User's Guide

TLNETCARD

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Documentation Notice: This User's Guide is a supplement to the printed manual that came with your TLNETCARD or network-enabled Tripp Lite device. Refer to the printed manual for instructions on hardware installation and basic configuration, including IP address assignment. If you have misplaced your printed manual, refer to the downloadable electronic version by going to www.tripplite.com/support and entering ***TLNETCARD*** in the search window.

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1. Introduction

TLNETCARD is an optional network card you can install in the accessory slot of a compatible UPS system. TLNETCARD connects your Tripp Lite device to your Ethernet network for remote monitoring, control and condition reporting. You can manage the device from an SNMP Network Management Station, a Web browser or telnet. The TLNETCARD can also send SNMP traps or email messages to the addresses you specify, alerting you automatically to events such as power failures.

1.1 System Requirements

- Tripp Lite UPS system with compatible accessory slot.
- Ethernet network that supports the TCP/IP protocol. Firewall ports 3664 and 3665 may need to be opened.
- One of the following options for remote monitoring and control:
  - SNMP-based Network Management Station (such as HP® OpenView®)
  - Web browser
  - VT-100 Telnet and/or SSH Client
- For "Terminal Mode" configuration only:
  - Terminal emulation software program (such as TeraTerm Pro by Ayera Technologies)
  - Computer with available DB9 serial port

Warning: Use of this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety or effectiveness is not recommended. Do not use this equipment in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.

2. Installation and Configuration

For instructions on hardware installation, refer to the printed manual that came with your TLNETCARD.

2.1 SNMP Configuration

There are multiple ways to configure the TLNETCARD:

- **TLNET Configurator:** Use the downloadable program TLNET Configurator to quickly set up one or more TLNETCARDs over the network. Refer to **Section 2.1.1** for more information.
- **Web-based Interface:** Individual TLNETCARDs can be configured over the network through their TLNET Supervisor interfaces. Refer to **Section 2.1.2** for more information.
- **Telnet Mode:** Configure the TLNETCARD over the network in text mode. Refer to **Section 2.1.4** for more information.
- **COM Port:** If a network connection is not available, the TLNETCARD can be configured through its COM port. Please refer to **Section 2.1.5** for more information.

Notes:

- *When initially connected to the network, the TLNETCARD will attempt to obtain an IP address via DHCP. If DHCP is disabled on the network, the TLNETCARD can be accessed using its default IP address: **192.168.1.100**.*
- *To ensure system security, it is highly recommended that the account and password be changed after the first login.*
- *If multiple TLNETCARDs are installed on the network, it is advisable to change the TLNETCARD's default Host Name to avoid conflicts. Likewise, it is recommended to disable BOOTP/DHCP and manually assign a valid static IP address to the TLNETCARD.*

2.1.1 Configuring with TLNET Configurator

The following instructions refer to the TLNETCARD Configurator utility software. The TLNETCARD Configurator can be downloaded at tripplite.com/support and typing TLNETCARD in the search field.

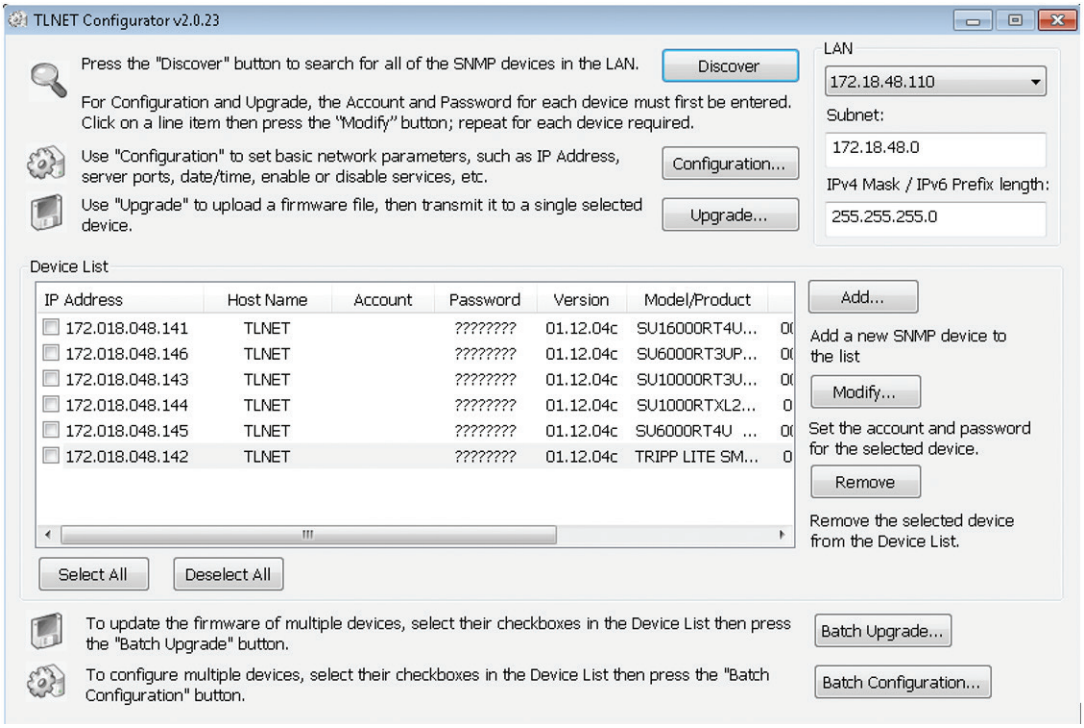
The TLNET Configurator utility (compatible with Windows 2000/2003/2008/XP/Vista/7) enables easy configuration and firmware upgrade of one or more TLNETCARDs. Follow the instructions below:

Step 1: Use a Cat5 cable to connect the TLNETCARD's Network port to the network.

Step 2: Ensure the two DIP switches of the TLNETCARD are set to the **OFF** position (Normal Mode) to enable network communication and that the workstation and the TLNETCARD are on the same LAN

Step 3: Once downloaded, launch TLNET Configurator.

Step 4: Click **Discover** to search all available SNMP devices on the LAN. A list of devices will be shown.

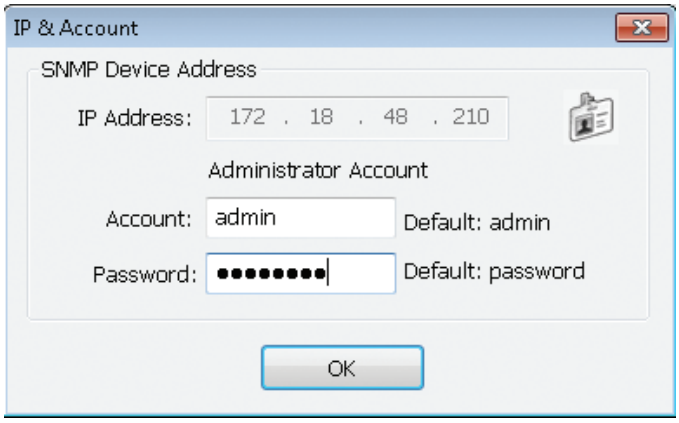


Notes:

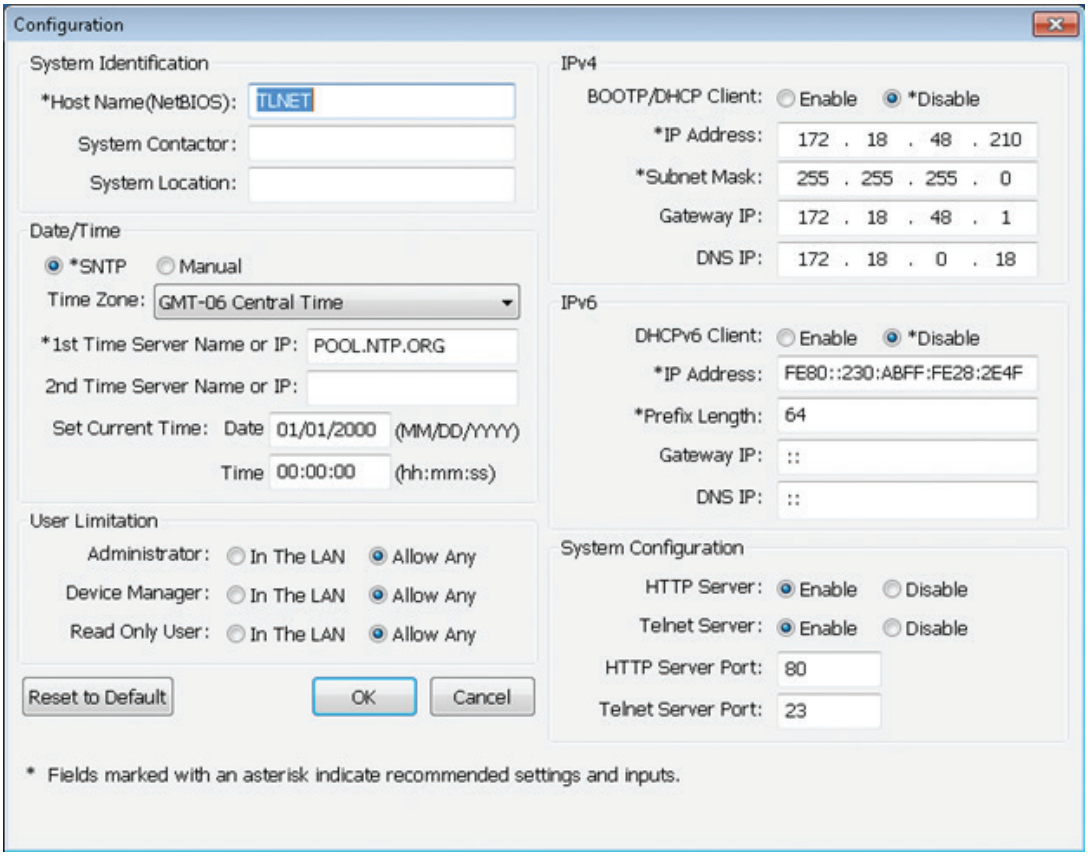
- *To search for SNMP devices in a different domain, change the Subnet and IPv4 IPv6 Prefix Length and click Discover.*
- *If the TLNETCARD cannot be found, verify that UDP port 3456 on the workstation is open.*

2. Installation and Configuration

Step 5: Select the TLNETCARD to be modified from the Device List. Click **Modify** and enter the Administrator's account and password (default: **admin/password**, case sensitive).



Step 6: Click **Configuration** to modify network settings.



Note: *To complete set-up of the TLNETCARD, refer to* ***Section 3 TLNET Supervisor.***

2.1.2 Configuring via TLNET Supervisor

To configure an individual TLNETCARD via web browser, follow the instructions below:

Step 1: Use a Cat5 network cable to connect the TLNETCARD's Network port to the network. Launch a web browser and enter the TLNETCARD's IP address – whether assigned by DHCP/network administrator or the default **(192.168.1.100)** – in the address bar.

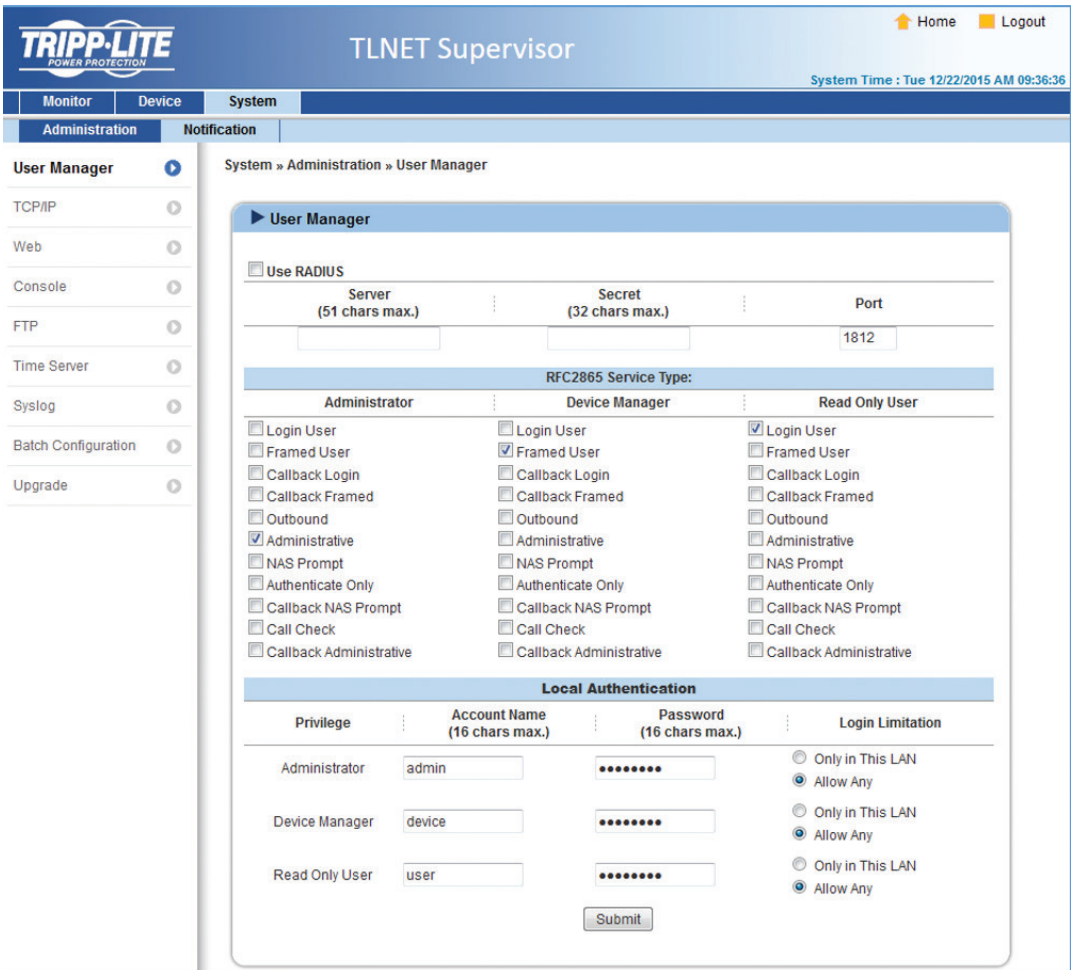
Step 2: Log in as Administrator (default account/password: **admin/password**, case sensitive).

2. Installation and Configuration

Step 3: Click **System** → **Administration** → **User Manager** to set up accounts and passwords under the "Local Authentication" section. The access permissions for the account types are as follows:

1) **Administrator:** Allowed to modify all settings.
2) **Device Manager:** Allowed to modify device-related settings.
3) **Read Only User:** Allowed to view settings only.

Manually specify whether users are allowed to log in from other LANs. If login attempts from external connections are to be blocked, select **Only in This LAN**. Otherwise, select **Allow Any**.



Step 4: Click **System** → **Administration** → **TCP/IP** to set Host Name, IP address, Subnet Mask and Gateway IP for the TLNETCARD.

Step 5: Click **Time Server** to manually set time and date for the system, or enable automatic time synchronization between the TLNETCARD and the time servers.

Note: *To complete set-up of the TLNETCARD, refer to* ***Section 3 TLNET Supervisor****.*

2.1.3 Configuring via Telnet

Step 1: Use a Cat5 network cable to connect the TLNETCARD's network port to the network.

Step 2: Connect the workstation (Windows or Linux) to the LAN that the TLNETCARD is connected to.

Step 3: For Windows, launch DOS prompt mode (**Start** → **Run** → key in **cmd** and press **Enter**). For Linux, launch Shell.

Step 4: Enter telnet <<IP Address>> to initiate telnet connection with the TLNETCARD.

Step 5: When connection is established, enter an Administrator's account and password (default: **admin/password**, case sensitive). The Main Menu will appear on the screen. Refer to **2.1.5 Configuring via Text Mode** for more information.

Notes:

- *The TLNETCARD does not support more than one concurrent terminal session.*
- *The TLNETCARD terminates idle connections after 120 seconds.*
- *For complete configuration, refer to* ***Section 3 TLNET Supervisor.***

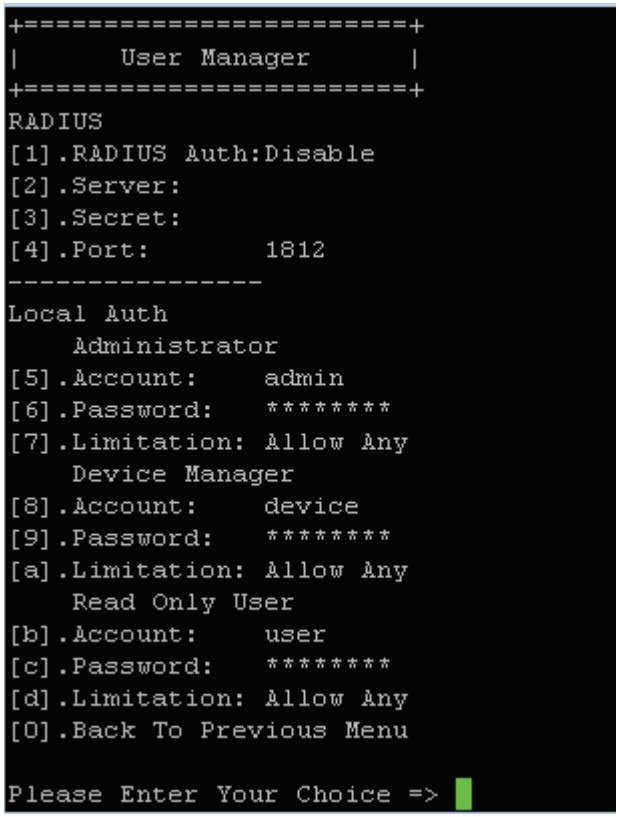
2. Installation and Configuration

2.1.4 Configuring via Text Mode

This section contains descriptions and default settings for configuring a TLNETCARD using a Telnet/SSH client such as HyperTerminal or PuTTY.

