NetLink Connect NLC

Network Connectivity Module

Installation and Operation Manual

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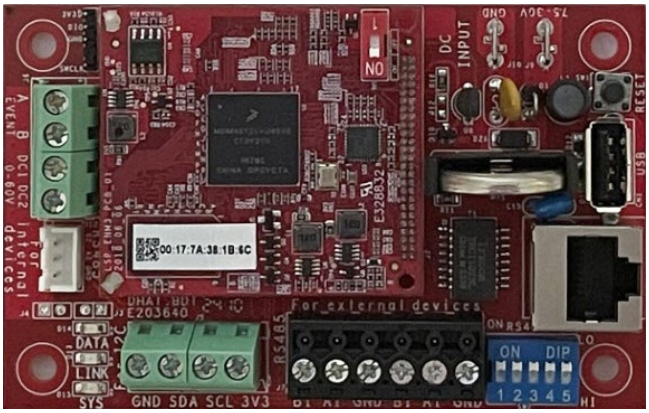

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P03-108 Rev A03

LSP Cybersecurity Guidelines

Protect data by implementing best practices

- Create custom password / User ID on setup
- Configure for secure web-based mgmt
- Use TLS (”https”) whenever possible
- Set SSL option to high whenever possible
- Use SNMP v3 with secured credentials
- Use IPV6 whenever possible

Table of Contents

Notes and Warnings iv
Symbol Definitions iv
Warnings iv
Regulatory Information iv
Conventions Used Within this Manual iv
Introduction v
Section 1 – Installation 1
1.1 Mounting the Network Module 1
1.2 NLC Module Overview 2
1.3 Connecting the NLC Network Module 4
Section 2 – Initial Configuration 7
2.1 Preparing to configure the Network Module 7
2.2 Configuring the Network Module 8
Section 3 – Using the NLC Module 16
3.1 The NLC Home Page 16
3.2 Connected Internal Devices 19
3.3 Using the Tools Page 23
3.4 Understanding The Email Report 25
Appendix 1 – Software Agreement 26

⚠ ***This manual covers Firmware Revision 1.3.29***

Older firmware revisions may not have all features described. See the latest firmware release notes at LifeSafetyPower.com/en/support/downloads

⚠ ***Resetting the NetLink***

If the user name or password is unknown for a NetLink board, press and hold the reset button located next to the backup battery for 10 seconds to return these values to default. Pressing the reset button for 30 seconds will also reset the IP address, certificate, and Cipher Suite to default. See section 2.2.1.1 for more information.

⚠ ***Upgrading NetLink Firmware***

The browser history / cache should be cleared after performing the firmware upgrade and before accessing the NetLink again to prevent any cached pages from giving outdated information. See Section 3.3 for detailed steps for firmware upgrades.

Notes and Warnings

Symbol Definitions

The following symbols are used throughout this manual

This symbol is intended to alert the installer of shock hazards within the enclosure. Service should only be performed by qualified service personnel

This symbol is intended to alert the installer to important information or information intended to help the installer avoid personal injury or property damage

Warnings

Installation and service should be performed only by qualified service personnel and should conform to all local codes

L'installation et l'entretien doivent être effectués uniquement par du personnel qualifié et doivent être conformes à tous les codes locaux

To reduce the risk of electric shock or fire, do not expose this equipment to rain or moisture

Pour réduire le risque de choc électrique ou d'incendie, n'exposez pas cet équipement à la pluie ou à l'humidité

This equipment shall be installed in a manner which prevents unintentional operation by employees, cleaning personnel, or others working in the premises, by falling objects, customers, building vibration, or similar causes

Cet équipement doit être installé de manière à empêcher tout fonctionnement involontaire par les employés, le personnel de nettoyage ou d'autres personnes travaillant dans les locaux, par la chute d'objets, de clients, de vibrations du bâtiment ou de causes similaires.

This equipment is not intended for use within the patient care areas of a Health Care Facility

Cet équipement n'est pas destiné à être utilisé dans les zones de soins aux patients d'un établissement de santé

Replace fuses only with the same type and rating as indicated in the specifications section of this manual.

Remplacez les fusibles uniquement par le même type et le même calibre que ceux indiqués dans la section des spécifications de ce manuel.

To prevent impaired operation, ensure that all wiring is routed and secured to prevent accidental open or short circuit conditions

Pour éviter un fonctionnement altéré, assurez-vous que tout le câblage est acheminé et sécurisé pour éviter les conditions accidentelles d'ouverture ou de court-circuit

The system and any batteries (if used) should be tested at least once per year to ensure proper operation

Le système et toutes les batteries (le cas échéant) doivent être testés au moins une fois par an pour assurer un fonctionnement correct

Regulatory Information

The following equipment discussed within this manual has been tested to the following standards:

- UL294, UL2610
- ULC S318
- CAN/ULC 60839-11-1

Conventions Used Within this Manual

Positional information (e.g. top, bottom, up, down, left, right, etc.) is referenced with the board or enclosure in the orientation shown in the illustrations in this manual.

Introduction

Product Description

The LifeSafety Power NetLink® Connect NLC module is an accessory module which may be used with LifeSafety Power (LSP) power systems to provide remote monitoring and control of the power system and connected devices. It features an embedded interface which can be accessed through the local or wide area network. Automated system status alerts may be sent via email, SNMP, XML, or through direct integration with an access control panel's dashboard.

The NLC allows the user to monitor power system status while providing values such as output voltage, fault status, battery voltage, battery charging current, and temperature. Additionaly, automated battery testing may be run manually, or scheduled to happen at defined intervals, eliminating the need for a technician to be on-site. When used with an M8, SD4, or SD16 managed output board, voltage and current for each individual output is provided, and each output may be individually power cycled.

The NLC monitors for and reports fault conditions, service due date approaching, battery condition, or on a time basis for status updates on regular intervals. A time and date stamped log of the past 1000 events is kept and may be viewed on demand, or immediately on an alert occurrence. When all parameters are in range, the log is updated once per selected interval with a snapshot of current values.

The NLC module provides a voltmeter input for monitoring a low voltage DC source, and an event input for monitoring dry contacts such as the enclosure tamper switch. Internal temperature is also sensed, and an I2C sensor input allows temperature and humidity monitoring of the space where the NLC is installed to alert of HVAC issues.

The NLC communicates to other managed accessory boards via a secure OSDP connection. Remote devices may be monitored via an OSDP connection to an NXB expansion board (see the NXB manual for more information).

Specifications

Power Input	Voltage	7.5–30VDC
	Current	60mA Nominal
ADC Input	Voltage	0–30VDC
	Resolution	10 Bits
	Accuracy	± 3% (from 10-30V)
Event1 Input	Voltage	8–30VDC
	Current	15mA Max.

Use typical wiring material type: UL/CSA recognized insulated wire, Insulation rating 300V or higher, 105C or higher, such as UL AWM Style 1581

Class 2 power limited wiring must be seperated from non-power limited wiring by a minimum of 1/4 inch and must use seperate knockouts

The installation and all wiring methods shall be in accordance with ANSI/NFPA70 and all local codes.

For ULC compliance, installation and all wiring methods shall be in accordance with the Canadian Electrical Code, C22.1, Part I, Section 32.

All input/output wiring to the module shall be located within the same room (3 m. max.).

The remote control features have not been investigated by UL.

The module shall be installed in UL Listed LifeSafety Power enclosures only.

Wiring to Event inputs shall be limited to 10m.

Le câblage à puissance limitée de classe 2 doit être séparé du câblage sans limitation de puissance d'au moins 1/4 de pouce et doit utiliser des débouchures séparées

L'installation et toutes les méthodes de câblage doivent être conformes à la norme ANSI / NFPA70 et à tous les codes locaux.

Pour la conformité ULC, l'installation et toutes les méthodes de câblage doivent être conformes au Code canadien de l'électricité, C22.1, partie I, section 32.

Tous les câbles d'entrée / sortie du module doivent être situés dans la même pièce (3 m. Max.).

Les fonctionnalités de la télécommande n'ont pas été étudiées par UL.

Section 1 – Installation

The following pages cover the installation of the NetLink Connect NLC Module.

1.1 Mounting the NLC Module

Use the following procedure when mounting the NetLink module to a LifeSafety Power enclosure.

1. Locate the appropriate mounting holes in the enclosure and snap the four standoffs provided into the holes.
2. Align the board mounting holes (mounting hole locations are indicated in the drawing below) with the standoffs and snap the board onto the standoffs. Be sure the board is properly oriented before snapping the board onto the standoffs.

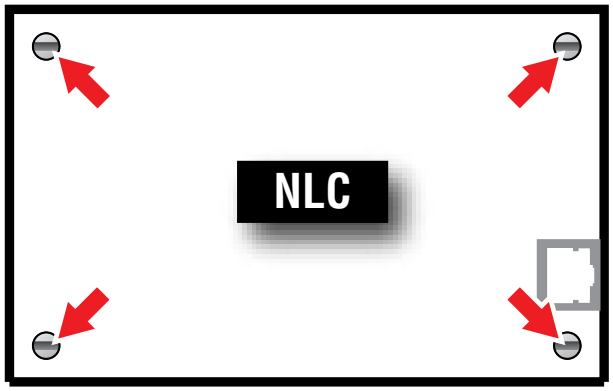


Figure 1.1

1.2 NLC Module Overview

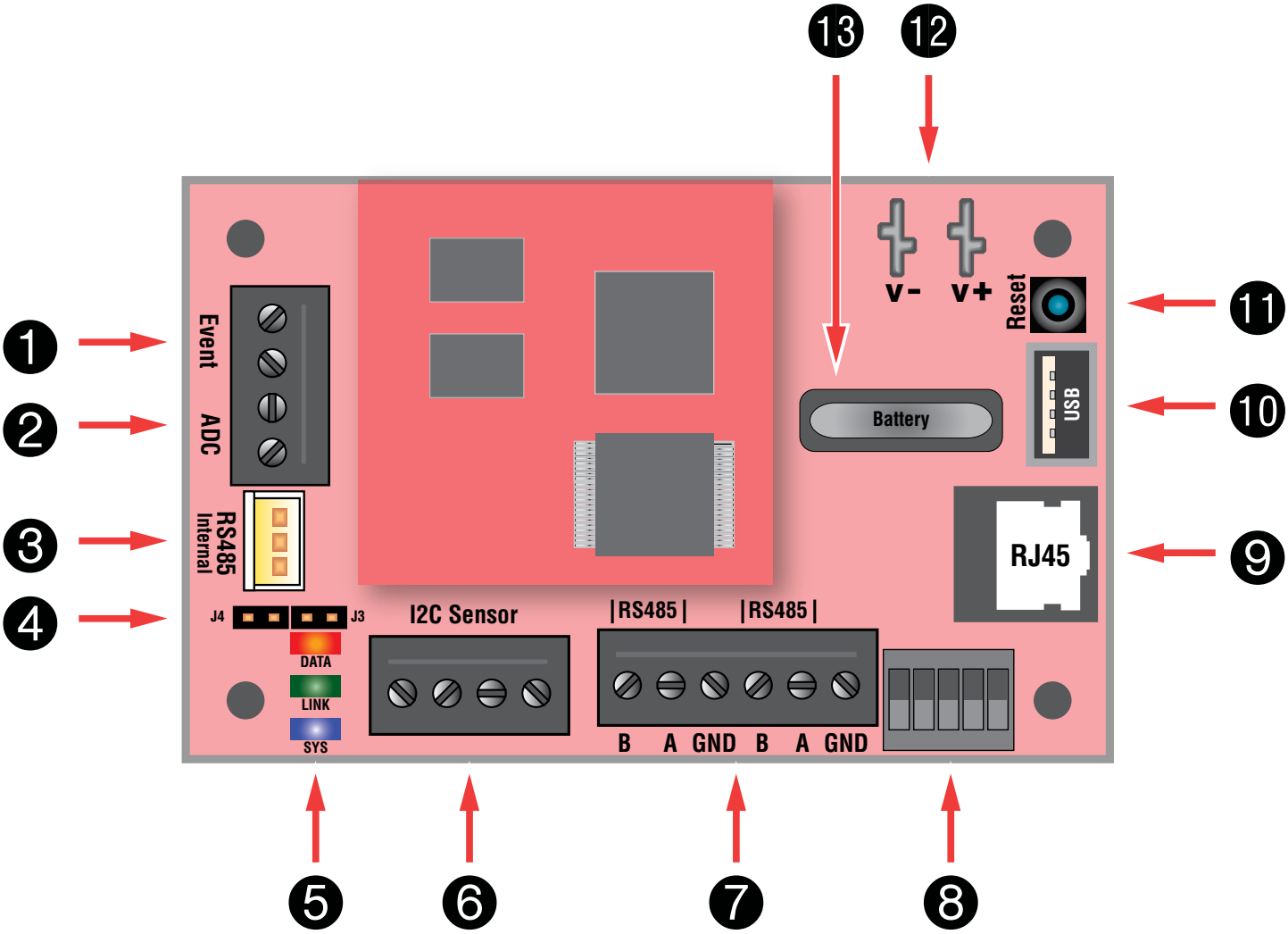


Figure 1.2 - NLC Board Layout

The following are basic NLC board descriptions. Refer to the appropriate section for more detailed information.

