SNMP Solo™

Owner's Manual

for:

SNMP Solo™

by:

TRIPP·LITE
POWER PROTECTION

MT-SE-37/02
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SNMP Solo has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy; and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

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Conventions Used In This Guide

This guide uses these conventions:
Bold italic print, as shown in this example, indicates field names, menu items, or values in the SNMP Solo software agent.
`Bold print`, as shown in this example, indicates filenames, directories, or items that you must type exactly as they appear.
`Italic print words or letters in braces { }` indicate values that you must supply. For example: *`{drive}`***`:\setup`**
Italic print words or letters in brackets < > indicate keys to press. If two keys are separated by a *+* plus symbol, then the first key should be pressed and held down while pressing the second key. For example: *<alt+enter>.*

Note:	**Notes contrast from the text to emphasize their importance.**

Warning:	**These messages alert you to specific procedures or practices; serious consequences may result including injury if you disregard them.**

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Introduction

Your SNMP Solo monitors one UPS attached to an EtherNet network using a Network Management Station. The complete SNMP Solo package includes hardware and software, a UPS cable, a power supply, a UPS Management Information Base (MIB), and a manual.

SNMP Solo Features

The SNMP Solo hardware adapter runs an embedded Simple Network Management Protocol (SNMP) software agent. This agent responds to SNMP GETS and SETS and, also, forwards traps to designated recipients when critical conditions occur to the UPS—such as going on battery backup.

The SNMP Solo features:

- **Compact Size**—A small unit that takes less space on your work area. Dimensions are 4¾"x3½"(12 x 8½ cm).
- **One Serial Port**—A DIP switch changes the adapter's single serial port to a configuration port for installation or to a communication port for normal operations.
- **Remote monitoring**—Monitors utility power and low battery status for one UPS from a remote workstation (NMS).
- **Remote Control**—Turns the UPS inverter off when the NMS sends the proper command.
- **NMSs To Receive UPS Alarms—**These traps (unsolicited messages) inform you about the power condition of your UPS.
- **Works with all major NMSs on EtherNet—**SNMP Solo works with the most widely used Network Management Systems: HP Open View, Novell NMS, Sun NetManager, IBM NetView, and many more.

Example Network With SNMP Solo

A typical installation of SNMP Solo monitoring a UPS on an EtherNet network follows in the illustration below. The SNMP Solo adapter communicates with the UPS to inform you of your system's power condition.

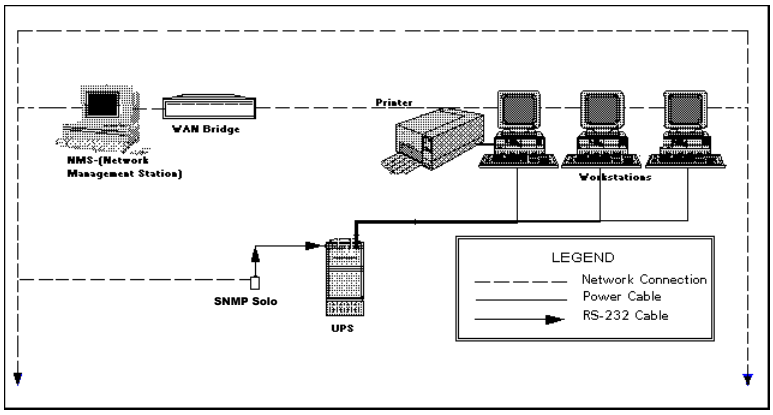


Figure 1 SNMP Solo Monitoring a UPS on EtherNet

SNMP Solo Package

The standard SNMP Solo package contains a NetMon Unit with supporting hardware and software.

SNMP Solo Package Contents

The components of your package are:

SNMP Solo Unit
Two 3.5“ Diskettes
Power Supply
SNMP Solo Manual
Configuration Cable labeled SM-SER-117A
UPS Interface cable
Worksheet included in the *Manual*

The SNMP Solo Unit

Figures 2 and 3 show the SNMP Solo’s panels and top. The network connection panel illustrates the following:

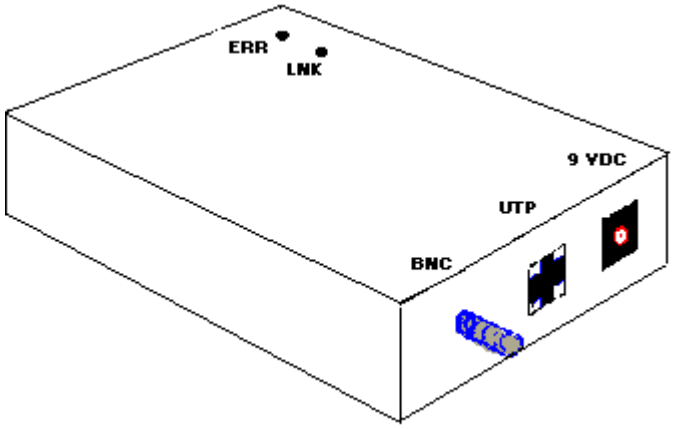


Figure 2 SNMP Solo Network Connection Panel

Network connection ports—SNMP Solo provides a BNC connector for 10Base-2 connection and a UTP (RJ-45) connector for 10Base-T networks.

Power connection port–SNMP Solo provides a connector for a 9VDC power supply.

The following illustration shows the serial port and the DIP switch. The serial port serves two purposes—adapter configuration and UPS communication.