Main Menu

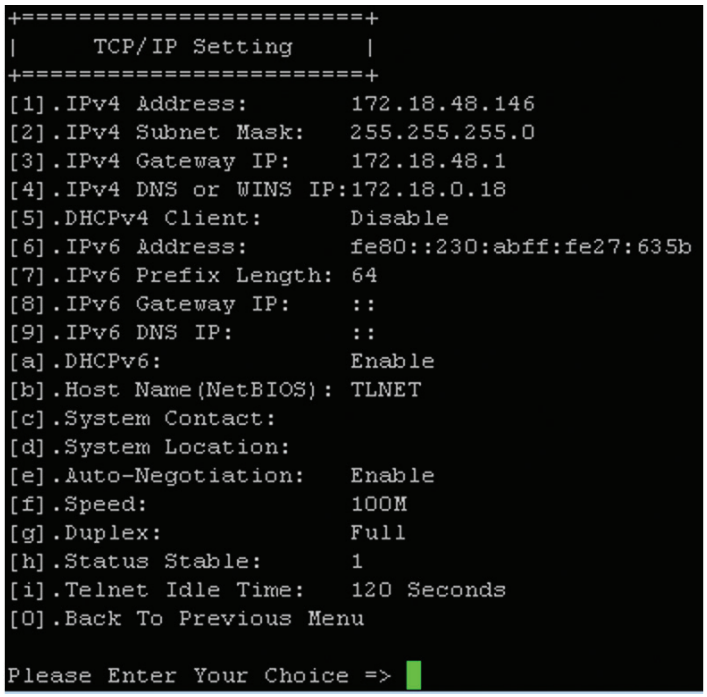
User Manager



No.	Item	Description	Default
[1]	RADIUS Auth	Specifies whether RADIUS is allowed.	Disable
[2]	Server	The RADIUS server's name.	
[3]	Secret	The RADIUS secret.	
[4]	Port	The RADIUS port number.	1812
[5]	Administrator Account	The Administrator's default account/ password (case sensitive).	admin
[6]	Administrator Password		password
[7]	Administrator Limitation	Restricts Administrator login area.	Only in This LAN
[8]	Device Manager Account	The Device Manager's default account/password (case sensitive). This account is only permitted to change device-related settings.	device
[9]	Device Manager Password		password
[a]	Device Manager Limitation	Restricts Device Manager login area.	Only in This LAN
[b]	Read Only User Account	The Read-Only User's default account/ password (case sensitive). This account is only allowed to view settings.	user
[c]	Read Only User Password		password
[d]	Read Only User Limitation	Restricts Read-Only User login area.	Allow Any

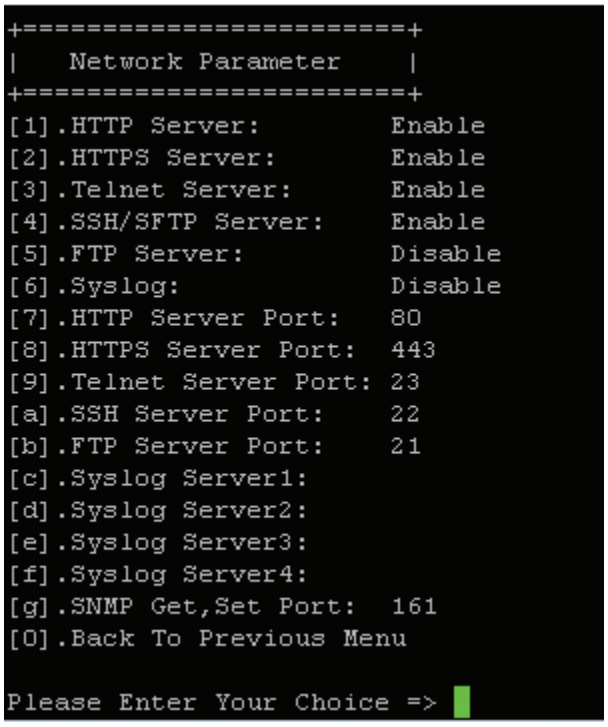
2. Installation and Configuration

TCP/IP Setting



No.	Item	Description	Default
[1]	IPv4 Address	The IPv4 address.	192.168.001.100
[2]	IPv4 Subnet Mask	The IPv4 subnet mask setting.	255.255.255.000
[3]	IPv4 Gateway IP	The IPv4 gateway's IP address.	192.168.001.254
[4]	IPv4 DNS or WINS IP	IPv4 Domain Name Server or WINS IP.	192.168.001.001
[5]	DHCPv4 Client	Enable/Disable DHCPv4 protocol.	Enable
[6]	IPv6 Address	The IPv6 address.	
[7]	IPv6 Prefix Length	The IPv6 prefix length.	
[8]	IPv6 Gateway IP	The IPv6 gateway's IP address.	
[9]	IPv6 DNS IP	IPv6 Domain Name Server's IP address.	
[a]	DHCPv6	Enable/ Disable DHCPv6 protocol.	Enable
[b]	Host Name (NetBIOS)	The Host Name for the TLNETCARD.	TLNET
[c]	System Contact	The System Contact information.	
[d]	System Location	The System Location information.	
[e]	Auto-Negotiation	Enable/disable automatic transfer rate (10/100Mbps) negotiation.	Enable
[f]	Speed	If the Auto-Negotiation is disabled, you can specify the transfer rate.	100M
[g]	Duplex	If the Auto-Negotiation is disabled, you can specify the duplex mode.	Full
[h]	Status Stable	Status change confirmation check time.	3
[i]	Telnet Idle Time	Telnet connection time-out setting.	60 Seconds

Network Parameter

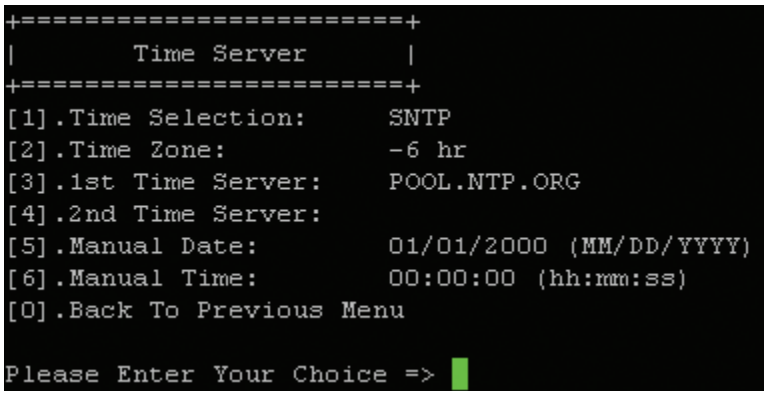


No.	Item	Description	Default
[1]	HTTP Server	Enable/disable HTTP protocol.	Enable
[2]	HTTPS Server	Enable/disable HTTPS protocol.	Enable
[3]	Telnet Server	Enable/disable Telnet protocol.	Enable
[4]	SSH/SFTP Server	Enable/disable SSH/ SFTP protocol.	Enable
[5]	FTP Server	Enable/disable FTP protocol.	Disable
[6]	Syslog	Enable/disable remote Syslog.	Disable
[7]	HTTP Server Port	HTTP port.	80
[8]	HTTPS Server Port	HTTPS port.	443
[9]	Telnet Server Port	Telnet port.	23
[a]	SSH Server Port	SSH port.	22
[b]	FTP Server Port	FTP port.	21
[c]	Syslog Server 1	The Host Name of remote Syslog Server 1.	
[d]	Syslog Server 2	The Host Name of remote Syslog Server 2.	
[e]	Syslog Server 3	The Host Name of remote Syslog Server 3.	
[f]	Syslog Server 4	The Host Name of remote Syslog Server 4.	
[g]	SNMP Get, Set Port	The SNMP port.	161

2. Installation and Configuration

Time Server

You can manually adjust time and date for the TLNETCARD or set up automatic time server synchronization. The TLNETCARD, Windows XP and later versions support SNTP (Simple Network Time Protocol).



No.	Item	Description	Default
[1]	Time Selection	SNTP or manual.	SNTP
[2]	Time Zone	Adjust your time zone.	+0 hr
[3]	1st Time Server	The first time server for SNTP.	POOL.NTP.ORG
[4]	2nd Time Server	The second time server for SNTP.	
[5]	Manual Date	Set the date manually.	01/01/2000
[6]	Manual Time	Set the time manually.	00:00:00

Soft Restart

Reset the TLNETCARD. This will not affect the operation of the UPS.

Default Reset

Reset to factory defaults.

Exit Without Saving

Exit and ignore changes.

Save and Exit

Preserve your changes and exit.

2. Installation and Configuration

2.1.5 Configuring through COM Port

If a network connection is not available, the TLNETCARD can be configured via COM port connection. Follow the instructions below:

Note: *If running a non-Windows system, refer to your system's user manual for Telnet clients.*

Step 1: Use the provided RJ45 to DB9 cable to connect the TLNETCARD's COM port to the workstations' COM port.

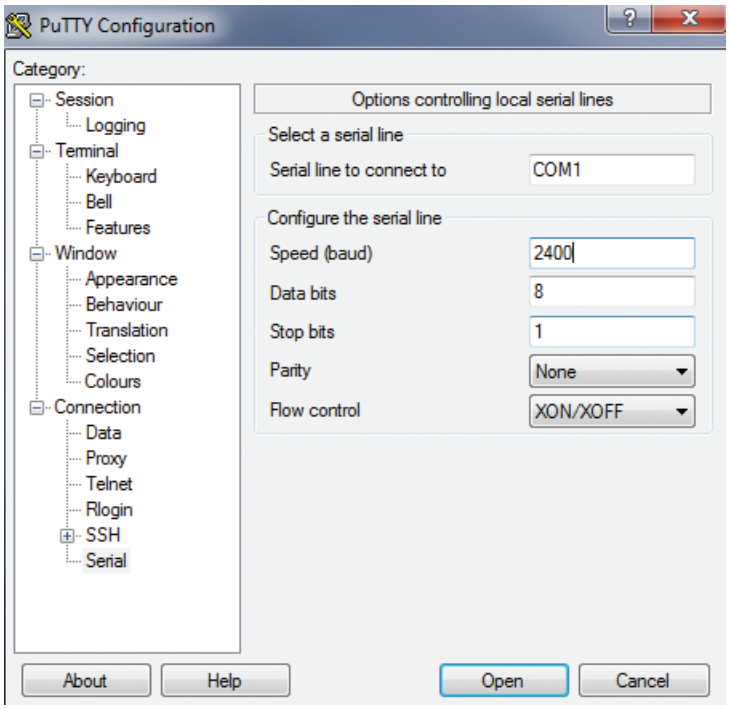
Step 2: Ensure the TLNETCARD's two DIP switches are set to the **OFF** position (Normal Mode).

Step 3: For Windows 2000, 2003, 2008 and XP, go to **Start** → **Programs** → **Accessories** → **Communications** and select **HyperTerminal**.

Note: *Microsoft has removed HyperTerminal from Windows Vista and later versions. If the OS does not include the program, a free alternative Telnet/SSH client PuTTY can be downloaded from http://www.putty.org.*

Step 4: Enter a name, choose an icon for the connection and click **OK**. From the **Connect** drop-down menu, select the COM port that is connected to the TLNETCARD.

Step 5: Click **Configure** and set up COM port parameters as follows:



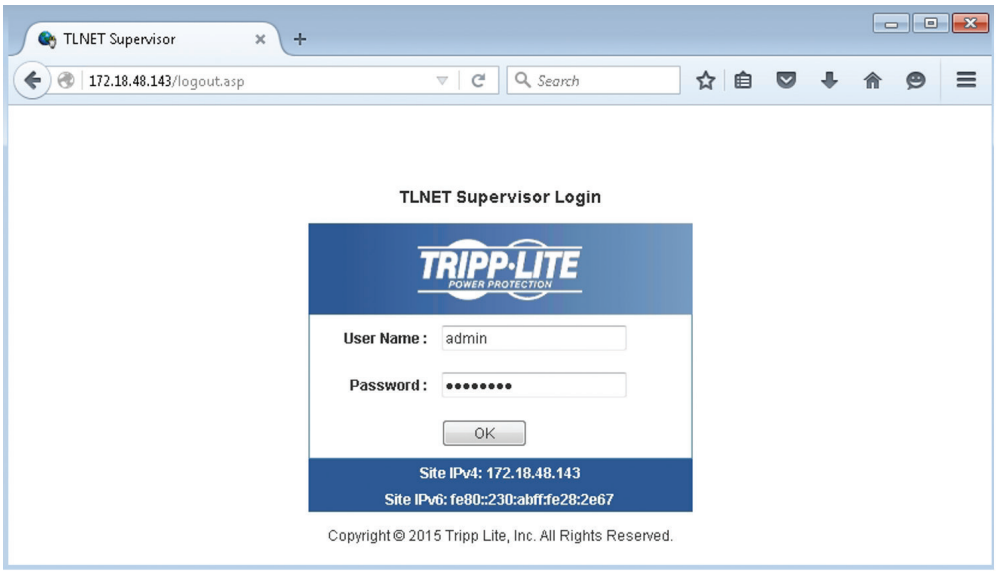
Step 6: Click **OK** to continue. Set the two DIP switches of the TLNETCARD to the ON position (Configuration Mode). HyperTerminal will automatically connect to the TLNETCARD; if it doesn't, click the telephone icon in the tool bar. When connection is established, log in with an Administrator's account/password (default: **admin/password**, case sensitive). Once logged in, the Main Menu appears on the screen. Refer to the next section for more information.

3. TLNET Supervisor

To configure the TLNETCARD via the TLNET Supervisor, follow the steps below:

Step 1: Ensure the TLNETCARD is connected to the LAN.

Step 2: The login page will appear when a connection is established. Enter the account and password (default: **admin/ password**).



Notes:

- *If unable to log in with the correct account and password, additional network configuration may be needed. The IP subnet of the computer may be different from the TLNETCARD's.*
- *The TLNETCARD will automatically log off if the connection is idle for 30 minutes.*

The TLNET Supervisor contains three main sections: **Monitor, Device** and **System**. Refer to **Sections 3.1 - 3.3** for more information.

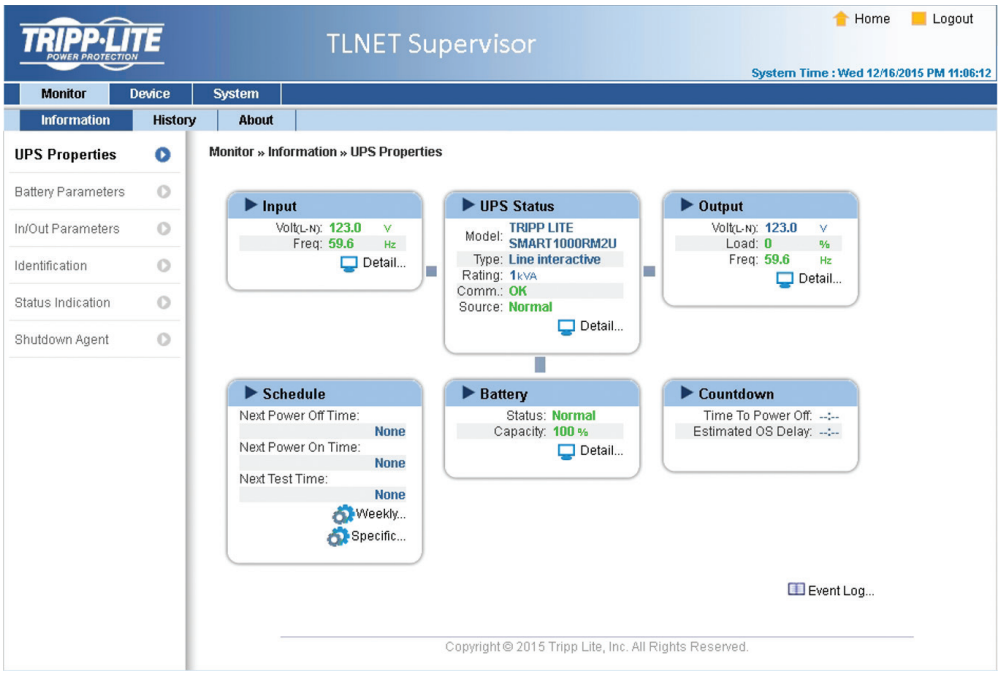
3.1 Monitor

3.1.1 Information

Note: *Because the information provided by a UPS differs by model, the web page will display different information accordingly.*

UPS Properties

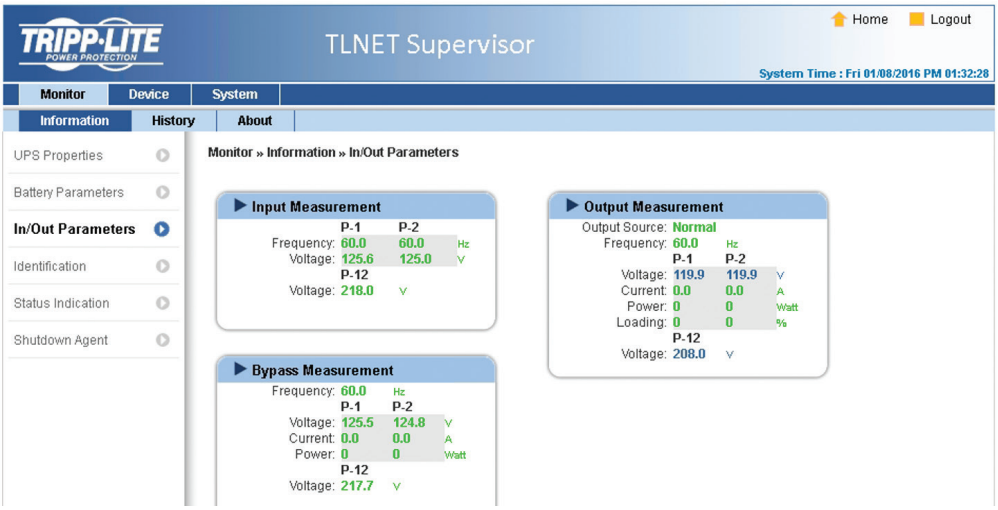
Go to **Monitor** → **Information** → **UPS Properties** for a status overview of the UPS system's primary parameters. The values will update automatically.



3. TLNET Supervisor

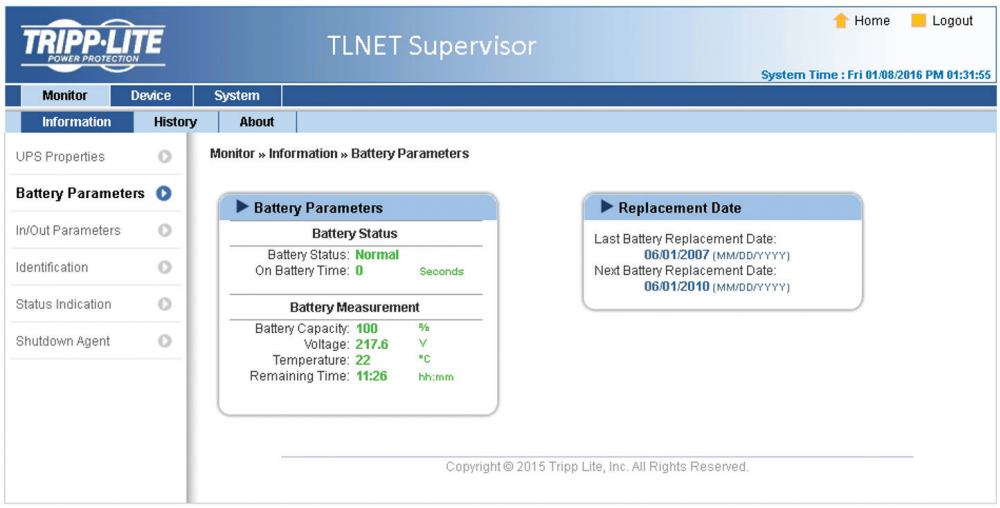
Battery Parameters

Go to **Monitor** → **Information** → **Battery Parameters** to view Battery Status, Battery Measurement and Battery Replacement Date.



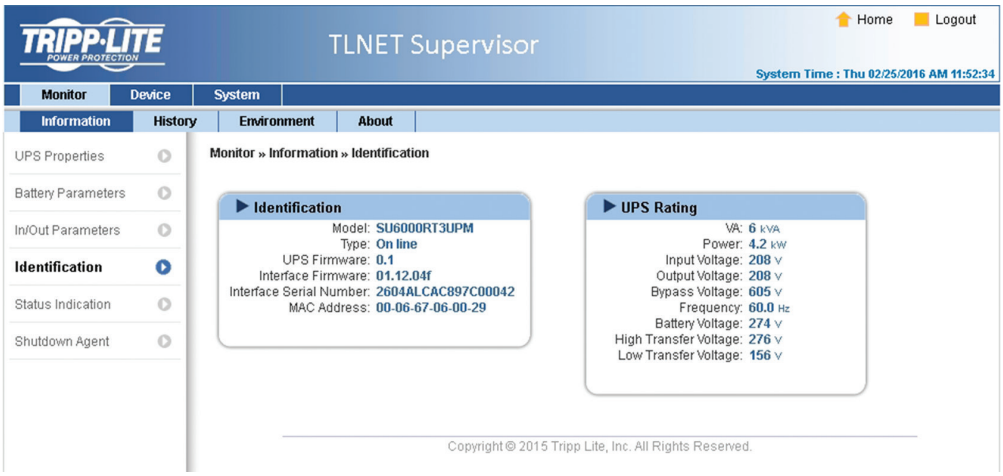
In/Out Parameters

Go to **Monitor** → **Information** → **In/Out Parameters** to view Input Measurement, Bypass Measurement, Output Measurement and Outlet Bank.



Identification

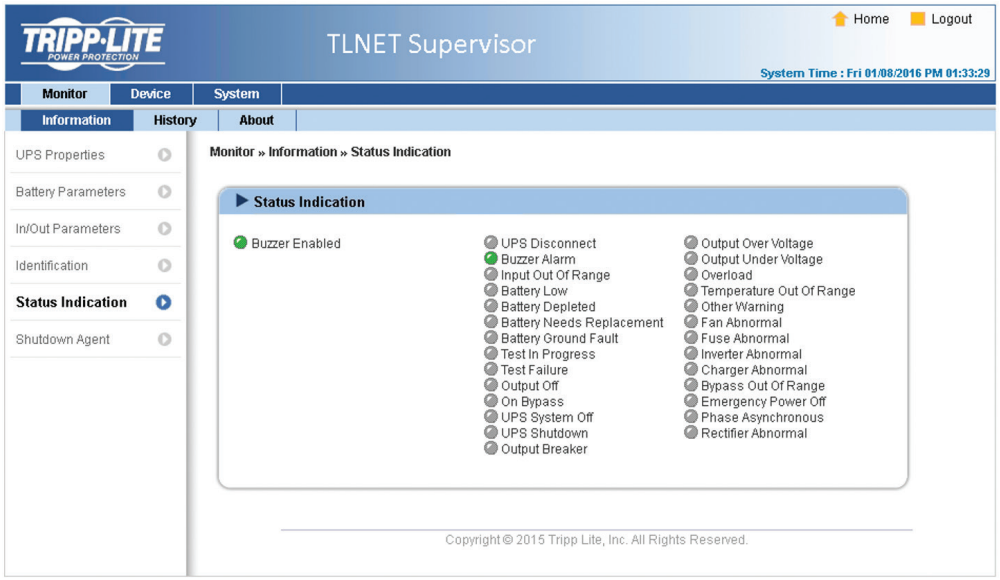
Go to **Monitor** → **Information** → **Identification** to view the system Identification and UPS Rating.



