System

Value	Notes
Breaker Status	Supported for MicroLogic meters only.
Frequency	
Power Factor	
Current A, B, C	
Voltage A-N, B-N, C-N	
Voltage A-B, B-C, C-A	
Real Energy Total	Rolls over at 10,000,000 KWH
Real Power Total	
Reactive Power Total	
Peak Demand Real Power	

Each PowerLogic meter must be entered into the QUCM to allow it to poll the devices. The meters may be connected directly to the QUCM's serial ports or accessed via Modbus/TCP over the Ethernet. The QUCM polls each of the meters in sequence and keeps a copy of the data to report to the IMPACC system and display on the web page. Each PowerLogic meter is assigned a virtual INCOM slave address and its data is presented to the IMPACC system as though it were an IQ Data Plus II meter. There are three methods for connecting to the IMPACC system: direct RS-232 serial, Ethernet, and remotely through a MINT.

Direct Serial MINT Emulation

Port 1 of the QUCM may be configured for "INCOM Slave (Direct from a PC, MINT Emulation)". An MM1 cable is used to connect the PC's RS-232 port to the QUCM. The QUCM-OE's Port 1 must be set for RS-232 if directly connected to the PC with the MM1 cable.

The IMPACC software will be configured so it thinks that the PC's serial port is connected to a MINT II. Table 3-1 shows the proper settings for the PC serial port connected to the QUCM.

Table 3-1 PC IMPACC Communication Settings

Setting	Value
Com Port	1 or 2 (PC's Com Port)
Type	MINT
Baud	19.2k
Format	n,8,1 No Ack/Nak
Uart	Display only
Timeout	510mS

After the serial port is configured in the IMPACC software then each new meter needs to be added. Table 3-2 shows the proper settings for the IQ Data Plus II for this con-

nection. The Device Address is in hex and needs to match the value configured in the QUCM for the PowerLogic meter.

Table 3-2 IMPACC Device Settings

Setting	Value
Select Device	IQ Data Plus I/II
Network	Com Port
Through	Direct
VIA	PONI
Device Address	in Hex
Com Port	1 or 2
Description	User Input
Via Address	0

Figure 3-1 shows a simple example with the IMPACC PC connected to QUCM Port 1 and two PowerLogic CM2000 meters connected to QUCM Port 2. The CMs are configured for standard PNIM operation at 9600 baud and EVEN parity with slave addresses of 1 and 2. These meters are configured as INCOM slaves ABC and ABD (hex).

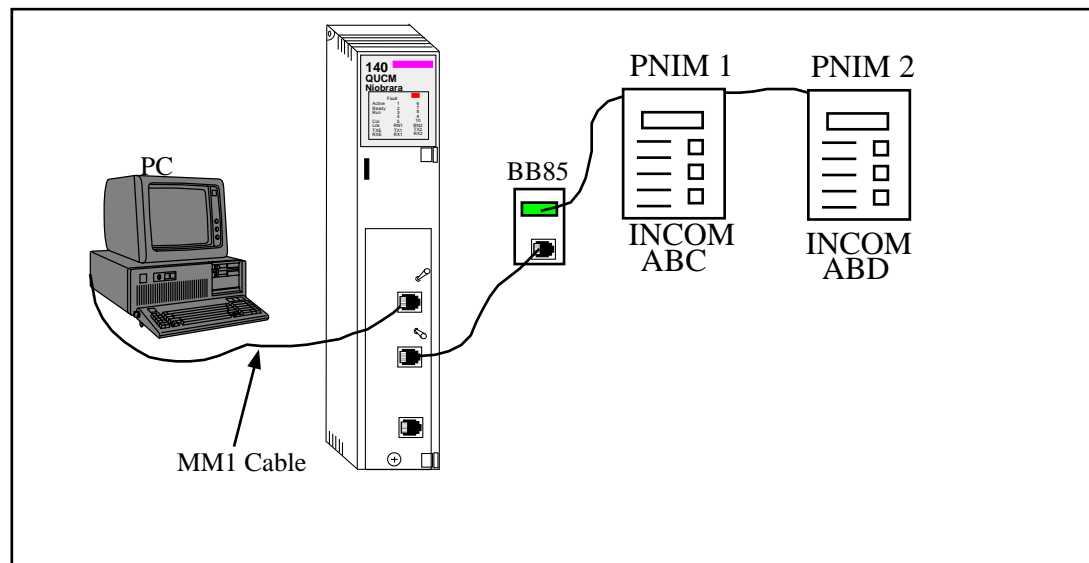


Figure 3-1 Direct Connect Example

Ethernet EMINT Emulation

The QUCM provides support for INCOM UDP Ethernet access from PowerNet. Simply add the QUCM's IP Address to the system as an EMINT with each of the virtual IQ Data Plus II downstream.

The EMINT emulation can be used even if the QUCM is configured to use Port 1 for a MINT emulation or connection.

