

**SPM-200**  
**SITE POWER MONITOR**

**NEWMAR®**

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ETHERNET

RESET

POWER STATUS

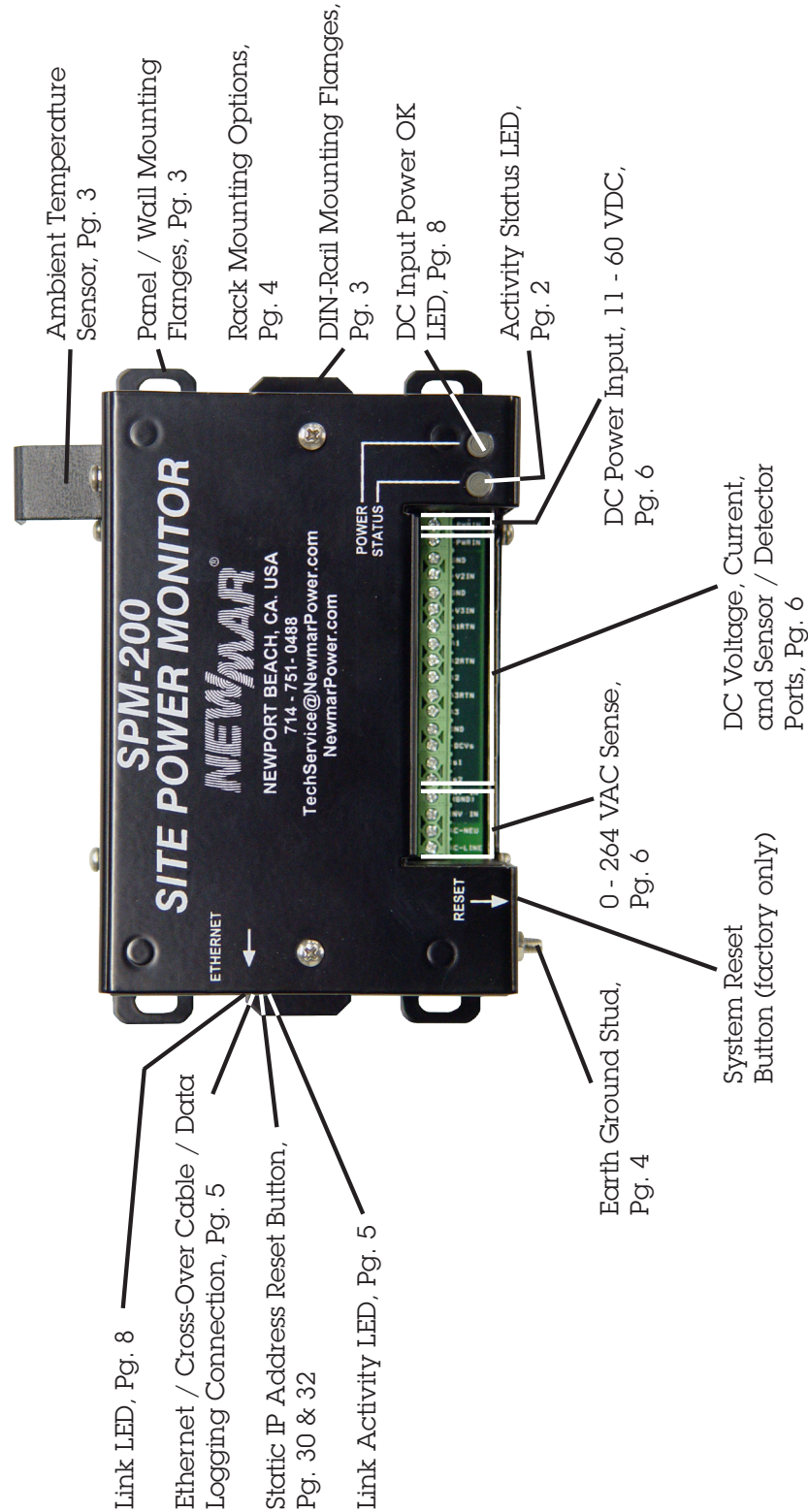
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## 1.0 Quick Reference Guide

**Firmware Update Access:** Check [www.newmartelecom.com/Site\\_Power\\_Monitor/Firmware\\_Update/Firmware.html](http://www.newmartelecom.com/Site_Power_Monitor/Firmware_Update/Firmware.html) for firmware updates. See page 23 for details.



## 2.0 Overview

### 2.1 General Description

Your NEWMAR Site Power Monitor, model SPM-200, web-enables and integrates intelligence to any site's AC and DC power system for 24/7 monitoring, alarm condition notification, and data logging of vital electrical functions. All sensor inputs are programmable, accessible, and managed via the Internet: TCP/IP or SNMP. View current conditions and log 30 day history of DC and AC power status at remote sites before dispatching personnel.

The SPM-200 is designed specifically for monitoring power supplies, rectifiers, batteries, converters, inverters, UPS, power distribution panels, and AC power at communication sites, base stations, outdoor enclosures and command vehicles via Ethernet or Wireless connection. The unit can be rack, DIN-rail, or wall mounted and is easily adapted to virtually any make of power system via nine sensor input ports which capture and stream critical data via the internet for analysis and logging of site history. Web page based programs are easily user configured for site parameters with up to 50 desired alarm conditions settings and multiple automatic notification options by e-mail, PDA, and mobile phone via text messaging.

Sites without internet access can use the monitor solely as a data logging instrument that captures and retains a 30 day history file, ready for download to a spread sheet on a lap top computer during maintenance visits for recording site history and analysis of component performance and failure conditions.

### 2.15 Front Panel LED Indicators

**Status:** Flashes on when polling sensor inputs. Approximated once every 5 seconds.

**Power:** Illuminates when DC input power is present

### 2.2 Sensor Inputs

In addition to a built-in temperature sensor, the SPM offers the following 9 sensor ports:

#### 2.2.1 Voltage

##### DC: 3 Ports:

- 2 each 0 to +40 VDC (Negative Ground), typically +6, +12, +24V systems
- 1 each 30-60 VDC (Positive Ground), typically -48V systems

**CAUTION:** If you intend to power -48 VDC **AND** monitor -48 VDC, input power **must** come from an isolated DC converter. If you need one, we will provide it free of charge. Contact NEWMAR: 800-854-3906 or E-Mail: Techservice@newmarpower.com and request model: **48-12-1i Kit**

- Accuracy  $\pm 2\%$

##### AC: 2 Ports:

- 90-264 VAC utility power (L-N or L-L Single Phase) Floating
- 90-264 VAC inverter output, Single Phase

**Note:** This input can be used to monitor a second utility or generator source providing it's a Line to Neutral source with grounded Neutral which must be connected to "INV IN (GND)" Terminal # 4

**WARNING!** Inverter GND terminal 4 is common to all SPM grounds and returns.

- Accuracy  $\pm 2\%$

##### DC: 1 Port:

- 100 amp/100mV differential shunt voltage (shunt included)
- Accuracy  $\pm 3\%$

#### 2.2.2 Current & Switch Inputs

##### DC: 1 Port:

- 100 amp/100mV differential shunt voltage (shunt included)
- Read battery charge/discharge (-) current, or load current

##### Dry Contact Switch Inputs: 3 ports

- Possible uses: voltage loss, door open, water leak detection, smoke alarm, component failure, breaker trip, high temperature, etc.



### 2.2.3 Temperature Sensor

This sensor is located on the top right hand side corner of the SPM-200 when vertically mounted and senses ambient temperature. A protective guard prevents damage to the exposed sensor.

Sensor Range: -20° C to +60° C/-4° F to +140° F  
Accuracy: +/- .5%

See section 5.1 SPM-200 Web page overview pages 17 and 18 for more information on setting Temperature unit (°C or °F) and Internal Temperature offset.

### 2.3 System Requirements

To enable the full remote access feature requires:

- Ethernet connectivity via RJ-45 plug, 10 BaseT
- Static IP address (see Appendix A for non-static IP address option)
- SNMP manager software. SPM-200 supports V1 & V2c

### 2.4 Materials Provided

The following items are provided with the SPM-200:

Qty (1) Screwdriver (00 Phillips)

- (1) Installation/Operation Manual (CD-ROM) and short form.
- (4) 1 Amp In-Line Fuse Assembly, P/N: 563-0498-0
- (4) ACG-1 Fuse, P/N: 554-0100-0
- (1) 100A/100mV shunt, P/N: 575-2000-0
- (4) # 8 Sheet Metal, SS, Pan Head Screws, 1". Phillips, P/N: 730-0816-2 (Mount SPM and Shunt)
- (2) DIN-rail (35mm) End Clamps, P/N: 701-0040-0
- (1) CAT .5 Cross-Over Cable, P/N: 873-0048-0 (use with laptop or PC for set-up)

### 2.5 Optional Accessories

The following materials are optional (not provided) and are available through NEWMAR. Please reference part number when ordering.

- Rack Mounting Kit, model: RM-SPM – 19 or 23", P/N: 020-5091-0
- 48 VDC to 12 VDC Isolated DC Converter, model: 48-12-1i
- Sensors
  - Water
  - Door/Window Open alarm
  - Fire/Smoke Detector
- Software
  - Multi site monitor software – Model: 100 SS –Site Software - SPM

## 3.0 Installation

### 3.1 Mechanical

There are 3 methods of mounting: Wall, DIN-rail, and Rack. Regardless of method, please observe the following: free air flow (away from other equipments' hot air exhaust so that the temperature sensor reads accurately). Indoor installation only! No exposure to rain, spray, or moisture. Plan your wire routing when considering location.

#### Option A: Wall, Panel, or Inside Enclosure Mounting

The SPM can be mounted on any flat secure surface (wall or tray) using screws through the four holes on the mounting tabs (#8 screws recommended). Orientation should provide access to the front panel terminal block.

#### Option B: DIN-rail Mounting


The chassis supports DIN mounting via a 35mm rail at least 8 inches long. Installer needs to provide DIN-rail. Two DIN-rail end clamps, P/N: 701-0040-0 provided.


### Option C: Rack Mounting

The unit can be rack mounted with Newmar optional 19" or 23" rack mounting kit, 2 RU (3.5 inches) tall, model RM-SPM, P/N: 020-5091-0.

### 3.2 Wiring

Connections for both operating power and sensor inputs are made to the terminal block on the front panel. The terminal block accommodates 16-22 gauge wire, and a small insulated screw driver is provided to ease your connection process. Do not over tighten screws. Be sure to strip at least ¼" of the insulation off the wires and fully insert them before tightening screws. It is recommended you tin the ends of stranded wire before inserting in the terminal block.

 **WARNING:** All un-grounded voltage inputs to the SPM must be fused with a 1 amp in-line fuses, except for the A1, A2, and A3 switch inputs (floating contact), and the Is1 and Is2 shunt input (terminals 5 & 6). All returns and GROUNDS on the SPM are common with the -V DC input terminal.

 **CAUTION:** Do not make connections to the SPM with the power on, or with any live AC or DC sources!

Refer to FIGURE 1 and 2 for details on the following steps. Each terminal block position has a reference number 9 abbreviated ID, and full description (see TABLE 1).

 **CAUTION: Chassis Ground Stud:** Connect to earth ground first! Stud size: #6-32

 **CAUTION:** If you intend to power -48 VDC AND monitor -48 VDC, input power must come from an isolated DC converter. If you need one, we will provide it free of charge. Contact Newmar: 800-854-3906 or E-mail: techservice@newmarpower.com and request model: **48-12-1i**

#### 3.2.1 DC Operating Power Input 11-60 VDC

Connect using 16-22 AWG wire. Connect your main DC power source to the -V and +V terminals being careful to observe proper polarity. A 1 amp fast blow fuse on the +V input is recommended for protection. The SPM draws approximately 200 m/A.

#### 3.2.2 DC Voltage Monitor Ports

There are three ports total that monitor DC voltage. Two are rated for 0-40 VDC input, (terminals 15-16 and 17-18) and a third, (terminals 7-8) with inverse ground reference rated for 30-60 VDC input, intended primarily for neg. 48 volt telecom system use. Note all DC sense voltage ties to the SPM must share a common ground with the DC power source. CAUTION: If you intend to power -48 VDC AND monitor -48 VDC, input power must come from an isolated DC converter. If you need one, we will provide it free of charge. Contact Newmar 800-854-3906 or E-mail: techservice@newmarpower.com and request model: 48-12-1i

#### 3.2.3 DC Current

Terminals 5 & 6 (Is1 and Is2) A 0-100mV DC shunt input and shunt are provided for measuring DC current (not provided) Shunt can measure load current, rectifier current, battery current (charge and discharge), depending on where the shunt is installed in the power distribution system. Use twisted pair wires for best results and steady noise free readings. Install shunt in positive or negative lead. Polarity of the shunt output can be swapped to achieve desired positive or negative current flow indication.