3. TLNET Supervisor

Status Indication

Go to **Monitor** → **Information** → **Status Indication** to view the status of various UPS parameters. When an event occurs, its corresponding icon changes color.

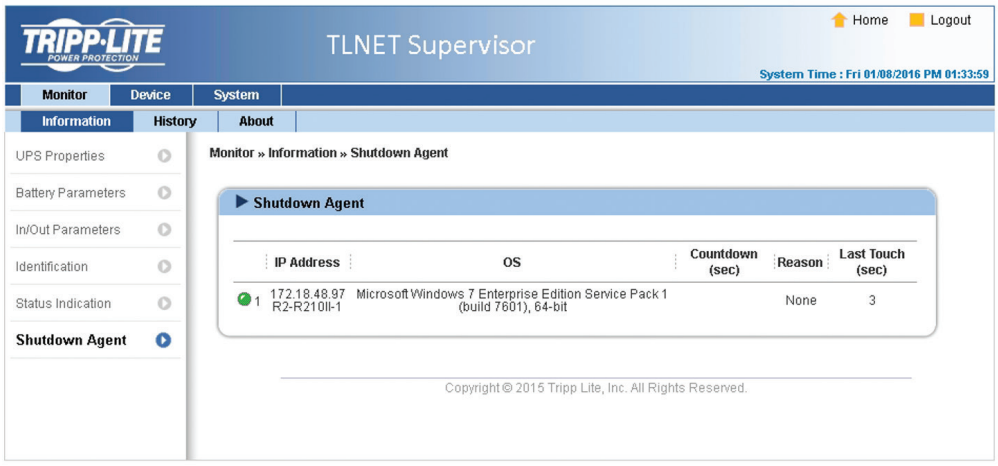


ShutdownAgent

Go to **Monitor** → **Information** → **Shutdown Agent** to view the designated PCs' shutdown information, including IP Address, Operating System, Countdown, Reason and Last Touch.

This page will only appear if:

- The PCs are connected to the UPS using this TLNETCARD.
- The PCs have TLNET Shutdown Agent installed on them.
- In **System** → **Administration** → **SNMP Trap**, the PCs' IP Addresses have been entered in the Target IP field and TLNET Shutdown Agent has been selected from the Trap Category's pull-down menu.

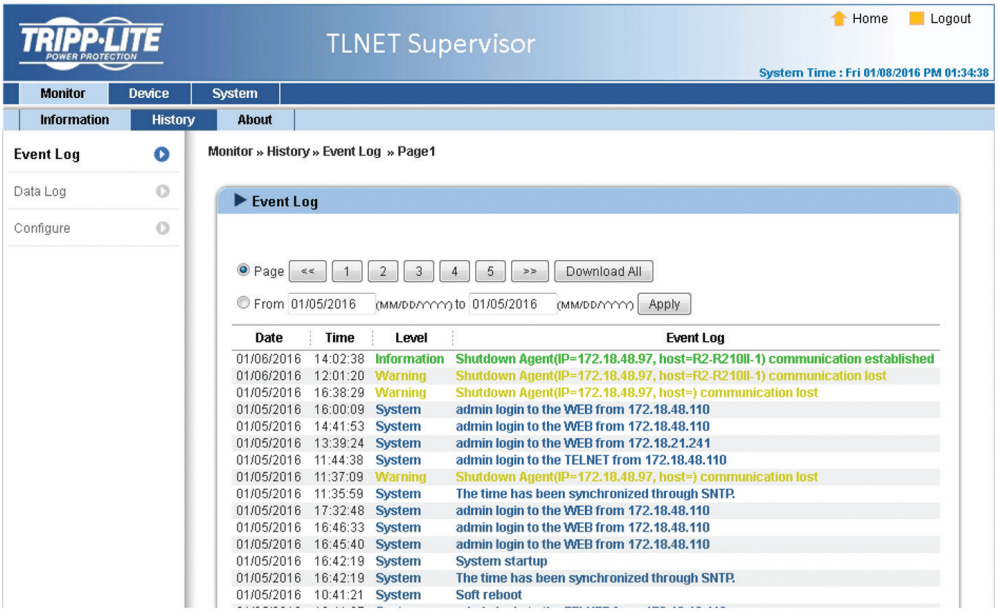


3. TLNET Supervisor

3.1.2 History

Event Log

Go to **Monitor** → **History** → **Event Log** → **selected pages** to view events that have occurred. The log overwrites entries when the maximum (1,000) is reached. The event archive can be downloaded (event_log.xls) by pressing the **Download All** button.

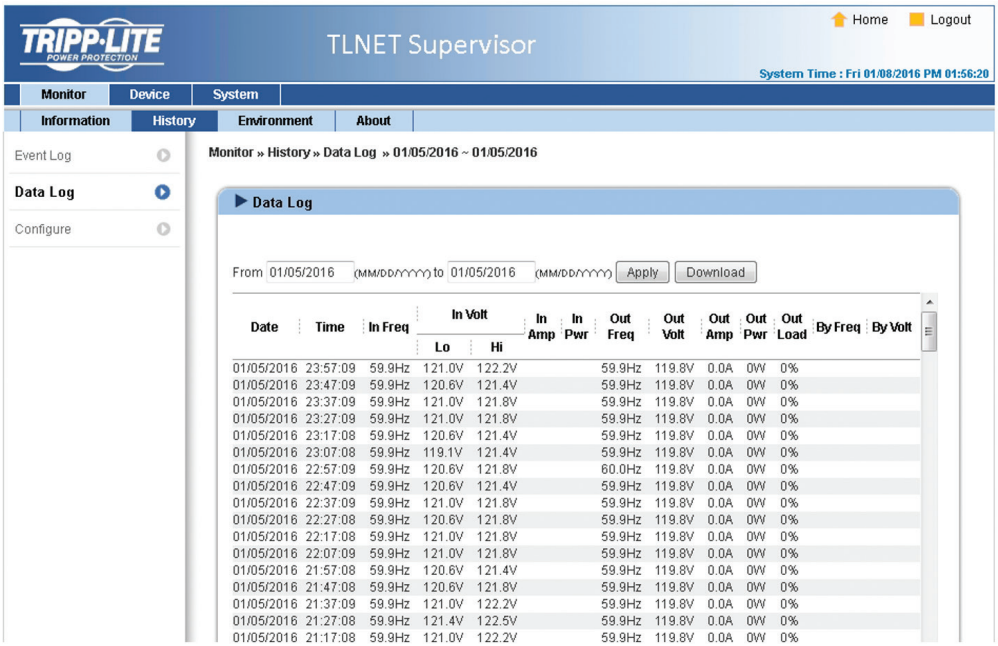


- **Download Event Log from UPS**

  The TLNETCARD sends a request to the UPS, collects the event logs saved there, then replies to the user through the network. This option only appears when the UPS supports this function; the event logs saved in the UPS may be different from the event logs saved in the TLNETCARD.

Data Log

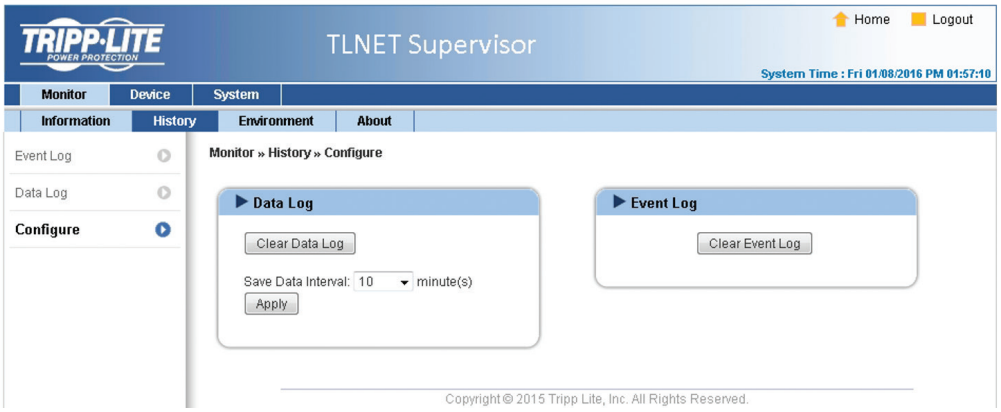
Go to **Monitor** → **History** → **Data Log** to view saved device data. The data archive can be downloaded (data_log.xls) by pressing the **Download** button.



3. TLNET Supervisor

Configure

Go to **Monitor** → **History** → **Configure** to clear the data and event logs and also to assign the Save Data Interval.



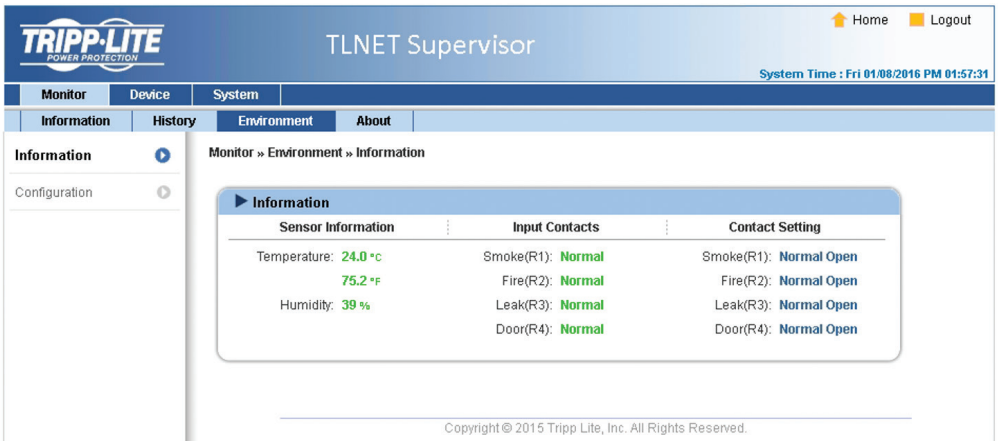
- **Clear Data Log:** Empties the data log only.
- **Clear Event Log:** Empties the event log only.
- **Save Data Interval:** The time interval at which data is recorded.

3.1.3 Environment

The Environment page is displayed only when a TLNETEM is use. TLNETCARD's DIP switch 1 should be set to the ON position and DIP switch 2 should be set to the OFF position when using a TLNETEM. For more information about the TLNETEM, refer to its Owner's Manual

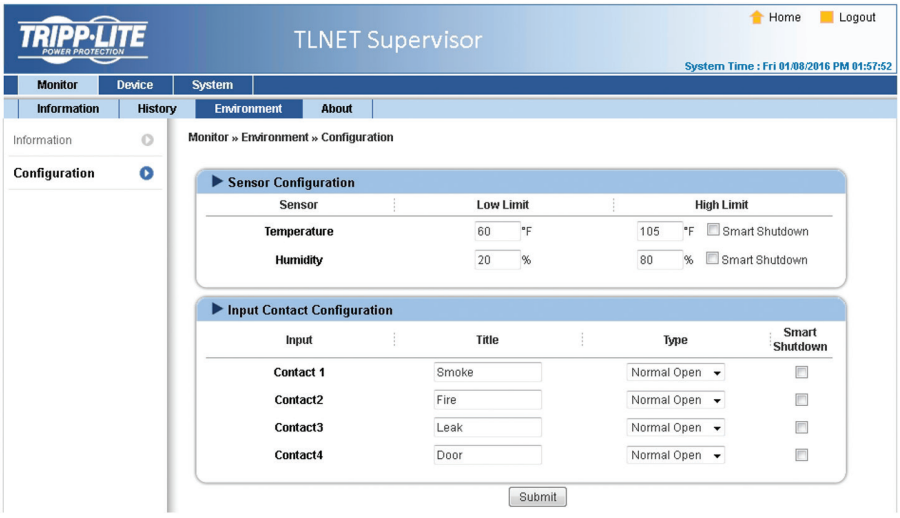
Information

Go to **Monitor** → **Environment** → **Information** to view the TLNET's readings and settings.



Configuration

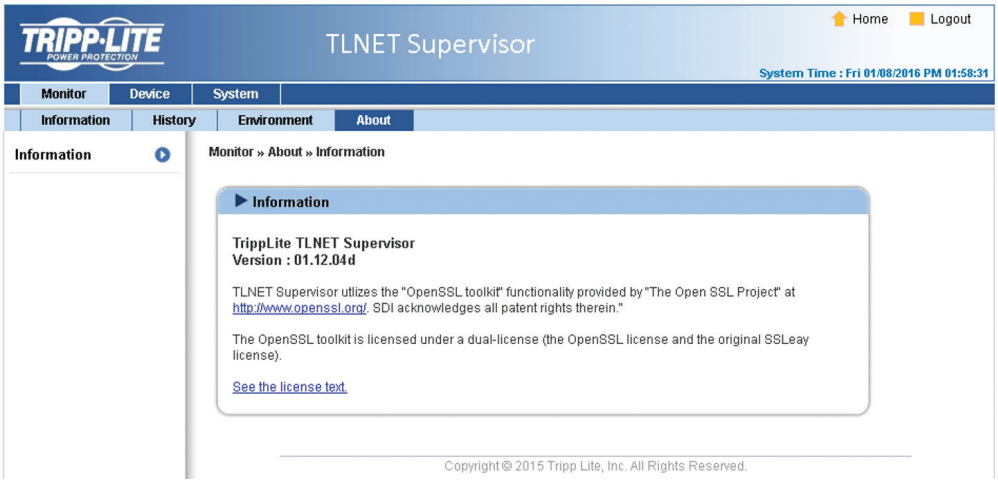
Go to **Monitor** → **Environment** → **Configuration** to configure the TLNETEM's thresholds and other settings.



3.1.4 About

Information

Go to **Monitor** → **About** → **Information** to view the TLNET Supervisor version and information about the OpenSSL toolkit and licenses.



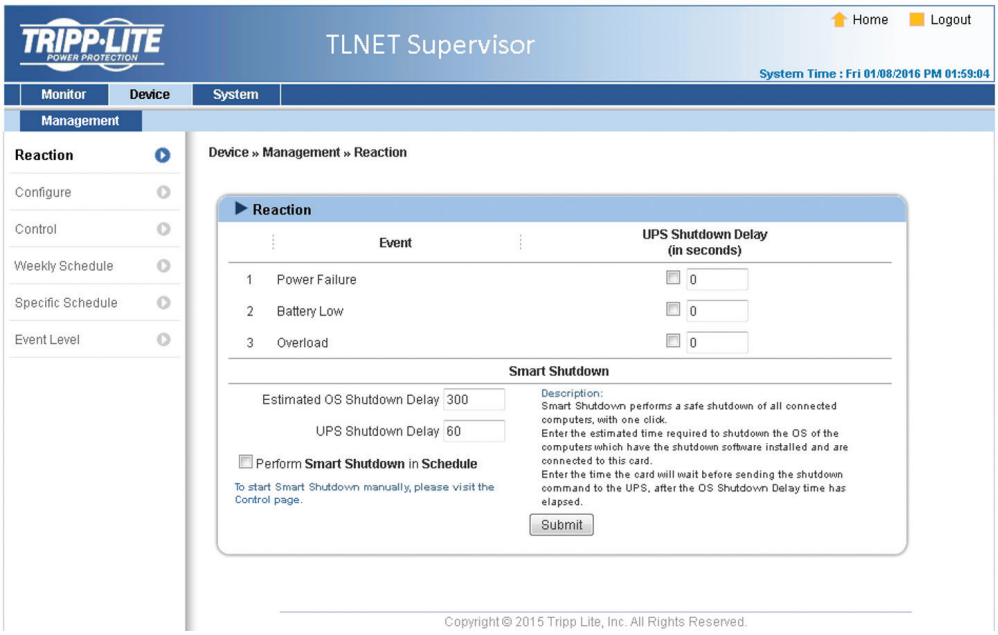
3.2 Devices

3.2.1 Management

Because functions will vary by model, all UPS systems will not necessarily support all of the configurations or control items stated below.

Reaction

Go to **Device** → **Management** → **Reaction** to enable and adjust the parameters under which UPS Shutdown and Smart Shutdown are executed.



- **UPS Shutdown Delay**

  Select the checkbox for each event that is to be a trigger for UPS Shutdown. Enter the time period the system will wait after the trigger event occurs before shutting down the UPS.

- **Smart Shutdown**

  Smart Shutdown performs a safe shutdown of all connected computers and then the UPS, with one click. Enter the estimated time required to shutdown the OS of the computers which have the shutdown software installed and are connected to the TLNETCARD.

  Enter the time period the TLNETCARD will wait before sending the shutdown command to the UPS, after the OS Shutdown Delay time has elapsed.

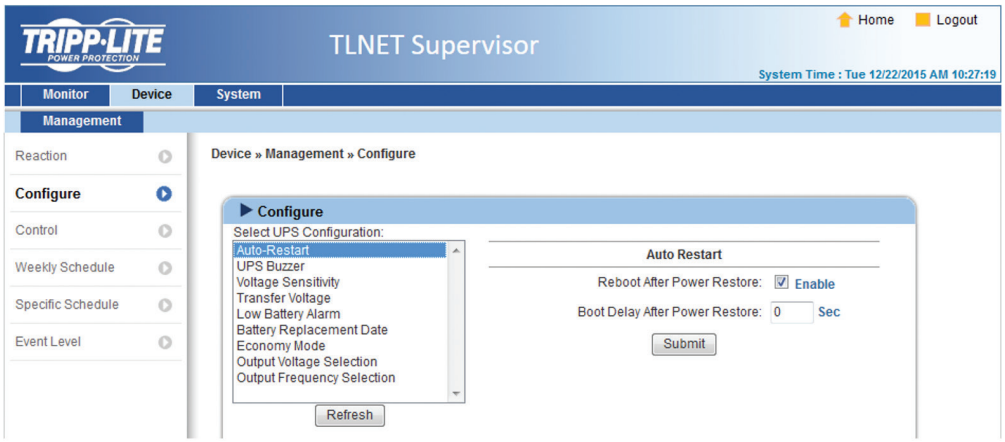
  Select the Perform Smart Shutdown in Schedule checkbox in order to execute a Smart Shutdown when "Shutdown" is selected as the action in either of the Schedules.

3. TLNET Supervisor

Configure

Go to **Device → Management → Configure** to configure the UPS. The configuration values are saved in the UPS or in the TLNETCARD.

Note: *For each of the following items, the Submit button must pressed for the modified settings to take effect.*



- **Auto Restart**

  Enables or disables auto restart after power has been restored.

- **UPS Buzzer**

  Enables or disables the UPS buzzer.

- **Voltage Sensitivity**

  This feature is not yet supported.

- **Transfer Voltage**

  Sets the desired levels for Low and High Transfer voltage.

- **Low Battery Alarm**

  When selected, this option will trigger a low battery alarm if the reported battery level falls below the one assigned in the provided text field.

- **Battery Replacement Date**

  Dates can be entered as a record for battery maintenance purposes. Selecting the checkbox will enable pop-up notifications to appear at a frequency set in the text box.

- **Bypass Transfer Frequency**

  After you set a tolerance of bypass transfer frequency and confirm your setup, the TLNETCARD will send the command to the UPS. If the UPS transfers to bypass mode and the bypass frequency is out of the tolerance, output will be turned off and critical loads will be protected.

- **Periodic Auto Test**

  Enables the UPS to automatically perform a battery test at a period determined by the pulldown menu selection.

- **Economy Mode**

  Enables greater electrical efficiency by suspending double conversion when the power quality is determined to be satisfactory.

- **Outlet Shed / Ramp**

  Ramp allows controllable loads to be turned on in a prescribed order when a specified trigger event takes place. For instance, when the UPS returns from an on battery event (i.e. trigger = no longer on battery).

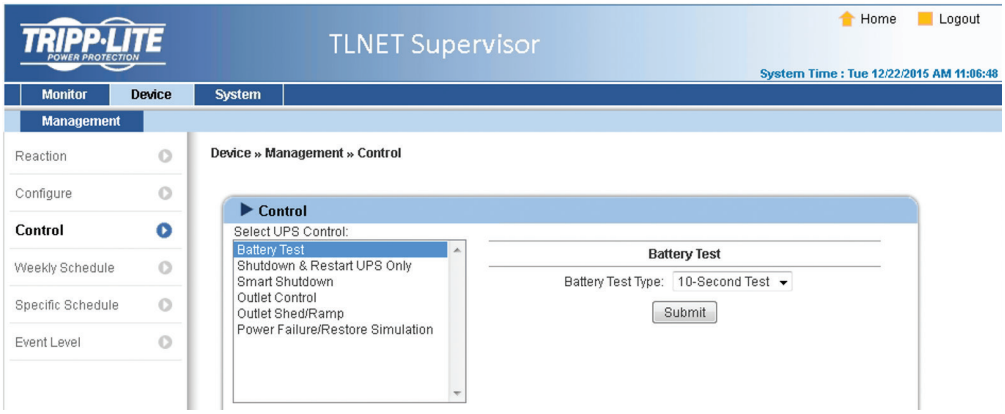
  Shed allows controllable loads to be turned off in a prescribed order when a specified trigger event takes place. For instance, when the UPS goes to battery (i.e. trigger = on battery).