1 *Event Input*

These terminals are for the Event1 input. This input will accept 9-30VDC to initiate an event alert. This input will only indicate an active or inactive condition and will not measure the voltage level. See section 1.3.5

2 *ADC Input*

This is the Analog to Digital Converter (ADC) input, which acts as a voltmeter. It accepts 0-30V and is used to measure positive or negative system voltages which are common grounded with the NetLink module. The ADC cable wiring must be routed away from high voltages. See section 1.3.7

3 *RS485 Internal Connection*

This connector allows for quick connection of accessory modules within the same enclosure as the NLC. For RS485 connections external to the enclosure, see #7.

4 *Jumpers J3 & J4*

These jumpers have no user function and should be left open at all times.

5 *Status LED Indicators*

These LEDs indicate the status of the Ethernet link to the NetLink board.

LED Indicator:

Green (LINK) Lights when NetLink is connected to a network

Red (DATA) Flashes during data transfer

Blue (SYS) Lights when the NetLink is fully booted up and running. During the bootup process, this LED may flash on and off several times. The NetLink will not be able to be accessed until this LED lights steady.

6 *I2C Sensor Input*

These terminals allow the connection of a temperature or temperature/humidity sensor to the NLC. This sensor may be used to monitor the environmental conditions of the room where the NLC is installed.

7 *RS485 External Connection*

This terminal strip allows the NLC to connect to managed LSP accessory boards outside of the enclosure where the NLC is located when used with an NXB expansion board. Communication is via OSDP. This RS485 buss utilizes 32 addresses, one of which is used by the NLC module. See #8.

For RS485 connections internal to the enclosure, see #3.

8 *RS485 DIP Switches*

These DIP switches set the RS485 address of the NLC board on the External RS485 buss (See #7). This address must be a unique address not used by an NXB board or other devices on the RS485 External connection.

9 *Ethernet Connection*

This is the RJ45 jack for the network connection. The ethernet cable is plugged into this jack. See section 1.3.2

⚠ NOTE: This port does not accept PoE power. Do not connect PoE to this port.

10 *USB Port*

This port is for future use and should be left open.

11 *Factory Reset Button*

This button resets the User Name, Password, and IP Address settings back to factory default. Typically used when IP and/or login information has been lost. See section 2.2.1.1 for more information.

12 *Input V+ & V-*

This is the power input for the NetLink board. This input accepts 8 to 30VDC ONLY from any power supply.

Note - The voltage input of the NetLink must be connected directly to the DC1 output or to the V+/V- fastons (if present) of the power supply.

13 *Backup Battery*

This is the coin cell battery for maintaining the clock when all power is removed from the NetLink. The battery type is CR2032.

1.3 Connecting the NLC Network Module

1.3.1 Making the Power Connections to the NLC Board

The DC power source for the NLC is connected to the DC INPUT fastons (Page 2, #12). The voltage of this source must be between 8 and 30VDC and should be backed up with a battery set or UPS to maintain communication during a loss of primary AC voltage. Do not attampt to power the NLC with PoE or AC power.

The power connections for the NetLink must connect directly to the main output or the V+/V- faston connectors (if present) of the power supply. (Figure 1.3)

⚠ **Note:** *Do not power the NetLink through another accessory board's output or from the B1/B2 connectors of the aqccessory board chain.* (Figure 1.4)

1.3.2 Making the Ethernet Connection to the NetLink

Plug the Ethernet cable into the RJ45 jack on the NetLink until the locking tab clicks. Connect the other end of the Ethernet cable to the network.

⚠ **Note:** This port does not accept PoE power. Do not connect PoE to this port.

⚠ **Note:** The NetLink board should be configured via a direct connection to a laptop or PC before connecting to the network. See the Initial Configuration Section (Section 2) of this manual for more details.

1.3.3 Connecting the Event Input

The Event Input monitors for presence or absence of a voltage. If monitoring a relay or switch contact (a common example would be the tamper switch of the enclosure), an external voltage must be run through the contact.

Example:
To monitor the NC tamper switch in an LSP enclosure, connect a positive voltage (from the power supply or distribution board) to one lead of the tamper switch. Connect the other lead of the tamper switch to the B (positive) terminal of the Event Input terminals. Connect the A (negative) terminal of the Event input terminals to the negative (DC Common) of the voltage source. (Figure 1.5)

1.3.4 Connecting the ADC (Voltmeter) Input

The ADC (voltmeter) input, measures a DC voltage. When using the voltmeter input, connect the voltage to be measured to the ADC terminals, observing polarity as marked on the PCB. The ADC wiring must be routed away from high voltages and the wire used must be rated for the voltages and temperatures in the area in which it is installed.

⚠ **Note:** The voltage being measured by the ADC input MUST be common grounded with the voltage source of the NLC board.

1.3.5 I2C Remote Temperature Sensor Input

The I2C remote temperature sensor input allows measuring a temperature up to 6 feet away from the NLC board. Wire the sensor into the I2C terminals (matching GND/SDA/SCL/3V3 with the markings on the sensor) and run the sensor wire to the area or device to be monitored.

1.3.6 Setting the NXB Address

The NLC and each NXB module must have unique addresses on the RS485 External buss. The NLC module is typically set to address 0. Setting the address is via DIP switch on the NLC PCB as follows:

Address	Switch Settings	Address	Switch Settings
0	On | On | On | On | On	16	Off | On | On | On | On
1	On | On | On | On | Off	17	Off | On | On | On | Off
2	On | On | On | Off | On	18	Off | On | On | Off | On
3	On | On | On | Off | Off	19	Off | On | On | Off | Off
4	On | On | Off | On | On	20	Off | On | Off | On | On
5	On | On | Off | On | Off	21	Off | On | Off | On | Off
6	On | On | Off | Off | On	22	Off | On | Off | Off | On
7	On | On | Off | Off | Off	23	Off | On | Off | Off | Off
8	On | Off | On | On | On	24	Off | Off | On | On | On
9	On | Off | On | On | Off	25	Off | Off | On | On | Off
10	On | Off | On | Off | On	26	Off | Off | On | Off | On
11	On | Off | On | Off | Off	27	Off | Off | On | Off | Off
12	On | Off | Off | On | On	28	Off | Off | Off | On | On
13	On | Off | Off | On | Off	29	Off | Off | Off | On | Off
14	On | Off | Off | Off | On	30	Off | Off | Off | Off | On
15	On | Off | Off | Off | Off	31	Off | Off | Off | Off | Off

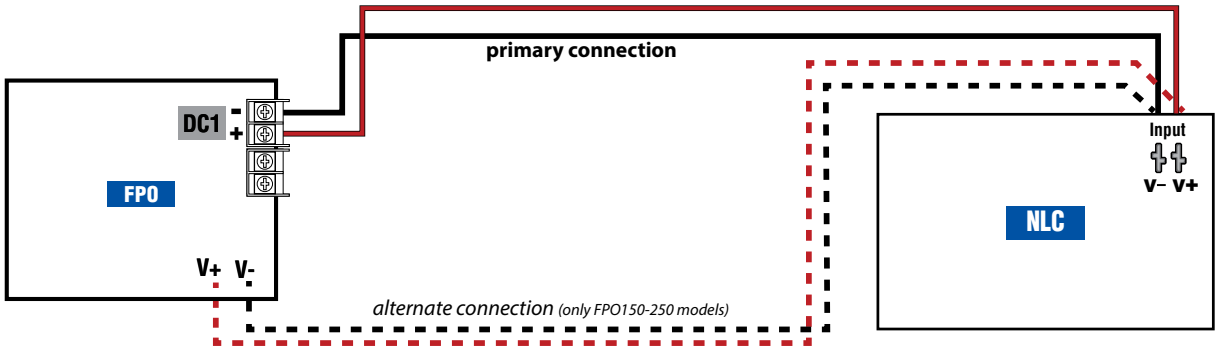


Figure 1.3 - Power the NLC from the V+/V- or DC ouput terminals on the main power supply

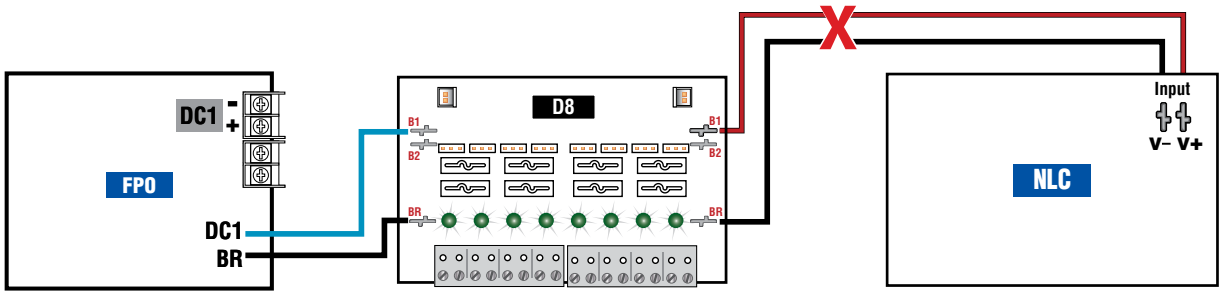


Figure 1.4 - Do not power from another accessory board's output terminals or B1/B2 connection

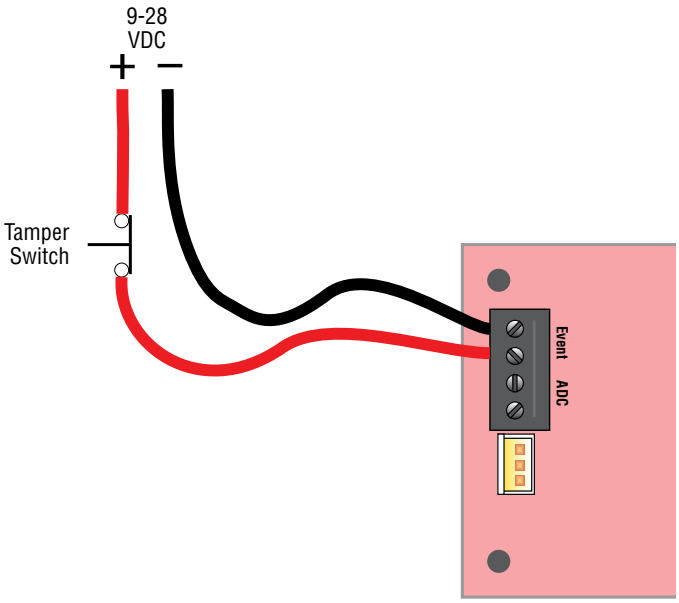


Figure 1.5 - Event Input Tamper Switch Wiring

1.3.7 Connecting Devices to be Monitored to the NetLink

Devices within the same enclosure as the NLC

Local devices connect to the NLC via the RS485 Internal connection (Page 2, #3). Plug one end of the RS485 cable into the NLC. Connect the other end to the RS485 connector of the device to be monitored (such as an FPO, B150, M8, or SD board - see the manual for the device being connected for the location of the RS485 connector).