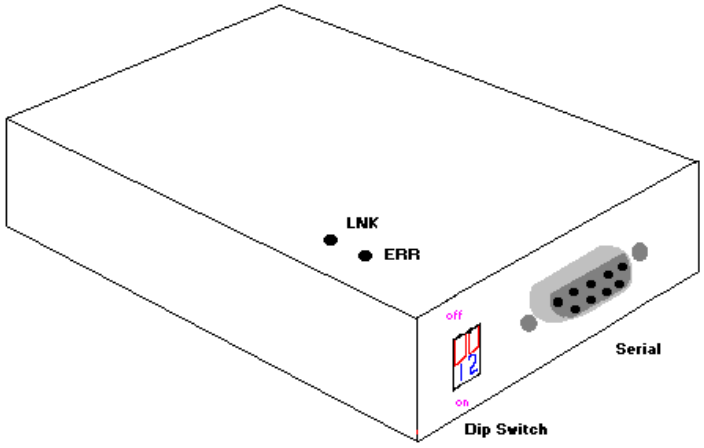


Figure 3 SNMP Solo Serial Port Panel

Status LEDs

The LED indicators inform you of network activity, which is the green LNK light, and the UPS status, which is the red ERR light.

DIP Switches

Use the DIP switch to configure with a dumb terminal or to communicate with the UPS for status monitoring.

Serial Port

The SNMP Solo uses this port for configuration during installation or for communications during normal operations.

Two 3.5" Diskettes

Your package contains two 3.5" MIB diskettes—one in DOS format and one in TAR format. These diskettes contain the UPS MIB file. Copy the MIB file to the appropriate **`NMS MIB`** directory for the UPS connected to your SNMP Solo.

The DOS disk also contains a copy of the programmed image file and the downloaded **`.exe`** program. See the *Upload Firmware* section for further explanation of these files.

Configuration Cable

Your package contains a cable labeled SM-SER-117A, female-to-female. Use this cable to connect the SNMP Solo serial port and a dumb terminal or PC for configuration. When you configure the SNMP Solo, be sure to set the DIP switch to the proper setting. Any dumb terminal or terminal emulation package, such as Microsoft Windows' Terminal will work fine.

Power Supply

The two types of power supplies offered are:

Power Supply Type	Input	Output
Wall Cube	120 VAC, 60 Hz	9 VDC, 1 amp
Universal	230 VAC, 50 Hz	9 VDC, 1 amp

WARNING: If you are using a power supply other than the one supplied with the SNMP Solo, be sure that the polarity of the new power supply is correct. If the polarity of the new power supply is incorrect, you may run the risk of damaging the adapter.

UPS Interface Cable

The manufacture-specific interface cable connects the UPS to the SNMP Solo unit. The table below defines the basic UPS device port configuration:

1	Low Battery	**6**	Not connected
2	Not Connected	**7**	Set to Voltage High (+12V)
3	Set to Voltage Low (-12 V)	**8**	Power Fail
4	Inverter Shutoff	**9**	Not connected
5	Ground		

System Requirements

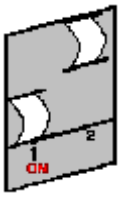
SNMP Solo requires a terminal for configuration and a network connection with an NMS for operation. The following is a description of all required components and a list of the most widely used NMSs.

- The components of your standard SNMP Solo package
- Connection to an EtherNet network
- An SNMP-based management station
  Some NMSs that support the SNMP Solo are:

  HP OpenView for UNIX
  HP OpenView for Microsoft Windows
  Novell NMS
  SunConnect SunNet Manager
  IBM NetView/6000
- A dumb terminal or a PC with an emulation package to configure the SNMP Solo SNMP Agent
- An RS232 communication port on your PC or terminal
- A UPS—any UPS type
  You can interface any contact closure UPS with SNMP Solo if you have the manufacture's specific cable supplied with your kit.
- Network identification values for the SNMP Solo:
  IP Address
  Net Mask
  IP Addresses for the NMS
  Definitions of Communities
  IP Address of the Gateway/Router

Initial Installation

This section describes the installation of the SNMP Solo adapter when you connect it to the UPS and the network. (Refer to the *Configuration* section for network communications' setup.) For configuration, connect the SNMP Solo temporarily to a PC with a terminal emulation package or to a dumb terminal. The following steps guide you in connecting the SNMP Solo to the network and UPS.



1. Install the UPS.
2. Adjust the DIP switches on the SNMP Solo for Configuration. Switch 1 is ON when down; switch 2 is OFF when up.
3. Temporarily, connect the SNMP Solo adapter to a dumb terminal or to a PC with the terminal emulation package.
   a) Using the configuration cable, connect the end of the cabled labeled "SM-SER-117A" into a dedicated RS-232 serial port on the configuration PC.
   b) Connect the other end into the SNMP Solo's serial port.
4. Configure the communications settings.
   a) Use the following settings to configure the dumb terminal or PC.

Baud rate →	**9600**	Flow Control Xon/XOFF	
Data bits →	**8**	Handshaking →	**None**
Stop bit →	**1**	Terminal Type:→	**ANSI (VT100)**
Parity →	**None**	Local Echo →	**Off**

b) A Windows's communication screen with the typical SNMP Solo setting:

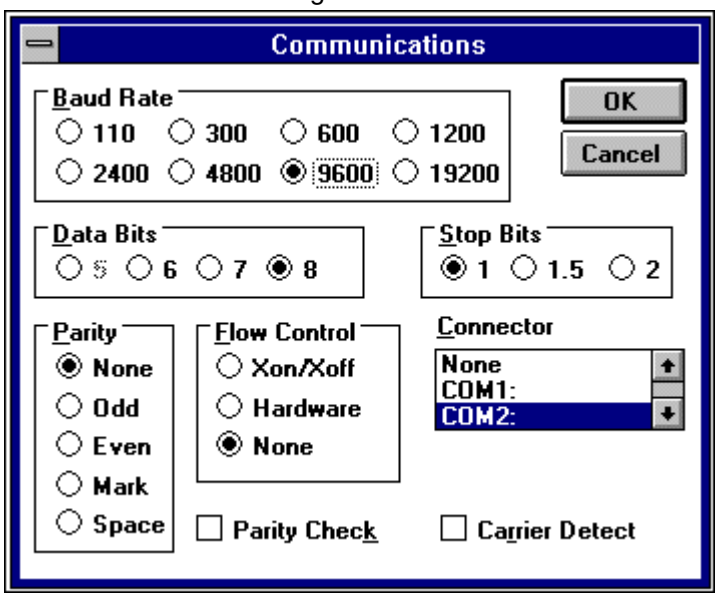


Figure 4 Communication Screen (Windows)

