# PHOENIX II
# DIGITAL CONTROLLER
# OPERATION MANUAL

Product Manual Part Number: 4380405PD
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# FACTORY DEFAULT SETPOINTS AND SETPOINT LIMITS

Factory defaults are user definable via Phoenix II front panel rotary control knob or Web interface

| Description | Default | Range | Resolution |
|---|---|---|---|
| Battery on Discharge | 26.0 VDC | 20-30 VDC | 100mV |
| Plant High Voltage Alarm | 28.25 VDC | 20-30 VDC | 100mV |
| Low Voltage Alarm | 26.0 VDC | 20-30 VDC | 100mV |
| Plant Low Low Voltage Alarm | 23.0 VDC | 20-30 VDC | 100mV |
| Low Voltage Load Disconnect (A B C) | 21.0 VDC | 20-30 VDC | 100mV |
| Low Voltage Reconnect (A B C) | 24.5 VDC | 20-30 VDC | 100mV |
| Low Voltage Disconnect Time | 4 h | .1-10h | .1h |
| Total Current Alarm (% Applied Globally) | 100% | 0-100% | 1% |
| Ambient Temperature Alarm (Threshold 1) | 10°C | 0°C to 100°C | 1°C |
| Ambient Temperature Alarm (Threshold 2) | 40°C | 0°C to 100°C | 1°C |
| Plant Float* | 27.0 VDC | 23.5 – 28.5 VDC | 100 mV |
| Plant Equalize* | 27.0 VDC | 23.5 – 28.5 VDC | 100mV |
| Rectifier Max Current | 103 ADC | 0 – 103 ADC | 0.1 ADC |
| Rectifier HVSD | 28.5 VDC | 27.5 – 32.5 VDC | 100mVDC |
| Temperature Compensation Slope | 36mV per °C | 0-120 mV per °C | 1mV per °C |
| Distribution Current Alarm | 80% | 0-120% | 1% |
| Battery Temperature Alarm (Threshold 1) | 10°C | -40°C to 100°C | 1°C |
| Battery Temperature Alarm (Threshold 2) | 50°C | -40°C to 100°C | 1°C |
| Rectifier Current Imbalance | .25 | .10 – 1.0 | 1% |
| Rectifier Temp Max | 80°C | 0-100°C | 1°C |
| Limited Recharge Setting | 80% | 50-100% | 1% |
| Max Alarm Test Time | 15 Min. | 1-255 Min. | 1 Min. |
| Float Current Limit | 750mADC | 0-10000mADC | 1mADC |
| Float Current Alarm Delay | 12h | 1-24h | 1h |
| Plant Equalize Time Setting | N/A | N/A | N/A |
| Plant High Voltage Shutdown | 29.0 VDC | 20-30 VDC | 100mV |
| Recharge Control Minimum | 24 VDC | 23.5 – 24.5 VDC | .1 |
| Recharge Rate Factor | .20 | .05 - .25 | .01 |
| Battery Current Variance | .20 | 0 - 1.0 | .01 |
| Variance Inhibit Minimum | .10 | .05 – .25 | .01 |
| High Float Current Factor | .05 | .02 – .25 | .01 |

*Actual setting will depend on type of batteries being used. Consult battery manufacturer's specifications.