#### 3.2.4 Dry Contact Switch Sensors

Terminals 9-10, 11-12, 13-14. Connect up to three devices with switched alarm contacts (N/C or N/O) between A1 and A1 RTN. Assign user-friendly names on Display Tab on monitor that describe the specific functions of each circuit. Some examples include: Magnetic Door Switch, Rectifier Alarms, Smoke Alarms, Battery Temp Alarms, loss of voltage, contact relay closure, etc. Multiple switches can be installed in series, or paralleled in a string to a single input to the SPM.

### 3.2.5 AC Voltage Monitoring

Two ports are available for monitoring AC voltage sources: One for Utility line power, and a second for an auxiliary/back up source such as generator or inverter with floating output.

**Utility power:** Connect AC voltage Line and Neutral to these input terminals 1&2. To measure and log AC voltages from 90-264 VAC, 47-63Hz. Fuse the Line side (hot) with a 1 amp fast blow fuse (provided).

**Auxiliary power:** Connect to inverter output to measure a secondary AC source of 90-264 VAC, terminals 3 &4. Fuse the line side (Hot) with a 1 amp fast blow fuse. Note: This input can be used to monitor a second utility or generator source providing it's a Line to Neutral source with grounded Neutral which must be connected to "INV IN (GND)", Terminal #4



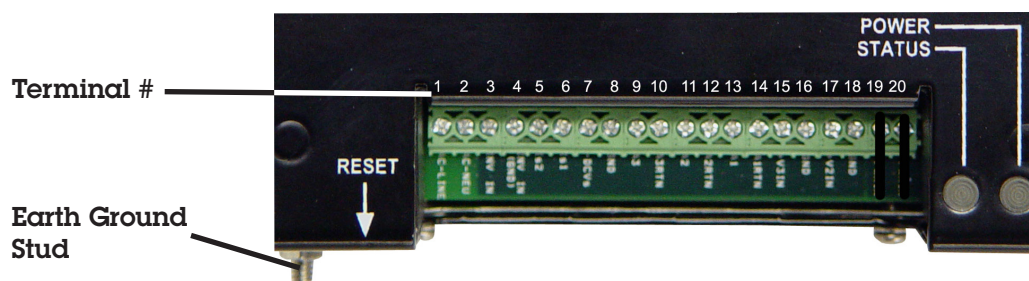
**CAUTION:** Never connect the line side (Hot) of an AC source to INV IN (GND) or any RTN terminal on the SPM.

### 3.2.6 Ethernet Connection

Remote monitoring requires Ethernet connection via RJ 45 jack. Plug into the port on left side of unit. A solid green LED on the port indicates a link is established. A flashing green LED on the jack indicates activity (com). The SPM-200 requires a 10BaseT connection.



**FIGURE and TABLE 1: Input Terminal Block Assignments**



Terminal#	Board ID	Function/Description	Default Webpage ID
1	AC-LINE	Measure AC utility power, 90 to 264VAC. This input is isolated from all other inputs.	Line Voltage
2	AC-NEU		
3	INVIN	Measures a floating AC sources like an inverter, 90 to 264 VAC. INV IN (GND) is common to all GND and RTN and -PWR IN.	Inverter Voltage
4	INVIN(GND)*		
5	Is 2	Measures DC voltages across a 100mV/100A current shunt. Is1 and Is2 inputs may be referenced to either (+) or (-) and/or RTN/GND. 60 volt max common mode and 100mV differential input	Shunt Current
6	Is 1		
7	-DCVs	Measures a negative voltage with reference to GND/RTN. -30 to -60 VDC.***	Volts DC C
8	GND*		
9	A3	Measures a relay or switch contact closure. Short across inputs will indicate CLOSE. Open circuit is OPEN.	Contact C
10	A3RTN*		
11	A2	Measures a relay or switch contact closure. Short across inputs will indicate CLOSE. Open circuit is OPEN.	Contact B
12	A2RTN*		
13	A1	Measures a relay or switch contact closure. Short across inputs will indicate CLOSE. Open circuit is OPEN.	Contact A
14	A1RTN*		
15	+V3IN	Measures a postive DC voltage, 0 to 40 volts with reference to GND/RTN.	Volts DC B
16	GND*		
17	+V2IN	Measures a postive DC voltage, 0 to 40 volts with reference to GND/RTN.	Volts DC A
18	GND*		
19	-PWRIN*	SPM-200 input power, 11 to 60 VDC, maybe powered directly from "Negative Ground" system only.**	(N/A)
20	+PWRIN		

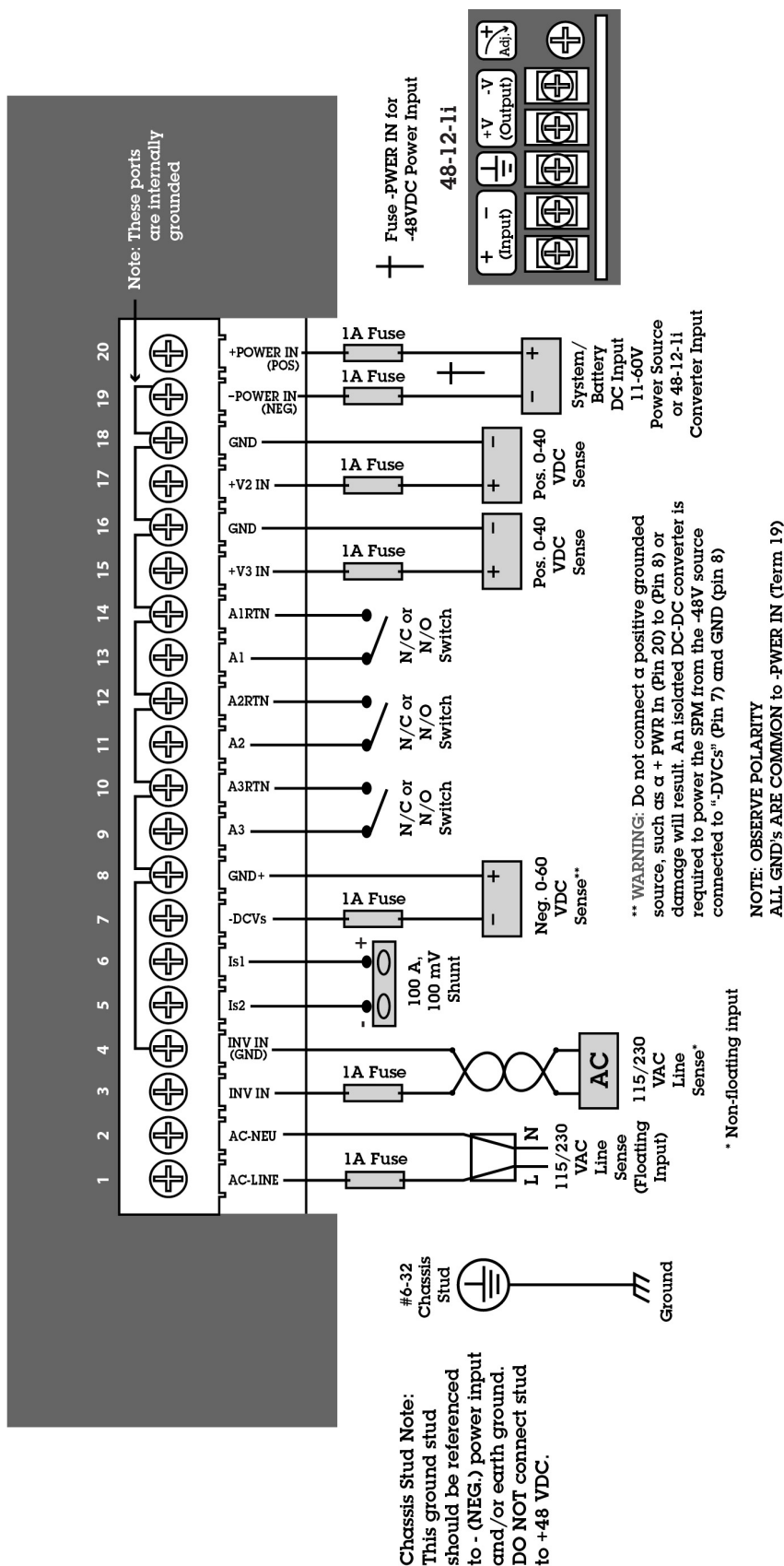
**\* CAUTION: Common to all input grounds and returns.**

**\*\* Neg. DCV is not compatible with input voltages that are positive with respect to pin 8 GROUND. CAUTION: If you intend to power from -48 VDC AND monitor -48 VDC, input power must come from an isolated DC converter. If you need one, we will provide it free of charge. Contact NEWMAR: 800-854-3906 or E-mail: techservice@newmarpower.com and request model: 48-12-1i**

**\*\*\* Positive ground inputs only (-48VDC)**

### FIGURE 2: Simplified Install Wiring Guide

**CAUTION:** If you intend to power -48 VDC AND monitor -48 VDC, input power MUST come from an isolated DC converter. If you need one, we will provide it free of charge. Contact NEWMAR: 800-854-3906 or E-mail: [techservice@newmarpower.com](mailto:techservice@newmarpower.com) and request model: 48-12-11



## 4.0 SET-UP MONITORING & DATA LOGGING

The SPM-200 Power Monitor does the following:

- Displays the current values of the temperature, 3 DC voltages and 2 AC voltages, 1 DC current value and 3 contact closures. The temperature can be displayed in Celsius or Fahrenheit.
- Allows the user to set multiple alarms on each of the measurements above. The alarms can be set to go off if the voltage or current exceeds some value or falls below some other values. Alarms can be set to go off if one of the contact closures goes from closed to open or vice versa. Multiple alarm thresholds can be set on each measurement
- Sends email(s) to one or more address(es) if an alarm is tripped. Text messages can also be generated. Emails can be sent to different addresses depending on which threshold has been crossed. For example, an email can be sent to the first responder's address when the voltage falls below 100V. If the voltage drops below 90V an email can be sent to the second level responder. Additionally SNMP traps can be generated when an alarm is triggered.
- Logs data from all the inputs. The log holds data from all the inputs for the last thirty days. The user can request that one or more inputs be graphed over a certain time period. The user can request the entire log be downloaded in CSV format, which can be read by Microsoft Excel or similar analysis software.

### 4.1 Basic Software Setup

#### 4.1.1 Initial Setup

This section will show how to do an initial setup of a new SPM-200. The easiest way to do this is to connect a laptop or some other PC directly to the unit to set the basic parameters. **Note:** The SPM-200 operates at a maximum of 10 Mb/s. It may be necessary to manually set you NIC or Switch to operate at 10 Mb/s. See your NIC or Switch manual for available options.

As shipped from the Factory the SPM's network interface is configured as follows:

- IP Address: 192.168.123.123
- Netmask: 255.255.255.0
- Default gateway: 192.168.123.1

To do the initial setup you must connect a laptop or a PC to the SPM using the Ethernet crossover cable supplied with the SPM, and configure the PC's network card to match the SPM's settings. The following steps will guide you through the process. (Note: you **must** use the supplied crossover cable, a regular Ethernet cable **will not work**).

- 1) Power the SPM with a DC 12, 24 or -48V source "wall wart" or other power supply. CAUTION: if you intend to power the SPM from -48VDC power AND monitor a -48VDC supply the input power **MUST** come from an isolated DC-DC converter. Newmar will supply a suitable converter free of charge – contact Newmar at 800-854-3906 or e-mail techservice@newmarpower.com and request model: 48-12-li.
- 2) The green power indicator should illuminate. Soon after powering the green status indicator will began blinking periodically.
- 3) Connect the SPM to a PC or laptop using the Ethernet crossover cable provided with the unit (P/N 873-0048-0.)
- 4) The green Link indicator (on the Ethernet Jack) will illuminate if a good link has been established. If it does not, check the connections or try a different crossover cable.
- 5) The unit has now been connected to the PC – the next step is to configure the PC's network interface card (NIC) to talk to the SPM.