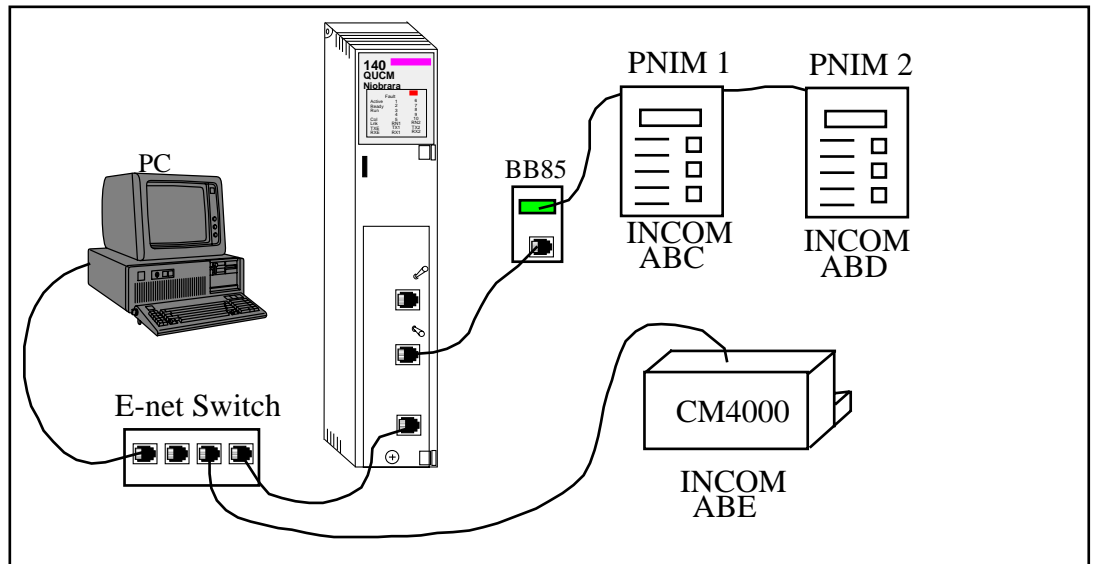


Figure 3-2 Ethernet Connection Example

Figure 3-2 shows a QUCM polling two CM2000s on a serial port and a CM4000 over Ethernet. The PC connects to the QUCM as though it were an EMINT and polls INCOM IQ Data Plus II slaves ABC, ABD, and ABE.

MINT Slave Emulation

There are cases where the QUCM cannot be located near the IMPACC computer so a direct physical connection to the computer's RS-232 port is not possible and the system may not support an Ethernet connection. It may be possible to add a MINT II remotely on the INCOM network and connect the QUCM to the MINT. There are specific limitations on this configuration:

- The INCOM network must be set to 9600 baud.
- The MINT II must have its serial port set to 19200 baud. Table 3-3 shows the required DIP switch settings for the MINT II.
- The MINT II only has a 100 message buffer and it is possible for a CONI master to overrun this buffer. The IMPACC software polls the slaves in the order that they are entered so it may be necessary to re-order the poll list so the PowerLogic meters are mixed into the poll list.

Table 3-3 MINT II DIP Switch Settings

Switch	Description	Setting
1 and 2	RS-232 Baud Rate	OFF, OFF = 19200
3	INCOM Baud Rate	OFF = 9600
4	RS-232 Stop Bits	OFF = 1
5	Modem Control	ON = No RTS/CTS
6	ACK/NAK Sent	ON = Not Sent
7	Handshake	OFF = Not Sent
8	Not Used	OFF

After the serial port is configured in the IMPACC software then each new meter needs to be added. Table 3-4 shows the proper settings for the IQ Data Plus II for this connection. The Device Address is in hex and needs to match the value configured in the QUCM for the PowerLogic meter.

Table 3-4 IMPACC Device Settings

Setting	Value
Select Device	IQ Data Plus I/II
Network	Com Port or CONI
Through	Direct
VIA	PONI
Device Address	in Hex
Com Port	1 or 2, or 0 for CONI
Description	User Input
Via Address	0

Figure 3-3 shows an example with the IMPACC network connected to QUCM Port 1 through a MINT II and two PowerLogic CM2000 meters connected to QUCM Port 2. The CMs are configured for standard PNIM operation at 9600 baud and EVEN parity with slave addresses of 1 and 2. These meters are configured as INCOM slaves ABC and ABD (hex).

The polling list in the PC should be set to poll in this order: 123, 124, ABC, 125, 126, ABC.