5. Press ***OK*** if you have the Windows Communications screen or accept your communication settings in the terminal emulation package. The terminal is now configured to communicate with the SNMP Solo adapter.
6. Connect the power supply with the 9VDC connector to the SNMP Solo adapter's power input. Connect the other end of the power supply with a standard plug into the UPS. Approximately five seconds after you supply power, the adapter displays the introductory screen on your terminal. Press <enter> to get to the main menu.
7. You are now ready to configure the SNMP Solo adapter. Refer to the *Configuration* section for a detailed discussion.

Configuration

You have previously installed the UPS, and you are ready to configure the SNMP Solo to work on your network. SNMP Solo is temporarily connected to a PC with a terminal emulation package or to a dumb terminal.

NOTE: Refer to the *Installation* section for the proper setting of the hardware adapter prior to configuring the device.

Press any key to display the *Main Menu*. From this menu you can select to enter the IP address, Gateway address, and MIB system group; you can set the access controls of SNMP communities; set traps, display settings; reset the settings to default values; save the new values and exit the program, and upgrade Firmware (See caution in the *Upgrade Firmware* section); and exit without saving.

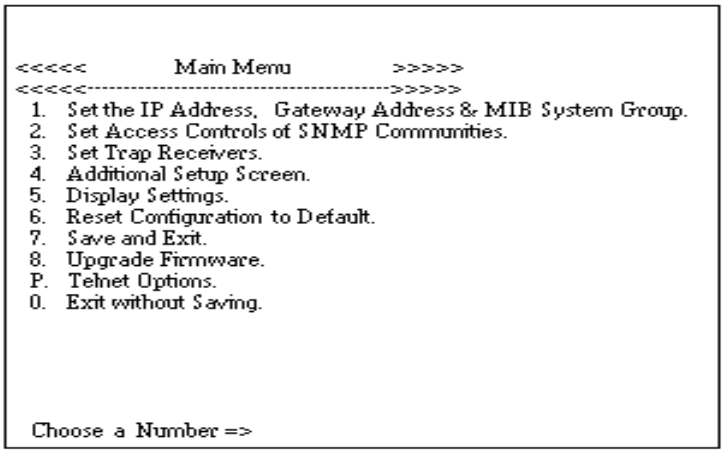


Figure 5 Main Menu

To select any option on the *Main Menu*, enter the number of the option you want at the Choose a Number=> prompt. The program displays the desired screen.

Set IP And Gateway Addresses And MIB System Group

To set the IP address, Gateway address, MIB system group, and other system configurations, type 1 at the prompt. The following screen displays:

```
Local Address: (Invalid)                          Serial NO: 00:C0:02:07:00:90
Gateway Address: (Invalid)
Network Id: (Invalid)
sysContact:
sysName:
sysLocation:

COMMANDS:
 1. Set the IP address, Netmask and Gateway.
 2. Set sysContact.
 3. Set sysName.
 4. Set sysLocation.
 0. Return to previous menu.
USAGES:
 1  IP_Address(XXX.XXX.XXX.XXX) [ Mask_bit_count Gateway(XXX.XXX.XXX.XXX) ]
 2  String_of_SysContact
 3  String_of_SysName
 4  String_of_SysLocation
EXAMPLE:
 to set the IP address to 127.100.90.57
 => 1 127.100.90.57

Enter Command =>
```

Figure 6 IP Address for the SNMP Solo and More

NOTE: The minimum requirement to operate SNMP Solo is to set the IP address.

To enter values, enter the number of the option, type a *<space>*, and enter the name. Press *<enter>*. Your new value displays next to the field heading on the top of the screen.

If you want to return to the *Main Menu*, press **0** (zero) and press *<enter>*.

For more information on IP addresses and net masks, see the Reference section of the *Appendix* in this manual.

To assign the IP address of SNMP Solo, the gateway, and the network, type at the prompt:

1, **<*space*>**, the IP address of the SNMP Solo, **<*space*>**, MASK_BIT_COUNT, **<*space*>**, the IP address of the gateway.

```
Enter Command =>1 198.218.129.200 6 198.218.129.201
```

The MASK_BIT_COUNT is used to indicate a mask for your gateway. The meaning of the numbers used in the MASK_BIT_COUNT will change based on the class of network you have. A Class A network has 24 options, a class B network has 16 options and a Class C has 8 options. The SNMP Solo automatically discovers the type of network in use from the first three digits of the IP address. The MASK_BIT_COUNT and the corresponding mask for each type of network is shown below.

Class A Network

0	255.000.000.000	12	255.255.240.000
1	255.128.000.000	13	255.255.248.000
2	255.192.000.000	14	255.255.252.000
3	255.224.000.000	15	255.255.254.000
4	255.240.000.000	16	255.255.255.000
5	255.248.000.000	17	255.255.255.128
6	255.252.000.000	18	255.255.255.192
7	255.254.000.000	19	255.255.255.224
8	255.255.000.000	20	255.255.255.240
9	255.255.128.000	21	255.255.255.248
10	255.255.192.000	22	255.255.255.252
11	255.255.224.000	23	255.255.255.254

Class B Network

0	255.255.000.000	8	255.255.255.000
1	255.255.128.000	9	255.255.255.128
2	255.255.192.000	10	255.255.255.192
3	255.255.224.000	11	255.255.255.224
4	255.255.240.000	12	255.255.255.240
5	255.255.248.000	13	255.255.255.248
6	255.255.252.000	14	255.255.255.252
7	255.255.254.000	15	255.255.255.254

Class C Network

0	255.255.255.0	4	255.255.255.240
1	255.255.255.128	5	255.255.255.248
2	255.255.255.192	6	255.255.255.252
3	255.255.255.224	7	255.255.255.254

The Gateway IP Address and MASK_BIT_COUNT are optional; SNMP adapter generates the Network IP address.