### 4.1.2 NIC Setup

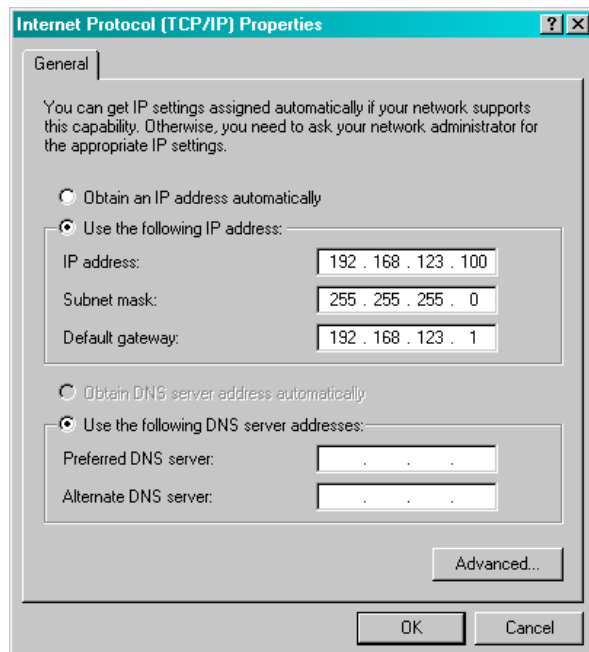
The following instructions describe the process in Windows XP. Earlier versions of Windows and Windows 7 follow a similar procedure. If you are using some other operating system please consult your users' manual for instructions on how to set up the network interface card.

1. Click on the Start button.
2. Select the Control Panel. If the control panel is not an option you may need to choose Settings → Control Panel.
3. Click on the Network Connections icon.
4. You should now see one or more icons that represent network cards/net adapters installed on your system. Choose the network card that you connected to the SPM and right click it, and select Properties.
5. Find and double-click Internet Protocol (TCP/IP) version 4 icon. This opens a window that shows your current network card settings. It should be similar to the window shown in figure 2. Make a note of the current settings, so that they can be restored later.
6. Ensure that "Use the following IP address" is selected and enter the following settings in the appropriate fields.

IP Address: 192.168.123.100  
Subnet Mask: 255.255.255.0  
Gateway: 192.168.123.1

7. Leave the DNS fields blank for now. Click the OK button on the TCP/IP window to save the changes. Then click OK on the Local Area Connection window to finalize the process.

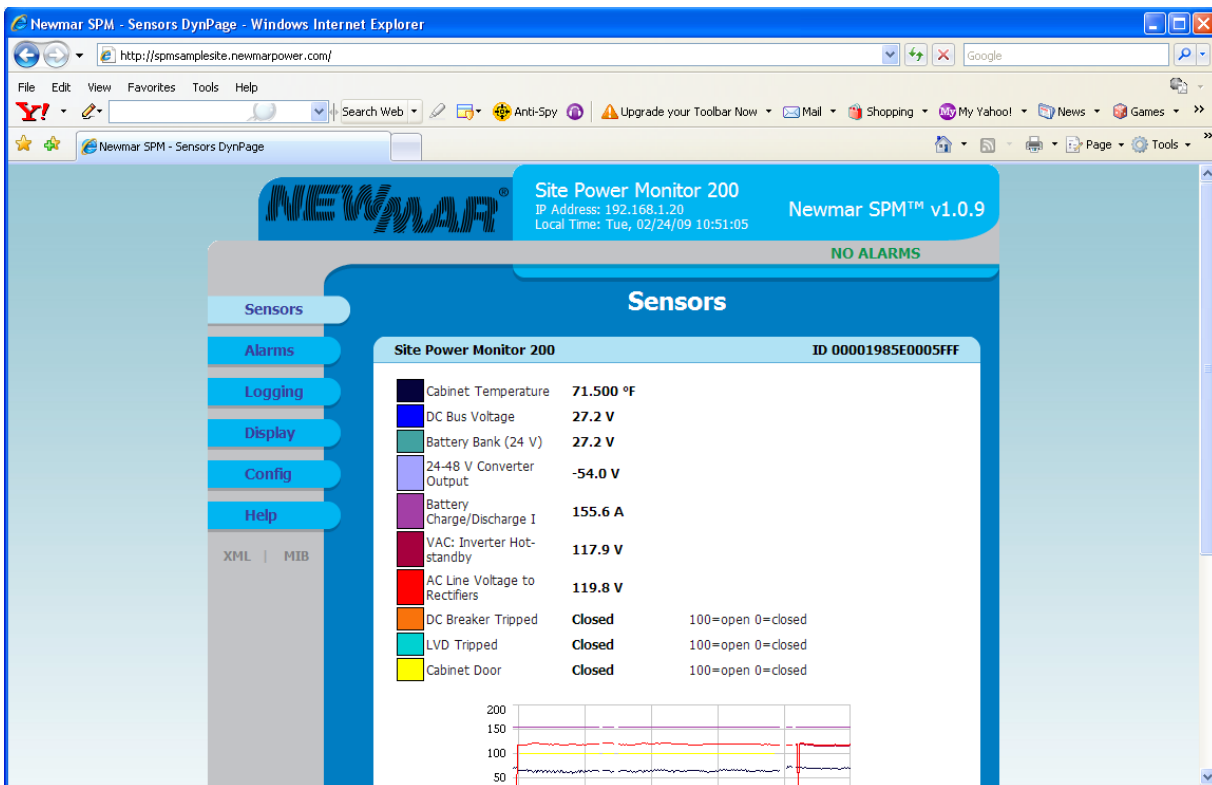
**FIGURE 3: NIC Settings for Unit at Default IP**



Once you have configured your network card to access the SPM, open your web browser and type <http://192.168.123.123> into the address bar. You should get a page which looks similar to this, see FIGURE 4:

**Note:** 100Mb/s network cards may need to be manually adjusted to work at 10Mb/s.

**FIGURE 4: SPM-200 Homepage (Un-Configured Unit)**



If you don't see the above webpage, check to make sure

- the green power light is lit
- the Link indicator on the Ethernet jack is lit
- the PC and the SPM are connected with the crossover cable
- You have correctly set the NIC in the PC

Note the indication near the top of the screen "Local Time: Time Not Set". The unit will not graph or log data until the clock has been set. The SPM has an internal power source that will keep the clock running for about two weeks without a power supply being connected to the unit. If the unit is disconnected for longer than two weeks the clock will have to be reset.

The illustrated unit has not been configured yet. The labels down the left column "Temperature" "Volts DC A", "Volts DC B" etc. are default names for the SPM's inputs. You will be able to replace those names with "friendly names" that mean more to you later on in the configuration process. The unit name in the upper right hand side: "Newmar SPM" is also a default and can be replaced with whatever you choose.

You have now successfully connected a local PC to the SPM and displayed the initial web page. You have proved that your SPM-200 is functional and that you can connect to it with a web browser. The next parts of the manual will cover how to set up the SPM so it can be accessed over the Internet, and how to further configure the SPM.

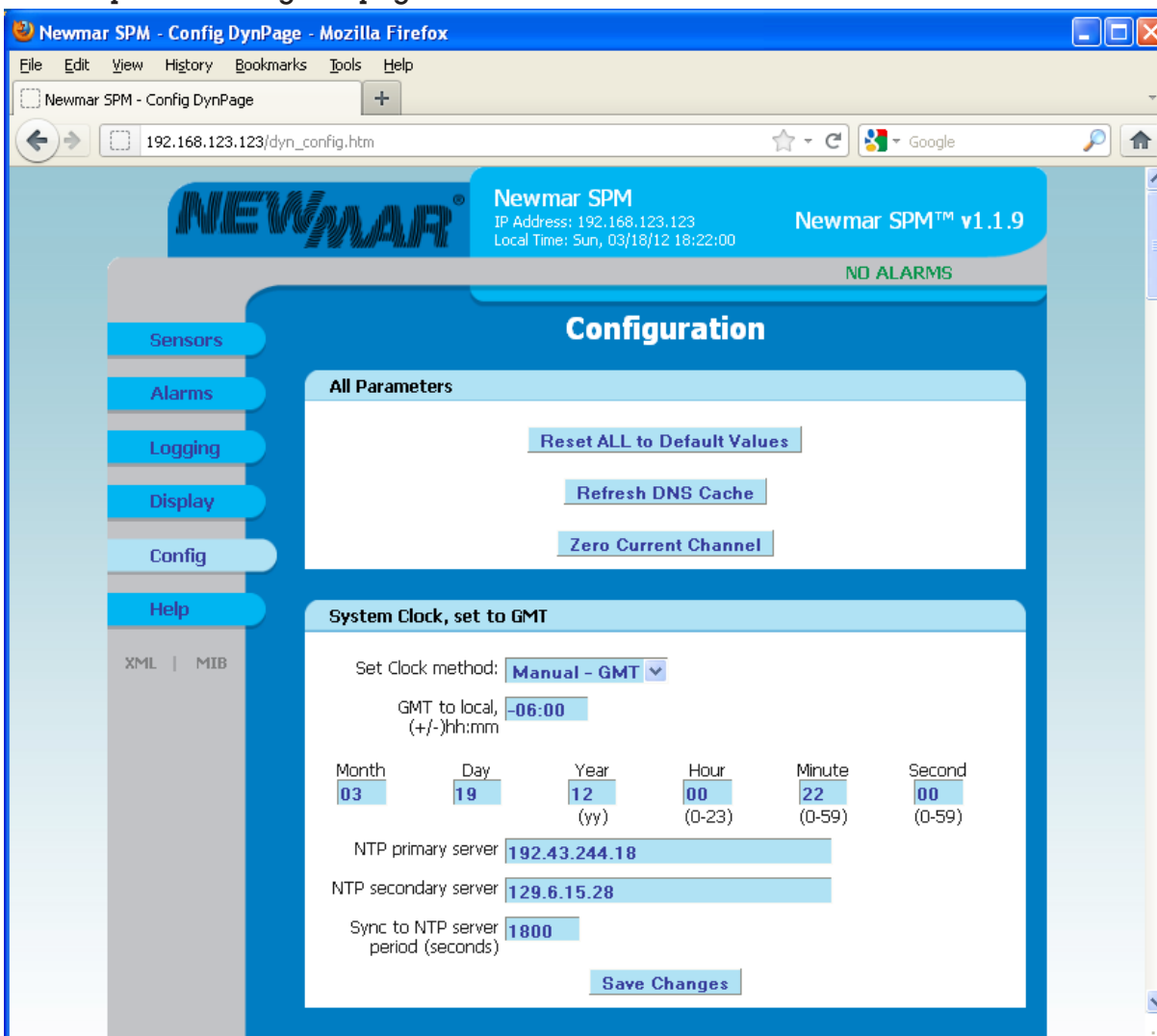
#### 4.1.3 Setting the Clock

This section covers setting the clock and configuring your SPM to connect over a network. NOTE: If you don't have a network to connect to, the SPM-200 can be used as a simple data logger with a Web interface. The only item that you must set is the clock, as described below.



To set the clock, click on the "Config" tag on the left side of the webpage. The top part of the Config page should look like this, see FIGURE 5:

**FIGURE 5: The Top of the Config Webpage**



Select "Manual -GMT" in the "Set Clock Method" pulldown. Enter the date and time in the appropriate boxes. The box asks for the time in GMT, and the offset from GMT for your local area. That is not necessary if you are setting the clock manually. Just set the local date and time and put "0:00" as the GMT to local offset. Be sure to click "Save Changes" when you are done. The date and time should then be displayed at the top of each page, and the SPM will begin logging data.

Note: The SPM will not adjust for Daylight Savings Time; you have to do that manually. It is also possible for the SPM to determine the correct time from an NTP server if one is available. Since the SPM is not connected to a real network that won't work now.

#### 4.1.4 Setting Account Names & Passwords

Now, scroll down the **Config** page until you find the **Name and Password Configuration** options block. Here, you can set up to three levels of password protection for the SPM-200, allowing you to restrict which user(s) in your organization are able to view or change the unit's settings. Although these settings are optional, Newmar Power highly recommends that you at least set up the Administrator account to prevent unauthorized changes to the network and administrative settings.

FIGURE 6: Account Settings

### Name and Password Configuration

NOTE 1: If Account currently has a password, leaving Old Password blank results in no changes to that account.  
NOTE 2: Administrator password may be used in the Old Password field of any account.  
NOTE 3: If setting New Password to blank, Account Name must also be blank.  
NOTE 4: If New Password is not blank, Account Name must not be blank.

Administrator Account Name   
If blank, all access is granted without a password.

Old Password

New Password

New Password Again  (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.

Control Account Name   
If blank, Control and View Only access is granted without a password.

Old Password

New Password

New Password Again  (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.

View Only Account Name   
If blank, View access is granted without a password.

Old Password

New Password

New Password Again  (again, to confirm)

Warning: Record your password. Loss of password may require 48 hours to recover.