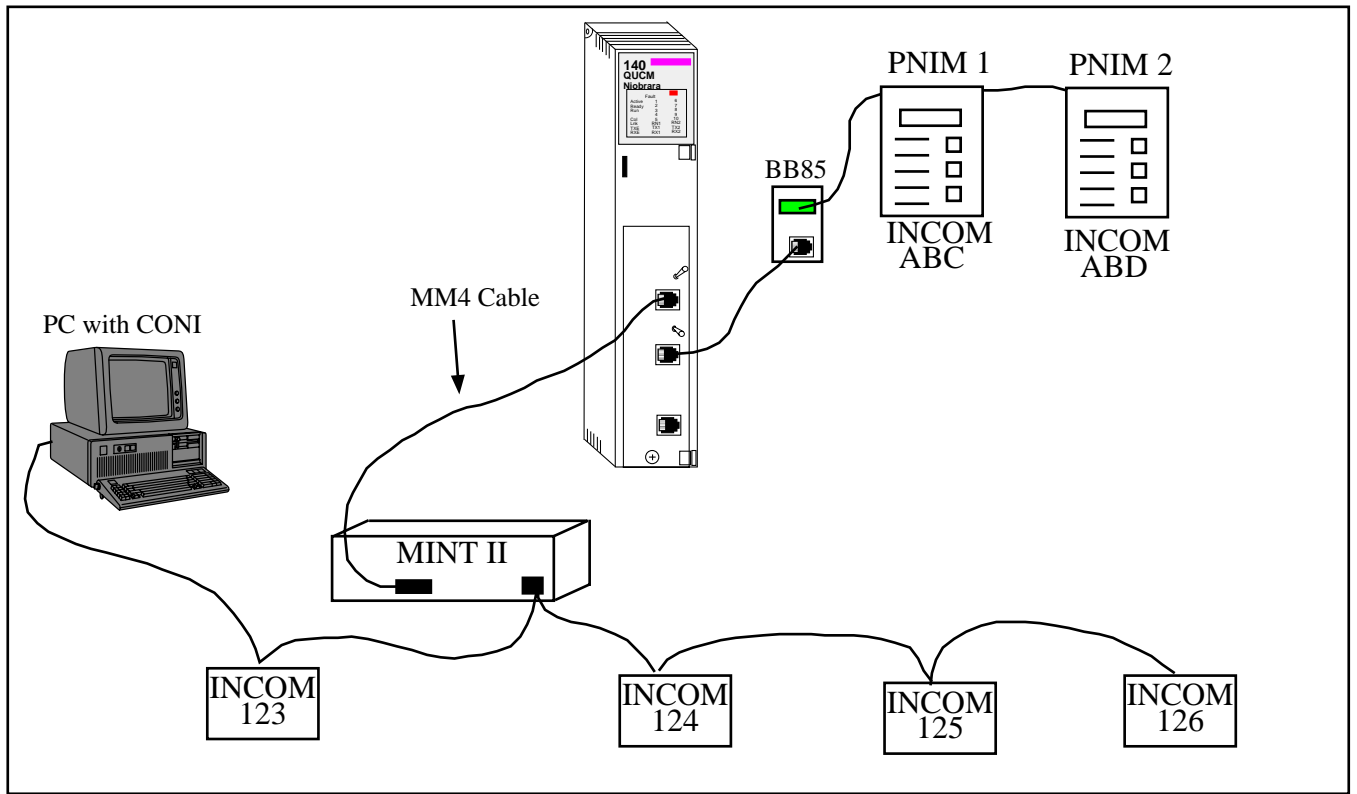


Figure 3-3 Remote Connect Example

Navigation Bar

The left side of each page includes a set of navigation links. This list changes dynamically based on the current page displayed. The root links are Home, Configuration, Statistics, and Help.

Home

The Home link displays a page similar to figure 4-1. It gives a brief summary of the number of devices configured, the settings on the two QUCM serial ports, and the status of the polled meters. The table of devices shows the Modbus/TCP destination Index, QUCM port number, PowerLogic Slave Address, PowerLogic meter IP Address, INCOM Slave Address, text Name, and a link for the online status.

Clicking on the online link in the Status will show a page for the current readings from the PowerLogic meter. See figure 4-2. This page gives the Breaker Status (for MicroLogic only), Frequency, Power Factor, Currents, Voltages, Energy, Real and Reactive Power, and Peak Demand Power. Links are provided at the bottom of the page for Next Device, Previous Device, and Home.