If the device to be connected only has an RS485 terminal strip and does not have a pluggable connector, the end of the RS485 cable may be cut off in order to connect to the terminals.

Up to 32 local devices may be connected to the NLC.

Devices outside of the enclosure containing the NLC

The RS485 terminal strip (Page 2, #7) allows connection of devices outside of the enclosure where the NLC is installed by using NXB boards. Up to 31 NXB boards can be connected to the NLC. See the NXB manual for more information. Alternatively, monitored devices may be connected directly to the RS485 terminals without an NXB.

The RS485 terminal strip has two connections available, for up to two RS485 branches. Both branches share the 32 addresses available.

RS485 Terminals:

A	Signal Line A
B	Signal Line B
GND	Ground

The A, B, and GND terminals from the NLC must be connected to the A, B, and GND terminals of the NXB or monitored device.

The next device in the chain should connect from the second set of RS485 terminals on the monitored device to the next device in the chain and so on. The final device in the chain must have a termination resistor installed between A and B on the second RS485 terminal set.

RS485 communication between the NLC and NXB modules uses the OSPD protocol. Wiring for the RS485 buss must be a single 24AWG twisted pair with drain wire and shield with 120 ohm impedance. The maximum total combined wire length is 2000ft.

⚠ **Note:** Failure to use the proper wire type, connection methods, and termination resistor may prevent proper communication.

⚠ **Note:** NXB boards and other devices connected to the RS485 terminals must each be set to a unique address. See the manual of the connected devices for addressing information. The NLC board must also have a unique address set using the dip switches (Page 2, #8)

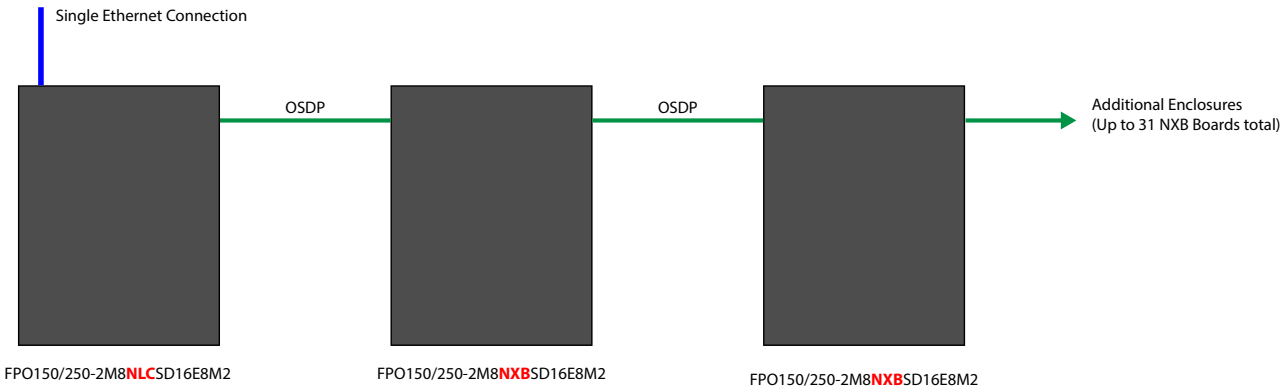


Figure 1.6 - Distributed Power Monitoring using the NLC & NXB

Section 2 – Initial Configuration

Before connecting the NetLink Connect to a network for the first time, the board must be configured using a laptop.

⚠ If using DHCP, a Network Scan Tool used for finding LSP devices is available at https://www.lifesafetypower.com/content/dam/assa-abloy/americas/ems/lifesafety-power-authored-assets/firmware-downloads/NetLink_scan_tool.zip.

2.1 Preparing to configure the Network Module

In order to perform the initial configuration of the NetLink, you will need the following:

- A computer (PC or Mac) set to a static IP address in the subnet 192.168.1.xxx, where xxx is a subnet address (0 to 255) not being used by any other device on the network. Do not use 192.168.1.9 or the final IP address you will be using for the NetLink. Disable any active WiFi connections. See Figure 2.1.
- A web browser installed on the computer.
- A standard (not crossover) ethernet cable long enough to reach between the computer and the NetLink.
- The NetLink to be configured must be wired into the system and powered. After powering the NetLink, wait for it to initialize - when ready, the yellow SYS LED will be lit steady.

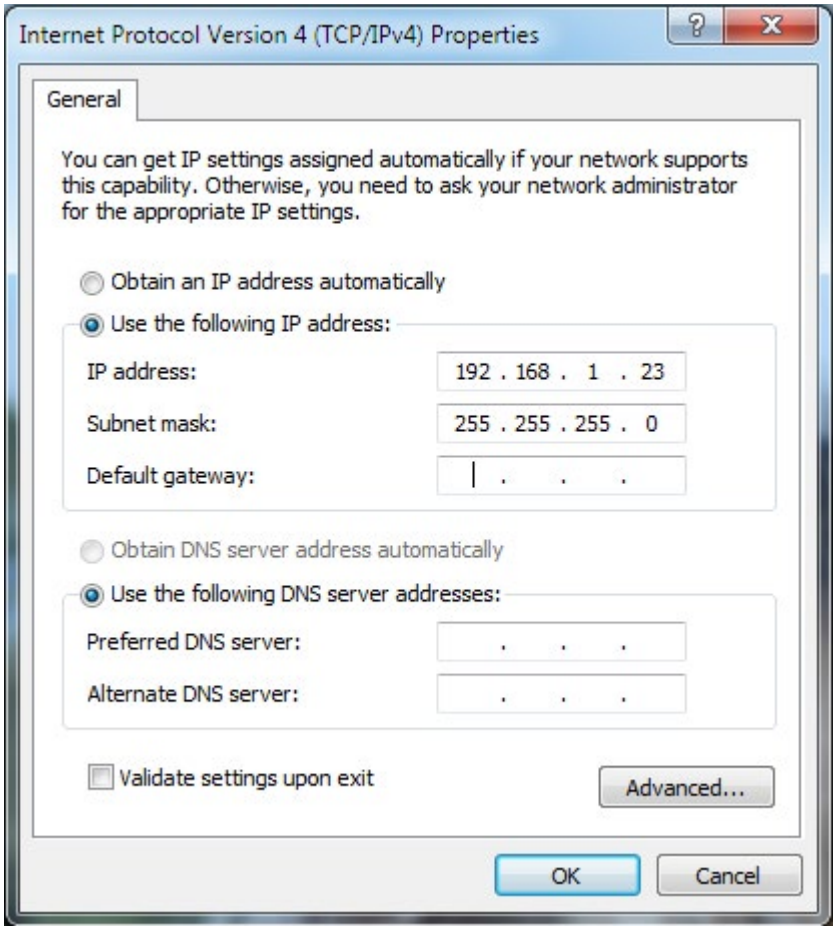


Figure 2.1 - Example of a PC Ethernet Port Settings Window

After the NetLink is powered within the system and initialized, connect the Ethernet cable between the Ethernet ports of the computer and the NetLink.

2.2 Configuring the NetLink Module

2.2.1 Logging into the NetLink for the first time

From the factory, the NetLink is preset with the following settings:

- IP Address: 192.168.1.9
- Username: admin
- Password: admin

Open a browser on the computer and enter the IP address into the address bar. When prompted, enter the user name and password. Note that BOTH are case sensitive (See Figure 2.2). On initial login, the NetLink will force a password change to a secure password. The home page for the NLC should appear in the browser window (See Figure 2.3).

⚠ If the wrong password is entered three consecutive times, the user will be locked out of the device for the programmed lockout time (24 Hours, by default). Enter the password carefully to avoid lockout. This time period may be changed on the configure page.

2.2.1.1 Resetting the NetLink

To reset the NetLink to factory default user name and password press and hold the reset button for 10 seconds.

To reset the NetLink to factory default user name, password, IP address, certificate, and Cipher Suite settings, press and hold the reset button for 30 seconds.

After releasing the button, the NetLink will reset and reboot - the reboot process could take up to 3 minutes to complete.

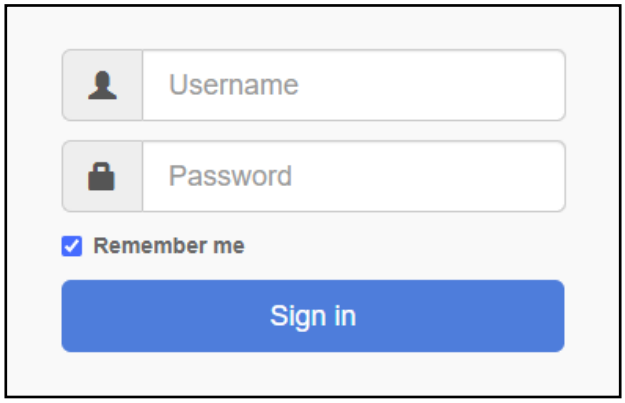


Figure 2.2 The NetLink Login Window (May appear different, depending on browser)

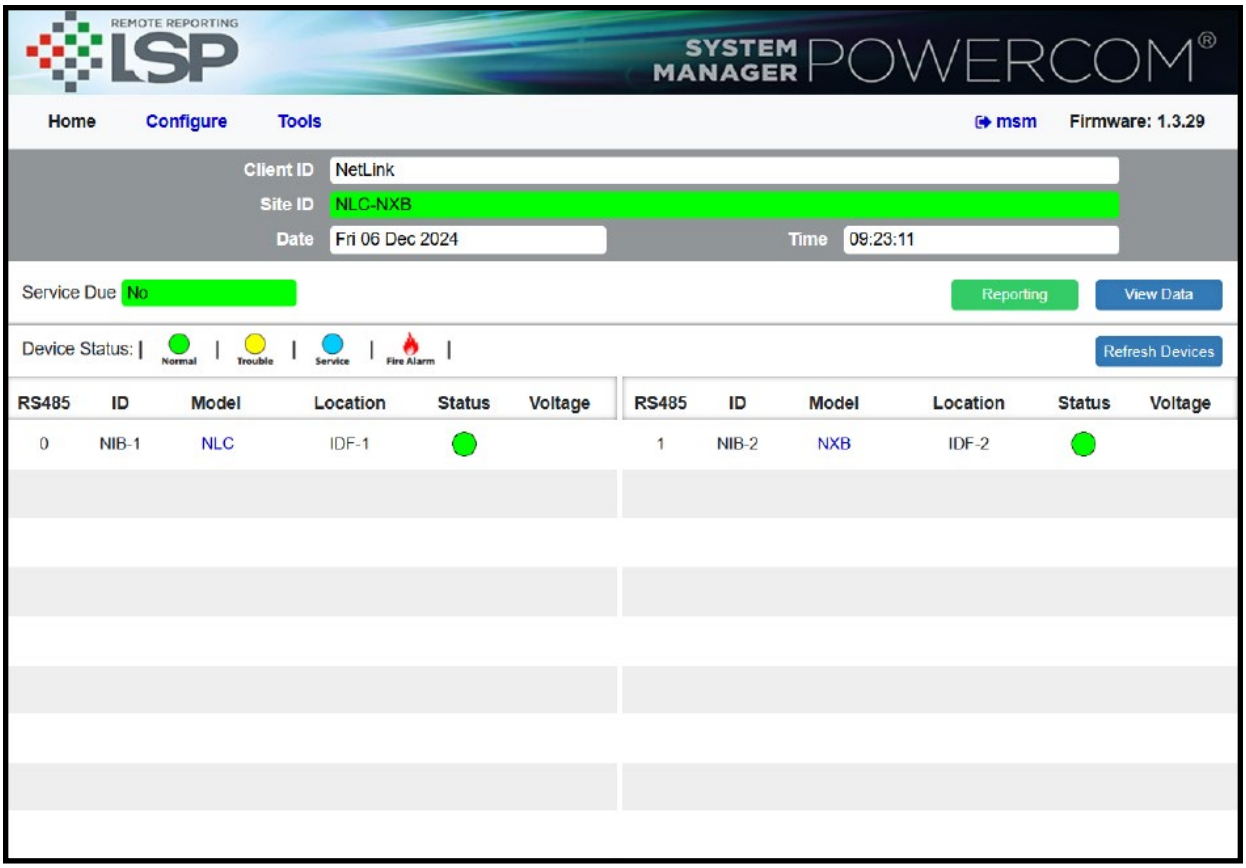


Figure 2.3 - Typical NLC Home Page

2.2.2 Configuring the TCP/IP Settings

In the menu bar at the top of the browser screen (Figure 2.3), click the "Configure" link. In the TCP/IP Settings block of the Configuration screen (See Figure 2.4), set the TCP/IP settings to the desired values for the network to which the NetLink will be connected.