If a given account's username and password fields are left blank, then the level(s) of access controlled by that account are available to anyone who connects to the unit. Accounts are listed in order of privilege, from highest to lowest, and lower-privilege accounts cannot be set unless the higher-privilege accounts above them are set as well; i.e. you cannot have a Control account without an Administrator account, and you cannot have a View-Only account without both a Control and Administrator account.

**Administrator:** this account has complete access to the SPM-200; all pages are viewable, and any setting can be changed – including the ability to change any other account's passwords. Note that this account is the only account which can access the **Config** page, and that you must configure this account before you can configure the **Control** or **View-Only** accounts.

**Control:** this account is able to view all of the web pages except for the **Config** page, and is able to change alarm settings on the **Alarms** page.

**View-Only:** this account is able to view all of the web pages except for the Config page, but is not able to change any settings. Once you have configured these accounts the way you want them, click the Save Changes button. If you have configured an Administrator account, the unit will now ask you to log in with that username and password before you can continue.

As always, don't forget to click the "Save Changes" button when you're done.

**At this point you have two options:**

- 1) Continue using the PC and the crossover cable to finish configuring the SPM-200, and later connecting it to the network it will really use. If you want to choose this option, skip over the section "Setting the Internet Address" for now, and come back to it later.
- 2) Connect the SPM to the real network now. To do this, complete the next section now and connect the SPM to the real network as soon as you've set the Internet Address

## 4.2 Setting the Internet Address

The next step is to set the "IP" or "Internet address of the SPM. Each SPM is initially set to 192.168.123.123 when it is built so the user can do the initial configuration, but that will probably need to be changed when a unit is installed.

There are a couple of ways to get an internet address:

- The simplest way is to use what's called a "Static" IP Address. A static address is just what it sounds like, an address that never changes. If the SPM will be part of a local network, the network administrator may be able to assign an address.
- Or, the IP address can be assigned by what's called a "DHCP Server". This is a server on your local network that automatically assigns IP addresses to each device on the network. An address assigned by DHCP is called a "Dynamic" address, because the address may not always have the same value
- If you intend to connect your SPM to the public Internet through an ISP, you will have to have a public static IP address so that it can be reached from a browser. It may not be possible to get a static address – your ISP may only be able to assign a dynamic address. If this is the case, see Appendix A for a solution.

Scroll down on the "Config" page until you see the network settings:

**FIGURE 7: Networking Section of the Config Webpage**

**Network**

MAC Address: 00:19:85:E0:00:5F

Use DHCP to obtain ☐

IP addr / netmask / gateway

IP Address: 192.168.1.175

Subnet Mask: 255.255.255.0

Gateway: 192.168.1.1

**Save Changes**

If you have a DHCP server, check the box indicated. Otherwise, enter the appropriate IP address, Subnet Mask and Gateway address. **CAUTION:** once you click "Save Changes", the SPM will **IMMEDIATELY** switch to the IP address you just entered, or attempt to obtain an IP address from a DHCP server. It will **NOT** respond at 192.168.123.123 anymore. Also note that if you select "DHCP" and there is no DHCP server available, you will not be able to access the SPM-200 again at all. See 9.0 Appendix B: Troubleshooting #14 which describes the "Reset" button in order to recover.

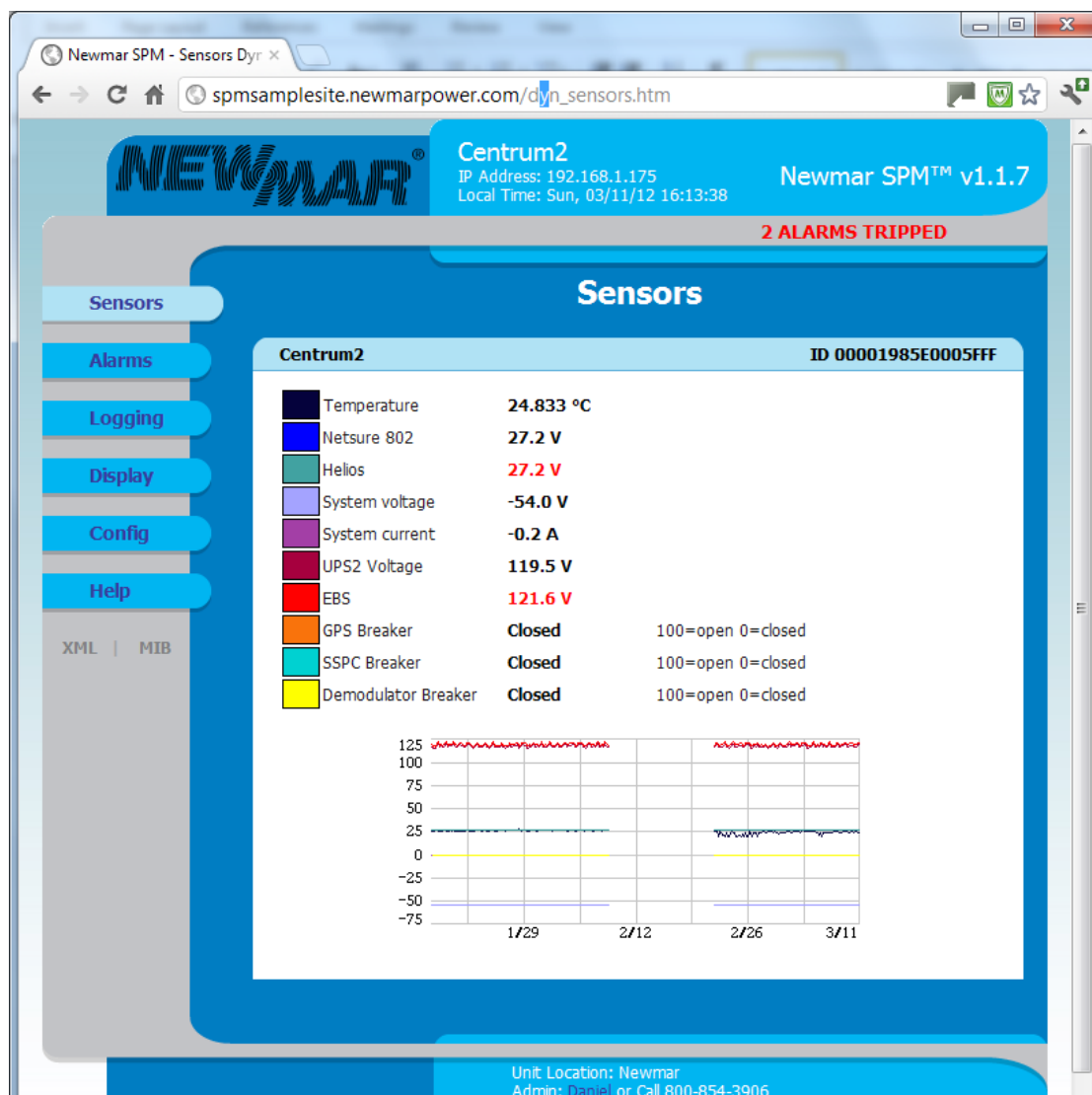
If you are sure you have the correct settings, go ahead and click the "Save Changes" button. Now you will have to disconnect the SPM from the PC and the crossover cable, and connect it to your real network. You should be able to access it by opening a browser window and entering the new address that you just set.

**Note:** Cross over cable cannot be used to connect to routers.

## 5.0 SPM-200 Web Page Overview

The **Sensors** web page is the home page for the SPM-200. It is the page that will be displayed when you first connect to an SPM. The Sensors Page shows the current value of all the inputs to the SPM. A Sensors Page from an SPM that has been running a while is shown on the following page, see FIGURE 8:

**FIGURE 8: SPM-200 Homepage (Configured Unit)**



Note that the default names on the previous illustration have been replaced by names that are more meaningful in this installation. Some other configuration variables have been changed, such as the temperature units. Temperature can be displayed in Fahrenheit or Celsius, whichever you choose. The clock has been set and some of the information in the box at the bottom has been customized as well.

This unit has been running for a while, so it displays a graph of all the data. This graph is not configurable; it always shows all the data. Later on you will see a screen that you can customize to show only the data you want to see.

Note that there is a gap in time on the graph. The SPM must have been turned off over that time span. Note also that "2 Alarms Tripped" appears at the top of the page. The values for "Helios" and "EBS" are red instead of black, indicating that these are the values that tripped the alarms.

The inputs are scanned every 15 seconds. This page is automatically refreshed once per minute. You can force the page to show the newest data immediately by clicking the "refresh" button on your browser.

### 5.1 Setting Low & High Alarm Trips

The **Alarms** web page is where you configure the alarms for the unit.

**FIGURE 9: Alarms Page**

Alarm#	Sensor	Trip Type	Trip Value	E-mail	Traps
Alarm#01	[Centrum2]-[Auxiliary Voltage]	High Trip	30.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm#02	[Centrum2]-[Main]	High Trip	130.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm#03	[Centrum2]-[Unity Shelf Voltage]	Unassigned		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm#04	[Centrum2]-[Auxiliary Voltage]	High Trip	44.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm#05	[Centrum2]-[System Voltage]	High Trip	44.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm#06	[Centrum2]-[System Voltage]	Low Trip	55.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm#07	[Centrum2]-[System Current]	Low Trip	55.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm#08	[Centrum2]-[System Voltage]	Low Trip	55.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



The user selects which data item each alarm covers. In the example above, Alarm#01 is set to trip if the "Auxiliary Voltage" input goes above 30.0V. We know it will trip if the value goes above the set point because "High Trip" has been selected. Note Alarm#06 is set to trip if the same input goes below 22.0V ("Low Trip"). Any number of alarms can be set on each input value, as long as the total number of alarms is less than 50.

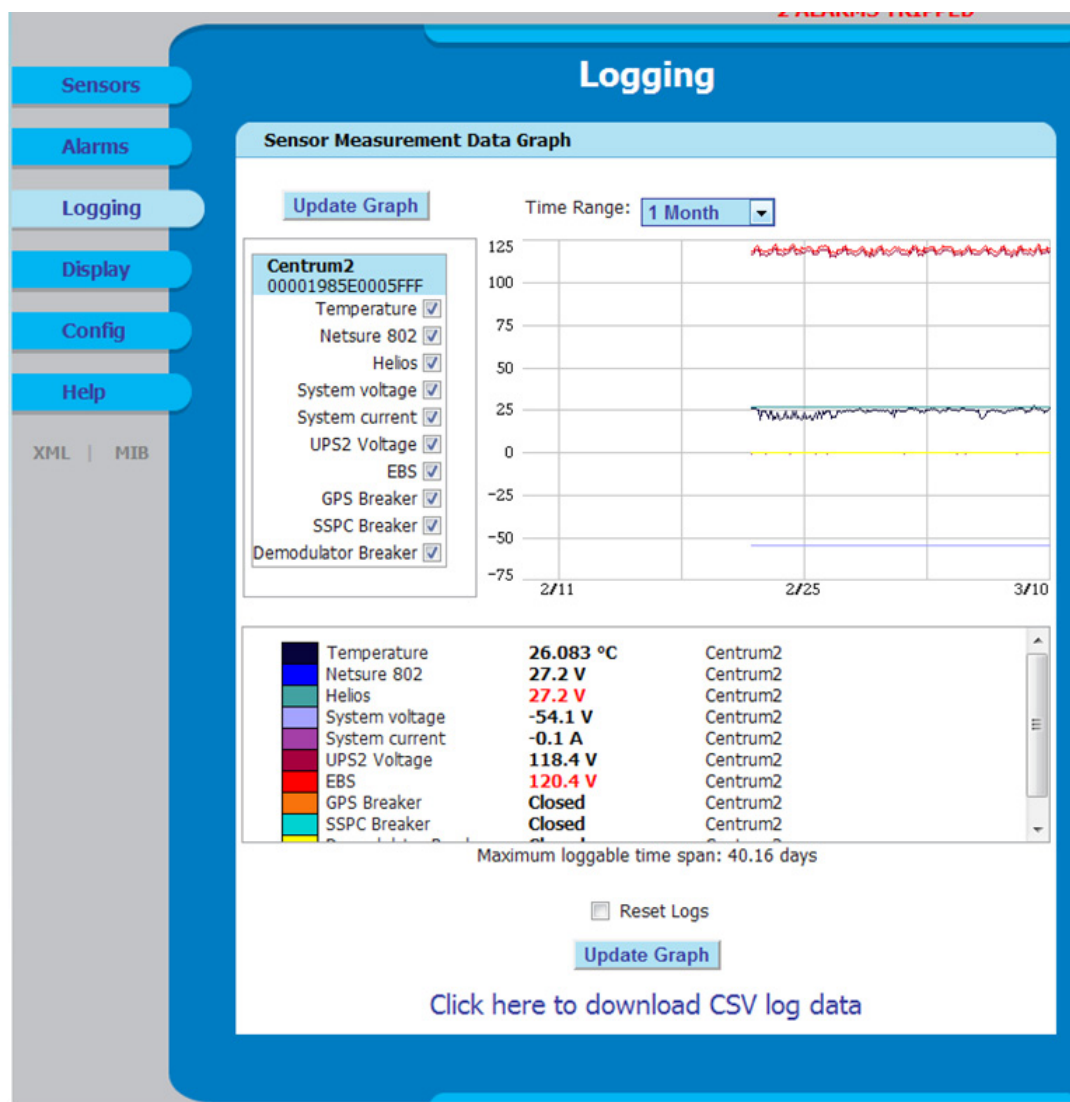
Note how Input Select is pulled down for Alarm#04. This illustrates how the user can select any input for any given alarm.