3. TLNET Supervisor

Control

Go to **Device** → **Management** → **Control** to configure relevant control commands.

Note: *For each of the following items, the* ***Submit*** *button must pressed for the specified control to be executed.*



- **Battery Test**

  This control executes a 10-second battery test.

- **Shutdown & Restart UPS Only**

  Upon pressing **Submit**, the UPS will shut down and/or restart per the parameters specified in this section.

- **Outlet Control**

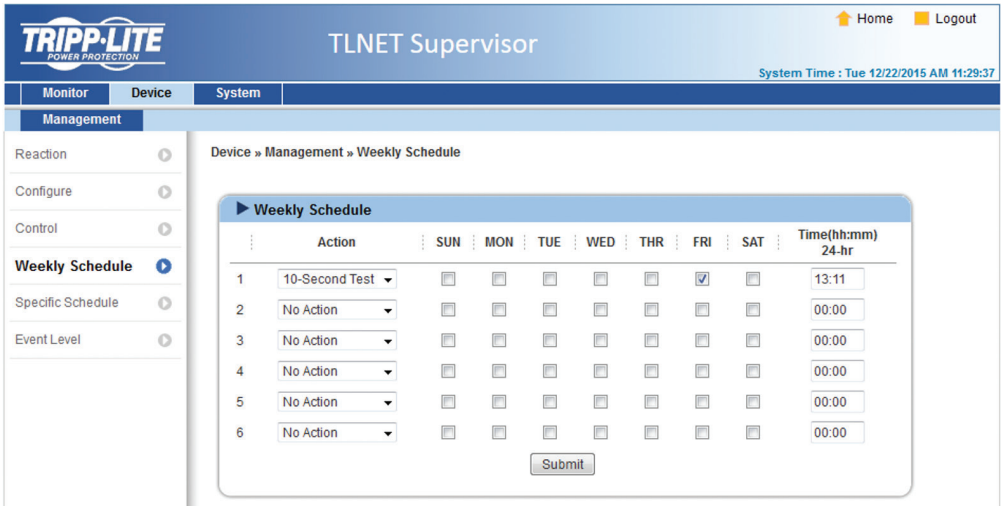
  Press the **Execute** button to control the corresponding outlet bank (on or off).

- **Power Failure/Restore Simulation**

  Click the **Power Failure Test** or **Power Restore Test** button to simulate a power failure or power restore event. This function verifies functionality of the connected software. The simulation will not influence UPS operations; the UPS remains in its existing UPS mode and will not transfer to battery.

Weekly Schedule

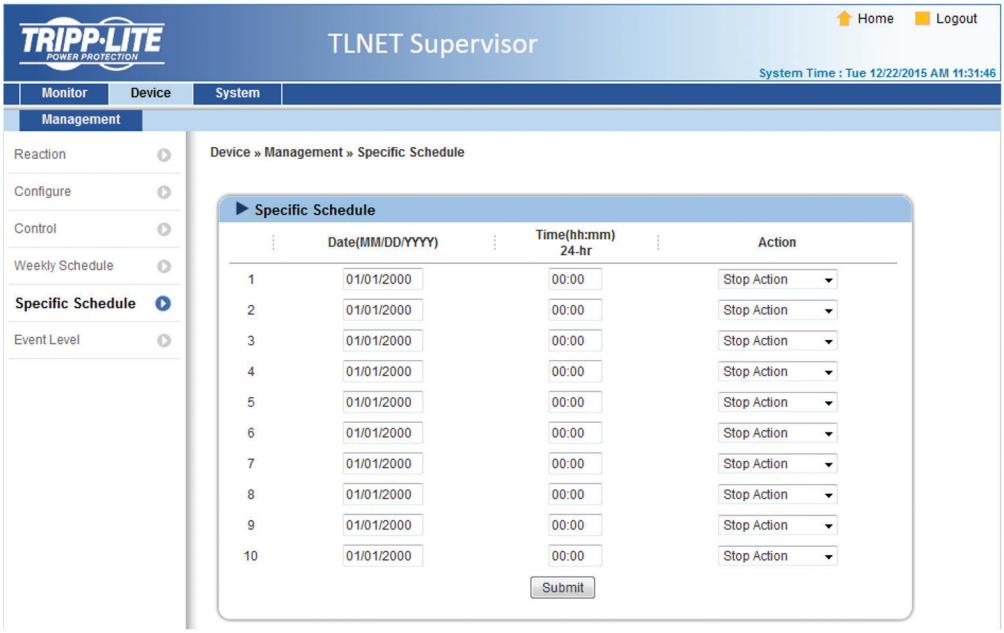
Go to **Device** → **Management** → **Weekly Schedule** to arrange a weekly schedule for the UPS. Select the day(s) and time for a specified action (No Action, Shutdown, Restart, 10-Second Test) to take place.



3. TLNET Supervisor

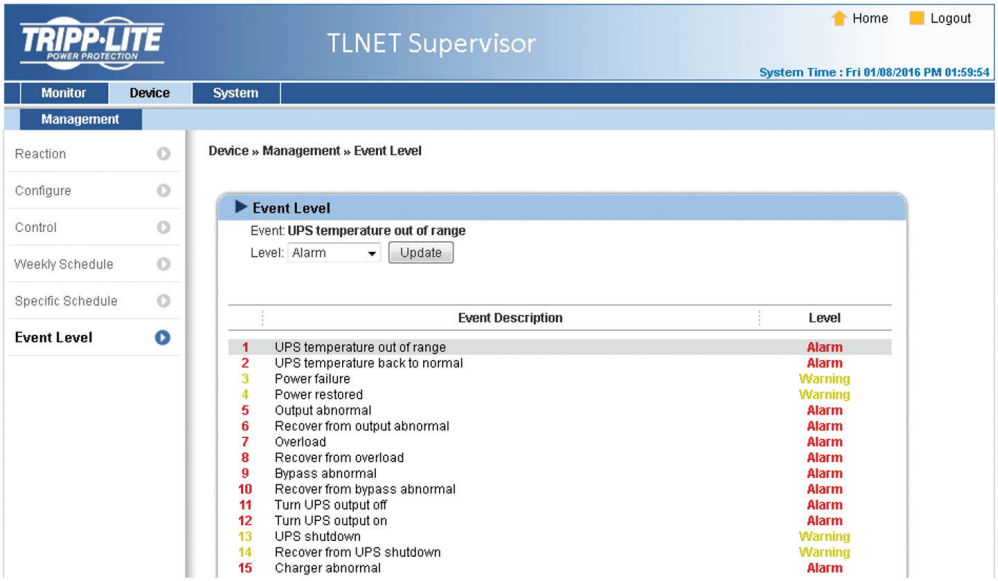
Specific Schedule

Go to **Device** → **Management** → **Specific Schedule** to arrange a specific schedule for the UPS. Select the calendar day(s) and time for a specified action (No Action, Shutdown, Restart, 10-Second Test) to take place.



Event Level

Go to **Device** → **Management** → **Event Level** to assign severity levels for each event.



3. TLNET Supervisor

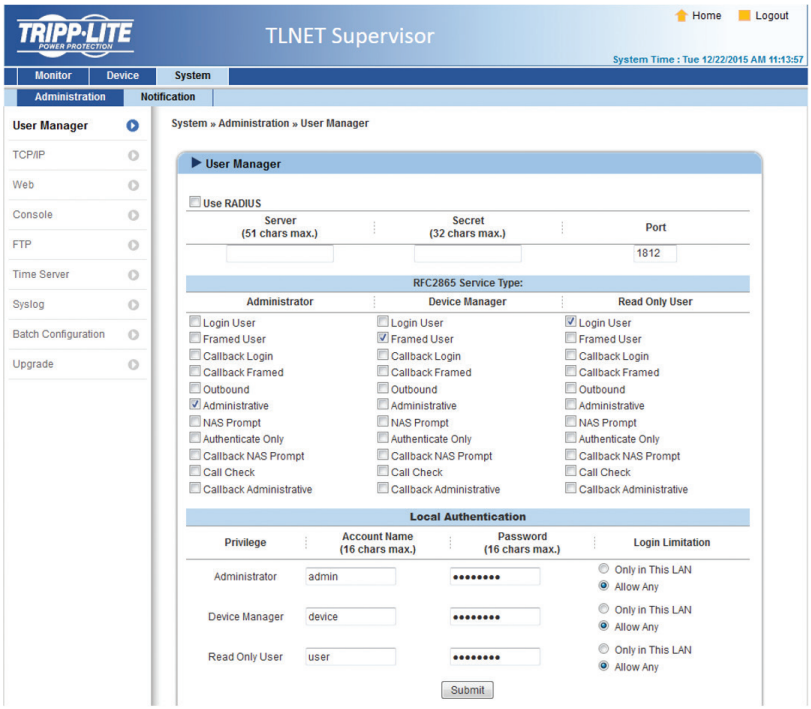
3.3 System

The System pages are accessible only to users with Administrator privileges.

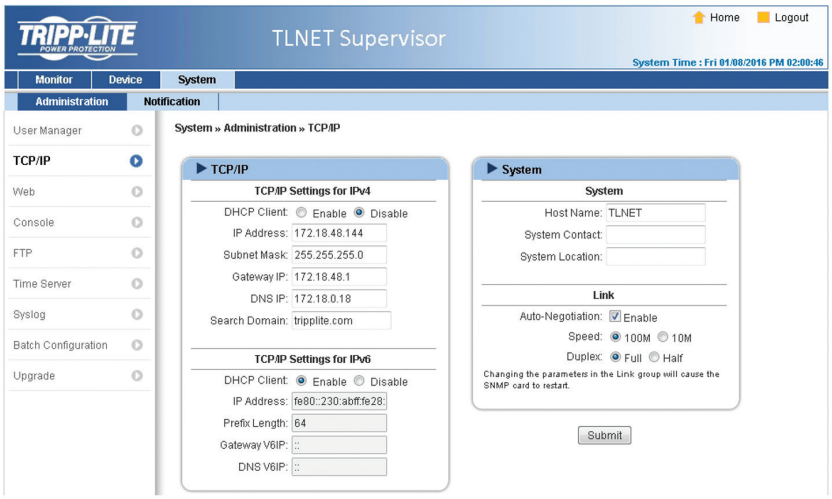
3.3.1 Administration

User Manager

The TLNETCARD supports RADIUS. Check the **Use RADIUS** box, enter the required Server, Secret and Port (default: 1812) information, then click **Submit**. The three user levels can be defined. If RADIUS is disabled, the Account Name, Password and Login Limitation can be managed via Local Authentication.



TCP/IP

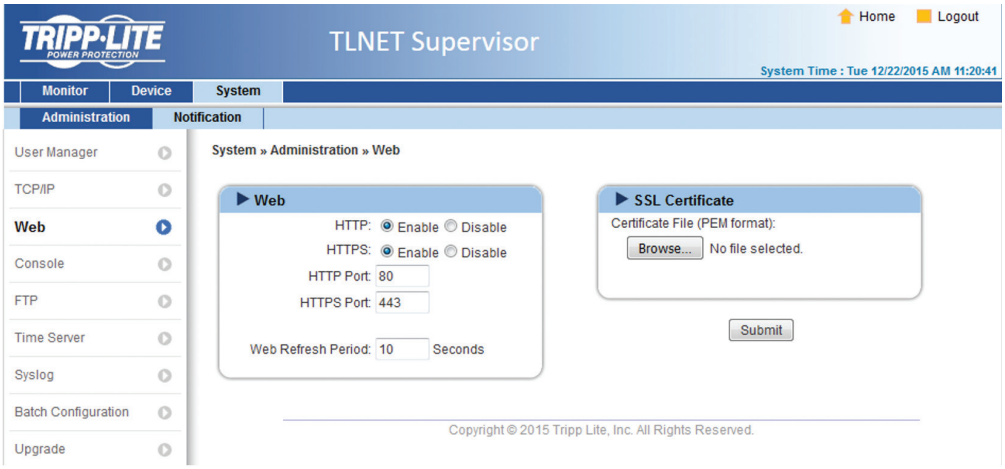


- **TCP/ IP Settings for IPv4**
  1) **DHCP Client:** Enable/Disable DHCP. If enabled, the DHCP server automatically assigns an IP address to the TLNETCARD.
  2) **IP Address:** The IP address in dotted format.
  3) **Subnet Mask:** The Subnet Mask for the network.
  4) **Gateway IP:** The IP address for the network gateway in dotted format.
  5) **DNS IP:** The IP address Domain Name Server in dotted format.
  6) **Search Domain:** If the domain entered cannot be found, the system defaults to the Host Name.

3. TLNET Supervisor

- **TCP/ IP Settings for IPv6**
  1) **DHCP Client:** Enable/Disable DHCP. If enabled, the DHCP server automatically assigns an IP address to the TLNETCARD.
  2) **IP Address:** The IPv6 address.
  3) **Prefix Length:** The prefix length for the IPv6 address.
  4) **Gateway V6IP:** The IP address for the IPv6 network gateway.
  5) **DNS V6IP:** The IP address for the IPv6 domain name server.
- **System**
  1) **Host Name:** The SNMP IPv6 Host Name on the network.
  2) **System Contact:** System contact information.
  3) **System Location:** System location information.
- **Link**
  1) **Auto-Negotiation:** Enable/Disable automatic transfer rate (10/100Mbps) negotiation.
  2) **Speed:** If the Auto-Negotiation is disabled, the transfer rate can be specified.
  3) **Duplex:** If the Auto-Negotiation is disabled, the duplex mode can be specified.

Web

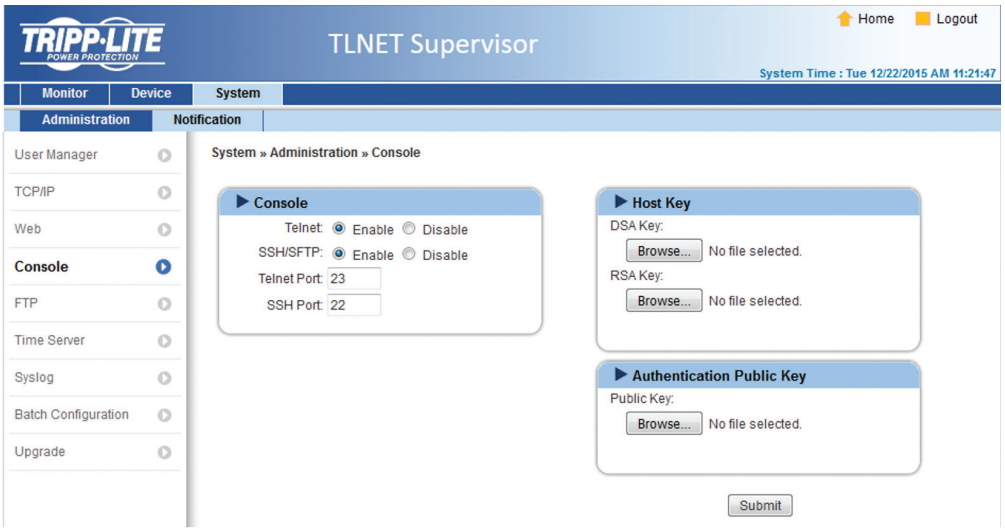


- **Web**
  1) **HTTP:** Enable/ disable HTTP connection.
  2) **HTTPS:** Enable/ disable HTTPS connection.
  3) **HTTP Port:** Assign an HTTP port number (default: 80).
  4) **HTTPS Port:** Assign an HTTPS port number (default: 443).
  5) **Web Refresh Period:** Enter a time period (in seconds).
- **SSL Certificate**
  1) To ensure connection security between the TLNETCARD and the connecting workstation, an SSL certificate can be used to encrypt and secure the integrity of transmitted data.
  2) Certificate File: The TLNETCARD supports PEM format which is generated by OpenSSL. Click **Choose File** to upload a certificate file.

Note: *For more information about generating a private SSL certificate file, visit http://www.openssl.org/.*

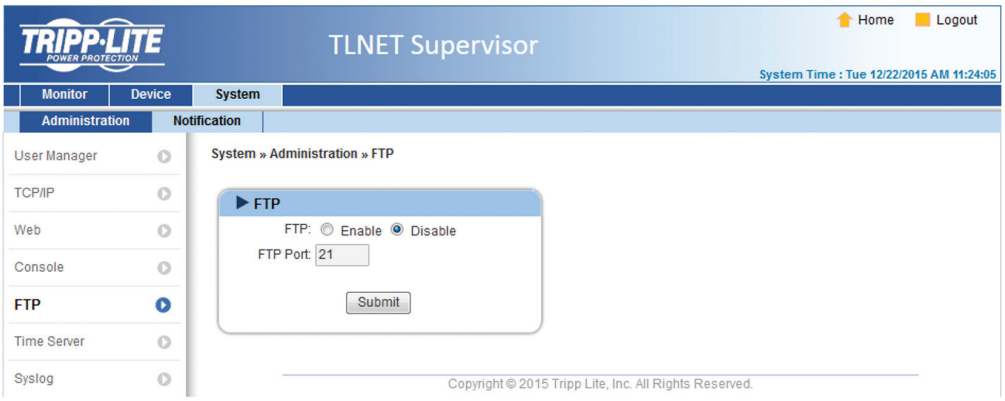
3. TLNET Supervisor

Console



- **Telnet:** Enable/ disable Telnet connection.
- **SSH/ SFTP:** Enable/ disable SSH/ SFTP connection.
- **Telnet Port:** Assign a Telnet port number (default: 23).
- **SSH Port:** Assign an SSH protocol port number (default: 22).
- **Host Key/ Authentication Public Key:** The TLNETCARD supports files generated by OpenSSH, including DSA, RSA, and Authentication Public Keys.

FTP

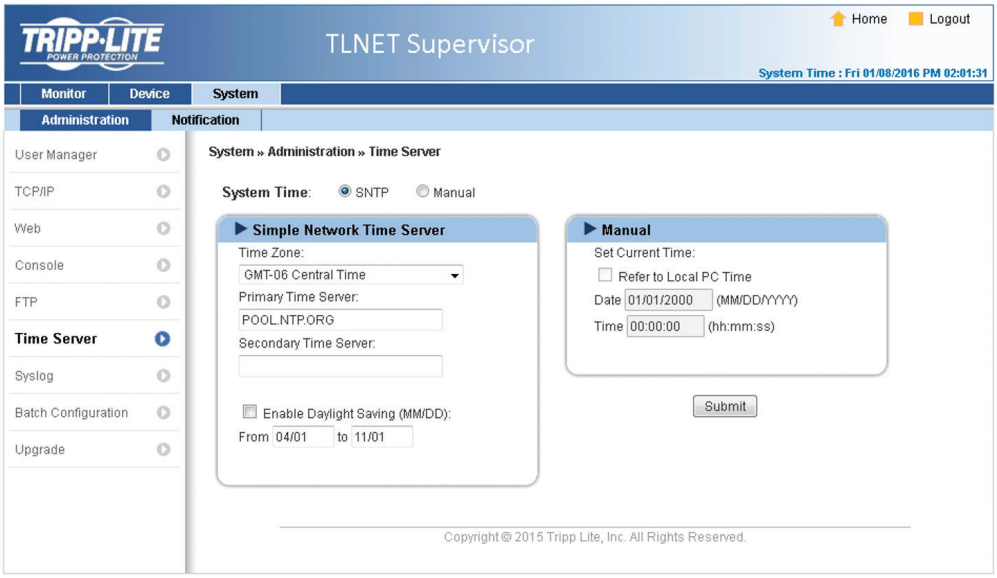


- **FTP:** Enable/ disable FTP connection.
- **FTP Port:** Assign an FTP port number (default: 21).

3. TLNET Supervisor

Time Server

The time and date can be automatically synchronized with SNTP servers or manually entered; select the desired option. If the SNTP server is not responsive, the event and data log will not register even when SNTP is enabled.



- **Simple Network Time Server**

  1) **Time Zone:** From the dropdown menu, select the time zone for the location where the TLNETCARD is located.

  2) **Primary/ Secondary Time Server:** Two time servers can be added. Every 60 minutes, the TLNETCARD synchronizes with the first responding server.