**NOTE: Factory default settings will be modified to reflect actual plant voltage configuration.**

| Description | Default | Range | Resolution |
|---|---|---|---|
| Battery on Discharge | -48.0 VDC | 40-60 VDC | 100mV |
| Plant High Voltage Alarm | -57.25 VDC | 40-60 VDC | 100mV |
| Plant Low Low Voltage Alarm | -44.0 VDC | 40-60 VDC | 100mV |
| Low Voltage Load Disconnect (A B) | -42.0 VDC | 40-60 VDC | 100mV |
| Low Voltage Reconnect (A B) | -50.0 VDC | 40-60 VDC | 100mV |
| Low Voltage Disconnect Time | 4 h | .1-10h | .1h |
| Total Current Alarm (% Applied Globally) | 100% | 0-100% | 1% |
| Ambient Temperature Alarm (Threshold 1) | 10°C | 0°C to 100°C | 1°C |
| Ambient Temperature Alarm (Threshold 2) | 40°C | 0°C to 100°C | 1°C |
| Plant Float* | 54.0 VDC | 48.0 – 57.5 VDC | 100 mV |
| Plant Equalize* | 54.0 VDC | 48.0 – 57.5 VDC | 100mV |
| Rectifier Max Current | 50 ADC | 0 – 50 ADC | 0.1 ADC |
| Rectifier HVSD | 58.0 VDC | 56.5 – 58.5 VDC | 100mVDC |
| Temperature Compensation Slope | 36mV per °C | 0-120 mV per °C | 1mV per °C |
| Distribution Current Alarm | 80% | 0-120% | 1% |
| Battery Temperature Alarm (Threshold 1) | 10°C | -40°C to 100°C | 1°C |
| Battery Temperature Alarm (Threshold 2) | 50°C | -40°C to 100°C | 1°C |
| Rectifier Current Imbalance | .25 | .10 – 1.0 | 1% |
| Rectifier Temp Max | 80°C | 0-100°C | 1°C |
| Limited Recharge Setting | 80% | 50-100% | 1% |
| Max Alarm Test Time | 15 Min. | 1-255 Min. | 1 Min. |
| Float Current Limit | 750mADC | 0-10000mADC | 1mADC |
| Float Current Alarm Delay | 12h | 1-24h | 1h |
| Plant Equalize Time Setting | N/A | N/A | N/A |
| Plant High Voltage Shutdown | 58.0 VDC | 55-59.5 VDC | 100mV |
| Recharge Control Minimum | 54 VDC | 48.5 – 54.5 VDC | .1 |
| Recharge Rate Factor | .20 | .05 - .25 | .01 |
| Battery Current Variance | .20 | 0 - 1.0 | .01 |
| Variance Inhibit Minimum | .10 | .05 – .25 | .01 |
| High Float Current Factor | .05 | .02 – .25 | .01 |

*Actual setting will depend on type of batteries being used. Consult battery manufacturer's specifications.

**NOTE: Factory default settings will be modified to reflect actual plant voltage configuration.**

| COMMON ACROYMS | | | |
|---|---|---|---|
| ABS | Alarm Battery Supply | LV | Low Voltage |
| ACF | AC Fail | LVD | Low Voltage Disconnect |
| ACO | (Audible) Alarm Cut Off | MJ | Major |
| ALM | Alarm | MN | Minor |
| AO | Analog Output | MP | Mid Point |
| AWG | American Wire Gauge | MON | Monitor |
| BAT | Battery | NC | Normally Closed (Open on Alarm) |
| BC | Battery Current | NO | Normally Open (Close on Alarm) |
| BCR | Battery Controlled Recharge | OC | Over Current |
| BCX | Battery Current (x represents any number) | PE | Power Earth (Earth Ground) |
| BD | Battery Disconnect | PL | Partial Load |
| BOD | Battery On Discharge | PMJ | Power Major |
| BS | Branch Shunt | PMN | Power Minor |
| BTC | Battery Temperature Compensation | PMNR | Power Minor Return |
| CBS | Control Battery Supply | PMJR | Power Major Return |
| CFA | Converter Fail Alarm | PNL | Panel |
| COF | Charger Off (GND Signal) | RCC | Remote Charger Control |
| COG | Central Office Ground | REMEQ | Remote Equalize |
| COM | Common | RFA | Rectifier Fail Alarm |
| CON | Charger On (GND Signal) | RFAM | Rectifier Fail Multiple |
| DCA | Distribution Current Alarm | RFAR | Rectifier Fail Alarm Return |
| DFA | Distribution Fuse Alarm | RS | Rectifier Restart |
| DO | Digital Output | RSR | Rectifier Restart Return |
| EBD | Emergency Battery Disconnect | RX | Receive |
| ECS | End Cell Switch | SG | Signal Ground |
| EPO | Emergency Power Off | SH | Shunt |
| EQ/EQL | Equalize | SHG | Shield Ground |
| FA | Fuse Alarm | TB | Terminal Block |
| GND | Ground | TCA | Total Current Alarm |
| HHVA | High High Voltage Alarm | TCOMP | Temperature Compensation |
| HVA | High Voltage Alarm | TR | Rectifier Turn On/Off |
| HVSD | High Voltage Shutdown | TRR | Rectifier Turn On/Off Return |
| LCA | Low Current Alarm | TS | Terminal Strip |
| LLV | Low Low Voltage | TX | Transmit |
| LMR | Limited Recharge | VM | Volt Meter |
| LOA | Low Output Alarm | VLV | Very Low Voltage |
| LOAR | Low Output Alarm return | WD | Watch Dog |
| LSO | Load Share Out | | |
| LUD | Local User Display | | |