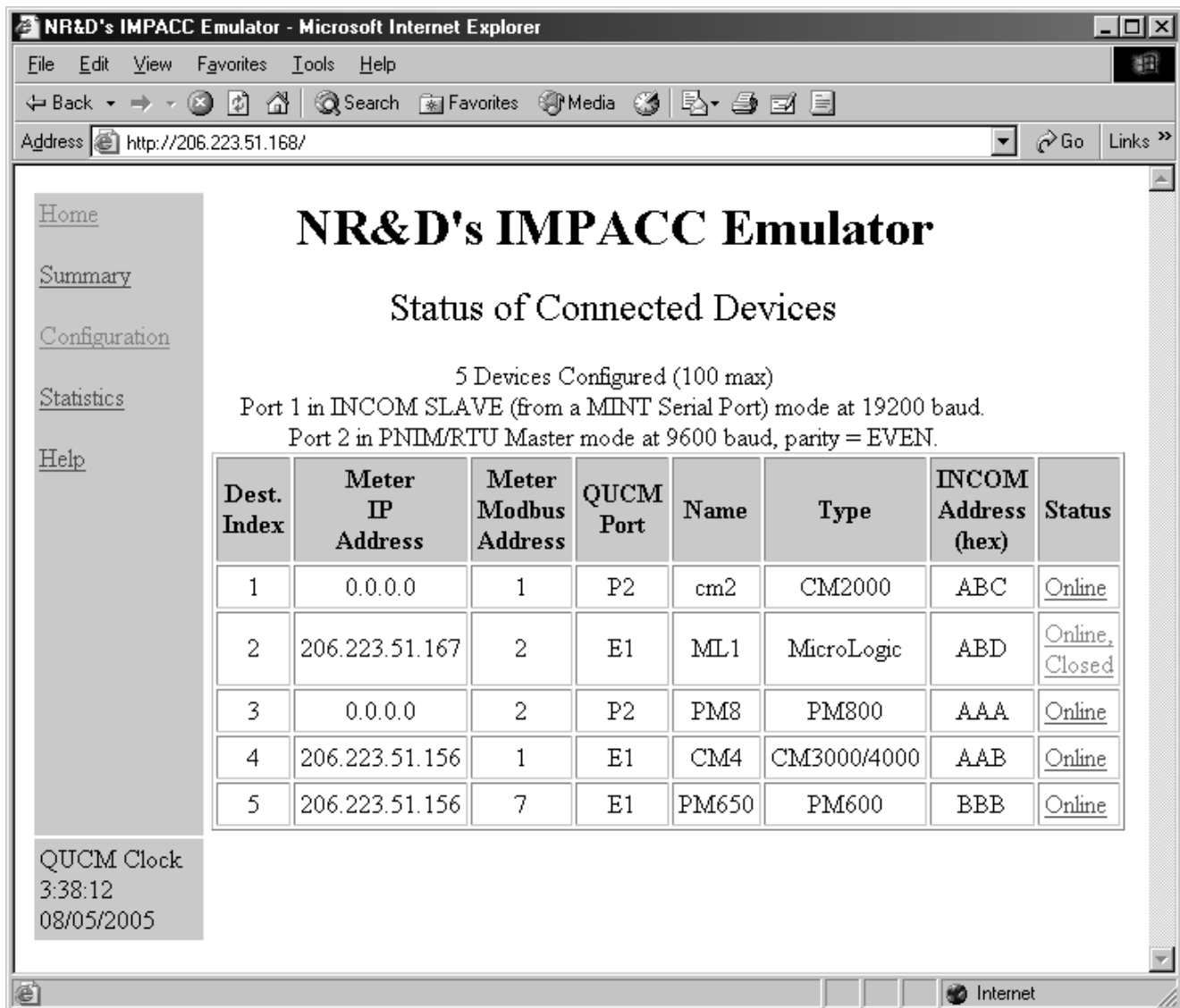


Figure 4-1 Main Page with five devices configured

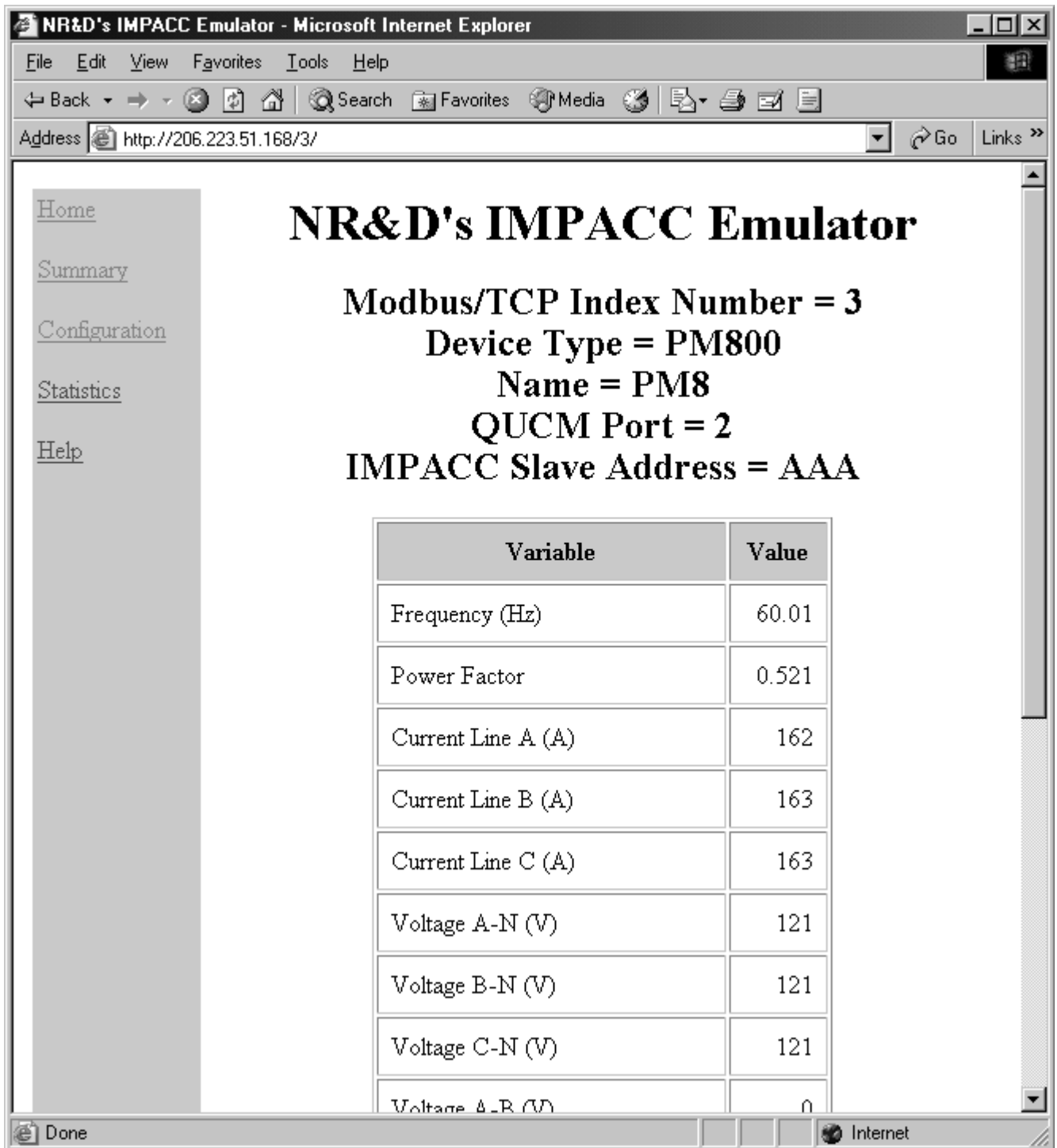
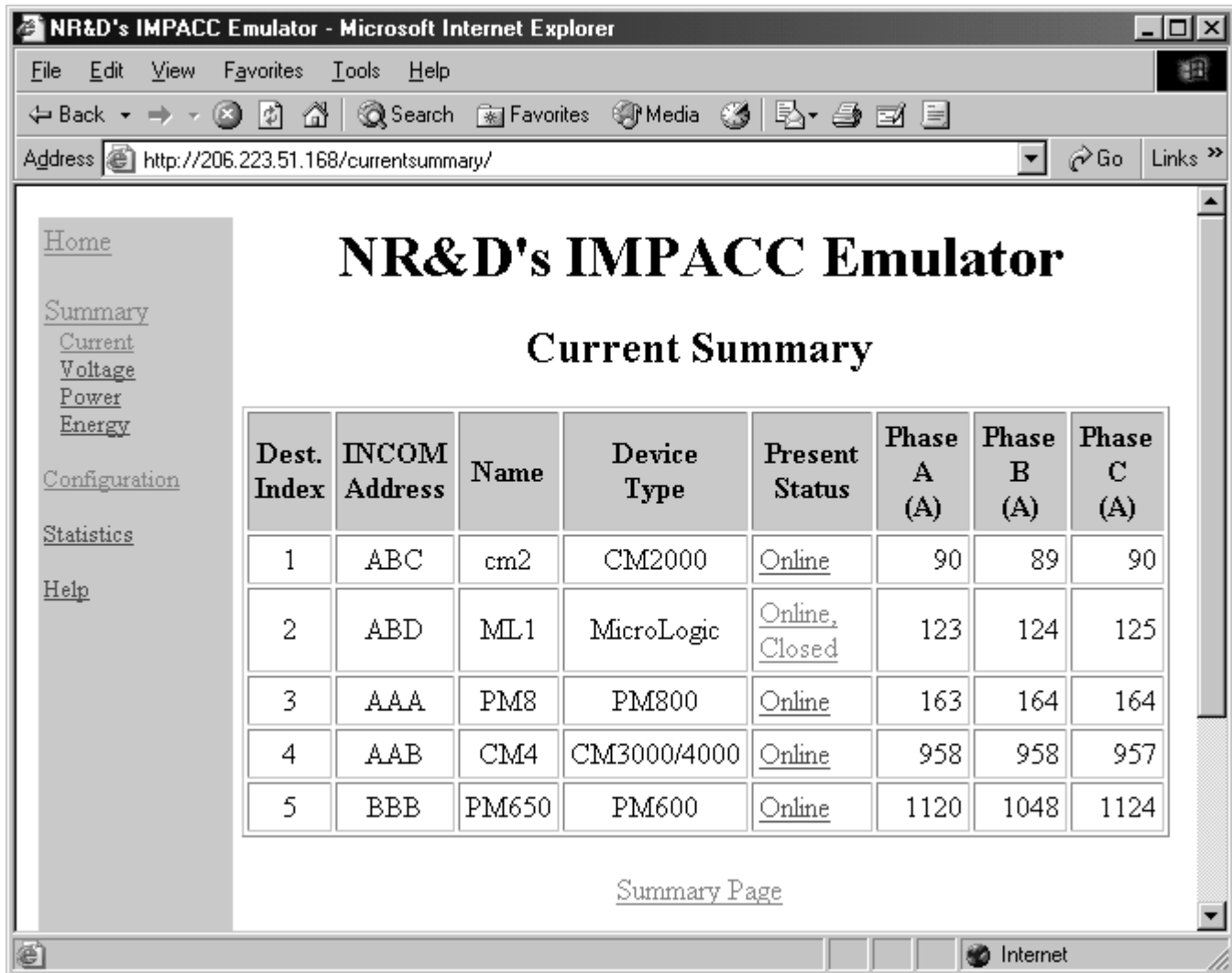