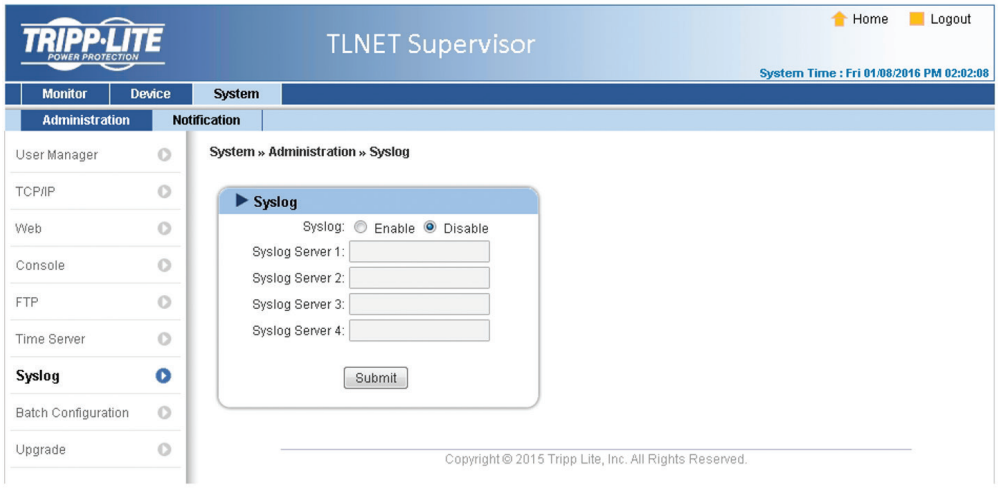
  3) **Enable Daylight Saving:** Check to enable daylight saving time.

- **Manual**

  If a time server is not accessible, the time and date can be linked to the local PC or set manually. Note that in the event of a power loss, the time and date may need to be re-entered once power is restored.

Syslog

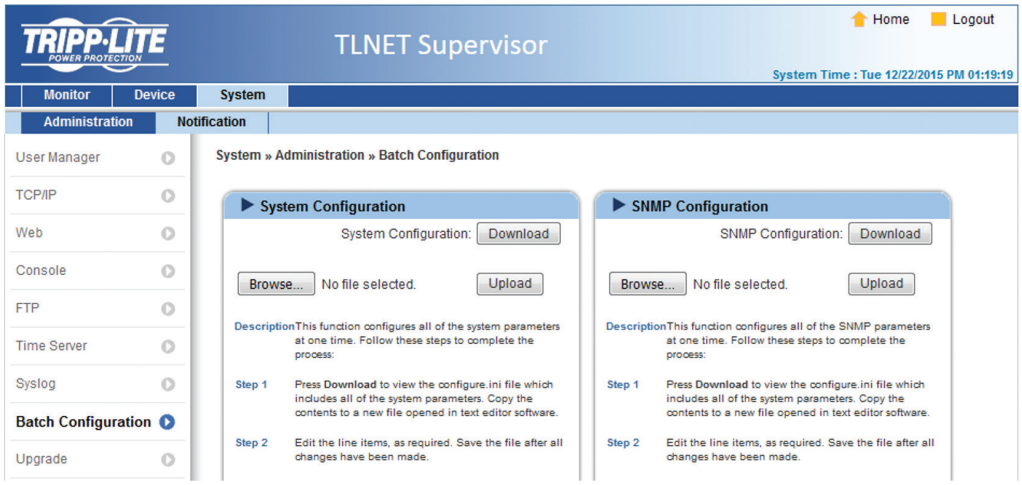
Syslog is used to store the event log on remote Syslog servers. This will not affect the local event log. Upon selecting the Enable option, enter the IP Addresses of up to four (max) Syslog servers.



3. TLNET Supervisor

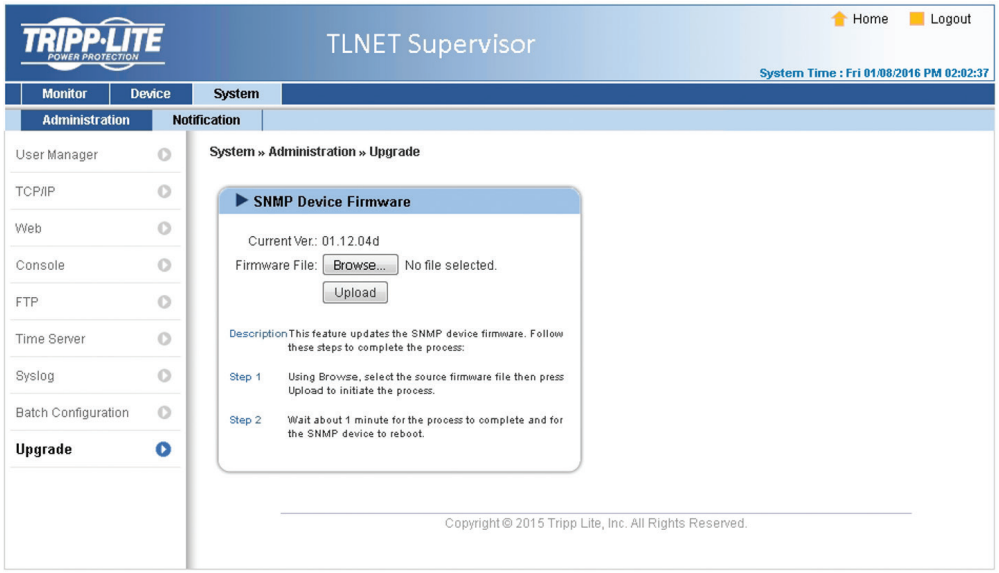
Batch Configuration

The TLNETCARD supports batch configuration for quick and effortless setup of multiple SNMP devices. Configuration information uploaded from a source device can be downloaded onto individual target devices using the TLNET Supervisor, or onto multiple target devices using the TLNET Configurator (see **Section 4.1**).



Upgrade

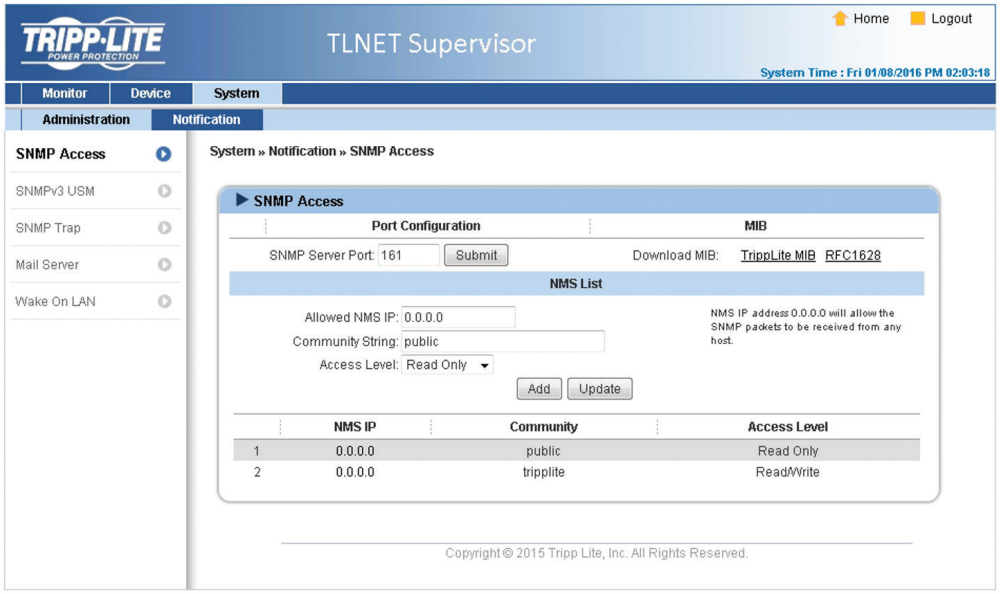
The Upgrade page shows the TLNETCARD's current firmware version. Instructions for performing a firmware update are provided on-screen. The upgrade process, including a card reboot, should take about one minute.



3. TLNET Supervisor

3.3.2 Notification

SNMP Access

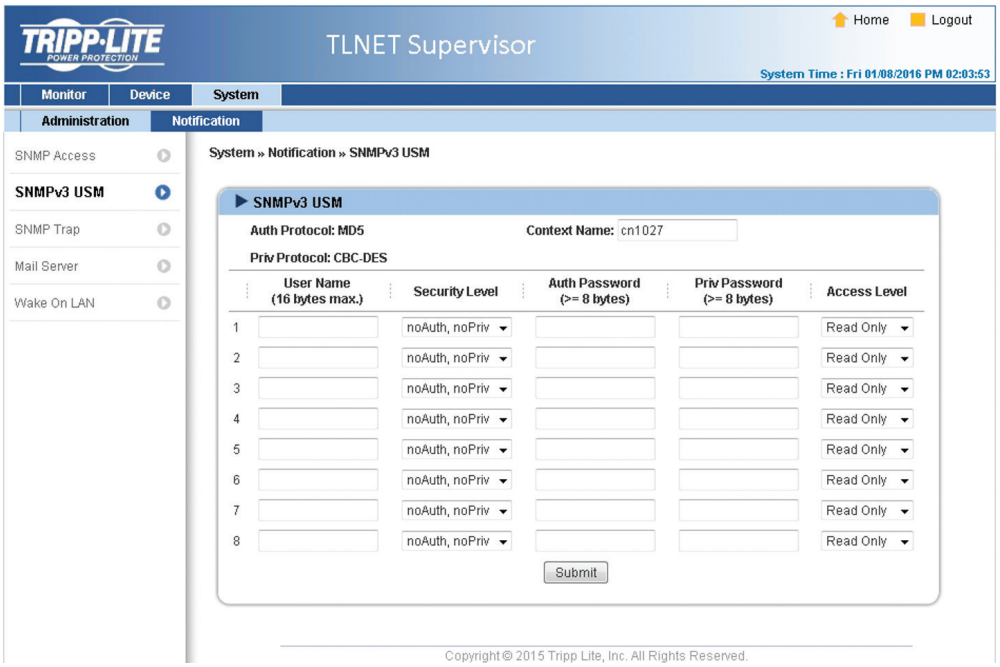


The TLNETCARD supports SNMP protocol and SNMP NMS (Network Management System), which are commonly used to monitor network devices. To prevent unauthorized access, the NMS IP addresses community strings and access levels for authorized users can be specified. The maximum number of IP entries is 256.

Note: *If IP address* ***0.0.0.0*** *is entered, the NMS IP access restriction is ignored. The TLNETCARD checks the community string to identify the configured access level and permission.*

SNMPv3 USM

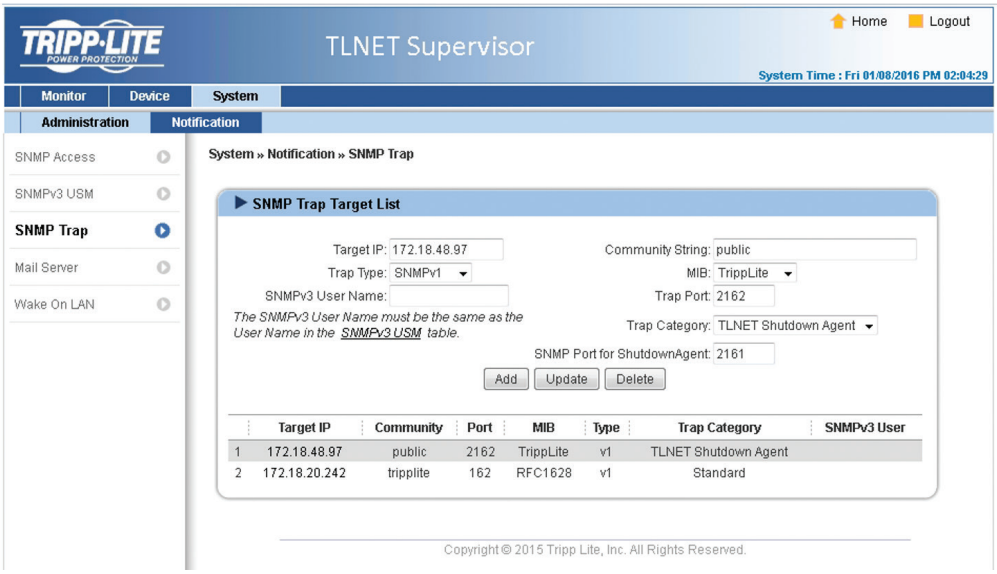
SNMPv3 offers features such as packet encryption and authentication to improve security. The SNMPv3 USM (User Session Management) allows assignment of eight User Names whose access is granted via SNMPv3 protocol. Their respective Security Levels, Auth Passwords, Priv Passwords and Access Levels can also be defined.



3. TLNET Supervisor

SNMP Trap

SNMP Traps alert users to specific events that occur in the monitored environment. SNMP Trap recipients must be added to the Target IP list by entering in their IP Addresses and related parameters, then clicking **Add**. Click the **Update** button to modify entries in the list. Items can be removed by clicking the **Delete** button.

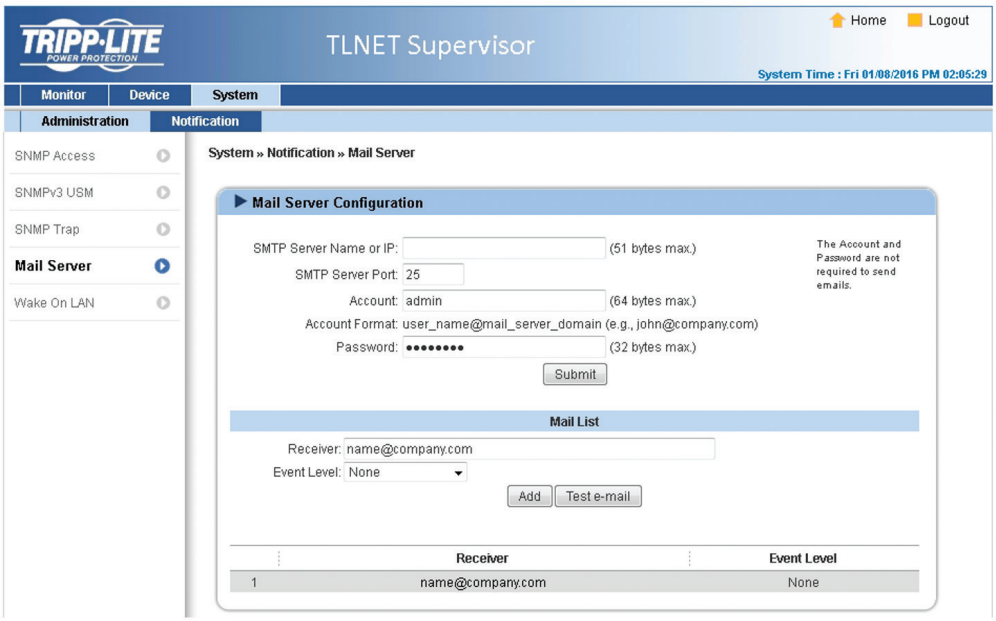


Notes:

The TLNETCARD supports SNMPv1, SNMPv2c and SNMPv3 traps. For SNMPv3 traps, specify an SNMPv3 USM User Name. Use Trap Category to determine which event notifications are to be sent to the Target IP Address. The three categories are:

- ***None:*** *No event notifications are sent to the target address.*
- ***Standard:*** *standard event notifications are sent to the target address*
- ***Shutdown Agent:*** *Shutdown Agent event notifications are sent to the target address. Go to* ***Monitor*** → ***Information*** → ***Shutdown Agent*** *to view the shutdown information of the designated PC.*

Mail Server



Set up an SMTP Server and specify a list of E-mail recipients who will receive notifications when events occur. The maximum number of recipients is 256.

Note: *If a DNS server is not available in the network, manually assign an SMTP server address to enable the E-mail notification system.*

- **SMTP Server Name or IP**

  If a Host Name is entered, a DNS IP should be added in TCP/ IP. See section 3.3.1 for more information.

- **Account**

  The mail server login account.

- **Password**

  The mail server login password.

- **Receiver**

  The recipients' E-mail addresses.

- **Event Level**

  Select the Event Level that when triggered, an E-mail notification is sent to the corresponding recipient.

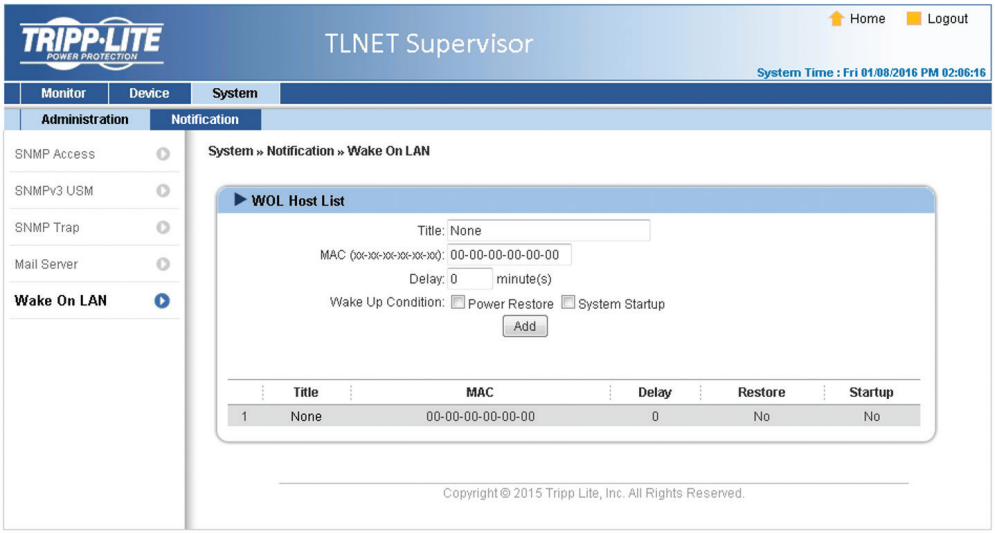
  1) **Information:** All event notifications are sent to the target address.

  2) **Warning:** Warning and Alarm event notifications are sent to the target address.

  3) **Alarm:** Only Alarm event notifications are sent to the target address.

Wake on LAN

The Wake On LAN function enables a networked PC to be started up after power is restored and/or the TLNETCARD starts up. This feature supports a maximum of 256 PCs.



4. TLNET Configurator

The TLNET Configurator utility simplifies configuration and firmware update of multiple TLNETCARDs as described in the following sections. Configuration of individual TLNETCARDs using the TLNET Configurator is covered in **Section 2.1.1**.

4.1 Batch Configuration

This function of the utility allows the configuration of one (source) TLNETCARD to be copied to one or more (target) TLNETCARDs.

Step 1: Within the TLNET Supervisor of the source TLNETCARD, go to **System → Administration → Batch Configuration** and select the **Download** button in either the System Configuration or the SNMP Configuration window. The contents of the configuration file will appear in a web page.

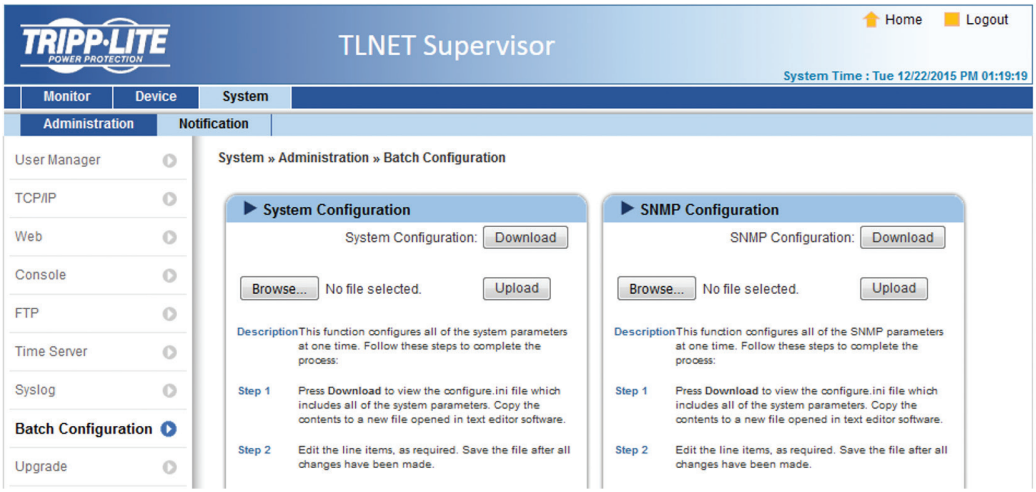
Step 2: Select and copy the entire contents of the configuration file.