To assign the system contact name, type **2** and enter the name of the person to contact about the SNMP adapter:

```
Enter Command =>3 Lois Lane
```

To assign the UPS name, type **3** and enter name of the UPS:

```
Enter Command =>3 Sparky No1
```

To assign the UPS location, type **4** and enter the location name:

```
Enter Command =>4 Room 1583
```

The top of the screen displays your new values:

```
Local Address: 198.218.129.200                    Serial NO: 00:C0:02:07:00:90
Gateway Address: 198.218.129.201
Network Id: 198.218.129.200 (255:255:255:252)
sysContact: Lois Lane
sysName: Sparky No1
sysLocation: Room 1583
```

Record the definitions on your Worksheet for reference. To return to the Main Menu, type 0 and press *<enter>.*

Set Access Controls

To set access controls of SNMP communities from the Main Menu, type **2** at the Choose a Number => prompt. The following screen displays a column of four Manager IP addresses with their access permission, the commands, and an example to guide you. Use this screen to specify which managers have access to the SNMP Solo agent, the community names, and what type of access the IP managers have–read only or read and write.

```
Current access controls of SNMP communities:
   Manager_IpAddr     Community String       Access Permission
   ************** ************************ *****************
1. 000.000.000.000                          NotAccess
2. 000.000.000.000                          NotAccess
3. 000.000.000.000                          NotAccess
4. 000.000.000.000                          NotAccess


COMMAND:
 set    --set all values of an entry's fields.
 clear  --reset to default.
 '0'    --return to main menu.
USAGES:
 set  Entry_Num IP_Address(XXX.XXX.XXX.XXX)  Community_String Access(r/w)
 clear Entry_Num
EXAMPLE:
 to set entry #3 to IP address=138.239.0.24,
 community string=private and access permission=write
 => set  3  138.239.0.24  private  w

Enter Command =>
```

Figure 7 Access Controls

To set an access control, at the prompt type:

Set, *<space>*, enter the number of the column from **1** through **4**, *<space>*, enter the IP address, *<space>*, name of the community string, *<space>*, and access code—**r** for read only or **w** for read and write. Press *<enter>*. For example:

```
Enter Command =>set 1 132.217.227.025 Dept#1 r
```

The new values display on the top of the screen:

```
Current access controls of SNMP communities:
   Manager_IpAddr     Community String       Access Permission
   *************** ************************ *****************
1. 132.217.227.025 Dept#1                    ReadOnly
2. 132.217.227.026 Dept#2                    ReadOnly
3. 132.217.227.027 Dept#2                    Read/Write
4. 132.217.227.032 Dept#7                    Read/Write
```

To clear access controls of any manager IP address, type **clear**, *<space>*, and the desired list number at the prompt. Press *<enter>*.

```
Enter Command =>clear 3
```

The top of the screen reflects your changes:

```
Current access controls of SNMP communities:
   Manager_IpAddr     Community String       Access Permission
   *************** ************************ *****************
1. 132.217.227.025 Dept#1                    ReadOnly
2. 132.217.227.026 Dept#2                    ReadOnly
3. 000.000.000.000                           NotAccess
4. 000.000.000.000                           NotAccess
```

To return to the Main Menu, type **0** and press *<enter>*.

Set Trap Receivers

Use this screen to determine which IP managers receive traps (messages) from your SNMP Solo. This screen permits you to send traps about your UPS to four IP addresses (managers). Also, you may determine the severity levels to assign to a particular manager. To access the trap setting screen, type **3** from the Main Menu. The following screen displays:

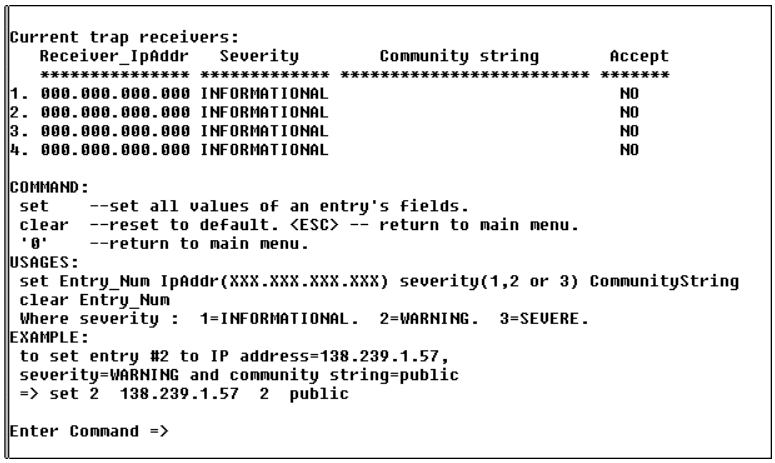


Figure 8 Trap Receivers

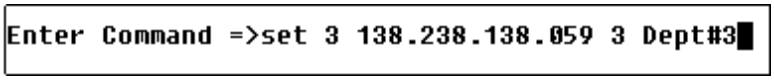
To set traps, at the prompt type:

Set, *<space>*, enter the number of the column from **1** through **4**, *<space>*, enter the IP address, <space>, severity code–1,2, or 3, and name of the community string. Press *<enter>*. The severity level codes for messages are:

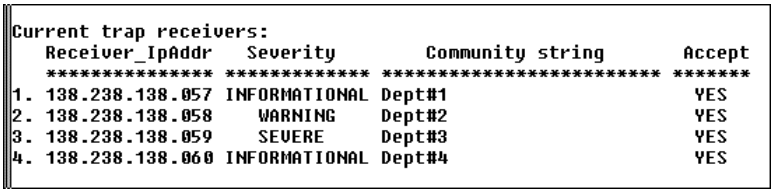
- **1** Informational
- **2** Warning
- **3** Severe

The trap receiver receives all assigned severity level messages and the ones rated above. If you assign severity code 2, the manager receives warning and severe levels.

