

# Juice Box Users Manual



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# Table of Contents

# Page

1. Package Contents.....	3
2. Introduction.....	3
3. Power over Ethernet Basics.....	3
4. Installation.....	4
5. LED Indicators.....	5
6. WEB Page Interface.....	6
7. SNMP Interface.....	7
8. RS232 Serial Interface.....	9
9. Change Network Settings.....	10
10. Change Web Page Pass Word.....	11
11. Port Configuration.....	12
12. Port Status Messages.....	14
13. Power Availability.....	15
14. Compatible Devices.....	16
15. Firmware Updates, Introduction.....	16
16. Network Controller Firmware Update.....	17
17. System Controller Firmware Update.....	17
18. Technical Specifications.....	18
19. Technical Support.....	20
20. Regulatory Compliance.....	20
21. Warranty.....	21

## 1. Package Contents

- Juice Box Ethernet Power Hub
- AC Line Cord (AC Input Units)
- DC Connector & Pins (DC Input Units)
- Rack mounting hardware including 2 mounting brackets and 4 black 8/32 by 5/16” flat head screws.
- Chassis feet for table mounting
- Juice Box CD ROM

If any of the above items are missing please contact System Engineering International customer support at 800-765-4734, or support@seipower.com.

## 2. Introduction

The Juice Box is a Power over Ethernet, PoE, mid span power hub. It allows a compatible device, such as a VoIP telephone or Wireless Access Point to receive both signal and power over the same cable. The Juice Box is fully compliant with the IEEE 802.3af standard but will also detect and power many legacy devices. Some legacy devices can be connected directly to the Juice Box while others may need an adapter. Please contact System Engineering International Technical Support if you need help determining your devices PoE compatibility.

The Juice Box is easy to install and takes only 1U of rack space. A WEB page based interface simplifies installation and configuration. An SNMP interface allows for continuous monitoring of port activity.

## 3. Power over Ethernet Basics

As the name implies, Power over Ethernet, (PoE), allows the Ethernet cable to carry power as well as signal to a device. A standard Ethernet cable has 8 conductors. On 10/100 Base T Ethernet pins 1, 2, 3, and 6 carry the Ethernet signal; pins 4, 5, 7, and 8 are normally unused. PoE uses the “unused” connections to supply power to compatible devices.

A Power over Ethernet mid span power hub has two RJ45 connectors per port, the DATA connection and the DATA + POWER connection. The Ethernet signal from the network switch

is connected to the DATA port. Inside the Juice Box a direct connection is made between the DATA PORT and the DATA + POWER port for the Ethernet signal, pins 1, 2, 3, and 6. On the DATA+POWER port, pins 4, 5, 7, and 8 are connected to special detection and power supply circuitry. This circuitry monitors the power connections for a special signature. If this signature is detected, then and only then is power supplied.

The power supplied by the Juice Box is 48 volts DC at a maximum current of 350 mA. This allows for a maximum output power of 16 watts. The actual power available to a device will depend on line loss. On a very short line the full 16 watts of output power is available. On the maximum specified Ethernet line of 100 meters the power available to a device will be no less than the 802.3af specification of 12.95 watts. This is the maximum power an 802.3af compatible device should use. Although a device can use as much as 12.95 watts, many devices use much less power, usually between 4 and 10 watts. Some devices also specifically limit their power availability below the 12.95 watts, to free up power for other devices, using a system of Device Classification. (See the section on Power Availability).

## 4. Installation

1. Check the package contents to insure you have all your components.
2. Mount the Juice Box in a rack or apply the rubber feet for table mounting.
3. Attach the AC line cord and plug into a standard outlet, or for DC units connect to a DC power source using the included connector and pins.
4. For units that include the WEB/SNMP interface, the Juice Box comes from the factory with the following network settings:
  - IP Address: 192.168.0.30
  - Subnet Mask: 255.255.255.0
  - Gateway: 0.0.0.0

You can use these settings if your computer has an IP address within the same range and this address is not currently in use on your network. If your computer has a different IP address range, or the default address is currently in use, or you will have multiple Juice Boxes on the same network you will then have to modify the network settings. To change the network settings please go to Change Network Settings in the RS232 Interface section in this manual.

5. The Juice Box comes from the factory with all Ports configured as the following:
  - Load detection: IEEE 802.3af only
  - Max Port Power: 15 watts

These settings will allow the Juice Box to power any IEEE 802.3af compatible device up to the full rated specification power limit. You can modify the port settings to detect legacy devices or limit the individual port power. To change the port settings please go the Port Settings section in this manual.