Step 3: Open a text editor application such as Notepad and paste the contents. Save the file to a location where it can be accessed by the TLNET Supervisor or Configurator (e.g. on the computer's desktop).

Step 4: If required, make edits to the configuration file, then save it with a .ini extension (e.g. *snmp.ini*).

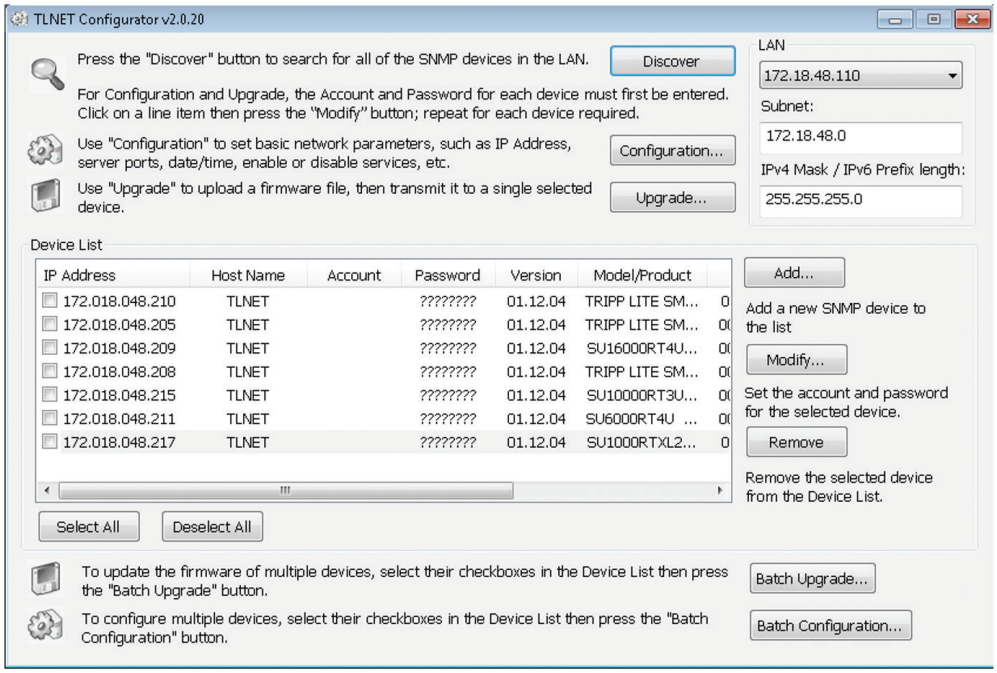
Note: *The configuration file name cannot contain spaces, hyphens or special characters.*

Caution: The Network settings, including IP Address, Mask and Gateway of the source TLNETCARD will be transferred to the target TLNETCARDS. To prevent a setting from being transferred to other devices, simply "comment out" its line item by placing a semicolon (;) at the beginning of the line item. In the example below, the IP Address will NOT be transferred but the remaining items will.



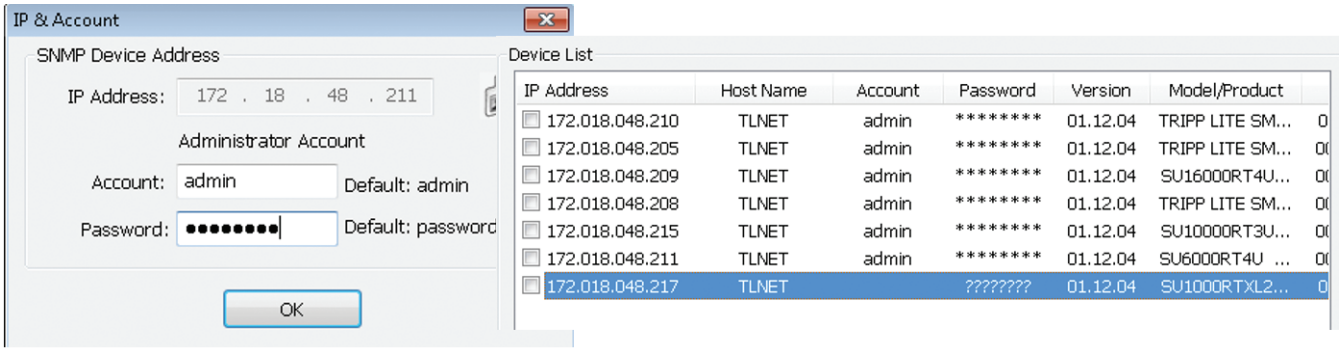

```
IdentName=
AttachDevice=
; IP=172.18.48.144
Mask=255.255.255.0
Gateway=172.18.48.1
DNS IP=172.18.0.18
Domain=tripplite.com
Bootp=Disable
```

Launch the TLNET Configurator and set the required network paramters (LAN, Subnet), then click **Discover**.

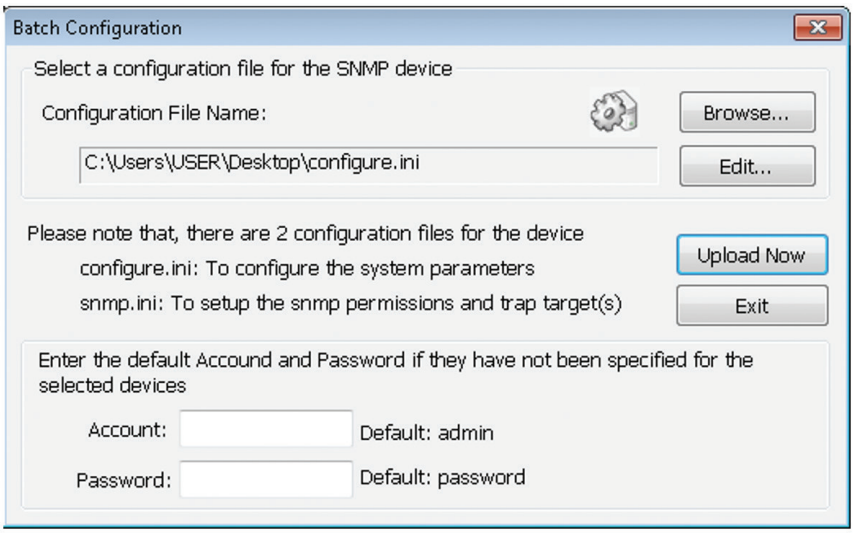


4. TLNET Configurator

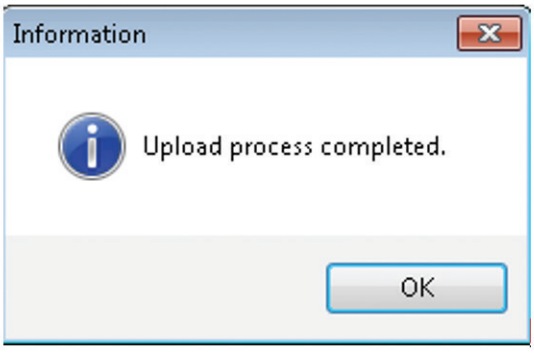
Step 5: The *Account* and *Password* fields for all target TLNETCARDs will need to be entered. If the cards all share the same account user name and password, skip to the next step. Otherwise, select each target TLNETCARD's line item (not its checkbox) and click **Modify** to enter the credentials. Once completed, the line item in the Device List will show values in the *Account* and *Password* fields.



Step 6: Select the checkboxes of all the target TLNETCARDs, then click on **Batch Configuration**. Click the **Browse** button in the pop up window, then navigate to and select the configuration file saved in Step 3. If the cards all share the same account username and password information, enter those credentials in the space provided. Even if the default values will be used, they need to be re-entered into fields.



Step 7: Click on the **Upload Now** button. A notification appears when the process is complete.



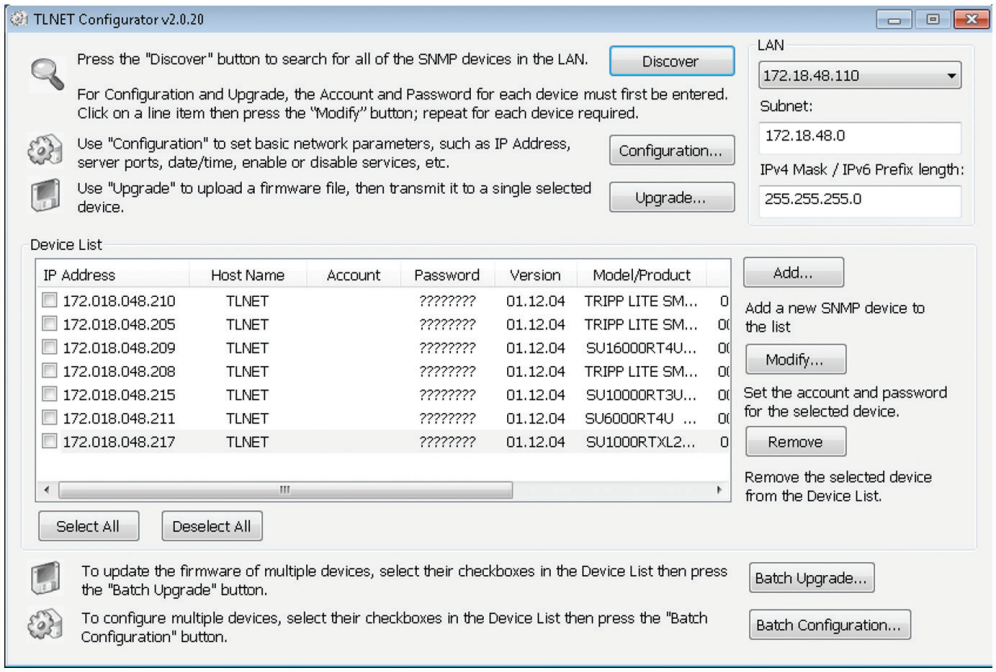
4. TLNET Configurator

4.2 Batch Upgrade

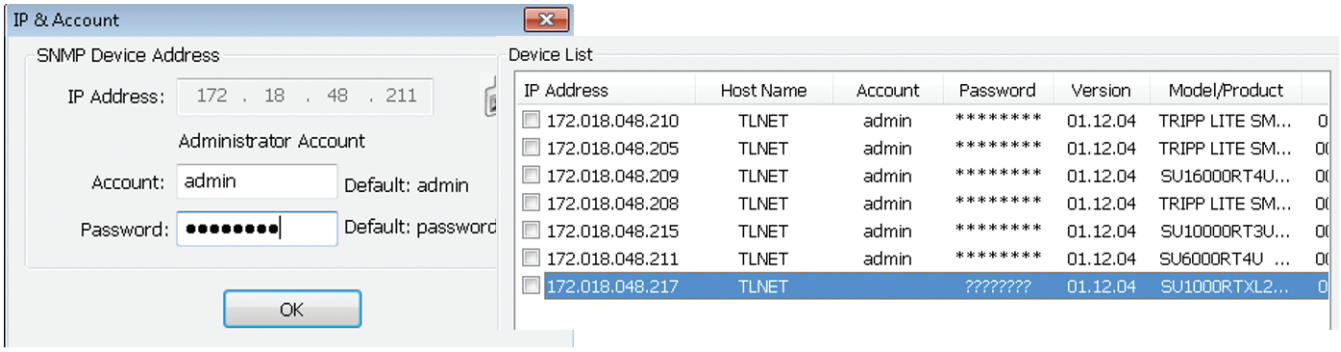
This function of the Batch Upgrade utility allows a firmware file to be loaded onto to one or more TLNETCARDs. Firmware files will typically be downloaded from Tripp Lite's website.

Step 1: Place the (downloaded) firmware file in a location where it can be accessed by the TLNET Configurator (e.g. on the computer's desktop).

Step 2: Launch the TLNET Configurator, set the required network paramters (LAN, Subnet), then click **Discover**.

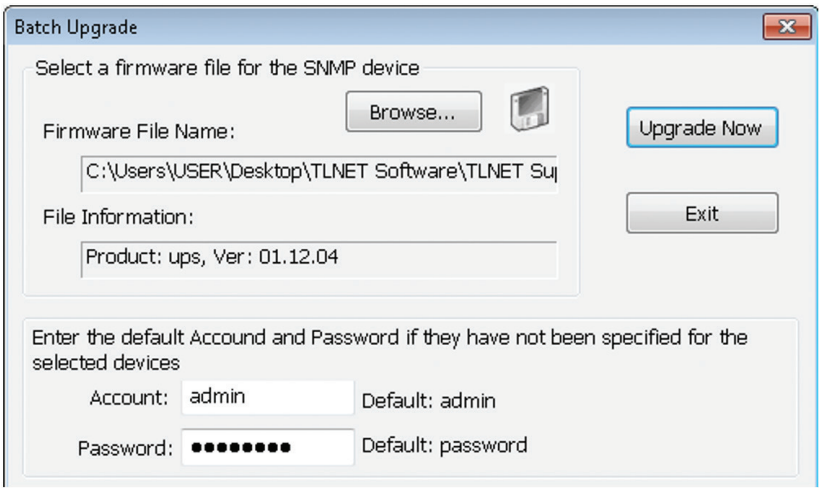


Step 3: The *Account* and *Password* fields for all target TLNETCARDs will need to be entered. If the cards all share the same account username and password, skip to the next step. Otherwise, select each target TLNETCARD's line item (not its checkbox) and click **Modify** to enter the credentials. Once completed, the line item in the Device List will show values in the *Account* and *Password* fields.

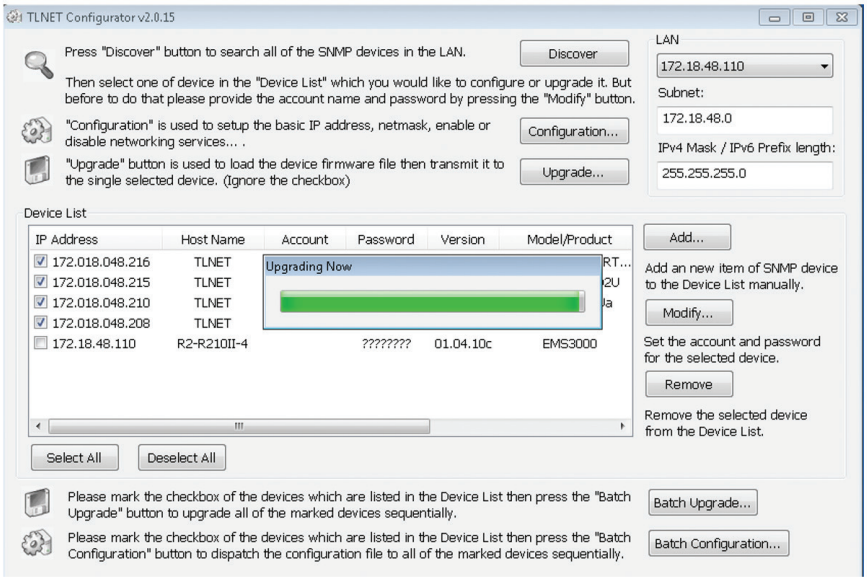


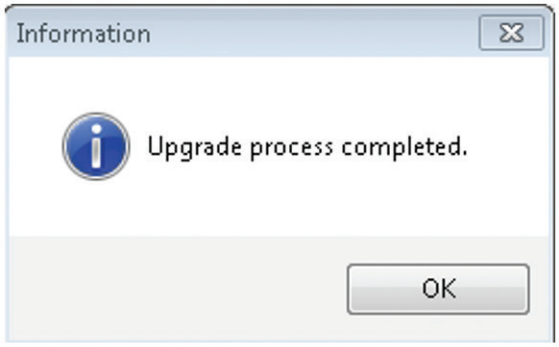
4. TLNET Configurator

Step 4: Select the checkboxes of all TLNETCARDs to be upgraded, then click on **Batch Upgrade**. Click the **Browse** button in the pop up window, then navigate to and select the firmware file saved in Step 1. If the cards all share the same account username and password information, enter those credentials in the space provided. Even if the default values will be used, they need to be re-entered into fields.



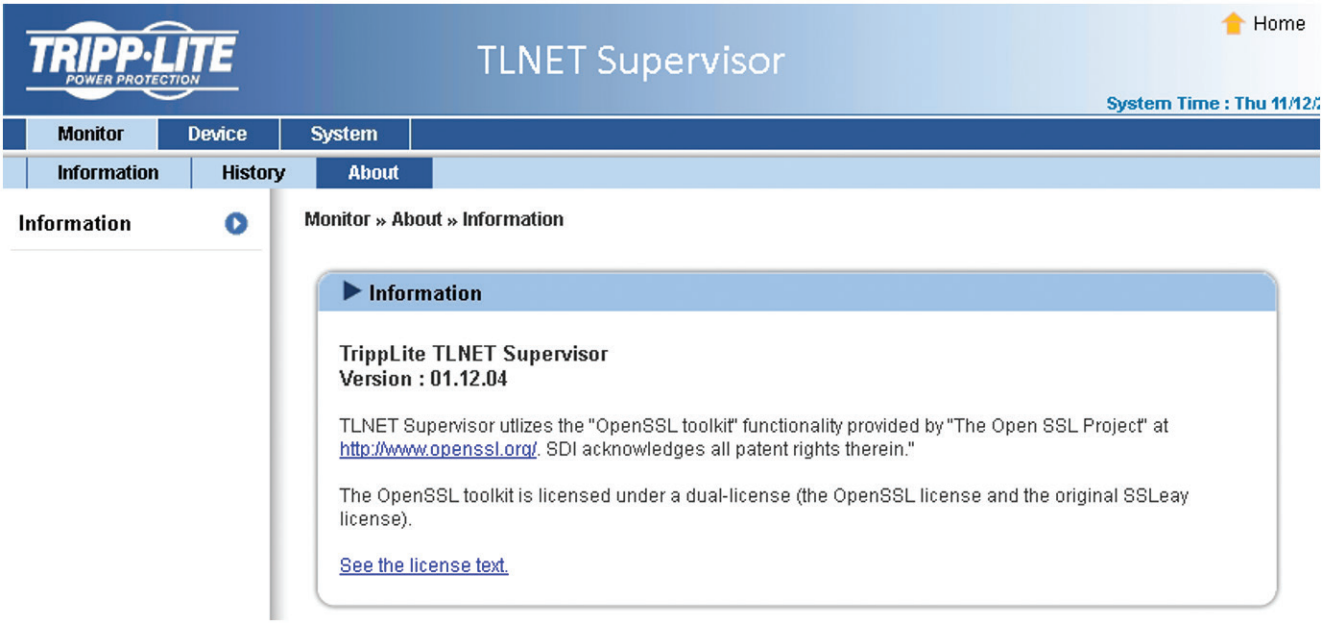
Step 5: Click the **Upgrade Now** button. A progress bar will indicate the upgrade status for each TLNETCARD sequentially. An information window will denote when the upgrade has been completed. Click **OK**.