When Alarm#01 is tripped it will send emails to the first two email addresses, and both SNMP traps will be triggered. (We'll see how to set the email addresses and SNMP traps on the Configuration Page later). Each alarm can send emails to any combination of the 5 email addresses and 2 SNMP traps. It is common to set one alarm to send an email to one or more email addresses if an input value exceeds a first threshold, and set a second alarm to send emails to different address(es) if the same input value exceeds a second threshold. This allows an escalation procedure to be set up.

If you make changes to this (and any other web page on the SPM-200) don't forget to click "Save Changes" when you're finished. If you don't, your changes will be lost.

The **Logging** page graphs selected data over a selected time range, and controls data logging in general.

**FIGURE 10: Logging Page**



This page allows the user to select data inputs and graph them over a chosen time period. The graph can show data over ranges in time from the last 15 minutes to the last month. The user can select any combination of the inputs to be graphed. (This is in contrast to the graph on the Sensors page, which always shows all the stored data.). At the bottom of the page is shown the maximum length of the log, in this case 40.16 days. That means if the SPM-200 has enough room in its memory to store data over that time. The memory is set up as a circular buffer - if the SPM-200 has run for more than that time, new data will replace the old on a first in – first out (FIFO) basis.

If you make changes on this page you must click the **"Update Graph"** button for the changes to take place.

If for some reason you want to delete all the data that is in memory, check the **"Reset Logs"** box. Caution – there is no way to recover the data after the reset button is checked.

The check boxes only control what data is being graphed, not what is being logged. The SPM-200 always logs the data from all the inputs. The data can be downloaded to a PC or a similar machine in Comma Separated Value (CSV) format. CSV is a very simple and general way to store data in a file. Most analysis programs, such as Microsoft Excel®, can read CSV data. So you can download all the data in memory and analyze it with Excel®.

Again, don't forget to click the "Save Changes" button.

**FIGURE 11: Display Page**

General	
Temperature Unit:	Celsius
Internal Temperature Offset:	-1.67C/-3F
WARNING: Internal temperature is pre-calibrated at the factory. The offset is necessary only when the unit is operating in a very low airflow environment where internal board heating inside the case causes internal temperature to read slightly warmer than the outside air.	
Interface Type:	Contemporary
Save Changes	

Devices		
Unique Address	Device Type	Friendly Name
00001985E0005FFF	spm	Centrum2
Save Changes		

Sensors	
Sensor	Friendly Name
Temperature (C)	Temperature
Temperature (F)	Temperature
Volts DC	Unity Shelf Voltage
Volts DC	Auxiliary Voltage
Volts DC	System Voltage
Shunt Current	System Current
Inverter Voltage	UPS Voltage
Line Voltage	Main
Contact	Breaker A
Contact	Breaker B
Contact	Unity Rectifier Fail
Save Changes	

The **Display** page is where you set the “friendly names” of the device and all the inputs, and set the units that you want temperature displayed in.

At the top of the page select whether you want the temperature displayed in Celsius or Fahrenheit degrees. You also have the option of entering an offset for the temperature display. As is explained on the page, you should not change the factory setting unless your SPM-200 is mounted somewhere with very little airflow. In that case the heat generated by the SPM-200 itself might cause the display to read a bit high.

The most important thing to do on this page is to set the name of this SPM-200, and more meaningful names for all of the inputs.

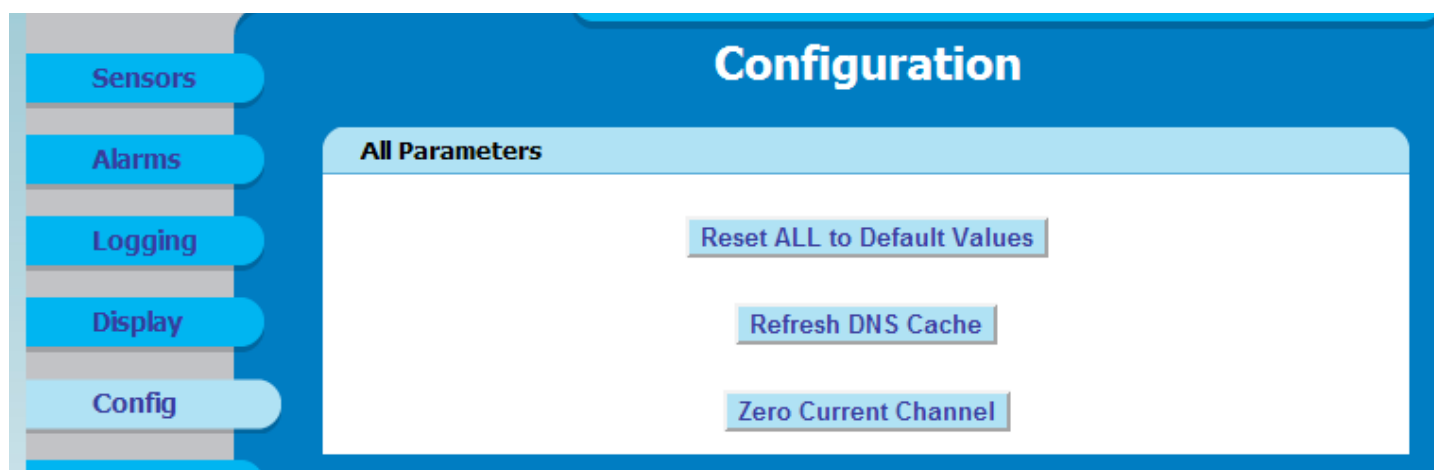
As always, remember to select “Save Changes” or your changes will not take effect.

## 5.2 Configuration Page

The last page is the **Configuration** page. We’ve already described how to set the date and time and the IP address on. Here we will discuss the rest of the entries.

The top of the Configuration page looks like this:

**FIGURE 12: Top of Configuration Page**



### 5.2.1 Reset All to Default Values

The first entry allows you to reset the configuration settings to the defaults. It will restore all the friendly names to the defaults, as well as other configuration settings including account names and passwords you may have made. However, it will not change the IP address.

**Caution:** When using the “Reset All to Default Values” button, remember to re-enter your account names and passwords.

### 5.2.2 Refresh DNS Cache

The DNS cache in the SPM-200 relates easy to remember web site names like “NewmarPower.com” to the IP address 192.220.29.161, which is the actual IP address of Newmar’s web server. The SPM-200 fills the cache with information from the DNS server that was set up in the Network configuration section. You can force the SPM-200 to empty the DNS cache and get new information from the DNS server if you want to.

### 5.2.3 Zero Current Channel (Shunt)

“Zero Current Channel” allows you to zero out any offset in the Shunt Current Channel. This channel measures a DC current by reading the (very small) voltage across the (very small value) shunt resistor that the current to be measured is flowing through. It is possible that there might be a constant offset on the reading that

causes the displayed value of the current to be wrong. Clicking the "Zero Current Channel" button zeros out this error. **CAUTION:** be sure that there is no current flowing through the shunt before clicking this button. If there is some current flowing then clicking the button will introduce a constant error into the current reading.

### 5.2.4 Web Server

Scroll down the Config page past the Clock and Network Settings sections until you see this:

**FIGURE 13: Setting up the Web Server and Configuring DNS**

The screenshot shows two configuration panels. The top panel, titled "Web Server", contains a "Protocols" dropdown menu set to "HTTP and HTTPS", an "HTTP Port" input field with the value "80", and an "HTTPS Port" input field with the value "443". A "Save Changes" button is located at the bottom right of this panel. The bottom panel, titled "DNS Servers", contains a "Primary IP" input field with the value "208.67.222.222" and a "Secondary IP" input field with the value "208.67.222.220". A "Save Changes" button is also located at the bottom right of this panel.

The "Web Server" section controls the SPM-200's built in Web Server. You can select the HTTP protocol, the secure HTTPS protocol, or both. The port numbers shown are the defaults for HTTP and HTTPS. You can change these numbers, but it's usually best to leave them at the default values.

### 5.2.5 DNS Servers

The "DNS" or "Domain Name Servers" section lists the addresses of the Internet servers that the SPM-200 will call to resolve Web names like "mail.xyzco.com" to their actual IP addresses. The values shown are for demonstration purposes only – consult your system administrator or Internet Provider to get the values for your network.

Password Configuration was previously mentioned in "Setting Account Names and Passwords" in Setup Section

Skip down to the Syslog Section:

### 5.2.6 Syslog Settings

**FIGURE 14: Syslog Settings**

The screenshot shows a configuration panel titled "Syslog". It contains a "Facility" dropdown menu set to "LOCAL0" and a "Daemon Address:port 1:" input field. A "Save Changes" button is located at the bottom right of the panel.

Syslog is a utility that runs on a UNIX machine to capture error messages from systems like the SPM-200. Newmar Support may ask you to configure this utility to help debug a problem with the SPM-200 software. It does not perform any function in the normal operation of the SPM-200.

Scroll down further to the **Email** Configuration Section.

### 5.2.7 Configuring Email Setting

**FIGURE 15: Email Settings**

The screenshot shows a web-based configuration page titled "E-mail". It contains the following fields and values:

- SMTP Server:** 192.168.1.6
- SMTP Port:** 25
- "From" E-mail Address:** techservice@newmarpower.com
- To E-mail Address 1:** TECHSERVICE@NEWMARPOWER.COM
- To E-mail Address 2:** (empty)
- To E-mail Address 3:** (empty)
- To E-mail Address 4:** (empty)
- To E-mail Address 5:** (empty)
- POP3 Server:** (empty)
- POP3 Port:** 110
- Username:** (empty)
- Password:** (empty)

Below the fields is a blue button labeled "Save Changes".

The SPM-200 can be configured to send emails when alarms are raised. Emails can be sent to any combination of five addresses. Refer back to FIGURE 7 – there we determined which alarms will cause emails to go to which of the five addresses. Here is where we set those addresses.

The SPM-200 uses the standard SMTP/POP3 email services. Contact Newmar support for information on using other email systems such as Gmail or AOL. Contact your system administrator or ISP for the SMTP and POP3 addresses for your system. The emails that are sent will have the return address that is entered in the "From" Email Address field, and they will contain information about which alarm has been tripped and why.

Again, the figure above is for illustration purposes only. It doesn't make much sense to have the "From" and "To" addresses be the same, but there's no reason you can't set it that way.

Again, don't forget to click the "Save Changes" button.

#### 5.2.7.1 Sending Text Messages

The SPM can send text messages by sending emails to a special address at the cell phone provider. Below is a list of addresses for some popular providers. For example, if you have cell service with AT& T, you can send a test message by sending an email to xxxxxxxxxx@txt.att.net, where xxxxxxxxxx is your cell phone number.



Simply enter this data in "To Email address 1-5", and save. Note: you will need to select under the ALARMS tab which alarms are to be routed to this email to receive a text message.