Consult your IT department for information on these settings.

After completing the TCP/IP settings, click the "Submit" button in the bottom right corner of the TCP/IP Settings box. IVPv and IPV6 settings are both available and either protocol may be enabled or disabled. **Note that the new TCP/IP settings will not take effect until the NetLink is rebooted or power to the NetLink is cycled.**

If the NetLink is connected to a DHCP network and DHCP is enabled, the DHCP server will automatically configure the TCP/IP settings. **Note that you will need a Network Scan tool to locate the NLC board's IP address.** You may use LSP's scan tool available at https://www.lifesafetypower.com/content/dam/assa-abloy/americas/ems/lifesafety-power-authored-assets/firmware-downloads/NetLink_scan_tool.zip to locate the NetLink's IP address before logging into the NetLink board.

Note: *The port number used by the NetLink can be set in the Port# field. By default the NetLink is set to use port 443. Connection to the NetLink must be through HTTPS.*

Note: *To access the NetLink board from outside the installation site's firewall, the firewall must have the ports used by the NetLink for https, and SNMP (if used) open. See your IT department for firewall port opening details.*

2.2.3 Time Settings

The Time Settings block (See Figure 2.4) is where the time and date are programmed into the NetLink. First, select the correct time zone from the drop down list. After the time zone is set, the time and date can be set one of three ways:

Manual Entry

Enter the correct time and date in the following format and click the "Submit" button:

For Date: **YYYY - MM - DD**

For Time: **HH : MM : SS**

⚠ ALWAYS enter two digits in the time fields. ie., 7AM = 07, not 7

The new date and time will take effect immediately.

Sync With Computer

The "Sync Date/Time with computer" button will set the date and time of the NetLink to match the computer currently being used to access the NetLink. The new date and time will take effect immediately.

Using an NTP Server

The NTP Server fields allow you to enter one or two NTP server addresses for automatic setting of the time and date via the internet. The NLC must be configured for internet access before this setting will work. Either the IP address of the server or the DNS name of the server may be entered. After entering at least one server address, click the "Get GMT Time" button to set the NetLink time and date. Depending on server traffic, it could take several seconds for the time setting to complete.

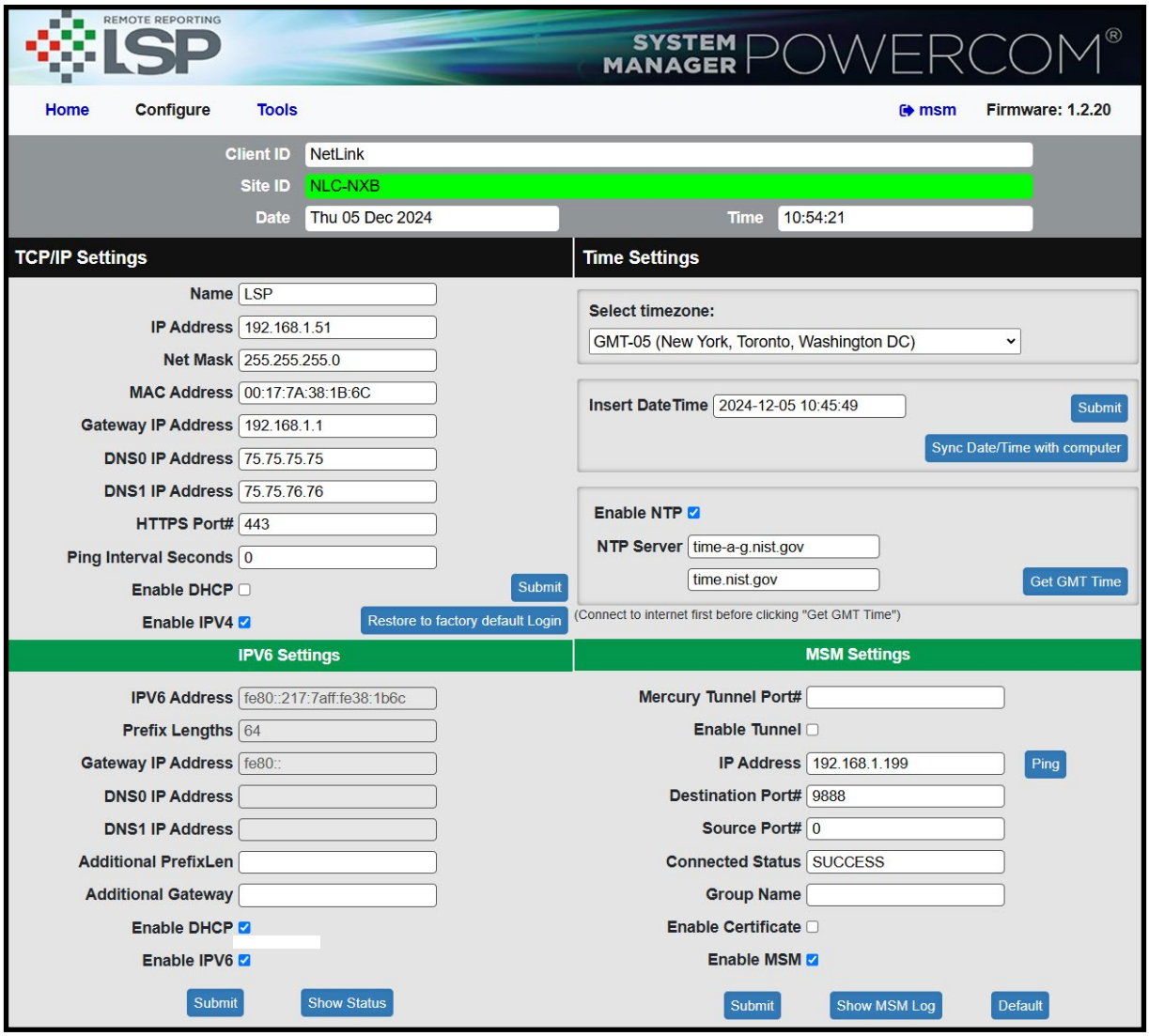


Figure 2.4 - Typical Configure Page (top portion)

2.2.4 MSM Settings

The MSM Settings (See Figure 2.4) are used when connecting the NetLink to an MSM Enterprise server or when configuring OneDrop.

For MSM, enter the IP address of the MSM Server in the "IP Address" field. Set the Port numbers as appropriate (typically 9888 for "Destination Port"). In Group Name, enter the group name for this NLC board within MSM. If using a certificate, check "Enable Certificate". Check "Enable MSM" and click Submit" to start the MSM connection. Consult the MSM Enterprise manual for more information.

To enable OneDrop, enter the Mercury port number, check "Enable Tunnel", and click "Submit". The Mercury board must also be configured for tunneling - see the SDU / OneDrop manual for more information.

2.2.5 Configuring the Email Settings

Scrolling down in the Configure page reveals the "Email Settings" section (Figure 2.6).

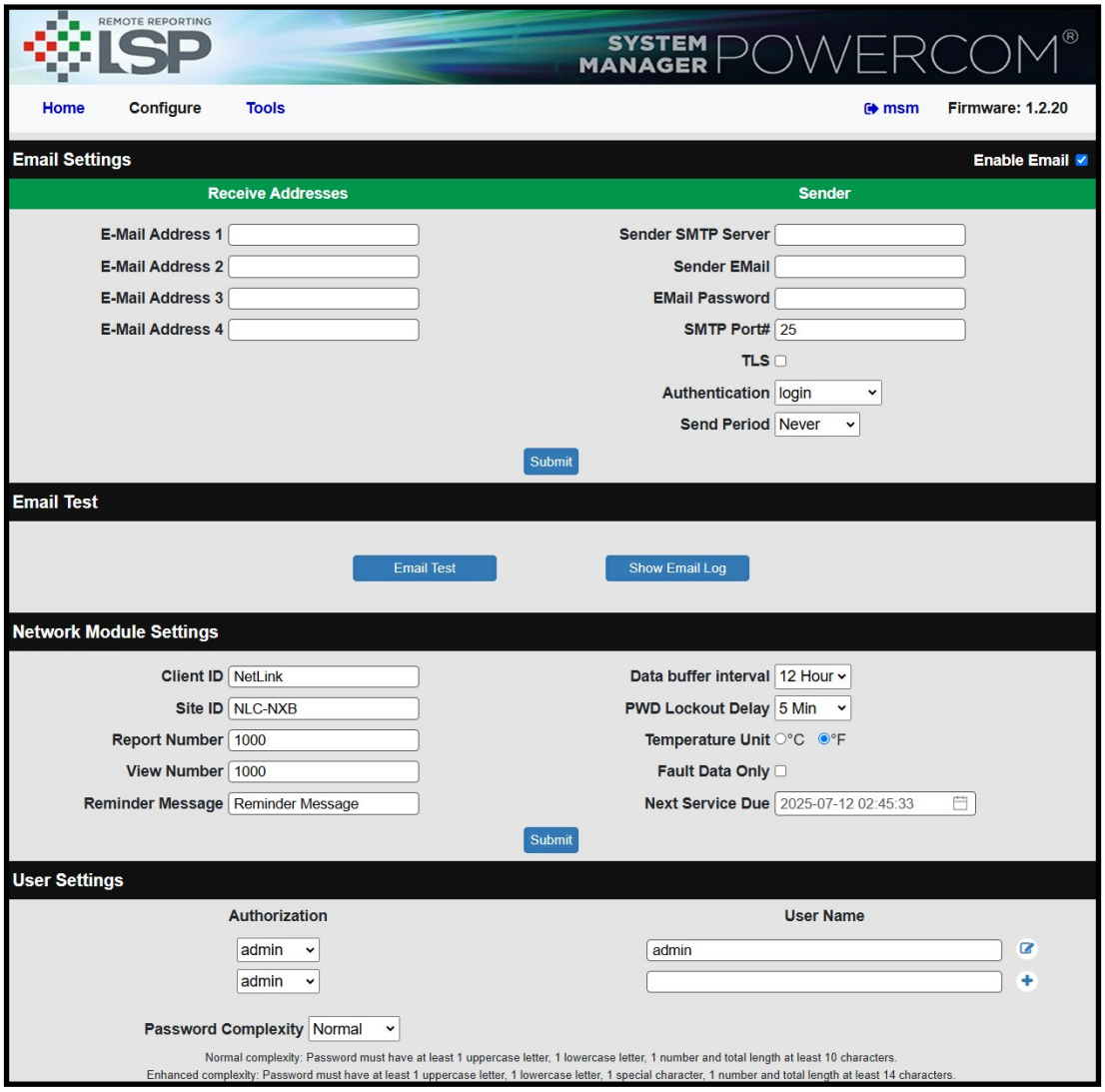


Figure 2.6 - Typical Configure Page (middle portion)

The NetLink can be configured to send email alerts on user-specified conditions and for periodic status reports. (See Figure 2.6).

Under "Receive Addresses", the email address or addresses to receive the alerts and reports should be entered. Up to four recipient email addresses may be entered.

Under "Sender", the settings of the account to send the emails should be entered. These settings include:

Sender SMTP Server	This is the address of the SMTP server for the email provider. Consult with your email provider for this address.
Sender Email	This is the email address which the NetLink will use to send emails.
Email Password	This is the password associated with the Sender's Email account
SMTP Port #	Enter the port number required by your email provider for sending email. Typically, this is "25".
TLS	Check this box if your email provider requires TLS or SSL encryption
Authentication	Choose the proper authentication method for your email provider from the drop-down list. Usually, this is "login". Select "off" to completely disable authentication.