#### 6. Connect devices to be powered.

- First determine if the device is designed to meet 802.3af or is a compatible legacy device. If you are unsure please see the section on Compatible Devices.
- Select an unused port and configure the port according to the device to be connected.
- Connect a patch cord from the Ethernet switch to the Juice Box DATA input connector. (The DATA input connector is the lower one of the port pair).
- Connect the Ethernet line that goes to the device to be powered to the DATA + POWER output connector. (The DATA + POWER output connector is the upper one of the port pair).
- When you connect a device, the Port LED indicator should change color to green to indicate the Juice Box is providing power to the device. Please see the LED Indicator section for a full description of the different Port LED Indicator colors.

## 5. LED Indicators

There are three different types of LED indicators in the Juice Box:

- Power over Ethernet Port Indicator
- System Power Indicator
- Ethernet Link Indicator (Units with WEB/SNMP Interface)

The **PoE Port** indicator gives the following information:

- Green – The Juice Box is providing power to the attached device.
- Flashing Green – The Juice Box has detected a valid signature from the device but the current drawn by the device is below the minimum of 10mA. This would happen only if it were a defective 802.3af device or an unusual legacy device.
- Yellow – The Juice Box has detected a fault condition. The Juice Box will indicate a fault condition if any of the following occur:
  - The power drawn by the device exceeds the amount in the Port Power Setting.
  - The power drawn by the device exceeds the Device Classification.

- The device draws more than 350 mA of current.
- The device has a short between the power connections, 4/5 and 7/8.

The **System Power** indicator is steady green when AC power is applied to the unit.

The **Ethernet Link** indicator has the two following modes:

- Steady green when network connection is established.
- Flashing green during network activity.

## 6. WEB Page Interface

A sample image of the Juice Box WEB page interface is show below.

The screenshot shows the Juice Box WEB page interface. At the top, it displays "Juice Box Live Demo 192.168.10.20" and a "Refresh" button. The main content is a table with the following columns: PORT DESCRIPTION, DETECTION METHOD, MAX PORT POWER, CLASS, STATUS, and OUTPUT POWER. The table lists 24 ports, with various statuses such as "DELIVERING POWER" and "OPEN". To the right of the table, there is a "Juice Box" logo, the "SEI Telephony Products" logo, and a "SYSTEM STATUS" section. The system status section includes: SYSTEM VOLTAGE: 48.1Vdc, POWER DELIVERED: 60W, POWER ALLOCATED: 89W, HUB TEMPERATURE: 29°C, and WEB PAGE REFRESH: 10 min. Below the system status, there is a "FIRMWARE VERSION" section with: SYSTEM CONTROLLER: v1.01 and NETWORK CONTROLLER: v1.13. At the bottom, there is a "PORT STATUS KEY" with icons for DELIVERING POWER (green circle), ENABLED AND SEARCHING (white circle), FAULT (yellow circle), and DISABLED (crossed circle).

PORT DESCRIPTION	DETECTION METHOD	MAX PORT POWER	CLASS	STATUS	OUTPUT POWER
1: PORT 1	LEGACY & 802.3af	15W	CLASS 0	DELIVERING POWER	4.4W
2: PORT 2	LEGACY & 802.3af	9W		OPEN	
3: PORT 3	LEGACY & 802.3af	4W	CLASS 1	DELIVERING POWER	3.2W
4: PORT 4	LEGACY & 802.3af	9W		OPEN	
5: PORT 5	LEGACY & 802.3af	9W	CLASS 0	DELIVERING POWER	7.8W
6: PORT 6	LEGACY & 802.3af	9W		OPEN	
7: PORT 7	LEGACY & 802.3af	4W	CLASS 1	DELIVERING POWER	2.1W
8: PORT 8	LEGACY & 802.3af	9W		OPEN	
9: PORT 9	LEGACY & 802.3af	9W	CLASS 0	DELIVERING POWER	8.3W
10: PORT 10	LEGACY & 802.3af	9W		OPEN	
11: PORT 11	LEGACY & 802.3af	9W	CLASS 0	DELIVERING POWER	7.5W
12: PORT 12	LEGACY & 802.3af	9W		OPEN	
13: PORT 13	LEGACY & 802.3af	9W	CLASS 0	DELIVERING POWER	7.6W
14: PORT 14	LEGACY & 802.3af	4W	LEGACY	DELIVERING POWER	3.2W
15: PORT 15	LEGACY & 802.3af	9W	CLASS 0	DELIVERING POWER	7.5W
16: PORT 16	LEGACY & 802.3af	13W		OPEN	
17: PORT 17	LEGACY & 802.3af	9W		OPEN	
18: PORT 18	LEGACY & 802.3af	9W		OPEN	
19: PORT 19	LEGACY & 802.3af	4W	CLASS 1	DELIVERING POWER	3.2W
20: PORT 20	LEGACY & 802.3af	9W		OPEN	
21: PORT 21	LEGACY & 802.3af	4W	CLASS 1	DELIVERING POWER	1.6W
22: PORT 22	LEGACY & 802.3af	9W		OPEN	
23: PORT 23	LEGACY & 802.3af	9W	LEGACY	DELIVERING POWER	3.9W
24: PORT 24	LEGACY & 802.3af	9W		OPEN	