A set trap example.



The top of the screen reflects your changes:



To remove a trap receiver from the list, type **clear**, ***<space>***, and the desired list number at the prompt. Press *<enter>*.

```
Enter Command =>clear 2
```

The top of the screen reflects your changes:

```
Current trap receivers:
   Receiver_IpAddr   Severity        Community string       Accept
   *************** ************** ************************ ********
1. 138.238.138.057 INFORMATIONAL Dept#1                      YES
2. 000.000.000.000   NO DEFINE                               NO
3. 000.000.000.000   NO DEFINE                               NO
4. 138.238.138.060 INFORMATIONAL Dept#4                      YES
```

To return to the Main Menu, type **0** at the prompt and press *<enter>*.

Additional Setup Screen

To set your UPS address, type **4** and press **Enter**. This will bring up the menu shown in Figure 9.

```
UPS Address: 0

COMMANDS:
 1. Set the UPS's Address.
 0. Return to previous menu.
USAGES:
 1. 0 - 127
EXAMPLE:
 to set the UPS address to 0
 => 1 0

Enter Command =>_
```

Figure 9 Additional Setup Screen

You need to set the UPS address. This address should match the address you assigned to the UPS when you installed the UPS. This address will determine which UPS the SNMP adapter communicates with. You can set the address by typing **2 <0-127>** and pressing **Enter**. Choose the number 0-127 that corresponds to the UPS address.

After you have set the UPS address, you can return to the main setup screen by typing `0` and pressing **`Enter`**.

NOTE: The UPS address you set must correspond to the address of the UPS you want the SNMP adapter to communicate with.

Display Settings

This screen displays all of SNMP Solo's current settings. To access this screen, type **5** at the prompt from the Main Menu. The current settings display:

```
Local Address: 132.217.227.250                    Serial NO: 00:C0:02:07:00:90
Gateway Address: (Invalid)
Network Id: 132.217.000.000 (255:255:000:000)
sysContact: Lois_Lane
sysName: Sparky_No1
sysLocation: Room_1583

Current access controls of SNMP communities:
   Manager_IpAddr     Community String       Access Permission
   *************** ************************ *****************
1. 132.217.227.025 Dept#1                    ReadOnly
2. 132.217.227.026 Dept#2                    ReadOnly
3. 000.000.000.000                           NotAccess
4. 000.000.000.000                           NotAccess

Current trap receivers:
   Receiver_IpAddr   Severity        Community string       Accept
   *************** ************* ************************ *******
1. 138.238.138.057 INFORMATIONAL Dept#1                     YES
2. 000.000.000.000   NO DEFINE                              NO
3. 000.000.000.000   NO DEFINE                              NO
4. 138.238.138.060 INFORMATIONAL Dept#4                     YES

 [Press any key to continue]
```

Figure 10 Display All Current Settings

The settings are the following fields:

- Local, SNMP Solo*'s*, Address and serial number (physical address)
- Gateway and Network address
- System Contact Name (Your system administrator's or a contact's name)
- System Name

- Location (location of your UPS and SNMP Solo)
- List of the current communities with their access control code
- List of the current trap receivers with their severity level codes

Reset Configuration to Default

If you press *<6>*, the program resets all fields to default. To display the results, press *<5>* for Display Settings. Most fields have no values.

```
Local Address: (Invalid)                          Serial NO: 00:C0:02:07:00:90
Gateway Address: (Invalid)
Network Id: (Invalid)
sysContact:
sysName:
sysLocation:

Current access controls of SNMP communities:
   Manager_IpAddr     Community String       Access Permission
   ************** ************************ *****************
1. 000.000.000.000                          NotAccess
2. 000.000.000.000                          NotAccess
3. 000.000.000.000                          NotAccess
4. 000.000.000.000                          NotAccess

Current trap receivers:
   Receiver_IpAddr   Severity        Community string       Accept
   ************** ************* ************************ *******
1. 000.000.000.000 INFORMATIONAL                            NO
2. 000.000.000.000 INFORMATIONAL                            NO
3. 000.000.000.000 INFORMATIONAL                            NO
4. 000.000.000.000 INFORMATIONAL                            NO

 [Press any key to continue]
```

Figure 11 Reset Values To Default

To Save and Exit

If you are satisfied with your configurations, save them and exit. To save, press *<7>*. The screen displays the following message:

```
<<<<<--------------------------->>>>>
 End of UPS SNMP Agent Setup Program.
 Turn off DIP switch of setup.
 Disconnect the power of SNMP agent.
 Connect the power of SNMP agent.
<<<<<--------------------------->>>>>
```

Figure 12 Save and Exit Messages For Configuration

This messages informs or directs you:

1. The Setup program has ended.
2. Turn off the DIP switch (switch 1 UP).
3. Disconnect the power supply from the SNMP Solo.
4. Re-connect the power supply to the SNMP Solo.

TelNet Options

You can also TelNet to the IP address of the SNMP Solo after it has been installed on your network. Once you have successfully established a TelNet connection with the adapter you may access the configuration menu as if you were directly attached to it via the configuration port.

```
Telnet Password: (none)

COMMAND:
 set     --set telnet password.
 clear   --clear Telnet password.
 '0'     --return to main menu.
USAGES:
 set <new password>
 clear

Enter Command =>
```

Figure 13 Telnet options

The TelNet options menu gives some additional features that you can use after you have established a TelNet connection.

Upload Firmware

CAUTION: The firmware upload has already been accomplished at the factory. Before you proceed with this option, you must contact our technical support team for assistance.