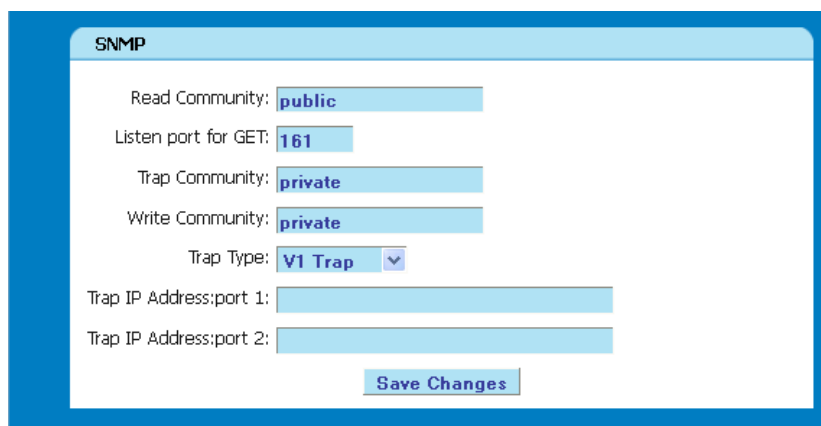
SMA Thru Email Paths:

T-Mobile: phonenumber@tmomail.net  
Virgin Mobile: phonenumber@vmobl.com  
Cingular: phonenumber@cingularme.com  
Sprint: phonenumber@messaging.sprintpcs.com  
Verizon: phonenumber@vtext.com  
US Cellular: phonenumber@email.uscc.net  
SunCom: phonenumber@tms.suncom.com  
Powertel: phonenumber@ptel.net  
AT&T: phonenumber@txt.att.net  
Alltel: phonenumber@message.alltel.com  
Metro PCS: phonenumber@MyMetroPcs.com  
Nextel: phonenumber@messaging.nextel.com  
Universal Format: phonenumber@teleflip.com

Scroll down again to the SNMP Section:

### 5.2.8 Configuring SNMP Settings

**FIGURE 16: SNMP Settings**



SNMP ("System Network Management Protocol") is an Internet Standard way to monitor the elements in a network. The SPM-200 software includes what is called an SNMP "Agent". SNMP agents send information to an "SNMP Management System", which is running somewhere on the network. Management Systems can poll Agents, or an Agent can send information to the Management System using something called a "Trap". The SPM-200 sends traps to either or both of the Trap addresses selected here for any alarm which has the "Trap" boxes checked.

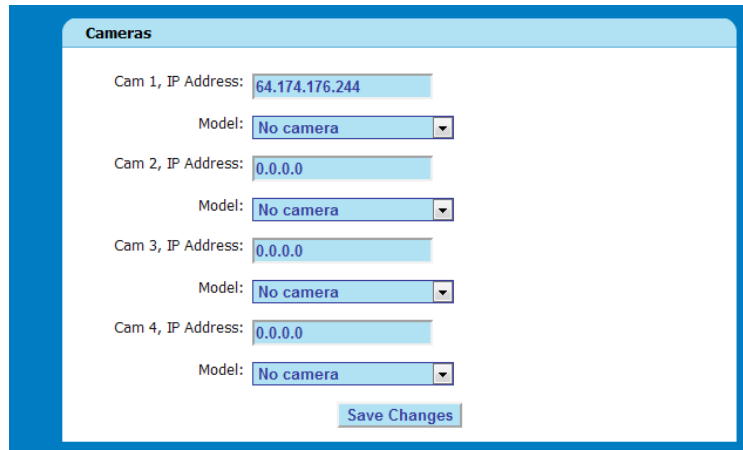
Your SNMP Management System requires MIB files which can be found on the SPM-200 sensors page for downloading.

If an SNMP Management System is running on your network, contact your system administrator for information regarding the parameters above.

Next is the Cameras Section:

## 5.2.9 Camera (IP) Configurations

FIGURE 17: Camera Configuration



The screenshot shows a web interface titled "Cameras" with a light blue header. It contains four rows of configuration fields for cameras. Each row has an "IP Address" text input and a "Model" dropdown menu. The first row is pre-filled with "64.174.176.244" and "No camera". The other three rows are pre-filled with "0.0.0.0" and "No camera". A "Save Changes" button is located at the bottom right of the form area.

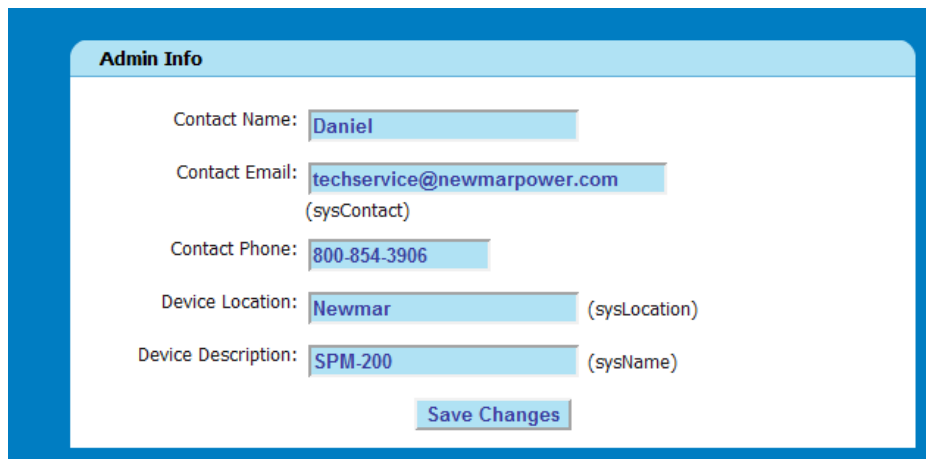
Camera	IP Address	Model
Cam 1	64.174.176.244	No camera
Cam 2	0.0.0.0	No camera
Cam 3	0.0.0.0	No camera
Cam 4	0.0.0.0	No camera

The SPM-200 can display thumbnail images from up to four Internet Cameras on the Sensors Page. Note that these cannot be simple "Webcams"; they must be cameras that have their own Internet interfaces. Note also that the SPM-200 does not monitor or do anything with the images from the cameras except display the thumbnails on the Sensors page. You must enter the IP address of each camera, and select the model from the drop down menu. Only certain cameras are supported. This is necessary because every different Camera has its own method of retrieving thumbnail images from it. Contact Newmar for information about what models are currently supported.

Next is the **Admin** Info Section:

### 5.2.9.1 Admin Information

FIGURE 18: Admin Information



The screenshot shows a web interface titled "Admin Info" with a light blue header. It contains five rows of configuration fields. Each row has a label, a text input, and a system identifier in parentheses. The fields are: "Contact Name" (Daniel), "Contact Email" (techservice@newmarpower.com), "Contact Phone" (800-854-3906), "Device Location" (Newmar), and "Device Description" (SPM-200). A "Save Changes" button is located at the bottom right of the form area.

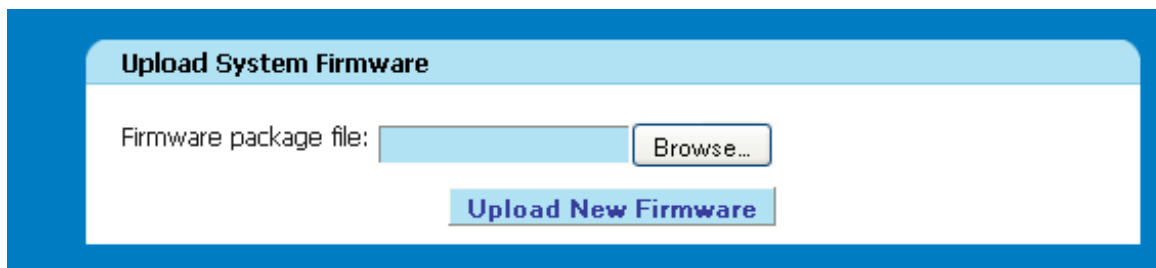
Field	Value	System Identifier
Contact Name	Daniel	
Contact Email	techservice@newmarpower.com	(sysContact)
Contact Phone	800-854-3906	
Device Location	Newmar	(sysLocation)
Device Description	SPM-200	(sysName)

This is where you enter the information that will be printed at the bottom of every web page. Enter the information that is appropriate for your installation. Again, don't forget to click the "Save Changes" button.

The next section allows you to **Upload New System Firmware**:

### 5.2.9.2 Firmware Download & Upload

FIGURE 19: Upload System Firmware



Upload System Firmware

Firmware package file:  Browse...

Upload New Firmware

From time to time Newmar may issue new firmware for the SPM-200. This will usually come as a "zip" file. Download the zip file from [www.newmartelecom.com/site\\_power\\_monitor/site\\_power\\_monitor.html](http://www.newmartelecom.com/site_power_monitor/site_power_monitor.html) to your computer and "unzip" it. Then navigate to this section of the Config page, and click the "Browse" button. Navigate to the directory that you unzipped the package into, and double click on the file with the ".PKG" extension".

Click the "Upload New Firmware" button, and wait. The upload process may take a few minutes, depending on the size of the update file and network traffic. (Note that due to the various differences between browsers, you may or may not see an in-progress report as each block of data is uploaded.) During this time, both the **IDLE** and **ACTIVITY** LEDs should blink in unison on the SPM-200.

Once the download is complete, an "Upload Succeeded" message will be displayed, with a 60 second countdown while the unit validates and installs the new software. Once it has completed, it will reboot the SPM-200. Once it has rebooted it will again display the "Sensors" page.

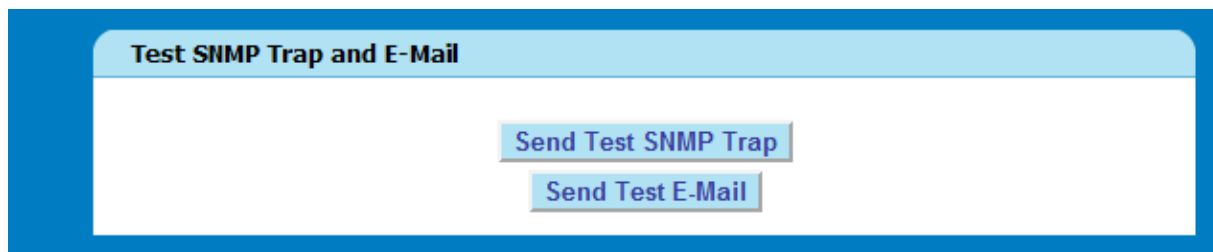
**Should you run into any trouble while updating, please DO NOT reset your SPM and contact us at:**

Phone: 800-354-3906 ■ Email: [techservice@newmarpower.com](mailto:techservice@newmarpower.com)

This next page is fairly self-explanatory:

### 5.2.9.3 Test SNMP Trap & Email

FIGURE 20: Test Buttons



Test SNMP Trap and E-Mail

Send Test SNMP Trap

Send Test E-Mail

Clicking on these buttons allows you to test if you have set up your email and SNMP traps properly.

The final section sets up the information that is gathered through Syslog.

## 5.2.9.4 Syslog Configuration

FIGURE 21: Syslog Configuration

Syslog Configuration								
Subsystems	Severity							
	emergency	alert	critical	error	warning	notice	inform	debug
os	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lwip	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
socket	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
macphy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
flashfl	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
webserv	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
spi0dev	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
device	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
host	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
setvars	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dynweb	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
snmp	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
alarms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
email	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
rtclock	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sntp	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
dns	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
datalog	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
graphin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
firmwar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
msgcatlg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[Save Changes](#)

These check boxes control what information is gathered by Syslog. You do not have to check any of these unless Newmar Support is trying to debug a problem with your software.

## 6.0 Specifications

### Inputs

**Power Source Voltage:** 11 - 60 negative / positive ground\*

\*CAUTION: If you intend to power -48 VDC AND monitor -48 VDC, input power must come from an isolated DC converter. If you need one, we will provide it free of charge. Contact NEWMAR: 800-854-3906 or E-mail: techservice@newmarpower.com and request model 48-12-1i Kit

### Input Current:

12 VDC: 0.14A

24 VDC: 0.07A

48 VDC: 0.05A

### Monitor Inputs: 9 total

DC Voltage: 3 ports:

1. 2 each 0-40 VDC, Negative Ground
2. 1 each 30-60 VDC, Positive Ground
3. Accuracy +/- 5%

AC Voltage: 2 ports:

4. 90-264 VAC utility power (L-N or L-L)
5. 90-264 VAC inverter output (floating)
6. Accuracy +/- 3%

- DC current one port:
  - +/- 100mv, 100 amp differential shunt voltage,
  - Read battery charge/discharge (-) current, or load current.
  - Accuracy +/- 5%
- Dry contact switch sensors, 3 ports
  - Possible uses: include: door open, water leak detection, smoke alarm, component fail, breaker trip, etc.
- Temperature sensor
  - Located outside case of unit
  - Range -20 to +60° C, -4 to +140° F
  - Accuracy +/- 0.5° C

### Reporting

- Ethernet Port connection: RJ-45, 10 BaseT (10Mb/s max.)
- HTTP: Web Access, Self-generated Web-page
- SNMP requires SNMP manager software. SPM-200 supports SNMP V1 & V2c
- SNMP: MIB with Gets, Traps, and Clears
- Alarms: HIGH and LOW trip, 50 max, user-programmable
- Logging: Excel logs created, time stamped, continuous graphing
- SMTP/POP3: email alerts, POP password
- Data Formats: XML, PDA, WAP (cell phone)
- Optional Console: Multiple Site Monitor with log aggregation and thumbnail camera views
- Remote Firmware upgrades: no need to visit the site.
- Local Data downloading and programming require and RJ-45 crossover cable (included)

### Data Screens

- Sensors
- Alarm settings (customized web page)
- Data logging
- Camera feeds (4 max.)