4. TLNET Configurator

Note: *The TLNET Configurator will not automatically show the updated firmware version in the Device List. Exit, then re-launch the TLNET Configurator to confirm the selected devices successfully uploaded the new firmware. The update can also be confirmed in the TLNET Supervisor interface of each device in the* ***Monitor >> About*** *tab.*

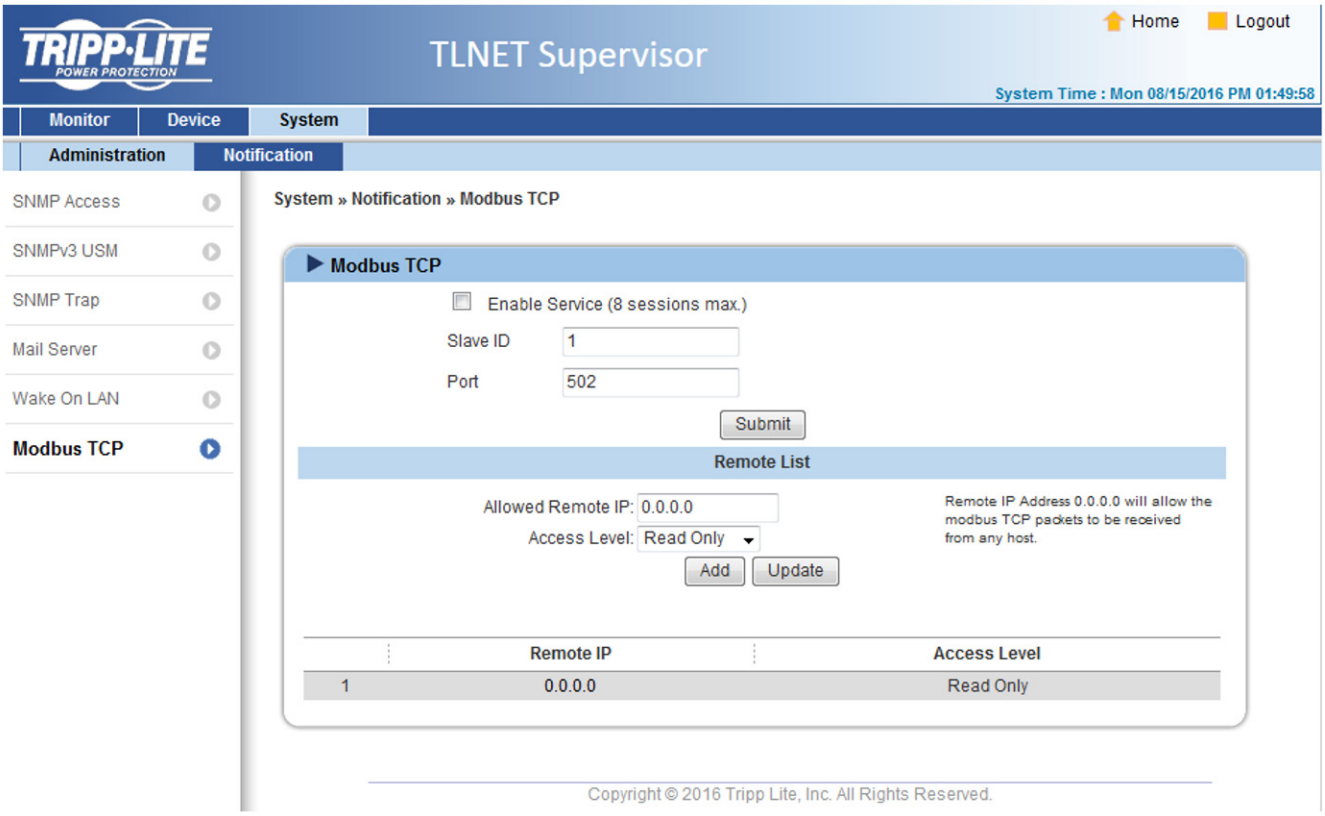


5. Modbus TCP

Beginning with firmware revision 01.12.05c, TLNETCARD supports Modbus TCP.

5.1 Configuration

In the TLNET Supervisor interface, go to **System** → **Notification** tab and select “Modbus TCP” from the menu. Select the “Enable Service” checkbox in order to allow up to 8 clients to access the TLNETCARD; leaving the box unchecked will disable TCP service. Enter the required ID and Port information, then click “Submit”. In the Remote List section, add the IP address and access level for each host, as required.



5. Modbus TCP

5.2 Operation

Discrete Inputs (Range 0x0100 - 0x012F, Read Function 0x02)

The Read Discrete Inputs function code is used to read 1-2000 contiguous statuses of Discrete Inputs in a remote device. The starting address and number of inputs is specified by the request Protocol Data Unit. Addresses start at 0 and Discrete Inputs numbered 1-16 would address as 0-15.

Description	Address (hex - dec)		Value 0	Value 1
Alarm Over Temperature	0x0100	256	OK	Over Temperature
Alarm Input Out Of Range	0x0101	257	OK	Input Bad
Alarm Output Bad (obsolete, reserved)	0x0102	258	OK	Output Bad
Alarm Overload	0x0103	259	OK	Overload
Alarm Bypass Out Of Range	0x0104	260	OK	Bypass Bad
Alarm Output Off	0x0105	261	Output On	Output Off
Alarm UPS Shutdown	0x0106	262	OK	Shutdown
Alarm Charger Fail	0x0107	263	OK	Charger Failed
Alarm Standby	0x0108	264	Others	Standby
Alarm Fan Fail	0x0109	265	OK	Fan Fault
Alarm Fuse Fail	0x010A	266	OK	Fuse Fault
Alarm Other Warning	0x010B	267	OK	General Fault
Alarm Awaiting Power	0x010C	268	OK	Awaiting Power
Alarm Shutdown Pending	0x010D	269	OK	Shutdown Pending
Alarm Shutdown Imminent	0x010E	270	OK	Shutdown Imminent
Buzzer Status	0x010F	271	Silent	Buzzer is Alarming
Economic Mode	0x0110	272	No	Yes
Alarm Inverter Fail	0x0111	273	No	Yes
Emergency Power Off	0x0112	274	Oiff	On
Buzzer State	0x0113	275	Disabled	Enabled
Battery Ground Fault	0x0114	276	Normal	Ground Fault
*Reserved	0x0115	277		
	~	~		
	0x0127	295		
Alarm bypass voltage/freq bad	0x0128	296	OK	Bypass Volt/Freq. Bad
Alarm bypass phase sequence bad	0x0129	297	OK	Bypass Phase Sequence Bad
Alarm bypass STS overload	0x012A	298	OK	Bypass STS Overload
Alarm bypass STS over temperature	0x012B	299	OK	Bypass STS Over Temperature
Alarm bypass STS Fault	0x012C	300	OK	Bypass STS Fault
*Reserved	0x012D	301		
	~	~		
	0x012F	303		

Coils (Range 0x0200 -- 0x020F, Read Function 0x01, Write Function 0x05)

The Read Coils function reads 1-2000 contiguous status of coils in a remote device. The starting address and number of coils is specified by the request Protocol Data Unit. Addresses start at 0 and Coils numbered 1-16 would address as 0-15.

The Write Coils function writes a single output to ON/OFF in a remote device. A specified constant in the data field requests the ON/OFF state. Addresses start at 0 and Coils numbered 1 would address as 0.

Description	Address (hex - dec)		Value 0	Value 1
UPS Buzzer	0x0200	512	Silent	Alarm
*Reserved	0x0201	513		
Economic Mode Setting	0x0202	514	Disable (Back from ECO mode)	Enable(Goto ECO mode)
*Reserved	0x0203	515		
AC Fail & Restore Auto-Reboot	0x0204	516	Disable	Enable(default)
*Reserved	0x0205	517		
Enable/Disable Buzzer	0x0206	518	Disable	Enable(Default)
*Reserved	0x0207	519		
	~	~		
	0x020F	527		

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Holding Register (Range 0x0300 -- 0x0321, Read Function 0x03, Write Function 0x06)

The Read Holding Registers function code is used to read contents of a contiguous block of Holding Registers in a remote device. The starting register address and number of registers is specified by the request Protocol Data Unit. Addresses start at 0 and registers numbered 1-16 would address as 0-15.

The Write Single Register function code is used to write a Single Holding Register in a remote device. The address of the register to be written is specified by the request Protocol Data Unit. Addresses start at 0 and registers numbered 1 would address as 0.

Description	Address (hex - dec)		Value	Unit
UPS Shutdown Delay	0x0300	768	0 – 9999 (0=Abort)	Seconds
UPS Restart Delay	0x0301	769	"0 – 65535 0~65534: Minutes to restart 65535: Cancel restart"	Minutes
Test	0x0302	770	0 = Abort test	for protocols 4001 & 4006
			3 = Test for 10 seconds	
			3 = Test for 10 seconds	for protocols 3003 & 3005
			0 = Abort test	for protocol 3015
			1/2/3 = Quick test	
			4= Deep battery test	
*Reserved	0x0303	771		
Low Transfer Voltage	0x0304	772	0 – 999	Voltage
High Transfer Voltage	0x0305	773	0 – 999	Voltage
Voltage Sensitivity	0x0306	774	0 = Normal	
			1 = Reduced	
			2 = Low	
Last Battery Replace Date -Year	0x0307	775	0 –9999	
Last Battery Replace Date - Month	0x0308	776	1 - 12	
Last Battery Replace Date - Day	0x0309	777	1 - 31	
Next Battery Replace Date - Year	0x030A	778	0 –9999	
Next Battery Replace Date - Month	0x030B	779	1 - 12	
Next Battery Replace Date - Day	0x030C	780	1 - 31	
UPS Periodic Auto-Test	0x030D	781	1 = Disable	
			4 = BiWeekly	
*Reserved	0x030E	782		
UPS Boot Delay	0x030F	783	0 – 999	Seconds
Bypass Frequency Tolerance	0x0310	784	5 to 50	0.1Hz
*Reserved	0x0311	785		
Test Time	0x0312	786	1 – 60	Minutes
Test Voltage	0x0313	787	0 – 999	Voltage
*Reserved	0x0314	788		
	0x0315	789		
External Battery Pack	0x0316	790	0 - 10	
*Reserved	0x0317	791		
	~	~		
	0x031C	796		
Bypass Low Transfer Voltage	0x031D	797	0 - 999 , Read Only	Voltage
Bypass High Transfer Voltage	0x031E	798		Voltage
Bypass Voltage Tolerance	0x031F	799	0 - 999	Voltage
Dry Contact Input Status 1	0x0320	800	High Byte -- B7:	
			0=Normal Open	
			1=Normal Close	
			B5 ... B0:	
			0=None	
			1=Dry Contact_in_1	
			2=Dry Contact_in_5	
			Low Byte -- B7:	
			0=Inactive, 1=Active	
			B6 ... B0:	
			0=None	
			1=Event1, ... 20=Event20	
Dry Contact Input Status 2	0x0321	801		

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Input Register (Range 0x0400 -- 0x051C, Read Function 0x04)

The Read Input Registers function code is used to read 1-125 contiguous input registers in a remote device. The starting register address and number of registers is specified by the request Protocol Data Unit. Addresses start at 0 and registers numbered 1-16 would address as 0-15.

Description	Address (hex - dec)		Value	Unit
Series	0x0400	1024	0 = T	
			1 = H	
			2 = NT	
			3 = NH	
			4 = DPS	
			5 = DPH	
Rating Input Voltage	0x0401	1025	0 to 999	Voltage
Rating Input Frequency	0x0402	1026	0 to 999	0.1 Hz
Rating Output Voltage	0x0403	1027	0 to 999	Voltage
Rating Output Frequency	0x0404	1028	0 to 999	0.1 Hz
Rating VA	0x0405	1029	0 to 65534	10 VA
Rating Output Power	0x0406	1030	0 to 65534	10 Watt
Low Battery Time (not used, reserved)	0x0407	1031	0 to 99	Minute
Mains Input Low Tx Voltage Point	0x0408	1032	0 to 999	Voltage
Mains Input High Tx Voltage Point	0x0409	1033	0 to 999	Voltage
Mains Input Low Tx Voltage Upper Bound	0x040A	1034	0 to 999	Voltage
Mains Input Low Tx Voltage Lower Bound	0x040B	1035	0 to 999	Voltage
Mains Input High Tx Voltage Upper Bound	0x040C	1036	0 to 999	Voltage
Mains Input High Tx Voltage Lower Bound	0x040D	1037	0 to 999	Voltage
UPS Type	0x040E	1038	0: On-Line	
			1: Off-Line	
			2: Line-Interactive	
			3: 3 Phase	
			4: Split Phase	
			5: Others	
			6: HVDC	
Rating Battery Voltage	0x040F	1039	0 to 999	Voltage
Mains Low Tx Freq Point	0x0410	1040	0 to 999	0.1 Hz
Mains High Tx Freq Point	0x0411	1041	0 to 999	0.1 Hz
Bypass Rating Freq	0x0412	1042	0 to 999	0.1 Hz
Bypass Freq Max Tolerance	0x0413	1043	5 to 50	0.1 Hz
Bypass Freq Set Tolerance	0x0414	1044	5 to 50	0.1 Hz
Bypass Low Tx Voltage Point/ Bypass Rating Voltage	0x0415	1045	0 to 999	Voltage
Bypass High Tx Voltage Point	0x0416	1046	0 to 999	Voltage
Bypass Low Tx Voltage Upper Bound/ Bypass Voltage Max Tolerance	0x0417	1047	0 to 999	Voltage
Bypass Low Tx Voltage Lower Bound/ Bypass Voltage Set Tolerance	0x0418	1048	0 to 999	Voltage
Bypass High Tx Voltage Upper Bound	0x0419	1049	0 to 999	Voltage
Bypass High Tx Voltage Lower Bound	0x041A	1050	0 to 999	Voltage
*Reserved	0x041B	1051		
	~			
	0x041D	1053		
Battery Condition	0x041E	1054	0 = Good	
			1 = Weak	
			2 = Replace	
Battery Status	0x041F	1055	0 = OK	
			1 = Low	
			2 = Depleted	
Battery Charge	0x0420	1056	0 = (obsolete)	
			1 = Charging	
			2 = Resting	
			3 = Discharging	
Seconds on Battery	0x0421	1057	0 to 65534	Second
Estimated Minutes Remaining	0x0422	1058	0 to 9999	

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Description	Address (hex - dec)		Value	Unit
Estimated Charge Remaining (not used, reserved)	0x0423	1059	0 to 999	
Battery Voltage	0x0424	1060	0 to 9999	0.1 Voltage
Battery Current	0x0425	1061	0 to 9999	0.1 Amp
UPS Internal Temperature	0x0426	1062	0 to 999	Degrees Celsius
Battery Level	0x0427	1063	0 to 100	%
External Batt-Pack Number	0x0428	1064	0 to 10	
Negative Battery Voltage	0x0429	1065	0 to 9999	-0.1 Voltage
Negative Battery Current	0x042A	1066	0 to 9999	0.1 Amp
*Reserved	0x042B	1067		
Negative Battery Level	0x042C	1068	0 to 999	%
Positive Charging Current	0x042D	1069	0 to 9999	0.1 Amp
Negative Charging Current	0x042E	1070	0 to 9999	0.1 Amp
Battery Charge Mode	0x042F	1071	0 = None	
			1 = Boost charge	
			2 = Float charge	
Input Num Lines(Phases)	0x0430	1072	0 to 9	
Input Frequency1	0x0431	1073	0 to 999	0.1 Hz
Input Voltage1	0x0432	1074	0 to 9999	0.1 Voltage
Input Current1	0x0433	1075	0 to 9999	0.1 Amp
Input Power1	0x0434	1076	0 to 65534	10 Watt
Input Frequency2	0x0435	1077	0 to 999	0.1 Hz
Input Voltage2	0x0436	1078	0 to 9999	0.1 Voltage
Input Current2	0x0437	1079	0 to 9999	0.1 Amp
Input Power2	0x0438	1080	0 to 65534	10 Watt
Input Frequency3	0x0439	1081	0 to 999	0.1 Hz
Input Voltage3	0x043A	1082	0 to 9999	0.1 Voltage
Input Current3	0x043B	1083	0 to 9999	0.1 Amp
Input Power3	0x043C	1084	0 to 65534	10 Watt
Input Voltage12	0x043D	1085	0 to 9999	0.1 Voltage
Input Voltage23	0x043E	1086	0 to 9999	0.1 Voltage
Input Voltage31	0x043F	1087	0 to 9999	0.1 Voltage
*Reserved	0x0440	1088	Value = 0xFFFF	
Total Output Power Factor	0x0441	1089	0 to 999	KW/KVA %
Output Source	0x0442	1090	0 = Normal	
			1 = Battery	
			2 = Bypass (3phase Reserve Power Path)	
			3 = Reducing	
			4 = Boosting	
			5 = Manual Bypass\	
			6 = Other	
			7 = No output	
Output Frequency	0x0443	1091	0 to 999	0.1 Hz
Output Num Lines(Phase)	0x0444	1092	0 to 9 (Number of output lines)	
Output Voltage1	0x0445	1093	0 to 9999	0.1 Voltage
Output Current1	0x0446	1094	0 to 65534	0.1 Amp
Output Power1	0x0447	1095	0 to 65534	10 Watt
Output Load1	0x0448	1096	0 to 999	Percent
Output Voltage2	0x0449	1097	0 to 9999	0.1 Voltage
Output Current2	0x044A	1098	0 to 65534	0.1 Amp
Output Power2	0x044B	1099	0 to 65534	10 Watt
Output Load2	0x044C	1100	0 to 999	Percent
Output Voltage3	0x044D	1101	0 to 9999	0.1 Voltage
Output Current3	0x044E	1102	0 to 65534	0.1 Amp
Output Power3	0x044F	1103	0 to 65534	10 Watt
Output Load3	0x0450	1104	0 to 999	Percent
Output Voltage12	0x0451	1105	0 to 9999	0.1 Voltage
Output Voltage23	0x0452	1106	0 to 9999	0.1 Voltage
Output Voltage31	0x0453	1107	0 to 9999	0.1 Voltage

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Description	Address (hex - dec)		Value	Unit
Total Output Power KW	0x0454	1108	0 to 65534	0.1 KW
Total Output Power KVA	0x0455	1109	0 to 65534	0.1 KVA
Bypass Frequency	0x0456	1110	0 to 999	0.1 Hz
Bypass Num Lines(Phase)	0x0457	1111	0 to 9 (Number of bypass lines)	
Bypass Voltage1	0x0458	1112	0 to 9999	0.1 Voltage
Bypass Current1	0x0459	1113	0 to 65534	0.1 Amp
Bypass Power1	0x045A	1114	0 to 65534	10 Watt
Bypass Voltage2	0x045B	1115	0 to 9999	0.1 Voltage
Bypass Current2	0x045C	1116	0 to 65534	0.1 Amp
Bypass Power2	0x045D	1117	0 to 65534	10 Watt
Bypass Voltage3	0x045E	1118	0 to 9999	0.1 Voltage
Bypass Current3	0x045F	1119	0 to 65534	0.1 Amp
Bypass Power3	0x0460	1120	0 to 65534	10 Watt
Bypass Voltage12	0x0461	1121	0 to 9999	0.1 Voltage
Bypass Voltage23	0x0462	1122	0 to 9999	0.1 Voltage
Bypass Voltage31	0x0463	1123	0 to 9999	0.1 Voltage
Bypass STS Temperature	0x0464	1124	0 to 999	Degrees Celsius
*Reserved	0x0465	1125		
*Reserved	0x0466	1126		
Test Result	0x0467	1127	0 = No test performed	
			1 = Test passed	
			2 = Test in progress	
			3 = General test failed (Obsolete)	
			4 = Battery test failed	
			5 = Deep battery test failed (Obsolete)	
			6 = Test Aborted	
Number of Output Relay	0x0468	1128	0 : Not Available	
			> 0 : Available(<=99)	
Temperature	0x0469	1129	0 – 999, 0xFFFF: NO Connect	0.1 Degrees Celsius
Humidify	0x046A	1130	0 – 999, 0xFFFF: NO Connect	%
Relay 1	0x046B	1131	0 : Off, 1 : On, 0xFFFF: NO Connect	
Relay 2	0x046C	1132	0 : Off, 1 : On, 0xFFFF: NO Connect	
Relay 3	0x046D	1133	0 : Off, 1 : On, 0xFFFF: NO Connect	
Relay 4	0x046E	1134	0 : Off, 1 : On, 0xFFFF: NO Connect	
*Reserved	0x046F	1135		
	~	~		
	0x0482	1154		
UPS Event Log Entry	0x0483	1155	0 to 500	
Event log report format	0x0484	1156	0: NT 9 byte format	
			1: NH 8 byte format	
			2: Oline 6 byte format	
Event Reporting method	0x0485	1157	0: ELS	
			1: EVT	
Power Module ID/Attribute	0x0486	1158	Lo: ID(1-6) Hi: Attribute	
			B0: PFC	
			B1: Rectifier	
			B2: Charger	
			B3: Inverter	
			B4: Bypass	
			B5, B6, B7: TBD	
Power Module ID/Attribute	0x0487	1159		
Power Module ID/Attribute	0x0488	1160		
Power Module ID/Attribute	0x0489	1161		
Power Module ID/Attribute	0x048A	1162		
Power Module ID/Attribute	0x048B	1163		

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Description	Address (hex - dec)		Value	Unit
Power Module ID/ General Status	0x048C	1164	Lo: ID(1-6), Hi: Status	
			B0: The power module exists or the power module is powered	
			B1: OFF	
			B2: Repair (NH+: The front screw is open)	
			B3: Fault shutdown	
Power Module ID/ General Status	0x048D	1165		
Power Module ID/ General Status	0x048E	1166		
Power Module ID/ General Status	0x048F	1167		
Power Module ID/ General Status	0x0490	1168		
Power Module ID/ General Status	0x0491	1169		
Power Module ID	0x0492	1170	Power Module ID: 1 ~ 6 PFC Status:	
			B0: PFC fuse open fault	
			B1: PFC over temperature warning	
			B2: PFC over temperature shutdown	
			B3: DC bus over voltage warning	
			B4: DC bus over voltage shutdown	
			B5: DC bus under voltage warning	
			B6: DC bus under voltage shutdown	
			B7: PFC circuit general fault	
			B8: Fan failure	
			B9: Output Current Limit	
			B10: PFC Off	
			B11: Inner communication failure	
			B12: Not calibrated	
			B13: Battery fuse open warning	
PFC Status	0x0493	1171		
Power Module ID	0x0494	1172		
PFC Status	0x0495	1173		
Power Module ID	0x0496	1174		
PFC Status	0x0497	1175		
Power Module ID	0x0498	1176		
PFC Status	0x0499	1177		
Power Module ID	0x049A	1178		
PFC Status	0x049B	1179		
Power Module ID	0x049C	1180		
PFC Status	0x049D	1181		
Power Module ID	0x049E	1182	Power Module ID: 1 ~ 6 Inverter Status:	
			B0: Inverter fuse open	
			B1: Inverter over temperature warning	
			B2: Inverter over temperature shutdown	
			B3: Fan failure	
			B4: Inverter short circuit	
			B5: Inverter STS failure	
			B6: Inverter voltage abnormal	
			B7: Inverter circuit general fault shutdown	
			B8: DC bus over voltage shutdown	
			B9: Inverter overload	
			B10: Inner communication loss	
			B11: EPO shutdown	
			B12: Inverter parallel communication loss	
			B13: Inverter parallel failure	
			B14: STS on/off. 1:on,0:off.	
			B15: Not calibrated	
Inverter Status	0x049F	1183		
Power Module ID	0x04A0	1184		
Inverter Status	0x04A1	1185		
Power Module ID	0x04A2	1186		