Send Period	Selects how often the NetLink sends a regular email status report. This period can vary from 1 hour to 6 months or, if you do not want the NetLink to send periodic reports, select "Never". Note that the "Send Period" setting does not affect the sending of email alerts generated on faults or events selected by the user, only the periodic status report.

⚠ **Note:** *Regarding Microsoft Exchange – Often, Microsoft Exchange will not be configured to accept SMTP connections. To use the NetLink's email functions through Microsoft Exchange, the Exchange service must be configured to allow SMTP connections. Consult with the administrator of your Microsoft Exchange Server.*

⚠ **Note: Click the "Submit" button to save the settings, which will take effect after rebooting the NetLink.**

TIP: *Most mobile phone providers have an email address available which will convert an email into an SMS text message. This email address is usually in the form of: (the mobile phone number)@xxxxxx. Consult with your mobile provider for more information. The CSV attachment will be removed, since SMS text messages are not compatible with attachments. Because of this, it is recommended that the SMS email be entered as an ADDITIONAL "Receive Address" on the NetLink, so that the CSV file will still be available via regular email.*

The "Email Test" button will try to establish a connection between the NLC and email server using the settings entered. Clicking "Show Email Log" will show details of the transaction for troubleshooting purposes.

2.2.6 Configuring the Network Module Settings

Below the Email Test block is the Network Module Settings block, where application-specific parameters of the NLC can be set (See Figure 2.6).

Client ID	Enter any meaningful name to help identify the site or customer. The Client ID will appear at the top of the home page.
Site ID	Enter any meaningful name to help identify the installation site of the NLC module. The Site ID text will appear at the top of the Home page, as well as in the subject line of email alerts and reports. If using MSM Enterprise, the Site ID will also be used for identification.
Report Number	This selects how many datapoints will be included in the CSV file within the email reports. Up to 1000 events may be stored.
View Number	This selects how many datapoints will be shown when viewing historical data within the NLC. Up to 1000 events may be stored.
Reminder Message	Enter a brief message to indicate the message which will appear in the Subject line of the alert email when the the Service Remider is sent. See "Next Service Due" below.
Data Buffer Interval	This selects the time period between "snapshots" of the data for the email/csv reports. Typically, this value should be set to 24 hours. Setting the interval too short will cause data to be pushed out of the buffer more quickly.
PWD Lockout Delay	Selects the length of time to lock out a user after three consecutive incorrect password attempts. Selections range from 5 minutes to 24 hours.
Temperature Unit	This selects between Fahrenheit and Celsius for all temperature measurements.
Fault Data Only	Checking this box will limit the data exported in the CSV file or shown on screen to only fault or alert data. Notmal conditions will be omitted.
Next Service Due	Enter a date and time indicating the next service due date. If "Service Due" is selected as an email alert condition, an alert email will be sent out to the specified email recipient(s) when the system time matches the due date time.

⚠ **Note:** After entering the above information into the NetLink Network Module Setting block, click the "Submit" button to save the settings. These settings will take effect immediately without rebooting the NetLink board.

2.2.7 User Settings

In the User Settings block of the Configure screen (bottom of Figure 2.6), user names, passwords, access levels, and password complexity for the NetLink board may be set.

The default user is "admin" and the password for this account is also "admin". On first login to the NLC, the user will be prompted to change this password for security reasons. Note that there must ALWAYS be at least one admin-level user.

Adding a New User

To add another user, first select the Authorization level desired for the user. Three authorization levels are available:

- Admin — Admin-level users have full control over the NetLink. There are no restrictions.
- Manager — Manager-level users have access to all areas of the NetLink except for the Configure page.
- Guest — Guest-level users may only view information on the NetLink screens. No changes can be made and none of the control features are available.

After selecting the Authorization level, enter the new user name in the User Name column and click the "+" button to the right of the user name. The User Settings section will expand, showing the fields to enter the password for the user. Passwords must meet the complexity level setting requirements. Re-enter the password into the Verify Password column.

After clicking Submit, the new user will be active and another blank row will appear for entering the next user name.

Deleting a User

To delete an existing user, click the red trash can icon to the right of the user name.

Changing a User's Password

To change the password of an existing user, click the paper and pencil icon to the right of the user name. Enter the old and new passwords and click "Submit"

The "Password Complexity" field selects between normal or enhanced complexity requirements. Normal complexity requires that the password has at least 1 uppercase letter, 1 lowercase letter, 1 number and a total length of at least 10 characters. Enhanced complexity requires at least 1 uppercase letter, 1 lowercase letter, 1 special character, 1 number and a total length of at least 14 characters.

2.2.8 Certificate Settings

The NetLink allows user-supplied certificates to be used. Click the "Upload Certificate" button for the certificate type being used (Figure 2.7). A window will appear to notify the user to enter and submit the password first if the certificate is password protected. After clicking OK, the Import Certificate screen (Figure 2.8) will appear. Contact your IT department for more information on the certificate used.

Click the Choose File button to select the certificate file to be used, then click Upload, then Confirm to upload the certificate to the NLC.

Click the "Exec Cert" button to implement the certificate.

The "Show Certificate Log" button will display the certificate log on-screen. Click "Hide Certificate Log" button to hide the log.

2.2.9 SSL Protocol and CipherSuite Settings

This section allows the user to select which SSL protocol to use. See Figure 2.7

2.2.10 Import and Export Configuration File

The NetLink allows the user to export most of the settings that are configured in the NLC and connected modules to a file. This file can be used as a backup or to transfer these settings to other NLC devices that require similar settings.

To export the settings, click the "Export Configuration File" button (See Figure 2.7). The exported file saves to the default download location of the browser.

To import a configuration file, click the Import Configuration File button to open the Import Settings screen. Click the Choose File button and select the configuration file to be imported. Click Upload, then Confirm to import the settings.

2.2.11 User Login Record

Click the "Show Login Log" button to show the history of login information for the NLC module. Click "Export Loging Log" to save the history to a CSV file. See Figure 2.7.

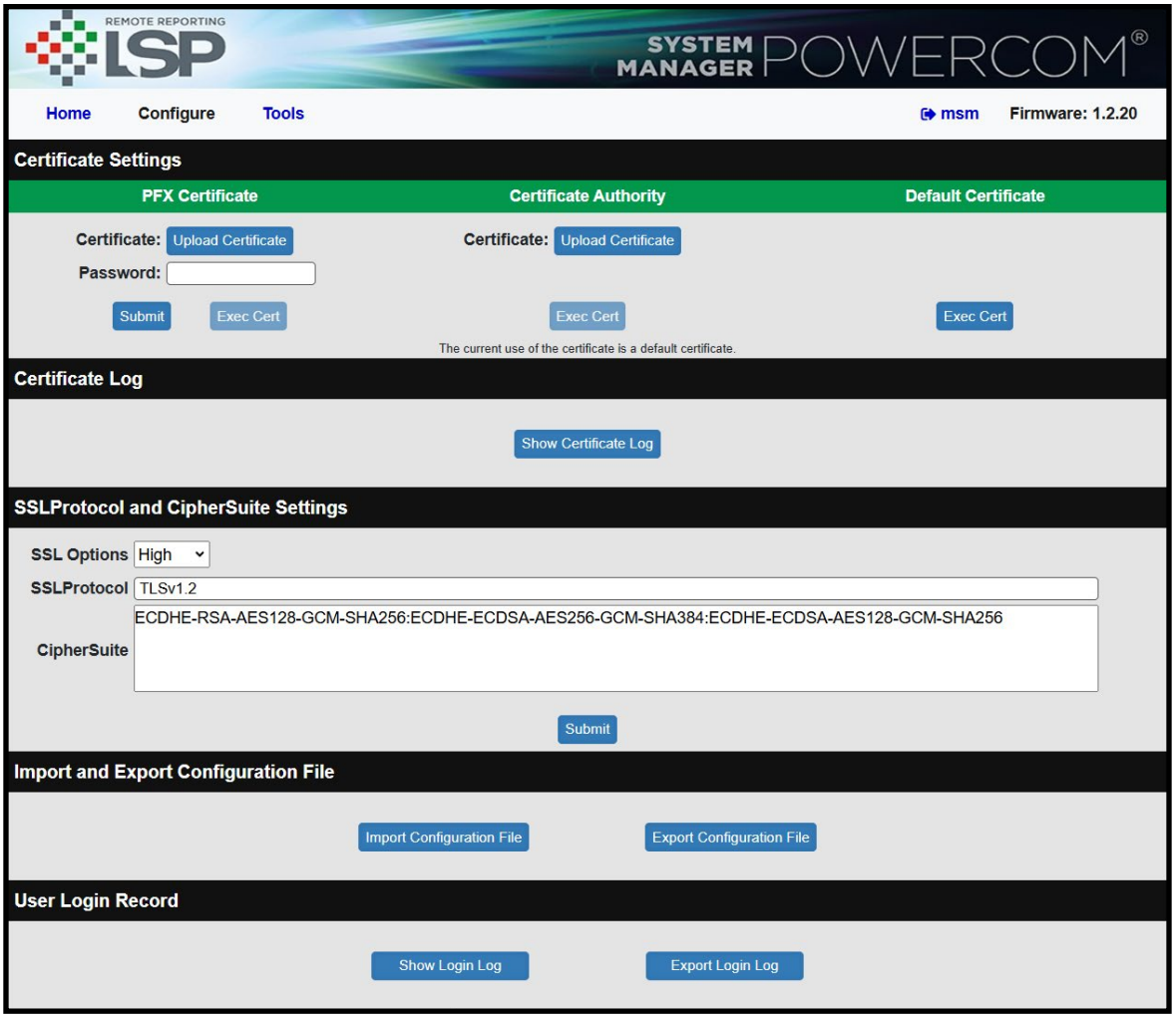


Figure 2.7 - Typical Configure Page (bottom portion)

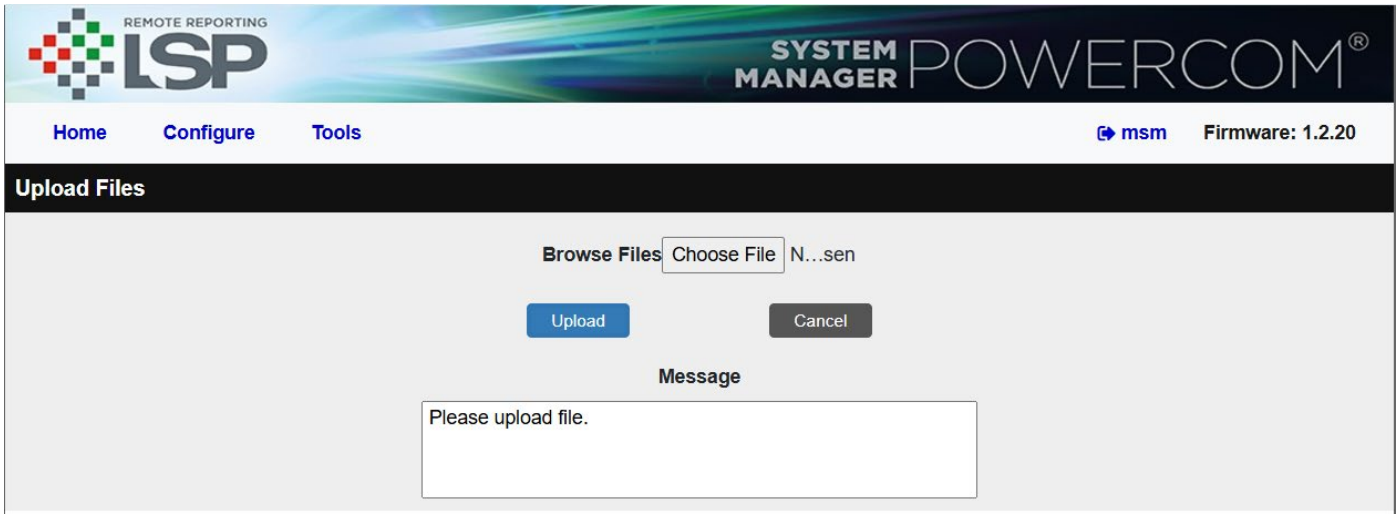


Figure 2.8 - Import Certificate Screen

Section 3 – Using the NLC Module

Before system parameters can be viewed, you must be logged into the NLC module using the proper IP address, user name, and password as shown in Section 2 of this manual.