**Data logging: remote or down load locally:**

- 30 day+ rolling history with 30 second interval refresh
- CSV file compatible

**Images:** Ethernet IP Camera enabled

**Alarms:**

- 50 user configurable all with separate high/low trip settings
- Notification by Via Internet, e-mail or mobile phone
- User-programmable notification to 5 different e-mails addresses

**Diagnostics / Indicators/ Controls:****Front panel LED's**

- Input Power ON/OK
- System OK
- Flashing Activity Indicator Ethernet port
- System reset button

**Protections**

- Reverse Polarity
- Input overvoltage
- External 1A fast-blow fuse required for DC power input (provided)

**Mechanical**

Case: Aluminum, black powder coat

Size: 2.18" x 3.27" x 4.66"

Weight: 1 lb

Mounting options:

- Wall mount
- Din rail
- 19 or 23 inch rack mount (via optional kit)

Input Ports:

- Screw terminals
- 16-22 AWG wire

**Environmental:**

Operating Temperature range: -20° C to +60° C / -4 to +140° F

**7.0 Warranty**

NEWMAR warrants that your Site Power Monitor be free from defects in material and workmanship for two years from date of purchase. If you have any questions about your SPM-200, please contact NEWMAR's Technical Service:

Phone: 1-800-241-3897 – From the hours of 7:30 A.M. to 4:30 P.M. weekdays, P.S.T.

Fax: 714-957-1621 – Anytime

E-Mail: techservice@newmarpower.com – Anytime

We are happy to consult with you to resolve any problems or questions you may have. If, during consultation, it appears the SPM-200 must be returned to the factory for repair, we will issue a Return Materials Authorization (RMA) number at that time.

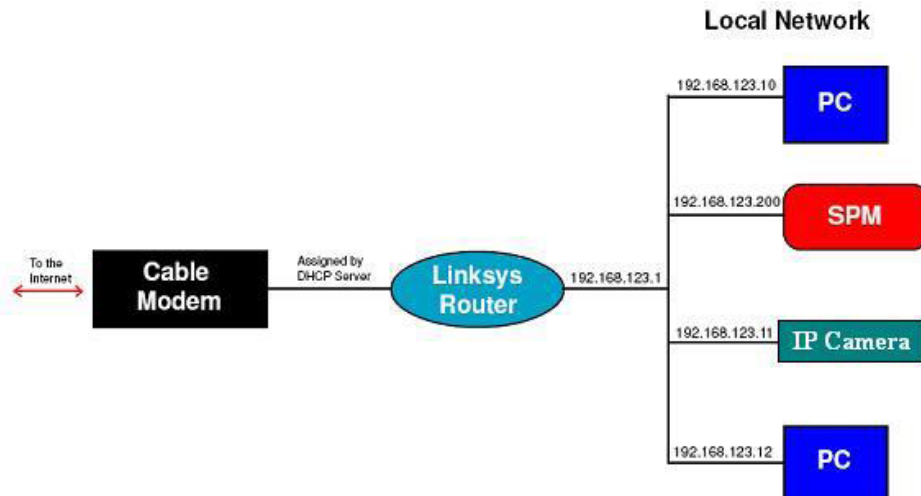
## 8.0 Appendix A: Operation Without a Static IP Address Using DynDNS

If you want to access your SPM-200 over the public Internet, your browser needs to know the unit's unique IP address. But it can be difficult to obtain a permanent "static" IP address in many situations.

Regular Internet servers have static IP addresses. A service called Domain Name Service ("DNS") translates the familiar names like [www.newmarpower.com](http://www.newmarpower.com) into its corresponding IP address (192.220.29.161). Newmarpower.com always has that IP address, so anyone can access it from anywhere on the web.

For a home or small office installation, Internet service is provided by a telephone or cable company using a DSL modem or a cable modem. The modem is connected to the Linksys router using 10baseT or 100baseT Ethernet. Local machines including the SPM are in turn connected to the router using Ethernet as well.

**FIGURE 22: Local Network and Router**



The local machines, including the local port of the router, are assigned addresses in a private domain such as 192.168.123.XXX. The external port is assigned a dynamic address by the Internet provider's Distributed Host Configuration Protocol (DHCP) server.

The dynamic IP address works fine for most typical applications that might be run in a home or small office environment, such as web surfing or checking email, but it presents a problem when using a server, such as the SPM. If people want to connect to the server/SPM from somewhere on the public Internet they need to know an IP address that they can use to reach it. Normally they find this address using the Internet's Domain Name Service (DNS). But if our server's address changes whenever the DHCP server changes it, then the regular DNS service can't keep up with it.

[www.dyndns.com](http://www.dyndns.com) offers a service that will solve this problem. What DynDNS does is allow you establish a URL in one of their domains, and they keep up with changes to your IP address. Your URL is something like [www.myUrl.dyndns.biz](http://www.myUrl.dyndns.biz). When you enter that into a browser DynDNS redirects the request to your current IP address. In order for this to work you have to have a client program on your device that updates DynDNS whenever your provider changes your IP address.

In the local network example, you want to be able to reach the SPM's Web Server from the public Internet. There are two issues:

- 1) The SPM-200 is behind a local router, and has an "unrouteable" IP address.
- 2) The IP address of the router is assigned by the Internet Provider's DHCP server, and thus may change without warning.

## Setting Up DynDNS:

There are three things that have to be done to solve the problem. The first is to use the DynDNS service to make the IP address of the router available to users on the public Internet. The second is to program the router to forward requests for web pages to the SPM, and the third is to configure the SPM.

To set up the DynDNS service, go to [www.dyndns.com](http://www.dyndns.com), preferably from a PC on the same subnet as the SPM you want to access from the Internet. Under the "Services" heading select "Free Dynamic DNS". Select "Get Started", and create a new account. Select one of their domains, such as [www.dyndns.biz](http://www.dyndns.biz) and select a hostname for your router, such as "myRouter". Log onto your e-mail, open DynDNS email to complete DynDNS confirmation and activate your account. Be sure to write down your host name, your URL, password, and user names. If you do this from a PC on the same subnet as your SPM, DynDNS will pick up your router's current IP address automatically. Once you complete this process DynDNS will be ready to forward users to your server.

Once you have DynDNS set up, you need to set up your router. Consult the manual for the Linksys router for instructions on how to log in to the Admin account. The Linksys software includes the client utility it needs to connect to DynDNS. On the "Setup" screen, choose the "DDNS" tab. Pull down "DynDNS.org" as the service you want to use. You will be prompted to enter the User ID and Password you set up, as well as the hostname you assigned to your router. The router should connect to DynDNS at this point. If it cannot, you may have not set your account up properly, or entered the wrong User ID or Password.

**FIGURE 23: Linksys Wireless G Broadband Router, Set-Up**



The next thing you must do is set up something called "port forwarding". DynDNS will forward a user's request to the router; you need the router to forward the request to your SPM. Go to the router's "Applications and Gaming" tab. This page tells the router to forward requests that come to it using certain protocols on certain ports to be forwarded to specific machines on the local network. You need to forward http and https to your SPM. On the first line under "Application" enter http. The default port number for http is 80. Enter the IP address of the SPM on your network. In the example network shown on the first page this address is "192.168.123.200". (You will assign this address to the SPM when you set it up). On the second line enter "https" (secure http). The default port for https is 443. Again, enter the IP address of the SPM. Be sure and save the settings before you exit.

**FIGURE 24: Linksys Wireless G Broadband Router, Applications/Gaming**

**LINKSYS**  
A Division of Cisco Systems, Inc.

Wireless-G Broadband Router **BobsRouter**

Applications & Gaming

Setup | Wireless | Security | Access Restrictions | **Applications & Gaming** | Administration | Status

Port Range Forward | Port Triggering | DMZ | QoS

**Port Range Forward**

Port Range					
Application	Start	End	Protocol	IP Address	Enable
http	80	to 80	Both	192.168.0.123	<input checked="" type="checkbox"/>
https	443	to 443	Both	192.168.0.123	<input checked="" type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>
	0	to 0	Both	192.168.0.0	<input type="checkbox"/>

**Port Range Forwarding:**  
Certain applications may require to open specific ports in order for it to function correctly. Examples of these applications include servers and certain online games. When a request for a certain port comes in from the Internet, the router will route the data to the computer you specify. Due to security concerns, you may want to limit port forwarding to only those ports you are using, and uncheck the **Enable** checkbox after you are finished. [More...](#)

Save Settings Cancel Changes

CISCO SYSTEMS

Note: some ISPs block access to port 80. If yours is one of them, you'll need to use some other port. Valid port numbers are in the range 0 to 65535, but to be totally compliant with the rules of the Internet you should pick a number between 49152 and 65535. This reduces the chance that some other service is also using the same port that you pick. If you do pick a number besides 80, you must configure the SPM to listen on the same port number, and to reach the SPM from the internet you will have to append the port number you chose to the URL, as in `http://myRouter.dyndns.biz:49152`. Adding a colon (:) to the link, followed by a number (port #), it will say "go to this port".

Lastly you must configure your SPM. Navigate to the "Config" page. Scroll down to the "Network" section, and assign the same IP address that you entered on the port forwarding page which is the SPM's IP address. The Gateway needs to be set to the IP address of the router (192.168.123.1 in our example). In the "Web Server" section, set the ports for http and https. Again, the defaults are 80 and 443, but if you selected different port numbers when you configured your router, enter the same numbers you selected there. Again, be sure to click on "Save Changes".

Once you have completed these steps, your server should be reachable from the public Internet. Note that the URL is `http://myRouter.dyndns.biz`, NOT `http://www.myRouter.dyndns.biz`. Do not include the "www" in the address; that is not correct.

## 9.0 Appendix B: Troubleshooting

1) Nothing happens when I power up the SPM - Neither the Power Indicator nor the Status Indicator light up.

- Check to make sure that DC power is connected. Pin 19 is ground and Pin 20 is +6 to +60 VDC.

2) The Power and Status Indicators light up, but I do not see any lights on the Ethernet Connector

- Check to make sure that the SPM is connected either to an Ethernet switch or directly to a laptop computer. If it is directly connected to a laptop, be sure you are using a "crossover" cable like the one supplied with the SPM. If the SPM is connected to a Switch do NOT use the crossover cable, use a regular Ethernet cable.

3) I am trying to do the initial setup, but my browser will not bring up the SPM's home page.

- Make sure that the SPM is connected directly to a laptop using the crossover cable supplied.
- Check to make sure that the IP address of the laptop is set to 192.168.123.100 as described in the "NIC Setup" section above.
- Make sure that you entered the correct IP address 192.168.123.123 into the Browser
- Try to contact the SPM using the ping utility from a command line prompt. If this does not work, then try resetting the SPM using the procedure described below to make sure that it is really set to the default address. If you've tried this and you still cannot "ping" the SPM then you probably have a networking issue that is beyond the scope of this document.

4) Our SPM is in service, but we have lost its IP address. How can we find it?

- The simplest thing to do is to reset the SPM. The IP Reset Button is located directly under the RJ45 Ethernet connector on the side of the SPM. To perform a "simple" reset, use a paperclip or jeweler's screwdriver (using pens or pencils is not recommended, since ink or graphite particles could rub off and get into the unit) to press and hold the switch for about 15-20 seconds, or until both the **IDLE** and **ACTIVITY** LEDs light up simultaneously. Release the switch, and wait for the LEDs to resume their normal pattern (about 5 seconds) to indicate that the reset process is complete. After a "simple" reset, the following settings will be reset to factory default:
  - **Name and Password Settings:** all three accounts (Administrator, Control, and View-Only) will be cleared.
  - Network Settings: will be reset to the factory default of:
    - **DHCP: Disabled** (box unchecked)
    - **IP Address: 192.168.123.123**
    - **Subnet Mask: 255.255.255.0**

5) We need to get make changes to the configuration of our SPM, but the guy who knew the passwords is no longer with the company.

- Again, the simplest thing is to reset the SPM as described in Question 4.

6) How do I get an IP address? I cannot get a static IP address for the unit.

- See Appendix A for a suggested solution.



**7) The graphs do not look right. They show dots, gaps, or appear blank.**

■ The first thing to realize is that the unit cannot graph data it does not have. If the unit has only been in service for 3 days, then the maximum length of the graph is 3 days. However, it is possible that the log has been corrupted. To fix this, you will need to delete the log history as described below:

1. Click on the Logs tab.
2. Download the logs by clicking on the appropriate link on this page. Skip this step if you do not need a backup of the log data.
3. Check the Delete Log History checkbox. If this box is grayed out, refer to the troubleshooting section on a grayed out logging frequency/delete logs checkbox.
4. Select Save Changes to delete the log history.