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Description	Address (hex - dec)		Value	Unit
Inverter Status	0x04A3	1187		
Power Module ID	0x04A4	1188		
Inverter Status	0x04A5	1189		
Power Module ID	0x04A6	1190		
Inverter Status	0x04A7	1191		
Power Module ID	0x04A8	1192		
Inverter Status	0x04A9	1193		
Power Module ID/ Charger Status	0x04AA	1194	Power Module ID: 1 ~ 6 Charger Status:	
			B0: Charger circuit general fault	
			B1-B7: Reserved	
Power Module ID/ Charger Status	0x04AB	1195		
Power Module ID/ Charger Status	0x04AC	1196		
Power Module ID/ Charger Status	0x04AD	1197		
Power Module ID/ Charger Status	0x04AE	1198		
Power Module ID/ Charger Status	0x04AF	1199		
Power Module ID	0x04B0	1200	Power Module ID: 1 ~ 6 Temperature: 0 - 9999	Temperature: Degree Celsius
Temperature - PFC	0x04B1	1201		
Temperature - TBD	0x04B2	1202		
Temperature – Inverter	0x04B3	1203		
Temperature – Inverter R	0x04B4	1204		
Temperature – Inverter S	0x04B5	1205		
Temperature – Inverter T	0x04B6	1206		
Power Module ID	0x04B7	1207		
Temperature - PFC	0x04B8	1208		
Temperature - TBD	0x04B9	1209		
Temperature – Inverter	0x04BA	1210		
Temperature – Inverter R	0x04BB	1211		
Temperature – Inverter S	0x04BC	1212		
Temperature – Inverter T	0x04BD	1213		
Power Module ID	0x04BE	1214		
Temperature - PFC	0x04BF	1215		
Temperature - TBD	0x04C0	1216		
Temperature – Inverter	0x04C1	1217		
Temperature – Inverter R	0x04C2	1218		
Temperature – Inverter S	0x04C3	1219		
Temperature – Inverter T	0x04C4	1220		
Power Module ID	0x04C5	1221		
Temperature - PFC	0x04C6	1222		
Temperature - TBD	0x04C7	1223		
Temperature – Inverter	0x04C8	1224		
Temperature – Inverter R	0x04C9	1225		
Temperature – Inverter S	0x04CA	1226		
Temperature – Inverter T	0x04CB	1227		
Power Module ID	0x04CC	1228		
Temperature - PFC	0x04CD	1229		
Temperature - TBD	0x04CE	1230		
Temperature – Inverter	0x04CF	1231		
Temperature – Inverter R	0x04D0	1232		
Temperature – Inverter S	0x04D1	1233		
Temperature – Inverter T	0x04D2	1234		
Power Module ID	0x04D3	1235		
Temperature - PFC	0x04D4	1236		
Temperature - TBD	0x04D5	1237		
Temperature – Inverter	0x04D6	1238		
Temperature – Inverter R	0x04D7	1239		
Temperature – Inverter S	0x04D8	1240		
Temperature – Inverter T	0x04D9	1241		

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Description	Address (hex - dec)		Value	Unit
Power Module ID	0x04DA	1242	Power Module ID: 1 ~ 6 Voltage: 0 - 9999	Voltage: 0.1Voltage
Inverter Voltage R	0x04DB	1243		
Inverter Voltage S	0x04DC	1244		
Inverter Voltage T	0x04DD	1245		
Power Module ID	0x04DE	1246		
Inverter Voltage R	0x04DF	1247		
Inverter Voltage S	0x04E0	1248		
Inverter Voltage T	0x04E1	1249		
Power Module ID	0x04E2	1250		
Inverter Voltage R	0x04E3	1251		
Inverter Voltage S	0x04E4	1252		
Inverter Voltage T	0x04E5	1253		
Power Module ID	0x04E6	1254		
Inverter Voltage R	0x04E7	1255		
Inverter Voltage S	0x04E8	1256		
Inverter Voltage T	0x04E9	1257		
Power Module ID	0x04EA	1258		
Inverter Voltage R	0x04EB	1259		
Inverter Voltage S	0x04EC	1260		
Inverter Voltage T	0x04ED	1261		
Power Module ID	0x04EE	1262		
Inverter Voltage R	0x04EF	1263		
Inverter Voltage S	0x04F0	1264		
Inverter Voltage T	0x04F1	1265		
Battery Cabinet #1 Temperature	0x04F2	1266	0 – 999	Degrees Celsius
Battery Cabinet #2 Temperature	0x04F3	1267	0 – 999	Degrees Celsius
Battery Cabinet #3 Temperature	0x04F4	1268	0 – 999	Degrees Celsius
Battery Cabinet #4 Temperature	0x04F5	1269	0 – 999	Degrees Celsius
Battery cabinet breaker	0x04F6	1270	1: close, 0:open	
*Reserved	0x04F7	1271		
	~	~		
	0x0502	1282		
Model Byte 0, 1	0x0503	1283	Lo: Byte0, Hi: Byte 1	
Model Byte 2, 3	0x0504	1284	Lo: Byte2, Hi: Byte 3	
Model Byte 4, 5	0x0505	1285	Lo: Byte4, Hi: Byte 5	
Model Byte 6, 7	0x0506	1286	Lo: Byte6, Hi: Byte 7	
Model Byte 8, 9	0x0507	1287	Lo: Byte8, Hi: Byte 9	
Model Byte 10, 11	0x0508	1288	Lo: Byte10, Hi: Byte 11	
Model Byte 12, 13	0x0509	1289	Lo: Byte12, Hi: Byte 13	
Model Byte 14, 15	0x050A	1290	Lo: Byte14, Hi: Byte 15	
*Reserved	0x050B	1291		
*Reserved	~	~		
*Reserved	0x050D	1293		
Firmware Version Byte 0, 1	0x050E	1294	Lo: Byte0, Hi: Byte 1	
Firmware Version Byte 2, 3	0x050F	1295	Lo: Byte2, Hi: Byte 3	
Firmware Version Byte 4, 5	0x0510	1296	Lo: Byte4, Hi: Byte 5	
Firmware Version Byte 6, 7	0x0511	1297	Lo: Byte6, Hi: Byte 7	
Firmware Version Byte 8, 9	0x0512	1298	Lo: Byte8, Hi: Byte 9	
Firmware Version Byte 10, 11	0x0513	1299	Lo: Byte10, Hi: Byte 11	
Firmware Version Byte 12, 13	0x0514	1300	Lo: Byte12, Hi: Byte 13	
Firmware Version Byte 14, 15	0x0515	1301	Lo: Byte14, Hi: Byte 15	
*Reserved	0x0516	1302		
*Reserved	~	~		
*Reserved	0x0518	1304		
CPU Byte 0, 1	0x0519	1305	Lo: Byte0, Hi: Byte 1	
CPU Byte 2, 3	0x051A	1306	Lo: Byte2, Hi: Byte 3	
*Reserved	0x051B	1307		
UPS Connection Status	0x051C	1308	0:Disconnection 1:Connection	

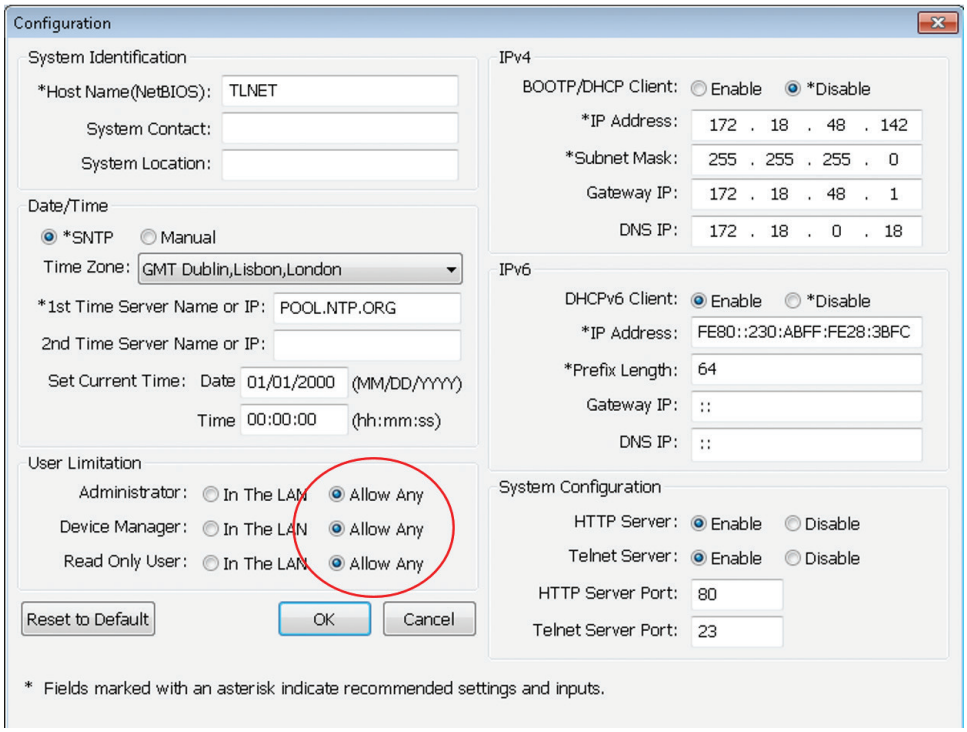
6. Troubleshooting

1. How do I confirm the link between the TLNETCARD and the UPS is established?

If the link between the TLNETCARD and the UPS is correctly established, the yellow LED on the TLNETCARD Network port should flash rapidly.

2. I can access the TLNET Supervisor, but I cannot login.

Check the IP addresses of the TLNETCARD and the workstation on which you are trying to log in. By default, they must be within the same LAN. To enable external connections, launch the TLNET Configurator and for that device's configuration, change User Limitation to *Allow Any*, as shown below.



3. I am unable to connect to the TLNETCARD via its Host Name

If you just assigned a new static IP address to the TLNETCARD, you may need to refresh the NetBIOS table so that it corresponds with the new setting. Although Windows updates its NetBIOS table periodically, you can manually force it to refresh by entering ***nbtstat –R*** in DOS prompt mode. After that, you should be able to connect to the TLNETCARD its Host Name. Ensure that the Host Name assigned to the TLNETCARD does not exceed 16 bytes.

4. I am unable to ping the TLNETCARD from my workstation

If the SNMP IPv6 is non-responsive, check the following:

a) If the green LED on the TLNETCARD's Network port is off, check that the network cable is correctly connected from the TLNETCARD to the network equipment.

b) If the green LED is on, the current IP address may be unreachable. Manually assign a valid IP address to the TLNETCARD.

c) If the green LED flashes and your network configuration includes a DHCP server, verify that the DHCP service is working properly. Otherwise, verify that the IP address is not already assigned to another device on the network. Note that if the current configuration is not useable, the TLNETCARD will reset to default IP settings (IPv4 address: 192.168.1.100/ net mask: 255.255.255.0/ gateway: 192.168.1.254).

d) If the problem persists, use a network cable to cross link the TLNETCARD and the workstation. Ping the TLNETCARD's default or assigned static IP address. If the ping is successful, indicating that the TLNETCARD is working properly, check your network equipment. If not, contact your local dealer or service personnel for assistance.

5. I am unable to perform an SNMP Get or Set command

Refer to **3.3.2 Notification** to check SNMP settings. Verify that the workstation's IP address is added to the NMS IP list with Read or Read/ Write (for Set) access. The community string on the workstation and the SNMP IPv6 must match.

6. I am unable to receive an SNMP trap

Refer to **3.3.2 Notification** to check SNMP Trap settings. Verify that the workstation's IP address is added to the Target IP list.

6. Troubleshooting

7. I forgot the Administrator's account and password

The Administrator's account and password can be reset via text mode. Refer to **2.1.5 Configuring through COM Port** to establish a COM port connection with the TLNETCARD. When the login information is prompted, key in ***rstadmin***—for both login and password—within 30 seconds, then press enter. The Administrator account and password are now reset to the default (admin/password).

8. How do I generate a private SSL certificate file (in PEM format) for HTTPs connection?

To ensure a secure connection between the TLNETCARD and your workstation, you can create your own SSL certificate file. Download and install the OpenSSL Toolkit from http://www.openssl.org. Launch Shell or DOS prompt mode and enter the following command to create your own certificate file:

openssl req –x509 –nodes –days 3650 –newkey
rsa:1024 –keyout cert.pem –out cert.pem

a) Answer the prompted questions. Proceed with the given directions. Once completed, a file named cert.pem is created in the current working directory.

b) Upload cert.pem to the TLNET Supervisor. Please refer to **3.3.1 Administration**, Web.

9. How do I generate DSA, RSA and Public keys for SSH?

For Linux:

a) Download and install OpenSSH from http://www.openssh.org.

b) Launch Shell and enter the following commands to create your own keys (ignore the prompt to provide a passphrase):

DSA Key:ssh-keygen –t dsa
RSA Key:ssh-keygen –t rsa

c) Upload DSA and RSA keys to the InsightPower SNMP IPv6 for UPS Web. Please refer to 5-3-1 Administration – Console for more information.

For Windows:

a) Download and install PuTTY from http://www.putty.org.

b) Run puttygen.exe from the installed directory.

c) Select SSH-2 RSA from the Parameters area and click Key → Generate key pair to generate a RSA key.

d) Click Conversions → Export OpenSSH Key and assign a filename to the RSA key. Ignore the prompt to provide key passphrase.

e) Select SSH-2 DSA from the Parameters, clickt Key → Generate key pair to generate a DSA key.

f) Click Conversions → Export OpenSSH Key and assign a filename to the DSA key. Ignore the prompt to provide key passphrase.

g) Copy the generated key from the text box, paste in a text editor and save as a text file.

h) Upload the DSA/ RSA/ Public keys files to the TLNET Supervisor. Refer to **3.3.1 Administration**, Console for more information.

10. How do I upload a configuration / firmware / key files via SSH/ SFTP?

For quick configuration of the TLNETCARD, the files can be uploaded via SSH/ SFTP. The TLNETCARD automatically imports your settings after the files are uploaded to the designated directories. Refer to the following table:

Directory	Files
\config_snmp	snmp.ini
\config_system	configure.ini
\ssh_dsa	DSA key
\ssh_rsa	RSA key
\ssh_pubkey	Public key
\upgrade_snmp	SNMP IPv6's firmware upgrade package (binary)
\upgrade_device*	Device's firmware upgrade package (binary)

*Appears on specific devices only.

Upload files to their respective directories. Make sure the filenames do not contain non-English characters to avoid read error. Overwrite existing files if prompted by your SFTP client.

APPENDIX A – Default System Settings

After performing a "Reset System To Defaults" in text mode. The System Configuration file will contain the following (default) contents:

```
[Format]
SNMP device
Version=20
Restart=No
[System]
Name=TLNET
Contact=
Location=
IdentName=
AttachDevice=
IP=192.168.1.100
Mask=255.255.255.0
Gateway=192.168.1.254
DNS IP=
Domain=
Bootp=Enable
HTTP=Enable
HTTPS=Enable
Telnet=Enable
SSH=Enable
FTP=Disable
HTTP Port=80
HTTPS Port=443
Telnet Port=23
SSH Port=22
FTP Port=21
SNMP Port=161
Trap Port=162
Status Stable=1
Hist Data Interval=600
SysLog=Disable
SysLog Server=
SysLog Server2=
SysLog Server3=
SysLog Server4=
Web Refresh=10
Telnet Idle=120
Auto Negotiation=Enable
Speed=100
Duplex=Full
V6 DHCP=Enable
V6 IP=::/0
V6 Gateway=::
V6 DNS=::
Language=0
[User]
Enable RADIUS=No
Enable Local=Yes
RADIUS Server=
RADIUS Secret=
RADIUS Port=1812
Admin Account=admin
Admin Password=password
Admin Limit=0
Device Account=device
Device Password=password
Device Limit=0
User Account=user
User Password=password
User Limit=1
RADIUS Admin User Type=32
RADIUS Device User Type=2
RADIUS User User Type=1
Password Encrypt=No
[Time]
SNTP=Yes
Zone=+0
Server1=POOL.NTP.ORG
Server2=
Manual Date=01/01/2000
Manual Time=00:00:00
Use PC Time=No
Daylight Saving=No
Start Date=04/01
End Date=11/01
[Mail]
Server=
SMTP Port=25
Sender=
Password=
Receive Num=0
[UPS Configure]
Power Fail Shutdown=No
Power Fail Shutdown Delay=0
Batt Low Shutdown=No
Batt Low Shutdown Delay=0
Overload Shutdown=No
Overload Shutdown Delay=0
Smart Shutdown Estimated OS
Delay=300
Smart Shutdown UPS Delay=60
Smart Shutdown Apply to
Schedule=No
Enable Load Warning=No
Load Warning=90
Enable Load Severity=No
Load Severity=100
Batt Low Warning=No
Batt Low Level=30
Enable Batt Notification=No
Batt Notification Day=0
[Wake On LAN]
WOL Num=0
[Weekly Schedule]
Number=6
Weekday1=0000000
Time1=00:00
Action1=0
Weekday2=0000000
Time2=00:00
Action2=0
Weekday3=0000000
Time3=00:00
Action3=0
Weekday4=0000000
Time4=00:00
Action4=0
Weekday5=0000000
Time5=00:00
Action5=0
Weekday6=0000000
Time6=00:00
Action6=0
[Specific Schedule]
Number=10
Date1=01/01/2000
Time1=00:00
Action1=0
Date2=01/01/2000
Time2=00:00
Action2=0
Date3=01/01/2000
Time3=00:00
Action3=0
Date4=01/01/2000
Time4=00:00
Action4=0
Date5=01/01/2000
Time5=00:00
Action5=0
Date6=01/01/2000
Time6=00:00
Action6=0
Date7=01/01/2000
Time7=00:00
Action7=0
Date8=01/01/2000
Time8=00:00
Action8=0
Date9=01/01/2000
Time9=00:00
Action9=0
Date10=01/01/2000
Time10=00:00
Action10=0
[Environment]
Title Input1=Smoke
Title Input2=Fire
Title Input3=Leak
Title Input4=Door
Temperature Low Limit=60
Temperature High Limit=105
Humidity Low Limit=20
Humidity High Limit=80
Normal Open Input1=Yes
Normal Open Input2=Yes
Normal Open Input3=Yes
Normal Open Input4=Yes
Smart Shutdown Temperature=No
Smart Shutdown Humidity=No
Smart Shutdown Input1=No
Smart Shutdown Input2=No
Smart Shutdown Input3=No
Smart Shutdown Input4=No
[End]
```

APPENDIX B – Default SNMP Settings

After performing a "Reset All To Defaults" in text mode, the SNMP Configuration file will contain the following (default) contents:

```
Version=4
[SNMP Trap]
Number=0
[SNMP Access]
Port=161
Number=1
IP1=0.0.0.0/32
Community1=public
Permission1=1
[SNMP USM]
Context Name=cn1027
User1=
Security1=0
Auth1=
Priv1=
Permission1=1
User2=
Security2=0
Auth2=
Priv2=
Permission2=1
User3=
Security3=0
Auth3=
Priv3=
Permission3=1
User4=
Security4=0
Auth4=
Priv4=
Permission4=1
User5=
Security5=0
Auth5=
Priv5=
Permission5=1
User6=
Security6=0
Auth6=
Priv6=
Permission6=1
User7=
Security7=0
Auth7=
Priv7=
Permission7=1
User8=
Security8=0
Auth8=
Priv8=
Permission8=1
[End]
```

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