Figure 4-2 Device Page

Summary

The Summary link has three sub-links that show summary pages Current, Voltage, Power, and Energy.



The screenshot shows a Microsoft Internet Explorer window titled "NR&D's IMPACC Emulator - Microsoft Internet Explorer". The address bar displays "http://206.223.51.168/currentsummary/". The page content includes a navigation menu on the left with links for Home, Summary (Current, Voltage, Power, Energy), Configuration, Statistics, and Help. The main content area is titled "NR&D's IMPACC Emulator" and "Current Summary". It contains a table with the following data:

Dest. Index	INCOM Address	Name	Device Type	Present Status	Phase A (A)	Phase B (A)	Phase C (A)
1	ABC	cm2	CM2000	Online	90	89	90
2	ABD	ML1	MicroLogic	Online, Closed	123	124	125
3	AAA	PM8	PM800	Online	163	164	164
4	AAB	CM4	CM3000/4000	Online	958	958	957
5	BBB	PM650	PM600	Online	1120	1048	1124

Below the table is a link for "Summary Page".

Figure 4-3 Current Data Summary

Configuration Page

The Configuration Page link will enter a set of pages for configuring the QUCM. A table is shown with the currently configured devices with links to Edit or Remove each device. Additional links are provided to Add Device, Serial Port Configuration, Change QUCM Titles, Change QUCM TCP/IP Address, Change Password, Store Configuration in Flash, and Home. See Figure 4-4.

Password

These pages are password protected based on a 3 minute activity timer. If the password timer has expired the user will be prompted to enter the password. Some configuration parameters require the password to be entered before the action is taken.

The default password is "master" and it is case sensitive.

Add Device

The Add Device link is used to add new remote devices. Each device allows the selection of the Modbus/TCP Destination Index, INCOM Slave Address (in hex), QUCM Port number, IP Address of the meter (or its gateway), Modbus Slave Address of meter, the type of meter, text Name, and In Service check box.