GLOBAL/SYSTEM:  PORT STATUS KEY:  DELIVERING POWER  ENABLED AND SEARCHING  FAULT  DISABLED

There are four information windows in the Juice Box WEB page interface:

- Unit Identifier
- Port Status
- System Status
- Firmware Version

**Unit Identifier** – This window displays the System Name and IP address. The system name can be changed by clicking on the Global System hyperlink and entering the new name in the System Name variable entry box. To change the IP address please see the “Change Network Settings” section.

**Port Status** – The Port Status window gives a quick visual reference of the status of each port and provides the capability to make both individual and global port changes to port designation, detection method and max port power. (See the Port Settings section for a detailed explanation of these functions.)

**System Status** – The System Status window displays information on important system parameters.

**Firmware Version** – The Firmware Version window displays the Network Controller and System Controller firmware version.

The Web Page interface can be password protected by entering a non-blank username and password. The Juice Box comes from the factory with the username and password blank. To change the username and password see the “Change Web Page Password” section of the manual.

## 7. SNMP Interface

The Juice Box SNMP interface is SNMPv1. SEI’s Enterprise number is 20364. The current Juice Box MIB is available on the Juice Box CD. Updated versions of the MIB will be available on the Juice Box web page.

All variables that can be read or set through the WEB page are available through the SNMP interface. Detailed explanations of these variables are available in their respective section of the manual.

The following are the individual port objects and main objects. Objects marked “R” are read only, objects marked “R/W” are read write.

### Port Objects

- Port Detection Setting (R/W)
- Port Max Power (R/W)
- Port Description (R/W)
- Port Status (R)
- Port Classifications (R)
- Port Power Delivered (R)

## Main Objects

- Global Max Power (R/W)
- Global Port Detection (R/W)
- Trap Destination IP Address (R/W)
- Trap Re-Transmission Period (R/W)
- Allocated Power Threshold (R/W)
- Total Power Delivered (R)
- Total Available System Power (R)
- Network Controller Firmware Version (R)
- System Controller Firmware Version (R)
- Total Power Allocated (R)
- Main System Voltage (R)
- Main System Temperature (R)

## SNMP Security

The “Get Community” and “Set Community” default values are “public” and “private” respectively. These can be changed via the RS232 interface using the “snmp config” command.

To change the get and set values use the following procedure:

- Connect your computer to the Juice Box via the RS232 interface using a standard serial cable.
- Start up the terminal adapter program.
- Press the Enter key, type “snmp status”, (case insensitive), then press the Enter key again.
- The current Juice Box SNMP settings will be displayed.
- Type “snmp config”, then press the Enter key. The system will respond with “ENTER SNMP GET COMMUNITY”. (If you make a mistake you can hit the “Backspace” key then re-enter the character.)
- Enter the “Get Community” value, then press the Enter key. The system will respond with “ENTER SNMP SET COMMUNITY”.
- Enter the “Set Community” value, then press the Enter key. The system will respond by displaying the entered values

## 8. RS232 Serial Interface

The RS232 Serial Interface can be used to view and set all system variables including the individual port and network interface parameters. To use the RS232 interface you will need a terminal adapter program such as Windows Hyper Terminal. Set up the terminal adapter program with the following parameters:

- Baud rate – 9600
- Data Bits – 8
- Stop Bits – 1
- Parity – None

There are eight RS232 Interface commands which are listed below. All commands are not case sensitive. For commands that report network information, NETWORK CARD NOT INSTALLED, will be reported for systems without a network card.

**system status** – reports the current firmware versions, network settings, Web Page username and password, SNMP community names, and the system power parameters (power delivered, power allocated, system voltage, internal temperature).

**ip status** – reports the current network settings.

**ip config** – used to change the Juice Box IP address, Subnet Mask, and Default Gateway.

**snmp status** – reports the current SNMP “Get Community” and “Set Community” values.

**snmp config** – used to change the SNMP “Get Community” and “Set Community” values.

**set pw** – used to change the WEB interface username and password.

**port status** – reports the detection setting, max power and connection status for each port and the system power parameters (power delivered, power allocated, system voltage, temperature)

**port config** - reports the detection setting, max power and connection status for each port and the system power parameters (power delivered, power allocated, system voltage, temperature). Then permits the user to modify the detection setting and the max power setting for each port.