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# TABLE OF CONTENTS

# FOREWORD

This manual includes operational instructions for the LINEAGE POWER Phoenix II digital controller. If you should have any questions or problems, please contact one of the following sources:

**SERVICE** - If for any reason further assistance is needed on any power equipment, complete engineering and field service groups are available at Phone: +1 972 244 WATT (9288) or toll-free at 888-LINEAGE (546-3243)

**PARTS ORDERING -** Replacement parts for power equipment may be obtained by forwarding a Purchase Order to:

Lineage Power
1376 State Route 598
Galion, Ohio 44833

OR Fax to: 419.462.8180

Include the following information:

A. Lineage part number and engineering level of equipment
B. If part is electrical, give circuit reference numbers and Lineage part numbers.
C. If part is mechanical in nature, give description as to where it is used.

**RETURN & REPAIR** - Equipment may be returned to the Factory for repair. In order to do this, the procedure must be as follows:

A. Call: +1 972 244 WATT (9288) or toll-free at 888-LINEAGE (546-3243)
B. Request a Returned Material Authorization (RMA) number for the defective equipment.
C. Return material prepaid to:

Lineage Power
1376 State Route 598
Galion, Ohio 44833

Attn: Field Service Dept

# PRODUCT INFORMATION

Please take a moment when the product is new to fill in this information. This data will allow faster service when calling Lineage Power to order accessories, spare parts, or request field service.

First, locate the product information label. This is typically located on the upper front of the equipment frame, or on the rear of the frame. Fill in the part number, as it appears on the label, in the space below.

| | |
|---|---|
| **PART NUMBER:** | **DATE CODE:** |
| **SERIAL NUMBER:** | **REV:** |

# WARNINGS

1. Electrical shock hazard. Do not attempt to remove, maintain, or install this equipment with power applied. Personnel that attempt to work on this equipment with the power applied may subject themselves or others to electrical shock that may cause serious injury or death.

   Le danger électrique de choc. Pas la tentative pour enlever, maintenir, ou installer cet équipement avec le pouvoir appliqué. Le personnel qui tente traiter cet équipement avec le pouvoir appliqué peut s'exposer ou les autres au choc électrique qui peut causer la blessure ou la mort sérieuse

2. The use of this equipment by unauthorized or untrained personnel should not be attempted. Personnel that work on this equipment without the proper training may subject themselves or others to electrical shock that may cause serious injury or death.

   L'usage de cet équipement par le personnel inautorisé ou sans formation ne devrait pas être tenté. Le personnel qui traite cet équipement sans l'entraînement correct peut s'exposer ou les autres au choc électrique qui peut causer la blessure ou la mort sérieuse

3. Do not attempt to work on this equipment if it is, or has been, exposed to a high moisture condition. It is recommended the equipment be returned to LINEAGE POWER to be properly tested. Working on this equipment during a high moisture condition subjects the user to electrical shock that may cause serious injury or death.