In a few seconds the graphs should go blank. Depending on the logging frequency, the graphing should begin in a few minutes.

**8) I cannot get email from the unit**

■ Below are some common solutions to email problems.

1. Check the Event Log for email errors. This may help diagnose the problem.
2. Make sure a numeric IP address is used for the SMTP Server IP address (and POP3 IP address if used).
3. The unit needs a 'From' address to send an email.
4. There should only be one email address in each 'To' field.
5. Some email servers require the POP3 fields to be filled in. If POP3 isn't required these fields should be left blank.

If an Exchange server is being used, then it needs to be configured to allow 3rd party emails. There is a checkbox for this purpose in the Exchange server.

**9) How do I get the SNMP MIB for the unit?**

■ The MIB for the unit can be found in two places. In the header of the SPM-200 webpage under Alternate Formats, is a link to the MIB. A copy of the MIB is also included in the firmware zip file of version 2.53 (is this the latest version) and higher.

**10) I need the SNMP OID's for the unit. (What's an OID?)**

■ An OID is an Object Identifier used with MIB's for SNMP. Click MIB on the navigation bar below the Help Tab to download the MIB files (MIB.ZIP)

■ In the zip file for firmware versions 2.53 or higher there is a CSV file that contains the list of OID's for the unit.

**11) I have not been able to get a SNMP trap from the unit.**

■ A SNMP manager must be configured to receive traps from the unit. Most SNMP programs have a database of traps they are monitoring for. The possible traps that can be sent by the unit must be added to this database. Some programs can take the unit MIB and extract the trap information. With other programs the trap data has to be entered manually. A CSV file is included in the firmware zip file of version 2.53 and higher. The CSV includes the OID's for the unit as well as the information for each trap. Below is a list of issues that might stop you from getting traps from the unit:

1. Check for errors in the Event Log.
2. Not all SNMP software is able to receive traps. Check if the software can receive version 1 traps.
3. Make sure the IP address configured on the unit, matches the IP address of the SNMP manager.

4. Ensure that the Trap Community String on the unit corresponds to the community string expected by the manager.
5. On some SNMP software, you have to enable trap monitoring and SNMP requests.

**12) The internal temperature on my unit seems to be reading high.**

- The internal temperature can read 2-3° F higher than an external sensor, because of the heat generated by the circuits in the unit. The following steps can help minimize internal heating.
- Go to DISPLAY, and set the desired temperature offset, and SAVE.
- Make sure there is good airflow to the unit.
- Heat can be transferred to the unit from other sources and through the rack. If possible mount the unit away from heat sources.

**13) I want to change the logging frequency or delete the logs, but they are grayed out.**

- An account level of Control or Admin Access is required to change the logging frequency period or delete the log data. It will be grayed out if the current access level is not high enough. To change this, do the following:
  1. To change to Control access click on the Control tab. For Admin click on Configuration.
  2. Enter the appropriate username/password for the appropriate account.
  3. Click on the Logs tab and the Logging Frequency and Delete Log History checkbox should no longer be grayed out.

**14) How do you reset the SPM-200?**

- The IP Reset Button, located under the RJ45 connector, has two functions:
  - 1) If you hold it down while you power up the unit, all of the user-configurable parameters are reset to the factory defaults.
  - 2) If you hold it down for 20 seconds while the power is on, it resets the IP address to 192.168.123.123 and the subnet mask to 255.255.255.0, and clears out any user IDs and Passwords that you have set. This is useful if you have forgotten the IP address you set.

## 10.0 Appendix C: The Console Program

This manual describes how to communicate with one SPM-200 using a web browser. If you only have one or a few SPM-200s it is not hard to look at them one at a time. However, if you have more SPMs, perhaps 5 or 10 or even more, monitoring them becomes a problem. Checking the status of each one is time consuming. Keeping track of which ones are in alarm is a problem. It is difficult to download each one's log data and keep straight which SPM the logs came from. It is very difficult to update firmware on many machines. Newmar offers a program called "Console" which makes it much easier to manage a large number of SPM-200s. Console allows you to:

- Monitor and control multiple SPM-200s from a single web based application
- Easily upgrade the firmware in some or all of the devices with one command
- Capture the log data from each SPM continuously in a SQL database on a PC server
- Compare sensor readings across devices with a stacked-bar view
- Graph sensor readings across devices on a single graph
- See the status of all units on a single page
- Easily see which units are in or close to alarm, which ones are normal, and which ones cannot be contacted
- Supports up to 200 SPMs
- Automatically recognizes the firmware of each unit to upgrade

Console runs on a single Windows based PC server. Multiple users can access the server through a web interface

### Server Requirements:

- Runs as a Windows Service. Can be started and stopped remotely.
- Supported on Windows XP/Vista/2003/2008 Server platforms
- Compatible with 32-bit and 64-bit Windows
- Requires at least 512 MB memory and 200 MB of disk space, not including the log files

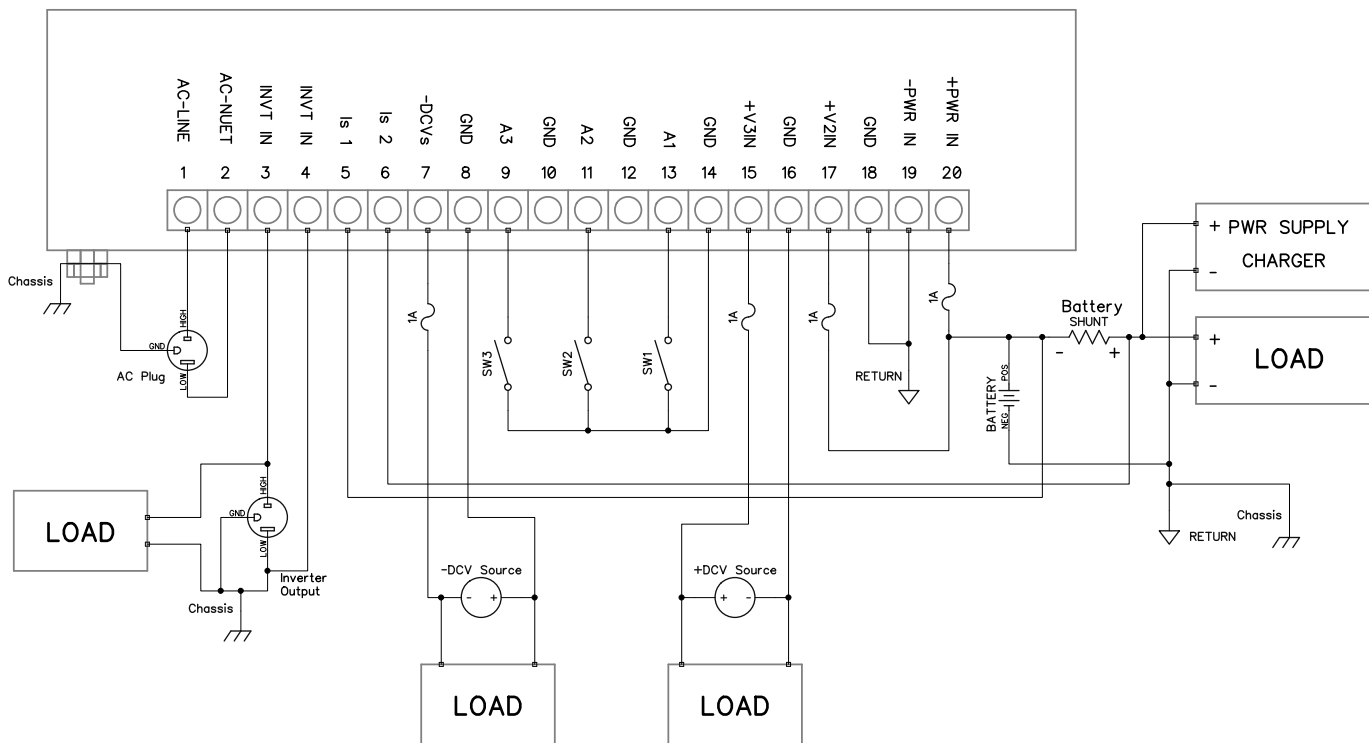
### Server Recommendations:

- For less than 20 SPM units: Pentium 4 CPU at 2 GHz, and 512 MB of RAM. This configuration would use Microsoft SQL CE.
- For 20 -75 SPM units: Pentium 4 CPU at 2.8 GHz, and 1 GB of RAM. This configuration would use Microsoft SQL CE.
- For more than 75 units: Core 2 Duo CPU at 2 GHz and 2 GB of RAM. This configuration would need Microsoft SQL Express.

Contact Newmar Support for more information about Console.

## 11.0 Appendix D1: Typical System Wiring: Negative Ground, Floating Sources

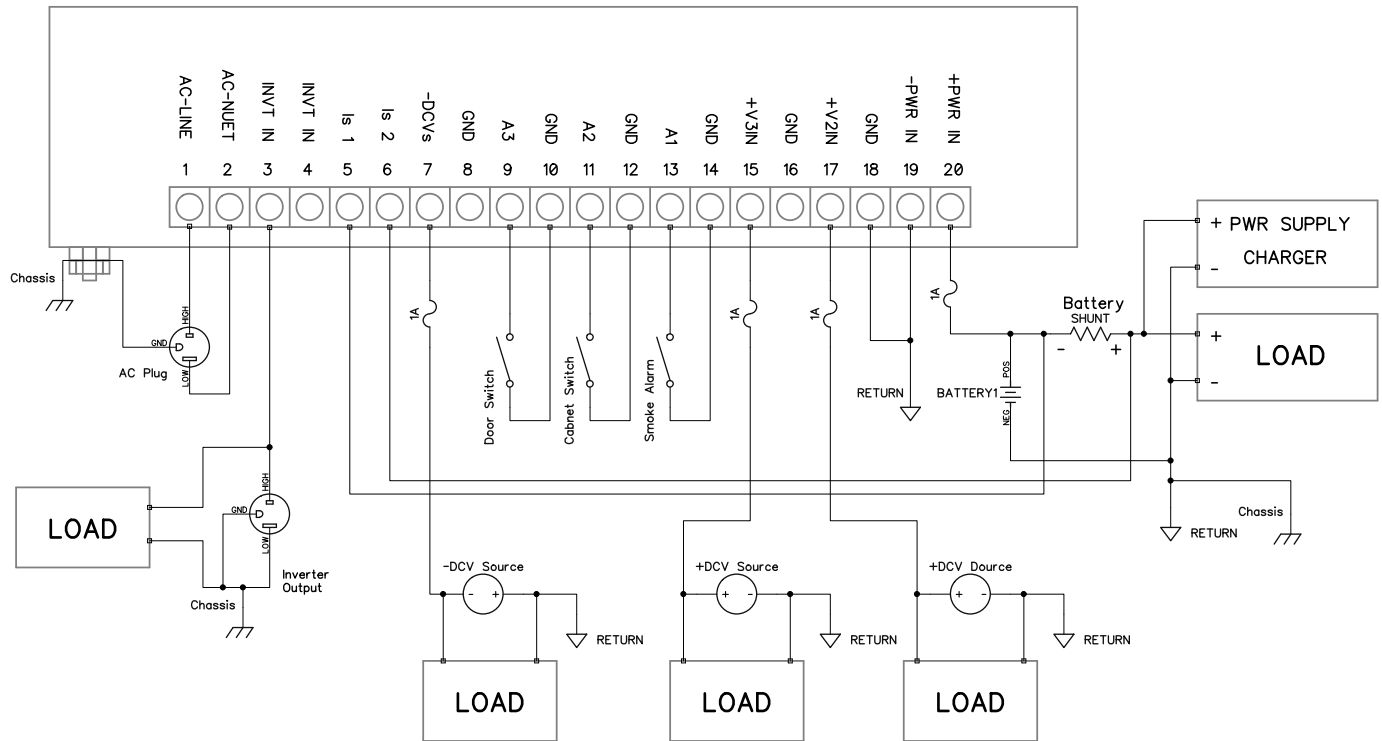
Negative Ground (RETURN) System with Auxillary Floating DCV Sources



(Floating DC Sources and Loads not common to RETURN bus)

## 11.0 Appendix D2: Typical System Wiring: Negative Ground, Common Returns

Negative Ground (RETURN) System





## 11.0 Appendix D3: Typical System Wiring: Positive Ground, Common Returns

### Positive Ground (RETURN) Systems