This option supports upgrades to the firmware program when they become available. Should an upgrade be available, call our technical support team for assistance with the upgrade.

If you inadvertently use this option, your system suspends (locks). To restart, unplug the power supply from the SNMP Solo, and re-connect the power supply to the SNMP Solo.

Exit Without Saving

This options lets you quit the program without saving any of your configuration settings. To exit, type **0** (zero).

Final Installation

Now that you have completed Configuration you are ready to connect the SNMP Solo to your UPS and to the network. Follow these steps to complete the installation:

1. Turn DIP switch 1 on the SNMP Solo from the **DOWN** (ON) position to the **UP** (OFF) position.
2. Disconnect the configuration cable from the SNMP Solo adapter and the terminal or PC. Store this cable for future use.
3. Disconnect the SNMP Solo from the power supply.
4. Locate the cable labled “73743”. This is the UPS interface cable. Place the SNMP Solo close enough to the UPS so the UPS interface cable can connect the SNMP Solo’s serial port and the UPS’s serial port.
5. Connect the labelled end of the UPS interface cable to the SNMP Solo’s serial port. Connect the other end to the UPS’s serial port.
6. Connect the SNMP Solo to the Ethernet cable—either UTP or BNC.
7. Reconnect the SNMP Solo to the power supply.

Verify the SNMP Solo Operation

After you complete all configuration settings and connect the SNMP Solo to the network, *check the LINK status*.

LED Status After Power Up

At first, green and red LEDs do not light.

Green LED begins to pulse randomly, showing network activity.

Five to ten seconds after power up, the red LED flashes rapidly; this indicates that the SNMP Solo is determining which UPS model is connected to your system.

After SNMP Solo determines your UPS model, the red LED turns off.

The red LED pulses once whenever the SNMP Solo detects a communication failure.

If the SNMP Solo detects three communication failures in a row, the red LED turns on and stays on until the SNMP Solo receives a successful communication from the UPS.

Establish Network Communications

1. PING SNMP Solo.
   Issue a PING command from the NMS. If you do not get a response, check the SNMP Solo's network connection and IP address.
2. Test the adapter with an NMS.
   Perform a "***get***" command and a "***set***" command. If either command fails, check the SNMP Solo access controls. The manager must have read permission to execute a ***get*** command successfully and read/write permission to execute a ***set*** command successfully.

(See the *Configuring the NMS* section for a detailed discussion.)

Your SNMP Solo SNMP adapter is now installed and completely functional.

Configuring the NMS

To complete the SNMP Solo installation and configuration process, you must compile the necessary MIBs to configure the NMS.

Any NMS with a MIB compiler can manage the SNMP Solo adapter. For instructions on how to compile MIBs for the most popular NMSs—Novell's NetWare Management Station, Hewlett-Packard's OpenView Network Node Manager, and SunConnect's SunNet Manager; see the corresponding heading below.

General Network Management Stations

Follow these general procedures to configure an NMS:

- Compile the device MIBs.
- Add SNMP Solo object to the *Management Map*.
- Ping the SNMP Solo.

HP OpenView Network Node Manager for HP-UX

Compile the Device MIB

8. Copy the UPS MIB file from the TAR formatted diskette into the subdirectory `/usr/OV/snmp_mibs`.
9. From the main menu, select ***Options***
10. Load/Unload ***MIBs: SNMP...***
11. Select ***Load***.
12. Select the MIB file copied earlier.
13. Select ***OK***.

Add SNMP Solo Object to the Management Map

1. Select the submap then ***Edit: Add Object***.
2. Select the group computer.
3. With the middle (or opposite) mouse button, drag the generic symbol subclass device to the submap.

4. Enter a name for the object in the Selection and Label fields of the *Add Object* box.
5. Highlight ***IP Map*** from *Object Attributes* group.
6. Select Set Object Attributes button.
7. Enter Host name and IP address of SNMP Solo adapter.
8. Enter ***OK***.
9. Enter ***OK*** at *Add Object* menu.
10. Enter ***OK*** at *Add Object:palette*.

Poll the Device OIDs

1. From the main menu, select ***Monitor: MIB*** values then ***Browse MIB: SNMP***.
2. Move around the MIBs to view the UPS device information.

Set the Device OIDs

From the main menu, select ***Monitor: MIB*** values then ***Browse MIB: SNMP***.

1. Select a MIB variable you want to alter; click on it.
2. Enter the new value then click on ***Set***.
3. Click on ***Start Query*** to view the changes.

Ping the SNMP Solo

1. Change active Window to ***Shell***.
2. Type ping <IP address> and press <enter>.

Novell's NetWare Management Station v.2.0

Compile the Device MIB

1. Copy the UPS MIB file from the DOS formatted diskette into the subdirectory

`\nms\snmpmibs\current`.

2. From the main menu, select ***Tools*** then SNMP MIB Compiler.
3. From the *SNMP MIB Compiler* box, select Compile.

Add SNMP Solo Object to the Management Map

The NMS will discover the NetMon and add it to the Management map during its discovery pass.

Poll the Device OIDs

1. From the main menu, select ***Tools*** then the *SNMP MIB Browser*.
2. From the *SNMP MIB Browser* box, select the IP protocol and then enter the IP Address.
   a) select the profile ***to read***.
   b) select ***OK***.

Set the Device OIDs

1. From the main menu, select ***Tools*** then *SNMP MIB Browser*.
2. From the *SNMP MIB Browser* box, select ***Add***.
3. From the *SNMP Profile Editor* box,
   a) assign the profile a name, a community, and a poll interval.
   b) select the OID groups from the Group Choice then select Add to transfer them to the Group Selection(s).
   c) Save the profile.

Ping the SNMP Solo

1. From the main menu, first select ***Fault,*** second ***Test Connectivity,*** and third ***Once***.
2. From the *Test Connectivity* box,
   a) type in the IP address.
   b) select ***Test***.