## 9. Change Network Settings

The Juice Box comes from the factory with the following network settings:

- IP Address: 192.168.0.30
- Subnet Mask: 255.255.255.0
- Gateway: 0.0.0.0

You can use these settings if your computer has an IP address within the same range and this address is not currently in use on your network. If your computer has a different IP address range, or the default address is currently in use, or you will have multiple Juice Boxes on the same network you will then have to modify the network settings.

To change the Juice Box network adapter settings use the following procedure:

- Connect your computer to the Juice Box via the RS232 interface using a standard serial cable.
- Start up the terminal adapter program.
- Press the Enter key then type “ip status”, (case insensitive), and press the Enter key again.
- The current Juice Box network settings will be displayed.
- Type “ip config”, press the Enter key, then follow the prompts to enter the IP Address, Subnet Mask, and Gateway.
- If you make a mistake you can hit the “Backspace” key then re-enter the character or press the Enter key which will cause the Juice Box to respond with “Invalid Entry” and allow you to enter the information again.
- If you press the Enter key three times the IP Config process will be aborted.
- If the new entry is successful the Juice Box will respond with the new settings.

## 10. Change Web Page Pass Word

The Juice Box Web Page Username and Password can be changed using either the WEB Interface or the Serial Interface. The maximum length for the Username and Password is 10 characters. All characters are valid except spaces. The Username and Password are case sensitive.

To change the Username and Password using the serial interface:

- Connect your computer to the Juice Box via the RS232 interface using a standard serial cable.
- Start up the terminal adapter program.
- Hit the Enter key then type “set pw”, (case insensitive), and press the Enter key again. The Juice Box will respond with “ENTER USER NAME”.
- Enter the username and press Enter. (). If no characters are entered the username will be blank. The Juice Box will respond with “ ENTER PASSWORD”.
- Enter the password. The Juice Box will respond by displaying both the Username and the Password.

To change the Username and Password using the WEB interface:

- Connect the Juice Box to a network switch that your computer has access to. (Or use a cross over cable with a direct connection). The Juice Box network connector is the RJ45 jack on the right side of the chassis above the DB9 connector.
- Open your Web browser and type “<http://>” and the IP address of the Juice Box into the URL address box. Then press Enter. (The factory default IP address is 192.168.0.30.) You should now see the Juice Box Web Page. (If you’ve programmed a username and password you’ll have to enter these first on the Log-in screen).
- Click on GLOBAL/SYSTEM link. The SYSTEM/GLOBAL PORT CONFIGURATION page will appear.
- Click on the CHANGE PASSWORD link. The CHANGE PASSWORD page will appear.
- Enter the current password in the box provided. If there is no current password, the CURRENT PASSWORD input box will be disabled.
- If desired, edit the USERNAME.
- Enter the new password twice.
- To remove password protection, leave the new password boxes blank and check the REMOVE PASSWORD PROTECTION box.
- Click on SUBMIT CHANGES.
- The Log-in window will appear after the password has been changed. The new password (and username, if it was changed) must be entered. If REMOVE PASSWORD PROTECTION was selected, then enter a blank username and password in the Log-in window.

## 11. Port Configuration

The Juice Box PoE ports can be configured for user defined port designations, device detection and maximum output power allowed. The factory default configuration is all ports set to:

- Port designation defaults to port number
- 802.3af detection only.
- Maximum power of 15 watts.

### Port Designations

The port designations are user defined up to a maximum of 30 characters.

### Device Detection

- **802.3af Only** – The Juice Box will supply power to the device only if it presents a valid 802.3af PD signature.
- **Legacy and 802.3af** – Power will be supplied to the device if it presents an 802.3af signature or if it has an impedance between approximately 4,000 ohms and 60,000 ohms. (This detection should be used ONLY if the device connected to the port is compatible with power connections to 4/5 and 7/8 with 48 volts on Pins 4/5 and 48 volt return on Pins 7/8).
- **Disabled** – Power is never applied to the port.
- **Forced On** – Power is always applied to the port. (This setting should only be used by a qualified technician as damage could occur to a non-compatible device.)

### Maximum Port Power

There are six possible operating modes where the Juice Box will output power to a load. These are:

- 802.3af Class 0
- 802.3af Class 1
- 802.3af Class 2
- 802.3af Class 3
- Legacy
- Forced ON

The maximum port power for Class 1, 2, and 3 is defined by the 802.3af specification as 4, 7, and 15.4 watts respectively. For 802.3af Class 0, Legacy, and Forced ON modes, the maximum port power can be set between 1 and 15 watts in 1 watt increments. If a load draws up to 1 watt over the allocated power the system will respond with an OVER-POWER warning in the port status information. If the load draws more than 1 watt over the allocated power, the system will disconnect the load and indicate a POWER FAULT condition.