The "**Destination Index**" is the Modbus/TCP slave address used to access the collected data in the QUCM for testing and debugging. Valid entries are 1 to 100.

The "**INCOM Slave Address**" is the slave address in hexadecimal used by the IMPACC software to represent this PowerLogic meter.

The "**QUCM Port**" is the port that the message will be transmitted from. Possible values are Port 1, Port 2, and Ethernet Socket 1. QUCM Port 1 may not be a valid choice if Port 1 is in an INCOM mode.

The "**IP Address**" is the entry for the PowerLogic meter's Ethernet port or bridge. If the meter is directly connected to the QUCM's serial port then set this value to 0.0.0.0.

The "**Modbus Address of Meter**" is the slave address or Destination Index used to access the meter. Typical values are 1-254.

The "**Device Type**" determines which type of PowerLogic meter is used. Possible values are CM100/200, CM2000, CM3000/4000, PM600, PM800, Enercept, and MicroLogic P-Type.

The "**Name**" is a text description for the remote slave. This description is shown in most QUCM tables. The maximum length is 20 characters.

The "**In Service**" check box is used to temporally disable a device.

Serial Port Configuration

The Serial Port Configuration page is used to set up the parameters for the QUCM's serial ports.

The "**Port Mode**" allows the setting of Port 1 or Port 2 operation. The following settings are allowed:

- INCOM Slave (Direct to from a PC, MINT Emulation) - This mode is used when the IMPACC computer is directly connected via RS-232 to the QUCM. The QUCM emulates a MINT. This mode is only available on Port 1.
- INCOM Slave (Direct from a MINT, Meter Emulation) - This mode has the QUCM emulating INCOM meters from a MINT. The IMPACC PC is remotely connected to the MINT through another MINT or a CONI card. This mode is only available on Port 1.
- PNIM/RTU Master - This mode allows both older SY/MAX meters (CM100, CM200, CM2000) and newer Modbus RTU meters on the same daisy-chain.

- PNIM Master - This mode is for older SY/MAX meters (CM100/200/2000).
- Modbus RTU Master - This mode is for the newer Modbus meters.
- PLOGIC Master - If an older CM100 or CM200 has many timeouts then change the mode to PLOGIC.
- Modbus RTU Slave - This mode is for access to the PowerLogic data for testing.

The Baud Rate settings allow the chosen serial port to be set at 1200, 2400, 9600, and 19200 baud. INCOM Slave modes should be set for 19200.

The Parity setting allow the port to be set to NONE or EVEN. The default value is EVEN.

Edit Title Page

The Edit Title page allows the setting of the HTML Title and Head values. The Title is displayed at the top of most browsers and it also the text displayed when book-marked. The Head is the text displayed in bold at the top of every QUCM web page.

QUCM TCP/IP Configuration

The QUCM TCP/IP page allows the changing of the IP Address, Subnet Mask, and Default Get of the QUCM. The new settings are not automatically stored to flash so they must be stored after the change.

Change Password

This page allows the user to change the default password for the configuration of the QUCM.

Store Configuration to FLASH

The Store Configuration to FLASH link must be used to save the current settings to non-volatile memory. All changes will be lost on power cycle if the store to flash is not used.