SunConnect SunNet Manager

Compile the Device MIB

1. Copy the UPS MIB file from the TAR formatted diskette into the subdirectory specified by **`na.snmp.schemas`** keyword in **`$SNMHOME/snm.conf.`**
2. Execute **`mib2schema`** on the MIBs. This creates respective **`*.mib.oid`** and **`*.mib.schema`** and **`*.mib.traps`** files.
3. In the ***SNM console window***, select ***File/Load***.
4. Select ***Management Database***.
5. Click on **`*.mib schema`**, where *= the name of each MIB copied in step 1 and select ***Load***.
6. Start a new shell window; change to the subdirectory **`$SNMHOME/agent`** and execute ***build_oid***. This creates an oid database using all compiled MIBs.
7. Append ***`*.mib.traps`*** to the file specified by ***`na.snmp-trap.default`*** keyword in **`$SNMHOME/snm.conf`**.

Add SNMP Solo Object to the Management Map

1. Enter the submap where the managed device will be placed.
2. Select ***Edit, Create, Component, lanbox*** with the right (opposite) mouse button. Select ***Create***.
3. The ***Properties*** box displays.
4. Enter the SNMP Solo 's name as it appears in **`etc/hosts`** or in the name server.
5. Enter the ***SNMP WrCommunity***.
6. Select the desired MIBs.
7. Choose a color for the device.
8. Select ***Apply***. This adds the device to the submap.
9. Create a managed device view with the following steps:
   a) Select the relevant submap .
   b) Select ***Edit***, ***Create***, ***View***, subnet with the right (opposite) mouse button.
   c) Select ***Create*** and press *<enter>.*
   d) Enter the view name.
   e) Copy and paste the glyph into the managed device view.

Poll the Device OIDs

1. Select the device glyph with the right mouse button.
2. Select **Quick Dum**, ***-MIB** then one of the MIB groups. A window appears displaying a snapshot of the group.

Set the device OIDs

1. Select the device glyph with the right mouse button.
2. Select ***Set Request***, ***-MIB**, {*OID name*}.
3. When the ***Set Tool*** application displays,
   a) Click on ***Get*** to receive the current values.
   b) Select a new value by clicking on ***New Value*** then by clicking ***Set***.
   c) Click on ***Get*** again to view the changes.

Ping the SNMP Solo

1. Change active Window to Shell.
2. Type ping <IP address> and press <enter>.

Appendix

This appendix has three sections: *Reference*, *Glossary*, and *Troubleshooting*.

Reference

This section discusses Communities, IP Addresses, Sub net masking, and routers/gateways.

Communities

A community is a string of printable ASCII characters that identifies a user group with the same access privileges. For example, a common community name is “public.”

For security purposes, the SNMP agent validates requests before responding. The agent can be configured so that only trap managers that are members of a community can send requests and receive responses from a particular community. This prevents unauthorized managers from viewing or changing the configuration of a device.

IP Addresses

Every device on an internetwork must be assigned a unique IP (Internet Protocol) address. An IP address is a 32-bit value comprised of a network ID and a host ID. The network ID identifies the logical network to which a particular device belongs. The host ID identifies the particular device within the logical network. IP addresses distinguish devices on an internetwork from one another so that IP packets are properly transmitted.

IP addresses appear in dotted decimal (rather than in binary) notation. Dotted decimal notation divides the 32-bit value into four 8-bit groups, or octets, and separates each octet with a period. For example, 199.217.132.1 is an IP address in dotted decimal notation.

To accommodate networks of different sizes, the IP address has three divisions—Classes A for large, B for medium, and C for small. The difference among the network classes is the

number of octets reserved for the network ID and the number of octets reserved for the host ID.

Class	Value of First Octet	Network ID	Host ID	Number of Hosts
A	1-126	first octet	last three octets	16,387,064
B	128-191	first two octets	last two octets	64,516
C	192-223	first three octets	last octet	254

Any value between 0 and 255 is valid as a host ID octet except for those values the InterNIC reserves for other purposes.

Value	Purpose
0, 255	Subnet masking
127	Loopback testing and interprocess communication on local devices
224-254	IGMP multicast and other special protocols

Subnetting and Subnet Masks

Subnetting divides a network address into subnetwork addresses to accommodate more than one physical network on a logical network.

For example: A Class B company has 100 LANs (Local Area Networks) with 100 to 200 nodes on each LAN. To classify the nodes by its LANs on one main network, this company segments the network address into 100 subnetwork addresses. (If the Class B network address is 150.1.x.x, the address can be segmented further from 150.1.1.x through 150.1.100.x.)

A subnet mask is a 32-bit value that distinguishes the network ID from the host ID for different subnetworks on the same logical network. Like IP addresses, subnet masks consist of four octets in dotted decimal notation. You can use subnet masks to route and filter the transmission of IP packets among your subnetworks. The value “255” is assigned to octets that belong to the network ID, and the value “0” is assigned to octets that belong to the host ID.

For the example above, if you want all the devices on the subnetworks to receive each other’s IP packets, set the subnet mask to 255.255.0.0. If you want the devices on a single subnetwork only to receive IP packets from other devices on its

own subnetwork, set the subnet mask to 255.255.255.0 for the devices on that subnetwork.

Subnet Mask	Routing and Filtering
0.0.0.0	IP packets are transmitted to all devices.
255.0.0.0	IP packets are only transmitted to devices whose IP address's first octet matches the sender's IP address's first octet.
255.255.0.0	IP packets are only transmitted to devices whose IP address's first two octets match the sender's IP address's first two octets.
255.255.255.0	IP packets are only transmitted to devices whose IP address's first three octets match the sender's IP address's first three octets.

Gateways

Gateway, also referred to as a router, is any computer with two or more network adapters connecting to different physical networks. Gateways allow for transmission of IP packets among networks on an internetwork.