The port configuration can be changed using either the WEB Interface or the Serial Interface.

### **WEB Interface Port Configuration**

- Connect the Juice Box to a network switch that your computer has access to. (Or use a cross over cable with a direct connection). The Juice Box network connector is the RJ45 jack on the right side of the chassis above the DB9 connector.
- Open your Web browser and type "<http://>" and the IP address of the Juice Box into the URL address box. Then press Enter. (The factory default IP address is 192.168.0.30.) You should now see the Juice Box Web Page. (If you've programmed a user name and password you'll have to enter these first on the sign on screen).
- Select the port you wish to change by clicking on the link for that port. Click on the Global link if you want to change all ports.
- Type in a new port designation if desired.
- Select the Port Detection Method from the DETECTION Method pull down menu.
- Select the maximum power from the MAX PORT POWER pull down menu.
- Click on UPDATE SETTINGS.

### **Serial Interface Port Configuration**

- Connect your computer to the Juice Box via the RS232 interface using a standard serial cable.
- Start up the terminal adapter program.
- Press the Enter key, type "port config", (case insensitive), then press the Enter key again.
- The current settings for all ports will be displayed.
- Enter the port number to change, press the Enter key, press "M" for modify, then follow the prompts to change the detection setting and max port power.
- If the "Enter" key is press for the selection then the current variable is kept unchanged.
- If you make a mistake you can hit the "Backspace" key then re-enter the character.
- If the "Enter" key is continually pressed you will exit the Port Configuration routine.

## 12. Port Status Messages

The system will display different Port Status messages depending on whether or not the system is delivering power and the status of the load. There are eleven different messages as defined below.

The following are Port Status messages displayed while the system is delivering power to the load.

- Delivering Power – Normal operation, no fault conditions.
- Over Power Warning – The load is drawing more power than specified by the 802.3af classification or the Max Port power setting. The system will allow up to 1 watt of power over the maximum to be drawn before the load is disconnected.

The following are Port Status messages displayed when the system is NOT delivering power to the load.

- Detect R High – The system has detected a signature resistance higher than the 802.3af specification of 26.5K.
- Detect R Low - The system has detected a signature resistance lower than the 802.3af specification of 19.0K.
- Insufficient Power Fault – All available system power has been allocated and there is none available for this port.
- Low Current Disconnect – The load is drawing less than the 802.3af specification of 10mA to stay connected. The 10mA minimum load current also applies to Legacy devices.
- Open – The system is not detecting any loads on this port.
- Over Current Fault – The load is drawing more current than the 802.3af specification of 350mA. This also applies to Legacy devices.
- Over Power Fault - The load is drawing over 1 watt more than either the 802.3af Classification amount or the Max Port power setting.
- Short Circuit – The system has detected a signature resistance of less than 3K.
- Start Up Fault – The load is drawing too much current too quickly in the detection process. This fault is usually only associated with certain Legacy devices, but could occur with a defective 802.3af device.

## 13. Power Availability

The PH24DC/NN, PH12DC/NN, PH12/NN, and PH6/NN models can provide the full 802.3af 15.4 watts per port for all ports.

The PH24/NN can provide 15.4 watts per port for up to 14 ports or up to 9 watts per port for all 24 ports. The following information pertains to the PH24/NN models only.

As devices are connected, the PH24/NN will allocate power to that port based on one of two methods. Method 1 is the IEEE 802.3af Device Classification system. Each 802.3af compatible device will have one of the four classifications as defined in the following table.

<b>Class</b>	<b>Minimum PSE Output Power</b>	<b>Class Description</b>
0	15.4 watts	Unknown Power
1	4.0 watts	Low Power PD
2	7.0 watts	Medium Power PD
3	15.4 watts	Full Power PD

The second method is the “Max Port Power” setting on the Port Status and Configuration web page. The “Max Port Power” can be set from 1 to 15 watts in 1 watt increments. This setting is only valid for 802.3af Class 0, Legacy, and Forced On modes. For Class 1, 2, and 3, the Juice Box will meet the 802.3af specification for minimum output power for the detected device class.

The PH24/NN will allocate power to newly connected devices until all 220 watts have been allocated. If the next device connected would require the PH24/NN to allocate more than 220 watts, then that device will not be powered.

These features allow the PH24/NN to provide power to more devices, since the system can allocate less than the maximum to any one device. If all ports are configured for maximum power then only 14 devices can be connected. If the max power is limited to 9 watts, then the PH24/NN can provide power to all 24 ports.