3.1 The NLC Home Page

The Home page of the NLC displays basic system information as well as the NLC and any connected external modules.

Figure 3.1 - Typical NLC Home Page

3.1.1 Basic Site Information

The top portion of the NLC Home page lists the Client ID and Site ID (as programmed on the Configure page) as well as the system time and date (Figure 3.1). The Site ID field will be green if there are no faults or service alerts detected. This field will turn yellow on any fault condition or blue on any service alert conditions. This basic site information carries through on every screen within the NLC, NXB, or other connected modules.

A Service Due field is also present for reporting of service items that need attention.

3.1.2 NLC and Connected External Devices

The bottom of the home page (Figure 3.1) shows the NLC and any devices connected to the External RS485 buss of the NLC. The RS485 column is the address of the connected module on the External RS485 buss. ID is a unique number given by the NetLink to each device. Model dsiplays the model number of the connected module. Location displays the location of the module as set within that module's settings. The "Status" indicator shows the current status of the device. Green indicates a normal state, yellow indicates a fault, and blue indicates a service item. A fire indicator shows that an FAI request has been received by the device. Power supplies will also display the measured output voltage. To access the page for a device, click the model number. See the manual for the connected device for details on that device. See Section 3.2 of this manual for more information on internal devices connected to the NLC module.

3.1.3 Reporting Button

The green Reporting button brings the user to the Reporting page (Figure 3.2). On this page, the user can select the parameters which will cause an alert. Typically, all items should be selected, but items may be deselected if the item is not relevent.

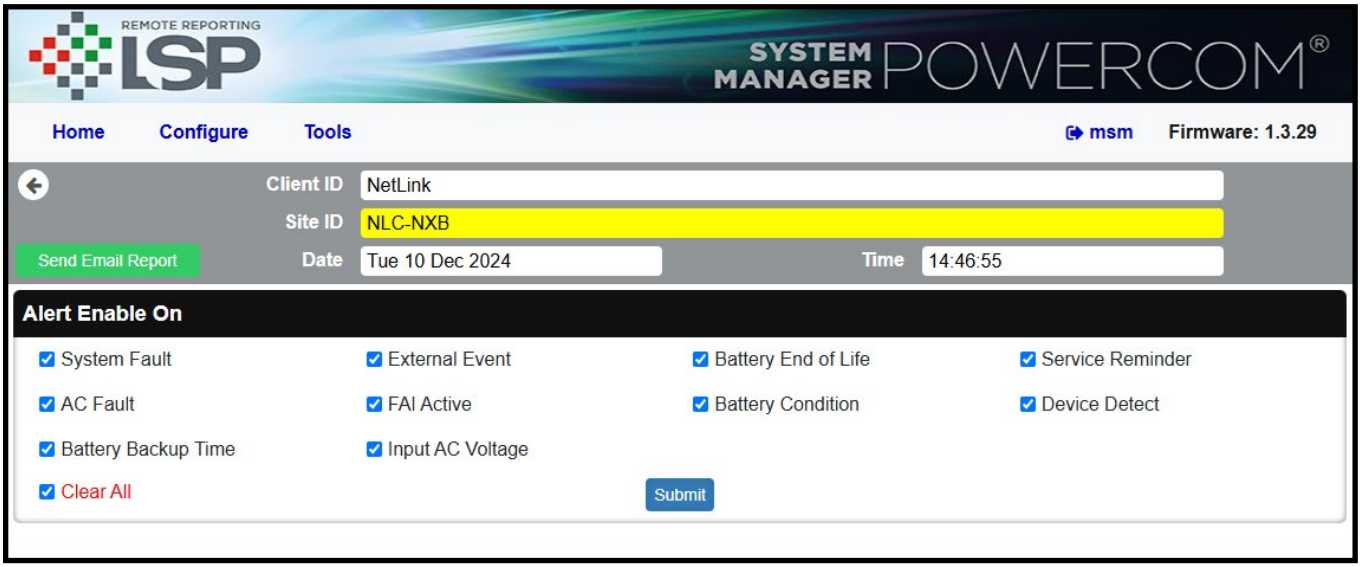
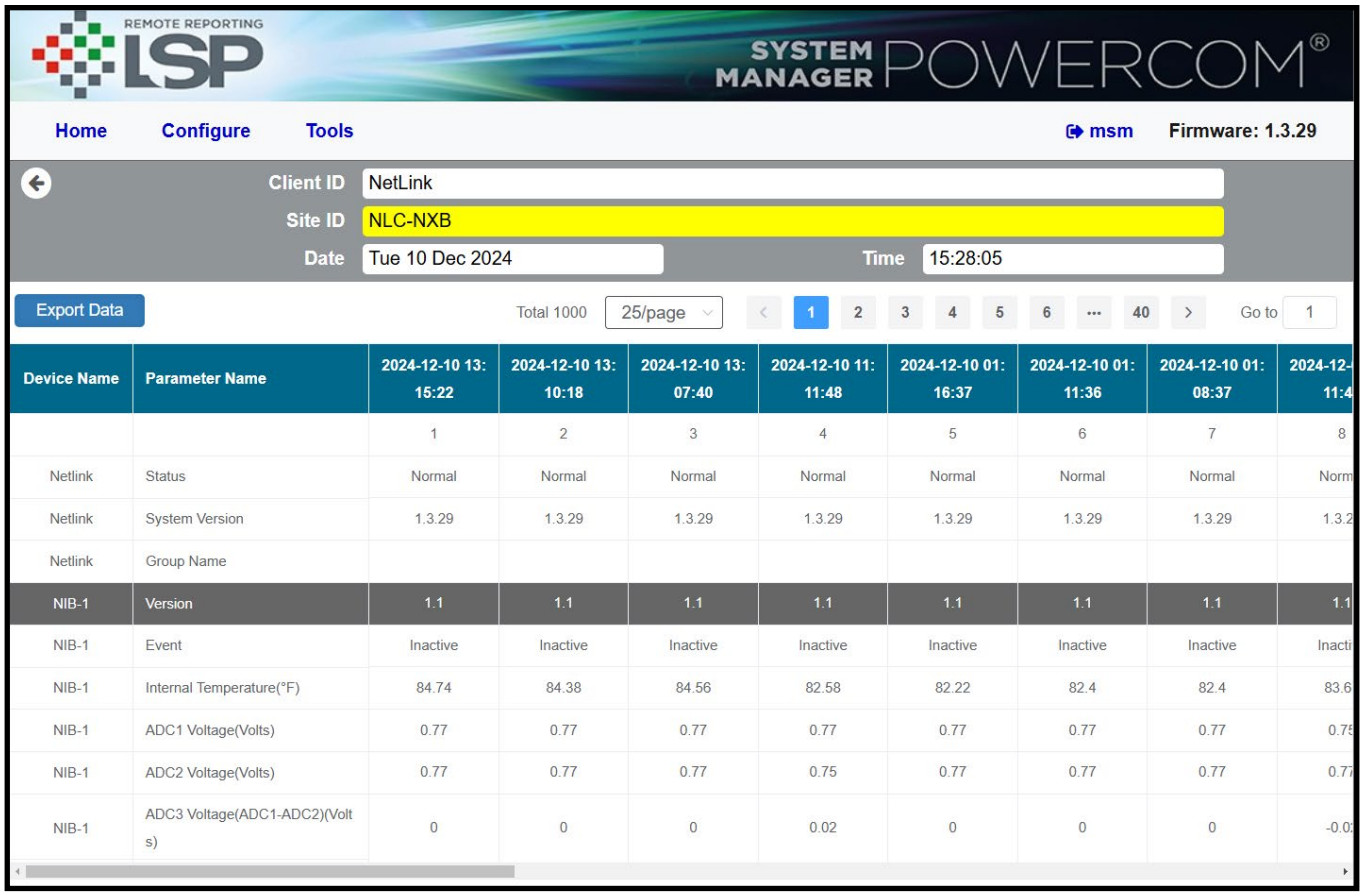


Figure 3.2 - NLC Home Screen Reporting Page

3.1.3 View Data Button

The blue View Data button allows the viewing of the data in the 1000 event buffer for the top-level NLC and NXB module data (Figure 3.3). The blue Export Data button will export the data to a CSV file for opening in an external application such as Microsoft Excel. The drop down field near the center selects how many columns per page are visible on screen. To the right are the selections for which page is being viewed.

The bottom portion of the screen shows the collected data for NLC & NXB modules. The left column is the Device name. This is the name given to the device by the NLC module. The second column is the Parameter Name. This is the parameter whose data is shown in that row. The remaining columns are the recorded data, with each column being a time and date stamped "snapshot" of data.



Device Name	Parameter Name	2024-12-10 13:15:22	2024-12-10 13:10:18	2024-12-10 13:07:40	2024-12-10 11:11:48	2024-12-10 01:16:37	2024-12-10 01:11:36	2024-12-10 01:08:37	2024-12-11:4
		1	2	3	4	5	6	7	8
Netlink	Status	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Norm
Netlink	System Version	1.3.29	1.3.29	1.3.29	1.3.29	1.3.29	1.3.29	1.3.29	1.3.2
Netlink	Group Name								
NIB-1	Version	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
NIB-1	Event	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inacti
NIB-1	Internal Temperature(°F)	84.74	84.38	84.56	82.58	82.22	82.4	82.4	83.6
NIB-1	ADC1 Voltage(Volts)	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.75
NIB-1	ADC2 Voltage(Volts)	0.77	0.77	0.77	0.75	0.77	0.77	0.77	0.77
NIB-1	ADC3 Voltage(ADC1-ADC2)(Volts)	0	0	0	0.02	0	0	0	-0.0

Figure 3.3 - NLC View Data Page

3.2 Connected Internal Devices

To view the detailed data for internal devices connected to the NLC, click the model number of the NLC from the home screen (Figure 3.1). This will open the NLC status screen (Figure 3.4).

3.2.1 The NLC Status Page

The NLC Status page displays the NLC parameters, reporting settings, configuration settings, and connected devices. See Figure 2.2. Click the Return (left arrow) button at the top to return to the NLC home page. The following sections describe the different areas of the NLC status page.