Glossary

The Glossary section defines the terms used in the SNMP Solo environment.

Agent	Implemented SNMP applications in network elements (hosts). Agents perform the network management's functions as requested by the network administrator from an NMS.
Dry Closure Input	Non-powered contact type inputs—switch, relay contact, open-collector.
Dry Closure Output	Form C dry-contact outputs which are common, normally open, or normally closed.
EtherNet	Local Area Network technology, originally developed by the Xerox Corporation, can link up to 1,024 nodes in a bus network. EtherNet provides raw data transfer in a rate of 10 megabits/sec. with actual throughputs in 2 to 3 megabits/sec. using a baseband (single-channel) communication technique. EtherNet uses carrier sense multiple access collision detection (CSMA/CD) that prevents network failures when two devices attempt to access the network at the same time. LAN hardware manufactures use EtherNet protocol; their products may not be compatible.
Gateway	A computer that attaches to a number of networks and routes packets between them. The packets can be different protocols at the higher levels.
IP	*Internet Protocol*—The TCP/IP standard protocol defines the IP datagram as the unit of information passed across a network.
IP Address	*Internet Protocol Address*—A 32-bit address assigned to hosts participating in a TCP/IP network. The IP address consists of network and host portions. It is assigned to an interconnection of a host to a physical network.
MAC	*Medium Access Control*—The network layer between the physical and the datalink layers. Specifically, the physical (hardware) address exists in this layer.
MIB	*Management Information Base*—The database, i.e., set of variables maintained by a gateway running SNMP.
NC	*Normally Closed* —Refers to a contact switch that is normally closed.
NIC	*Network Interface Controller*—The hardware interface to the physical connection to the network.
NMS	*Network Management Station*

NO	*Normally Open*—Refers to a contact switch that is normally open.
OID	*Object Identifier*—The variables defined in a MIB.
Personality	The current device specific software uploaded to the SNMP Solo.
Router	A computer that manages traffic between different network segments or different network topologies. It directs the destination IP address. The network media can be different, but the higher level protocols must be the same.
RS-232	A specification for serial communication between data communication equipment and computers.
SNMP	*Simple Network Management Protocol*—A standard protocol used to monitor IP hosts, networks, and gateways. SNMP defines a set of simple operations that can be performed on the OIDs of the MIBs managed by the monitored Agents. It employs the UDP/IP transport layer to move its object between the Agents and the NMS.
Sub-Agent	A software module that manages specific MIB sub-groups for an Agent. They communicate with the Agent using a SMUX (multiplexer).
TCP/IP	*Transmission Control Protocol/Internet Protocol*—A protocol suite used by more than 15 million users with a UNIX association and widely used to link computers of different kinds.
TES	*Terminal Emulation Software*—Communications program to transform a personal computer into a terminal for the purpose of data communications.
TFTP Server	*Trivial File Transfer Protocol Server*—A host to provide services according to TFTP; a TCP/IP standard protocol for file transfer with minimal capability and overhead depending on UDP for its datagram delivery service.
UDP/IP	*User Datagram Protocol/Internet Protocol*—A TCP/IP standard protocol. It enables transfer of information between applications running on different host. It is referred to as an unreliable, connectionless datagram delivery service.
UPS	*Uninterruptible Power Supply*—A device that supplies power to your system with rechargeable batteries if there is an AC power failure.

Troubleshooting

Problem: **The TES (Terminal Emulation Software) does not display anything.**

Solution: ***Make sure the Dip switch is set correctly. Switch 1 is ON when DOWN and Switch 2 is UP.*** This applies only when you power up.

Make sure the TES's communication parameters are correct. They should be 9600 baud rate, no parity, 8-data bits, and 1 stop bit.

Make sure the ends of the SM-SER-117A cable are plugged into their respective ports.

The ends of the cable indicate which belongs to the CPU and which belongs to the SNMP Solo.

The end of the hooded cable nearest the label belongs to the CPU, and the end farthest away belongs to the SNMP Solo.

PROBLEM: **The NMS cannot ping the SNMP Solo.**

Solution: ***Make sure the network connection to the SNMP Solo is good.***

Solution: ***Make sure the cable is in good condition.***

Solution: ***Make sure to set the Community String [Set Access Controls, Type 2, Set 1 through 4]. Follow these steps:***

Name the community with any lowercase name. (A UPS monitors a designated community.)

Solution ***Make sure to set the Manager Table. Set Access Controls, Type 3, Set 1 through 4]. Follow these steps:***

Define the Manager IP Address, Community string, and Access Permission together.

The trap manager's community should be the same number as the number of the community it monitors.

The trap manager's status is set to Accept YES to enable sending traps or to Accept to No to disable.

Placing a Technical Support Call

In order to diagnose the problem you are having, our technicians need the following information from you:

Installation Site:

Company Name:_____

Address:_____

City:_____ State:_____ ZIP code:_____

Installation Site Contact:

Full Name:_____

Phone Number:_____ Fax Number:_____

If you are a consultant,

Consultant Name:_____

Phone Number:_____ Fax Number:_____

Computer System:

Operating System and version:_____

System Manufacturer:_____

System Model Number:_____

NMS name and revision number:_____

_____

UPS:

Manufacturer:_____

Model Name/Number:_____

Type of Port Connector (How many pins, male or female.):

_____

What are the symptoms?

_____

_____

_____

☎ *Technical Support* ☎

If you have any questions about your SNMP Solo or about any Tripp Lite product, you can contact us at:

(773) 869-1234

Reference Worksheet

Local Address: ___.___.___.___ Serial No: __:__:__:__:__:__
Gateway Address: ___.___.___.___
Network ID: ___.___.___.___
System's Contact Name: _____
System's Name: _____
System's Location: _____

Current access controls of SNMP communities:

Manager IP Address	Community String	Access Permission

Current trap receivers:

Receiver IP Address	Severity	Community	Accept