If your device is an 802.3af Class 0 or a Legacy device then you should set the “Max Port Power” to a value just high enough to insure that the unit is continuously powered. To do this, find the max device power in the product specifications or from the manufacturer. For devices that use 1 to 6 watts add 1 watt for the “Max Port Power” setting. For devices that use 7 to 13 watts add 2 watts for the “Max Port Power” setting.

## 14. Compatible Devices

Devices to be directly connected to the Juice Box must either be designed to meet the 802.3af standard or be a compatible legacy device. Devices that meet the 802.3af standard will have an appropriate statement printed in the brochure, user's manual or other product literature. A compatible legacy device must meet the following criteria:

- Be able to accept 48 volts DC on pins 4/5 and 48 volt DC return on pins 7/8.
- Draw more than 10 mA and less than 350 mA of current.
- Present an impedance on pins 4/5 and 7/8 between approximately 4,000 ohms and 60,000 ohms

The Juice Box web site [www.seipower.com/ethernet.htm](http://www.seipower.com/ethernet.htm) contains a list of known compatible devices. However, because there are so many, not all compatible devices are listed. If you're device is not listed or you're not sure if it is compatible please contact the device manufacturer or SEI Technical Support.

Devices that cannot be directly connected to the Juice Box may still be powered via PoE by utilizing an adapter or splitter. Please contact SEI Technical Support for the appropriate device recommendation.

## 15. Firmware Updates, Introduction

The Juice Box has two microprocessor controllers with separate firmware. One is the Network Controller and the other is the System Controller. The Network Controller runs the network interface, WEB page server, and the SNMP interface. The System Controller performs all other functions such as port load detection, power allocation, LED control, etc. The Network Controller's firmware is updated through the network interface using the "Network Controller Firmware Update" utility. The firmware for the System Controller is updated through the RS232 interface using the "System Controller Firmware Update" utility.

## 16. Network Controller Firmware Update

1. If you have not done so already connect the Juice Box to your network and make sure the Juice Box network settings are compatible with your computer. (See Network Settings).
2. Go to the SEI WEB page, [www.seipower.com](http://www.seipower.com). Click on the “Power over Ethernet” link, then click on “Firmware Download”. This will download a ZIP file containing the most recent Network RAM Loader Firmware, (JBRLVx\_x.bin), and Network Controller Firmware, (JBNetCntlVx\_x.bin). Save the ZIP file to a temp directory and extract the bin files.
3. Insert the Juice Box CD into your CD drive.
4. Using Explore, look at the contents of the CD.
5. Open the “Network Controller Firmware Update” directory and copy the UDPDownload.exe and UDPDownload.ini files to the same temp directory as in step 2 above. Double click on the UDPDownload.exe file. This will start the “Network Controller Firmware Update” utility.
6. When the program is started it will search for all Juice Boxes on your network and list them in the Board List/Status window. You can also do a manual search by clicking on Search in the tool bar.
7. Select the Network RAM Loader firmware file you downloaded in step 2 in the RAM Loader selection window.
8. Select the Network Controller firmware file that you downloaded in step 2, in the User Program window.
9. Click on Download in the tool bar.
10. Select the Juice Box IP address(es) to be updated and click on OK. The update utility will install the new firmware, restart the Juice Box(es) Network Controller(s), and re-scan all Juice Boxes on the network so you can visually verify that the firmware has been updated in each unit.
11. Exit the program when completed.

## 17. System Controller Firmware Update

1. Connect the Juice Box to your computer via the RS232 interface using a standard serial cable.
2. Insert the Juice Box CD into your CD drive.
3. Using Explore, look at the contents of the CD.
4. Open the “System Controller Firmware Update” directory and double click on “setup”. This will install the “System Controller Firmware Update” utility.
5. When the install screen appears click on the “Install” button. On the next screen click on “Continue” button.
6. Follow any necessary prompts and when the setup has completed, click on “OK”.

7. Go to the SEI WEB page, [www.seipower.com](http://www.seipower.com). Click on the “Power over Ethernet” link, then click on “Firmware Download”. This will download a ZIP file containing the most recent System Controller Firmware, JBSysCntlVx.x.hex.. Save the ZIP file to a temp directory and extract the hex file.
8. Click on “Start”, highlight “Programs”, then click on “Juice Box System Controller Firmware Update”. When the program starts it will search for the Juice Box and if found will display “JuiceBox Detected” in the status window.
9. If the Juice Box is not detected check the RS232 connection.
10. Click on the “Load Hex File” icon in the tool bar and select the file you downloaded in step 7. When the file is loaded “HEX file imported” will be seen in the status display.
11. Click on the “Reprogram Device” icon in the tool bar.
12. When reprogramming is finished the Juice Box will restart.
13. Exit the program.