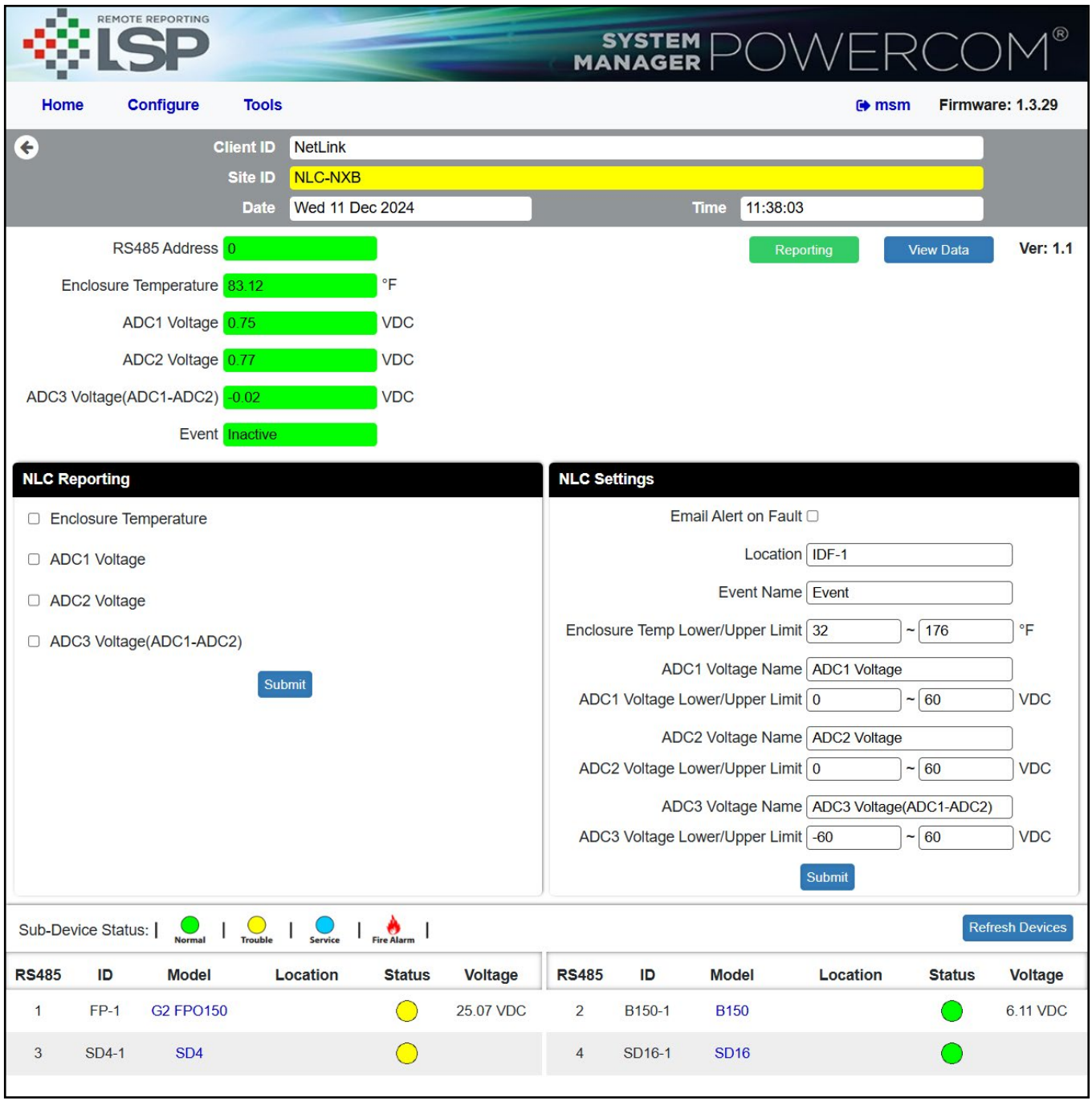


Figure 3.4 - Typical NLC Status Page

3.2.2 NLC Parameters

Below the basic site information are the parameters collected directly by the NLC module, reporting settings, and data viewing (See Figure 3.5).

RS485 Address	This is the programmed RS485 address of the NLC module. Typically, the NLC is address 0.
Enclosure Temperature	This is the temperature of the NLC module. This temperature sensor is installed on the NLC PC board.
External Temperature	If an external temperature sensor is connected to the I2C sensor input, this parameter will display the external sensor's temperature.
Humidity	If a temperature/humidity sensor is connected to the I2C sensor input, this parameter will display the external sensor's humidity measurement.
ADC1 and ADC2 Voltage	These are the voltages measured by the on-board Analog-to-Digital converters (ADC). This measurement is shown as a positive or negative voltage in Volts DC.
ADC3 Voltage (ADC1-ADC2)	This field shows the difference between the ADC1 and ADC2 readings.
Event	This field shows the status of the Event 1 input. This field will show "Active" on a yellow background or "Inactive" on a green background to indicate the status of the Event1 input.
Reporting	Clicking the Reporting button brings the user to the Reporting page for the internal modules connected to the NLC. On this page, the user can select the parameters which cause alerts and appear in the CSV report for any connected modules, such as power supplies and output modules. See the manual for the connected module for information on the parapeters shown. Click the Return (left arrow) button at the top to return to the NLC Status page.
View Data	The NLC saves a snapshot of data at the interval programmed on the configure page. These snapshots can be reviewed by clicking the View Data button. There are up to 1000 events available for review. To save the data, click the Export Data button. Click the Return (left arrow) button at the top to return to the home page.

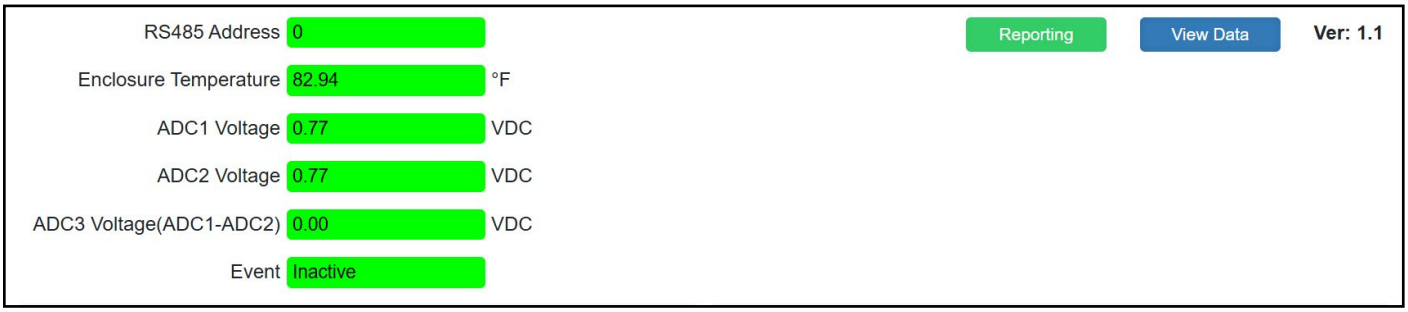


Figure 3.5 - NLC Parameters Section

3.2.3 NLC Reporting Section

The middle left section of the NLC status page allows the selection of the NLC parameters (See Section 3.2.2) which may cause alerts and appear on the CSV report. Reporting data for connected modules is set with the green "Reporting" button in the top section of the NLC status page (See Section 2.2.1). After selecting the parameters, click the "Submit" button to save the changes. See Figure 3.6.

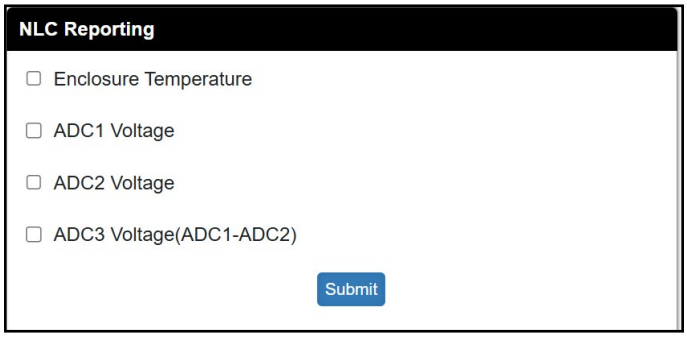


Figure 3.6 - NLC Reporting Section

3.2.4 NLC Settings Section

To the right of the NLC Reporting section is the NLC Settings section. These fields allow the user to set the NLC location, parameter names, and upper and lower limits for the NLC parameters, including temperature, humidity, and ADC voltage. After setting the values, click the "Submit" button. Check the Email Alert on Fault button to receive email alerts on any of these parameters being out of range. See Figure 3.7.

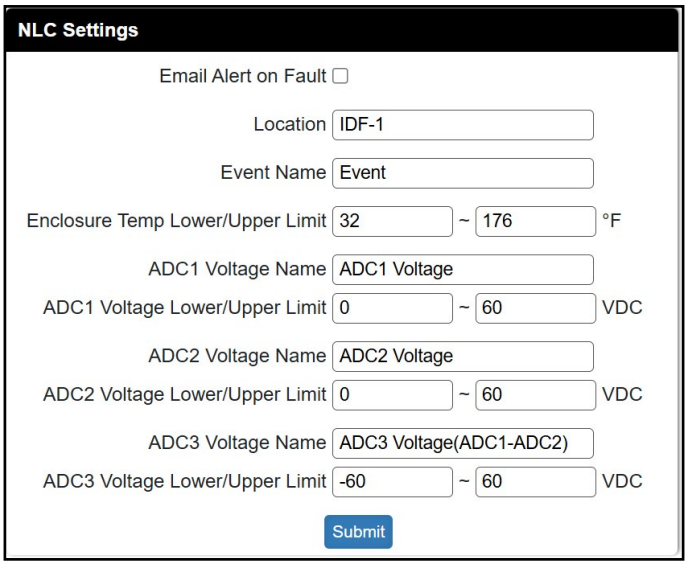


Figure 3.7 - NLC Settings Section

3.2.5 Connected Devices Section

The bottom of the NLC Status page shows the devices connected to the RS485 Internal Buss of the NLC (See Figure 3.8). The device table displays the following parameters:

RS485	This is RS485 address set by DIP switches for the connected module. This is the address for the module on the NLC's internal RS485 buss. See the manual for the connected module for RS485 addressing information for that device.
Device ID	This is a unique ID given by the NLC to each device connected to its internal RS485 buss.
Model	The model number of the connected module.
Location	This is the location programmed into the connected module. This allows the user to identify the location where this module is installed. Note that this is separate from the NLC Location field.
Status	This indicator shows the current status of the connected module. Green indicates a normal state, yellow indicates a fault, and blue indicates a service item. A fire indicator shows that an FAI request has been received by the device.
Voltage	Power supplies connected to the NLC will display the measured voltage of its output.
Refresh Devices	This button forces the NLC to immediately refresh the connected devices list.

Clicking the model number of the connected device opens the status page for that device. Consult the manual for the connected device for more information.

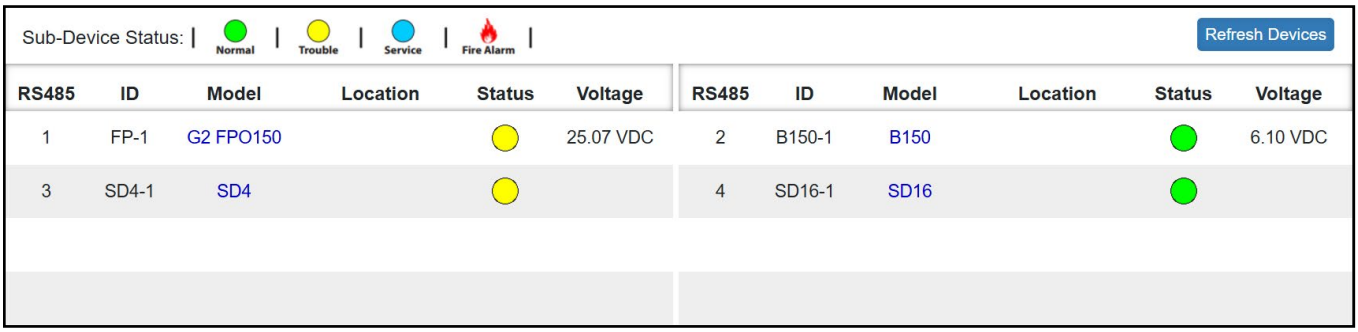


Figure 3.8 - NLC Connected Devices Section

3.3 Using the Tools Page

Clicking the Tools link at the top of the display will bring up the Tools page (See Figure 3.9). This page allows upgrading of the firmware, rebooting the module, and adding system notes.