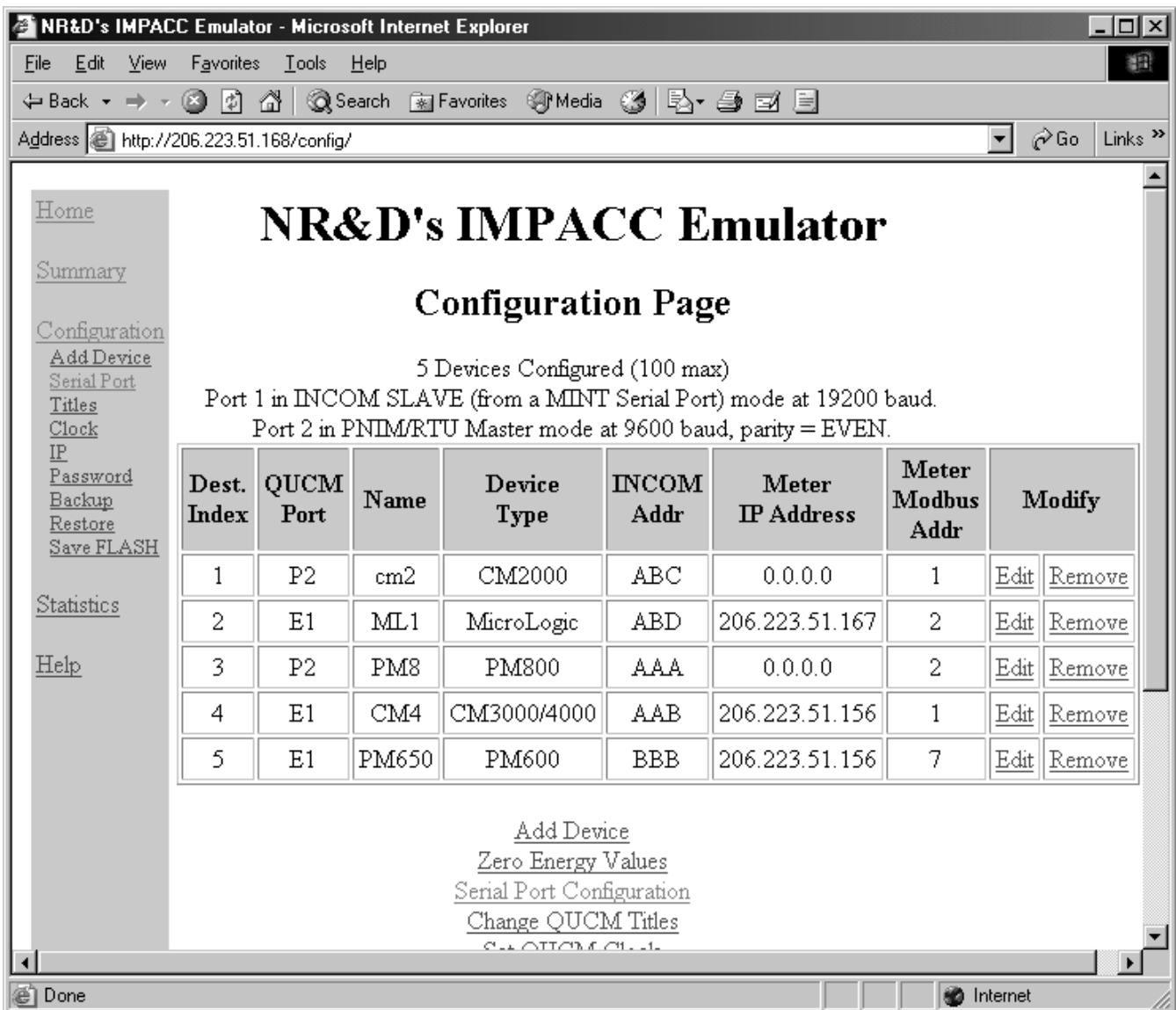


Figure 4-4 Configuration Page

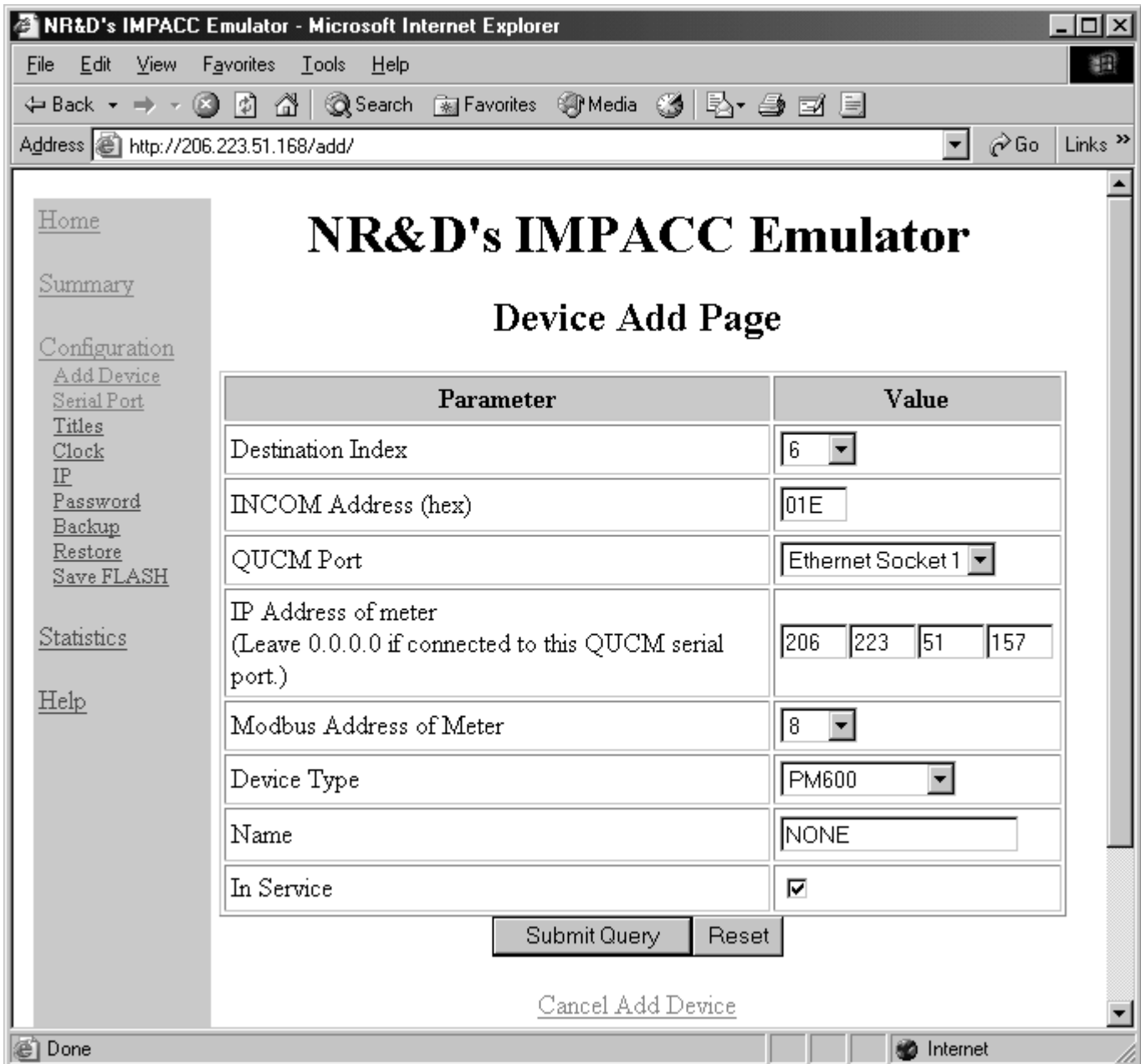
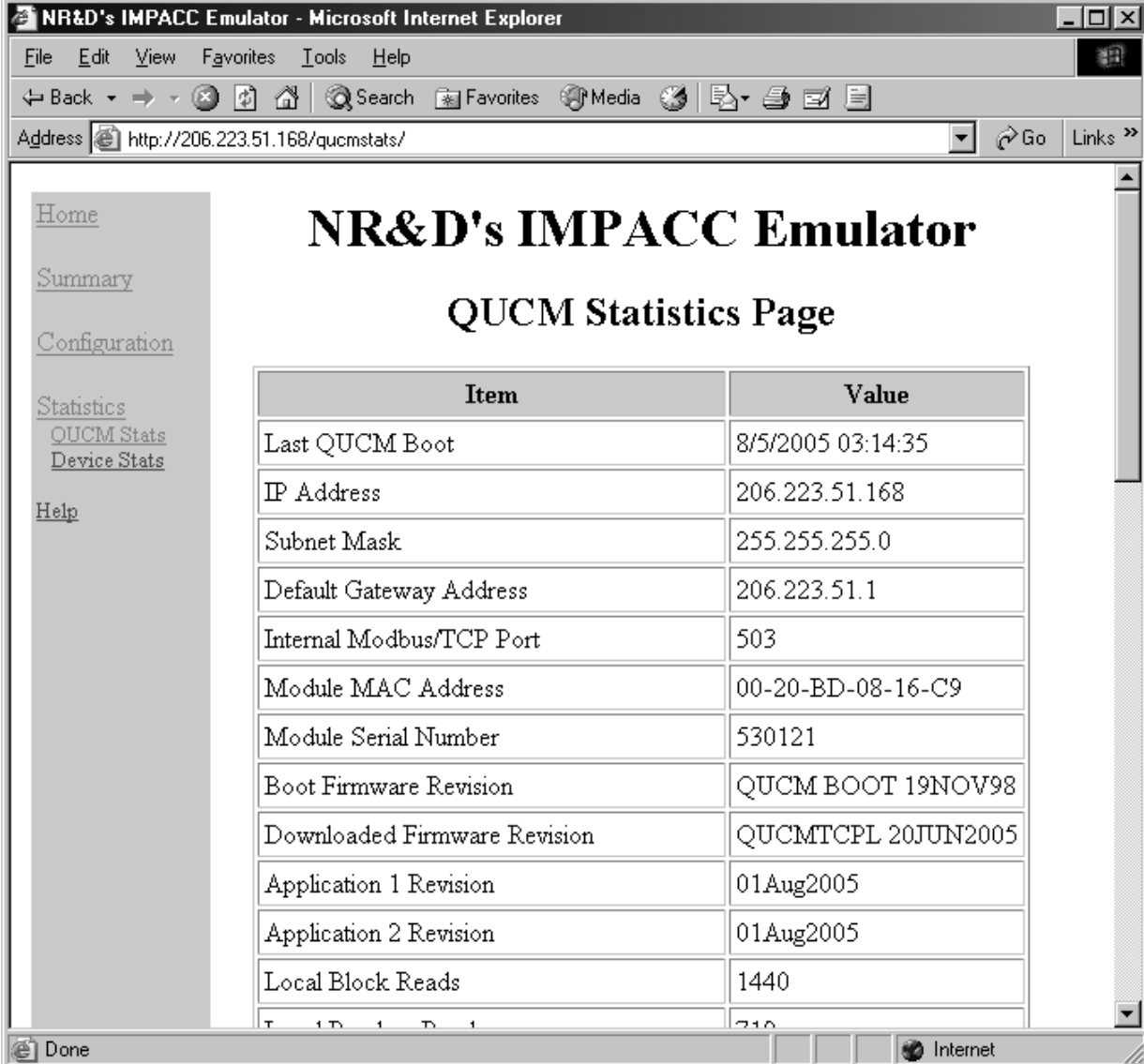


Figure 4-5 Add Device Page

Statistics Pages

There are two links for statistics: QUCM and Device stats. (See Figure 4-6 for the QUCM stats sample page) The QUCM stats page shows a variety of information about the QUCM itself including the MAC address, IP settings, firmware revisions and downloaded application revisions. The Device Stats page shows a summary of the communication counters for each device.



The screenshot shows a web browser window titled "NR&D's IMPACC Emulator - Microsoft Internet Explorer". The address bar shows "http://206.223.51.168/qucmstats/". The page content includes a navigation menu on the left with links for Home, Summary, Configuration, Statistics (with sub-links for QUCM Stats and Device Stats), and Help. The main content area is titled "NR&D's IMPACC Emulator" and "QUCM Statistics Page". It features a table with the following data:

Item	Value
Last QUCM Boot	8/5/2005 03:14:35
IP Address	206.223.51.168
Subnet Mask	255.255.255.0
Default Gateway Address	206.223.51.1
Internal Modbus/TCP Port	503
Module MAC Address	00-20-BD-08-16-C9
Module Serial Number	530121
Boot Firmware Revision	QUCM BOOT 19NOV98
Downloaded Firmware Revision	QUCMTCPL 20JUN2005
Application 1 Revision	01Aug2005
Application 2 Revision	01Aug2005
Local Block Reads	1440
...	...

Figure 4-6 Statistics Web Page

Help Pages

There are a number of help pages to assist in building the serial cables and settings on the MINT. Figure <help page> shows the help page for the DDC2I.