## 18. Technical Specifications

### Interfaces

- WEB/SNMP (PH24, PH24DC, PH12, PH12DC, PH6, PH6NN)
- Serial RS232

### Input Power - AC Models

- Input Voltage: 85 VAC to 240 VAC
- Input Power: PH24 - 275 watts max  
PH12 – 230 watts max  
PH6 – 115 watts max

### Input Power - DC Models

- Input Voltage: 46 VDC to 57 VDC (Voltage input terminals are isolated from chassis/earth ground)
- Input Current: PH24DC – 8.8 amps max  
PH12DC – 4.4 amps max  
PH6DC – 2.2 amps max
- Input Connector: Molex 03-12-1036 housing with 18-12-1222 terminal

## Output Power

- Fully IEEE 802.3af compliant
- Pin assignments: Pins 4/5 – (+ 48 Vdc), Pins 7/8 – (48 Vdc return)
- Output voltage: 48 Vdc nominal
- Output power per Port: 15.4 watts max
- Output power Total: PH24DC – 382 watts max  
PH24 – 220 watts max  
PH12, PH12DC -191 watts max  
PH6, PH6DC – 96 watts max
- Output current: 10 mA (min) - 350 mA (max)

## LED Indicators

- PORT
  - Green – Providing Power
  - Flashing Green – Valid signature detected but below specification power consumption
  - Yellow – Fault
- LINK – Green when network connection is established. Flashing green during network activity.
- PWR – Green when Juice Box is powered.

## Physical Characteristics

- Width – 19.0 in, (483mm)
- Depth – 12.0 in, (305mm)
- Height – 1.75 in, (44mm)
- Weight – 9.0 lb (4.1 kg)

## Environmental

- Operating temperature: 32°F to 104°F, (0°C to +40°C)
- Storage Temperature: -4.0°F to 122°F, (-20°C to +50°C)
- Humidity: 0 to 95% non-condensing
- Thermal: PH12 & PH24 – 150 BTU/hr max  
PH6 – 75 BTU/hr max  
PH12DC & PH24DC – 25BTU/hr max  
PH6DC – 12 BTU/hr max

## Regulatory

- FCC Part 15 Class B
- UL 60950-1
- CAN/CSA 60950-1
- CE Mark

## 19. Technical Support

You can find software updates and user documentation on the System Engineering International website at [www.seipower.com](http://www.seipower.com).

SEI provides free technical support for customers worldwide for the warranty period of the product. Customers can contact SEI technical support by email or by phone.

SEI Technical Support over the Telephone: (800-765-4734)

SEI Technical Support via email: [support@seipower.com](mailto:support@seipower.com)

## 20. Regulatory Compliance

**FCC Statement:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**Safety:** This equipment has been tested and found to comply with safety requirements as stipulated by UL60950-1 and CAN/CSA-C22.2 No. 60950-1

## 21. Warranty

**Conditions:** Subject to the terms and conditions set forth herein, System Engineering International, (SEI), provides this Limited warranty for its product only to the person or entity that originally purchased the product from SEI or its authorized reseller or distributor.

**Limited Warranty:** SEI warrants that the hardware portion of the product will be free from material defects in workmanship and materials from the date of original purchase for the period of 2 years.

SEI's sole obligation shall be to repair or replace the defective Hardware during the Warranty Period at no charge to the original owner or to refund at SEI's sole discretion. Such repair or replacement will be rendered by SEI at an Authorized SEI Service Office. The replacement Hardware need not be new or have an identical make, model or part. SEI may in its sole discretion replace the defective Hardware (or any part thereof) with any reconditioned product that SEI reasonably determines is substantially equivalent (or superior) in all material respects to the defective Hardware. Repaired or replacement Hardware will be warranted for the remainder of the original Warranty Period from the date of original date of purchase.

**Limited Software Warranty:** SEI warrants that the software portion of the product ("Software") will substantially conform to SEI's then current functional specifications for the Software, as set forth in the applicable documentation, from the date of original purchase of the Software for a period of ninety (90) days ("Warranty Period"), provided that the Software is properly installed on approved hardware and operated as contemplated in its documentation. SEI's sole obligation shall be to replace the non-conforming Software (or defective media) with software that substantially conforms to SEI's functional specifications for the Software. Except as otherwise agreed by SEI in writing, the replacement Software is provided only to the original licensee, and is subject to the terms and conditions of the license granted by SEI for the Software. Software will be warranted for the remainder of the original Warranty Period from the date of original purchase.