   Pas la tentative pour traiter cet équipement si c'est, ou a été, exposé à une haute condition d'humidité. Il est recommandé l'équipement s'est retourné à PECO deux être convenablement essayé. Traiter cet équipement pendant une haute condition d'humidité expose l'utilisateur au choc électrique qui peut causer la blessure ou la mort sérieuse.

4. Use of an attachment other than one approved by LINEAGE POWER will void any and all warranties, implied or other, and will increase risk of fire, or may possibly cause electrical shock, injury, or death to personnel.

   L'usage d'un attachement autrement qu'un approuvé par LINEAGE POWER annulera n'importe quel et toutes garanties, implicites ou autres, et augmentera le risque de feu, ou probablement peut causer le choc électrique, la blessure, ou la mort au personnel.

5. Do not operate this equipment if it has been dropped or otherwise damaged. Trying to operate this equipment if it has been damaged subjects yourself or others to electrical shock that may cause serious injury or death.

   L'usage d'un attachement autrement qu'un approuvé par LINEAGE POWER annulera n'importe quel et toutes garanties, implicites ou autres, et augmentera le risque de feu, ou probablement peut causer le choc électrique, la blessure, ou la mort au personnel.

6. Before you proceed, ensure the input source is not live and the input circuit breaker(s)/fuse(s) has been tripped or removed. If these procedures have not been followed and the input/output power is live, serious personnel injury or death may occur.

   Avant que vous procédez, assurez que la source d'entrée n'est pas en vie et le circuit d'entrée breaker(s)/fuse(s) a été trébuché ou a été enlevé. Si ces procédures n'ont pas été suivies et le pouvoir input-output est la blessure de personnel ou la mort en vie et sérieux peut arriver

7. A rack/shelf may contain several operating systems. If there is another system in the general area you want to install this system, be cautious of any exposed connectors or wires and, with permission, remove power to the other systems. Failure to take the necessary safety precautions subjects the installer or maintenance personnel to severe electrical shock that may cause serious injury or death.

   Une étagère/étagère peut contenir plusieurs systèmes d'exploitation. S'il y a un autre système dans le secteur général que vous voulez installer ce système, êtes prudent de connecteurs ou de fils exposés et, avec la permission, enlevez le pouvoir aux autres systèmes. L'échec pour prendre les précautions de sûreté nécessaires exposent le personnel d'installateur ou entretien au choc électrique sévère qui peut causer la blessure ou la mort sérieuse

8. This equipment may connect to lead-acid batteries. Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. **Wash hands after touching batteries.**

   Cet équipement peut connecter des piles mener-acides. Les postes de pile, les terminaux, et les accessoires apparentés contient l'avance et les premiers composés, les produits chimiques connus à l'état de Californie pour causer les défauts de cancer et naissance ou l'autre mal reproducteur. Laver des mains après avoir touché des piles.

# CAUTIONS

1. Follow proper grounding instructions.

   Suivre fonder correctes les instructions.

2. If connecting batteries, remove the battery-box-fuse or trip the circuit breaker. Check batteries and connections for proper polarity and power before connecting the batteries to the system.

   Si connectant des piles, enlever la pile-boîte-le fusible ou trébuche le disjoncteur. Vérifier des piles et des connexions pour la polarité et le pouvoir correcte avant de connecter les piles au système.

3. To remove the circuit breakers or fuses, the DC and/or AC input to the system will need to be disconnected, thereby disabling the system output to the load(s). Take the necessary precautions and inform the plant engineer that the system output power to the loads will be disabled.

   Pour enlever les disjoncteurs ou les fusibles, les données de courant alternatif de et/ou de DC au système auront besoin d'être débranché, de cette façon rendant infirme la production de système au chargement (les chargements). Prendre les précautions nécessaires et informer l'ingénieur de plante que le pouvoir de production de système aux chargements seront rendus infirme.

4. Before performing any maintenance, ensure AC or DC power is not applied to the system.

   Avant d'exécuter n'importe quel entretien, assurer que le pouvoir de courant alternatif ou DC n'est pas appliqué au système.