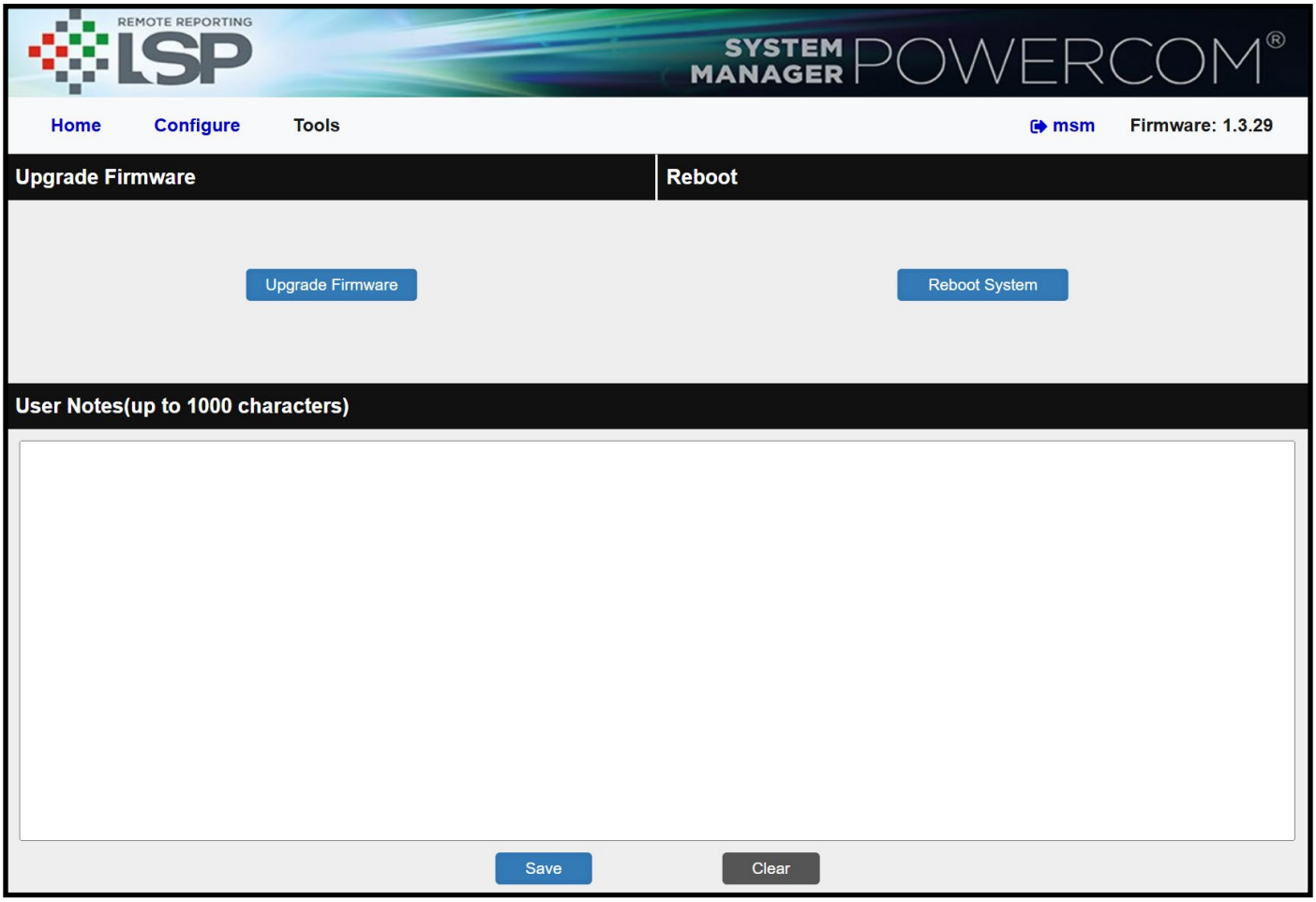


Figure 3.9 - The Tools Page

Upgrading Firmware

The Upgrade Firmware section is at the top left of the Tools page (See Figure 3.9). To upgrade the firmware, first ensure that the new firmware file is available on your computer, then click the "Upgrade" button and the Upgrade window will appear.

Click the "Browse..." button and locate the new firmware file with the file extension ".bin" on your computer. Once the file is selected, click the "Download" button to temporarily download the new firmware into the RAM of the NetLink board. This process will take from 30 seconds to three minutes depending on network speed and traffic, and the message box will display "Download...". Once the firmware is loaded into the NetLink's RAM, it can then be burned to the processor in the NetLink. Verify the correct file name and click the "Confirm" button to confirm the upgrade. Next click the "Burn" button to begin burning the firmware to the NetLink's processor.

⚠ **Note:** Please review the "Read Me" file included with the firmware download and install any bridge updates that may be required before updating to the latest version.

⚠ **Note:** This process may take up to 12 minutes - ***DO NOT REMOVE POWER TO THE NetLink DURING THIS PROCESS*** or the NetLink will be rendered nonfunctional.

Once the update is complete, a message will appear in the message box indicating "Update Finished". The NetLink will reboot automatically in order to start the new firmware. The reboot will take 1-2 minutes to complete.

⚠ **Note:** *While the device is rebooting, the browser history / cache should be cleared before accessing the NetLink again to prevent any cached pages from giving outdated information.*

Rebooting the NetLink Board

The "Reboot" section is on the top right of the Tools page (See Figure 3.9). To reboot the NetLink, click the "Submit" button. Once the "Confirm Reboot" message appears in the Message window, click the OK button to Confirm the reboot. The rebooting process will take approximately 1-2 minutes, during which time you will lose communication with the NetLink. Communication will be restored once the blue (yellow on Gen 1) LED lights steady.

⚠ **Note:** Operating of all connected modules within the system will remain fully operational during and after the reboot.

User Notes

This section allows the user to enter notes such as service history, installation specifics, reminders, etc. Up to 1000 characters may be entered.

3.4 Understanding The Email Report

The report file sent by email by the NLC is sent as an unformatted .CSV file. Many programs, such as Microsoft Excel, will import a .CSV file to allow viewing of the data (See Figure 3.10). Note that the fields included will vary depending on the specific system and which parameters are selected in the Reporting sections. See the manual for the connected device for information about that device's parameters.

The example in Figure 3.10 has been reformatted for better readability in Excel. The columns show the stored data by date & time for the NLC and any connected devices. The columns are:

Device Name	This column shows which device the associated parameter belongs to. In this example, the devices are the NetLink and FP-1.
Parameter Name	This column shows the available parameters which are being monitored. These parameters vary depending on the device(s) connected to the NetLink and the reporting parameters selected.
Date/Time Stamp	To the right of the Parameter Name column are one or more columns with date/time stamps. These columns are the data, measured at the dates and times listed. The number of columns displayed is set by the "Report Number" field setting on the Configure page.

A1 | Device Name

	A	B	C	D	E	F	G	H	I
1	Device Name	Parameter Name	2024-12-11 11:21:05	2024-12-11 11:19:09	2024-12-11 11:11:52	2024-12-11 05:26:50	2024-12-11 05:21:47	2024-12-11 01:13:43	2024-12-11 0
2			1	2	3	4	5	7	
3	Netlink	Status	FP-1 System Fault Yes	FP-1 System Fault Yes	FP-1 System Fault Yes	FP-1 System Fault Yes	FP-1 System Fault Yes	FP-1 System Fault Yes	FP-1 System
4	Netlink	System Version	1.3.29	1.3.29	1.3.29	1.3.29	1.3.29	1.3.29	1.3.29
5	Netlink	Group Name							
6									
7	FP-1	Model Number	G2 FPO150	G2 FPO150	G2 FPO150	G2 FPO150	G2 FPO150	G2 FPO150	G2 FPO150
8	FP-1	Version	1.2	1.2	1.2	1.2	1.2	1.2	
9	FP-1	System Fault Status	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	FP-1	System Fault Description	External Fault	External Fault	External Fault	External Fault	External Fault	External Fault	External Faul
11	FP-1	AC Fault Status	No	No	No	No	No	No	No
12	FP-1	FAI Status	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
13	FP-1	FAI Latch	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
14	FP-1	Output voltage(Volts)	25.07	25.07	25.07	25.07	25.07	25.07	
15	FP-1	Output Current(Amps)	0.44	0.44	0.4	0.44	0.44	0.44	
16	FP-1	Input AC Voltage(Volts)	130.35	130.67	130.67	130.02	130.02	129.37	
17	FP-1	Battery Fault Detect	Active	Active	Active	Active	Active	Active	Active
18	FP-1	Battery voltage(Volts)	0	0	0	0	0	0	
19	FP-1	Battery Charger Current(Amps)	0.12	0.12	0.12	0.12	0.12	0.12	
20	FP-1	Total Power-up Time(Hours)	28227	28227	28227	28221	28221	28217	
21	FP-1	Battery Installed Time(Hours)	25161	25161	25161	25161	25161	25161	
22	FP-1	AC Fault Total	25	25	25	25	25	25	
23	FP-1	System Fault Total	54	54	54	54	54	54	
24	FP-1	BBattery Runtime Test Total	26	26	26	26	26	26	
25	FP-1	Battery Runtime Test Failed Total	5	5	5	5	5	5	
26	FP-1	Repeat Test Interval	0	0	0	0	0	0	
27	FP-1	Battery State of Charge	0	0	0	0	0	0	
28	FP-1	Required Standby(Hours)	0	0	0	0	0	0	
29	FP-1	Actual Standby(Hours)	0	0	0	0	0	0	
30	FP-1	Battery Life	0	0	0	0	0	0	
31	FP-1	Battery Capacity	0	0	0	0	0	0	

Figure 3.10 - Example Email Report CSV File

Appendix 1 – Software Agreement

LIFESAFETY POWER INC. SOFTWARE LICENSE AGREEMENT AND WARRANTY STATEMENT

NOTICE: PLEASE READ THIS DOCUMENT CAREFULLY. This Software License Agreement ("AGREEMENT") defines and governs use of LIFESAFETY POWER INC. Software and includes WARRANTY DISCLAIMERS. Your acceptance of this AGREEMENT is an acknowledgement, representation and warranty that you have the full right and authority to enter into, execute, and perform obligations under this AGREEMENT, or that you have the authority to enter into and execute this AGREEMENT as an Authorized Representative of a business entity or corporate entity and to bind that business entity or corporate entity to perform obligations under this AGREEMENT by your acceptance, acknowledgment and representation.

TERMS AND CONDITIONS

1. Definitions.
   - (a) "Authorized Representative" refers to any person duly authorized by a business entity or corporate entity (i.e. a "legal entity") to enter into this AGREEMENT and to bind the legal entity to the terms and conditions herein.
   - (b) "Recipient" refers to any individual or legal entity, entering into and executing this AGREEMENT for purposes of use of LIFESAFETY POWER INC. Software, where "use" is as defined by this AGREEMENT.
   - (c) "Documentation" refers to any related explanatory written materials or files including, without limitation, any end-user manual, specifications or other written materials provided to Recipient for the Software.
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(i) Corporate Headquarters, Mailing Address: LIFESAFETY POWER INC., 304 Terrace Drive, Mundelein, IL, 60060 USA.

(ii) Website Address: www.lifesafetypower.com

(b) Independent Contractors. The parties are independent contractors and will so represent themselves in all regards. Neither party is the agent of the other and neither may bind the other in any way. Nothing in this AGREEMENT is intended or shall be construed to create between the Parties a relationship of principal and agent, partners, joint venturers, or employer and employee. No Party shall hold itself out to others or seek to bind or commit another Party in any manner inconsistent with this AGREEMENT.

(c) No Waiver. Neither party will be deemed to have waived any of its rights under this AGREEMENT by lapse of time or by any statement or representation other than (i) by an Authorized Representative and (ii) in an explicit written waiver. No waiver of a breach of this AGREEMENT will constitute a waiver of any prior or subsequent breach of this AGREEMENT.

(d) Force Majeure. To the extent caused by force majeure, no delay, failure, or default will constitute a breach of this AGREEMENT.

(e) Choice of Law & Jurisdiction. This AGREEMENT shall be governed solely by the internal laws of the State of Illinois, without reference to such State's principles of conflicts of law. The parties consent to the personal and exclusive jurisdiction of the federal and state courts of Illinois, United States of America.

(f) Severability. All of the provisions of this AGREEMENT are intended to be distinct and severable. To the extent permitted by applicable law, the parties hereby waive any provision of law that would render any clause of this AGREEMENT invalid or otherwise unenforceable in any respect. In the event that a provision of this AGREEMENT is held to be invalid or otherwise unenforceable, such provision will be interpreted to fulfill its intended purpose to the maximum extent permitted by applicable law, and the remaining provisions of this AGREEMENT will continue in full force and effect.

(g) Conflicts among Attachments. In the event of any conflict between the terms of this main body of this AGREEMENT and those of any attachment including those of any documentation, the terms of this main body will govern.

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