**Submitting A Claim:** The customer shall return the product to the original purchase point based on its return policy. In case the return policy period has expired and the product is within warranty, the customer shall submit a claim to SEI as outlined below:

- The customer must submit with the product as part of the claim a written description of the Hardware defect or Software nonconformance in sufficient detail to allow SEI to confirm the same.
- The original product owner must obtain a Return Material Authorization ("RMA") number from the Authorized SEI Service Office and, if requested, provide written proof of purchase of the product (such as a copy of the dated purchase invoice for the product) before the warranty service is provided. To obtain an RMA contact SEI Customer Support at 800-765-4734.
- After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the

package. Do not include any manuals or accessories in the shipping package. SEI will only replace the defective portion of the Product and will not ship back any accessories.

- The customer is responsible for all in-bound shipping charges to SEI. No Cash on Delivery (“COD”) is allowed. Products sent COD will either be rejected by SEI or become the property of SEI. Products shall be fully insured by the customer and shipped to **System Engineering International, 5115 Pegasus Court, Suite Q, Frederick, MD 21704**. SEI will not be held responsible for any packages that are lost in transit to SEI. The repaired or replaced packages will be shipped to the customer via UPS Ground or any common carrier selected by SEI, with shipping charges prepaid. Expedited shipping is available if shipping charges are prepaid by the customer and upon request.

SEI may reject or return any product that is not packaged and shipped in strict compliance with the foregoing requirements, or for which an RMA number is not visible from the outside of the package. The product owner agrees to pay SEI’s reasonable handling and return shipping charges for any product that is not packaged and shipped in accordance with the foregoing requirements, or that is determined by SEI not to be defective or non-conforming.

***What Is Not Covered:*** This limited warranty provided by SEI does not cover: Products, if in SEI’s judgment, have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; Initial installation, installation and removal of the product for repair, and shipping costs; Operational adjustments covered in the operating manual for the product, and normal maintenance; Damage that occurs in shipment, due to act of God, failures due to power surge, and cosmetic damage; Any hardware, software, firmware or other products or services provided by anyone other than SEI; Products that have been purchased from inventory clearance or liquidation sales or other sales in which SEI, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product. Repair by anyone other than SEI or an Authorized SEI Service Office will void this Warranty.

***Disclaimer of Other Warranties:*** EXCEPT FOR THE LIMITED WARRANTY SPECIFIED HEREIN, THE PRODUCT IS PROVIDED “AS-IS” WITHOUT ANY WARRANTY OF ANY KIND WHATSOEVER INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IF ANY IMPLIED WARRANTY CANNOT BE DISCLAIMED IN ANY TERRITORY WHERE A PRODUCT IS SOLD, THE DURATION OF SUCH IMPLIED WARRANTY SHALL BE LIMITED TO NINETY (90) DAYS. EXCEPT AS EXPRESSLY COVERED UNDER THE LIMITED WARRANTY PROVIDED HEREIN, THE ENTIRE RISK AS TO THE QUALITY, SELECTION AND PERFORMANCE OF THE PRODUCT IS WITH THE PURCHASER OF THE PRODUCT.

***Limitation of Liability:*** TO THE MAXIMUM EXTENT PERMITTED BY LAW, SEI IS NOT LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY LOSS OF USE OF THE PRODUCT, INCONVENIENCE OR DAMAGES OF ANY CHARACTER, WHETHER

DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF GOODWILL, LOSS OF REVENUE OR PROFIT, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, FAILURE OF OTHER EQUIPMENT OR COMPUTER PROGRAMS TO WHICH SEI'S PRODUCT IS CONNECTED WITH, LOSS OF INFORMATION OR DATA CONTAINED IN, STORED ON, OR INTEGRATED WITH ANY PRODUCT RETURNED TO SEI FOR WARRANTY SERVICE) RESULTING FROM THE USE OF THE PRODUCT, RELATING TO WARRANTY SERVICE, OR ARISING OUT OF ANY BREACH OF THIS LIMITED WARRANTY, EVEN IF SEI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE SOLE REMEDY FOR A BREACH OF THE FOREGOING LIMITED WARRANTY IS REPAIR, REPLACEMENT OR REFUND OF THE DEFECTIVE OR NON-CONFORMING PRODUCT. THE MAXIMUM LIABILITY OF SEI UNDER THIS WARRANTY IS LIMITED TO THE PURCHASE PRICE OF THE PRODUCT COVERED BY THE WARRANTY. THE FOREGOING EXPRESS WRITTEN WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ANY OTHER WARRANTIES OR REMEDIES, EXPRESS, IMPLIED OR STATUTORY.

***Governing Law:*** This Limited Warranty shall be governed by the laws of the State of Maryland. Some states do not allow exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the foregoing limitations and exclusions may not apply. This limited warranty provides specific legal rights and the product owner may also have other rights which vary from state to state.