5. Fuse holders, fuses, and circuit breakers are not to be loaded to more than 80 percent of their ampere rating.

   Fondez les supports, fusibles, et des disjoncteurs ne doivent pas être chargés à plus de 80 pour cent de leur estimation d'ampère.

# SECTION 1: GENERAL

## 1.1 PHOENIX II SYSTEM CONTROLLER

The intuitive front panel interface of the Phoenix II system controller provides access to an extensive feature set. From the controller, the technician has the ability to change power plant settings, interrogate alarms, and view historical logs.

The Power Plants RJ45 (10/100 Base-T) connection serves as both remote Ethernet and Craft Port access to the Phoenix II controller. The RJ45 connector is well marked and located on the top center in the front of the distribution area on power plants equipped with the Phoenix II. The Phoenix II WebPages can be accessed via Internet browser to provide the user graphical access to the Phoenix II features. See Section 3 for Ethernet and Craft Port usage.

**NOTE: The host PC must have the Java™ application v 1.6 or later installed to view the Phoenix II web pages. Visit www.java.com/en to download this free application.**

**NOTE: A Quick Start Guide is provided that supports the most commonly used functions.**


**FIGURE 1-1: PHOENIX II CONTROLLER**

## 1.2 PHOENIX II CONTROLLER SHELF LIFE

Due to the characteristics of the aluminum electrolytic capacitors and the controller's lithium ion battery, the (not in service) shelf life of a Phoenix II is three years. Over time, the oxide film located on the anode foil of aluminum electrolytic capacitors may begin to deteriorate. If a Phoenix II has exceeded the manufacturing date printed on the box prior to being placed into service, the system must be sent back to LINEAGE POWER for maintenance prior to being placed into service.

The Phoenix II has a Lithium battery installed to retain all configuration settings and performance trend logs for up to 4 years after all power has been removed from the system. The design life of the installed Lithium battery is greater than 20 years and requires no maintenance.

Store the Phoenix II in a location that does not have direct sunlight and in the following conditions:

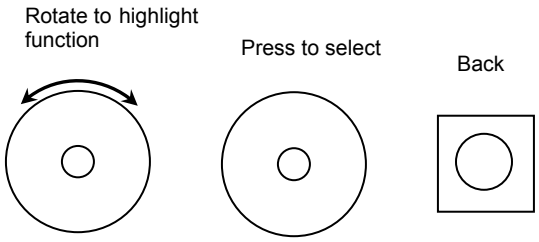
**TABLE 1-1: STORAGE**

| | |
|---|---|
| Normal temperature: | Temperature 5°C to 35°C |
| Normal humidity: | Humidity: 45% to 85% |

# SECTION 2: CONTROLLER NAVIGATION

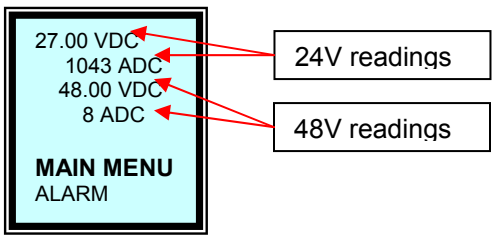
## 2.1 BASIC FRONT PANEL NAVIGATION FOR THE PHOENIX II

A. Ethernet / Craft port is well marked and located on upper center of the distribution area of the power plant
B. Status LED's
C. Rotary / Push control knob
D. Test jacks for Voltage and Current
E. Alarm cut-off (ACO)
F. Back / Home button.
G. 6-line LCD. Commonly referred to as the Local User Display, or LUD.

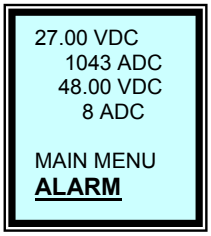
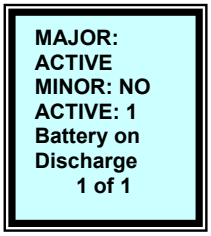




- Rotate control knob either direction to the desired menu option.
- Press control knob to activate selection.
- Press the Back button once to go back one menu. Press and hold for 2 seconds to go back to the home screen

The Quick Start Guide supplied with every power plant provides navigation instructions to common status screens, setpoints, and functions. All functions are completed by scrolling and depressing the control knob.

| PLANT VOLTAGE AND CURRENT |
|---|
|  |
| Plant voltage and current are displayed on the Main menu screen. Both 24 and 48 readings are displayed if the power plant is equipped with converter modules. |



| VIEW ACTIVE ALARMS | |
|---|---|
|  |  |
| Scroll to highlight **Alarm** Depress control knob | Scroll to view all present alarms |



**NOTE: Any changes made to setpoints that are out of the range for the particular setpoint will not be accepted by the controller. Ranges are noted on the Web Pages and listed in the associated tables within this document.**

## 2.2 FRONT PANEL DISPLAY

The following sections describe the navigation and features of the Phoenix II controller that are available through the front panel display.

The “walkup” front panel main page displays power plant Voltage and Current for both primary and converter outputs and 2 menu options MAIN and ALARM.

- By scrolling to and selecting ALARM, current plant alarms will be displayed
- By scrolling to and selecting MAIN, Submenus are available for viewing and changing plant functions.

The ALARM selection displays all active alarms. Whenever alarms are cleared (retired), the change will be reflected in the Alarm Menu Screen as ALM CLRD.

The alarm conditions described in this section are displayed in the User Interface only if the alarm condition exists. Cleared alarms will not be visible from this view.

## 2.3 SYSTEM ALARMS / CONDITIONS / EVENTS

The distinction between Conditions, Events and Alarms is that a Condition or Event becomes an Alarm by virtue of mapping a condition or event to an “Alarm” extension device in the alarm configuration menu. These devices include:

- Alarm relays
- Email (SMS)
- SNMP trap

The front panel display will give the user a visual alarm indication as listed in table 2-1.
Illuminated Green SYSOK and FLOAT LEDs indicate normal plant operation. These indicators will illuminate when the condition or event occurs even if not mapped to an alarm output extension device.

There is also an audible alarm that enunciates when any of the plant conditions or events occurs. The audible alarm is not considered an alarm extension device. The Audible Alarm Cutoff button (ACO) on the front panel will silence the audible alarm but does not clear the alarm. If an additional alarm is activated, the audible alarm will enunciate the new alarm.

When the ACO has been activated to silence an audible alarm, a 2 second duration “nuisance” alarm will enunciate every 4 minutes to remind the user that an alarm condition still exists.

**TABLE 2-1: SYSTEM ALARMS / EVENTS / CONDITIONS**

| Acronym | LED Color | Alarm Name | Description |
|---|---|---|---|
| SYSOK | Green | System OK | The absence of all alarms; Plant Normal |
| FLOAT | Green | Float Mode | The plant is charging the batteries at the configured float voltage. |
| TCA | Amber | Total Current Alarm | This active state reflects a condition whereby the plant load current measurement exceeds the corresponding distribution load current rating setpoint. |
| EQL | Amber | Equalize (Boost) Mode | The plant is charging the batteries at the configured equalize (boost) voltage. |
| TCOMP | Amber | Temperature Compensation | This active state reflects the plant float voltage has been increased (low temp) or decreased (high temp) by a voltage determined by the TCOMP coefficient setting. |
| TEMP | Amber | Temperature | The ambient temperature is outside the band between low and high temperature setpoints. |
| BAT | Amber | Battery Temperature | The battery temperature is above the high temperature setpoint. |
| LMR | Amber | Limited Recharge (Redundancy Loss) | The limited recharge alarm is active when the load exceeds a set percentage of the rectifier current capacity of the plant during “normal” plant operation. |
| DCA | Amber | Distribution Current Alarm | This active state reflects a condition whereby a branch current measurement exceeds the corresponding setpoint. The branch current feature must be enabled. |
| PMN | Amber | Power Minor | Power Minor is a summary of conditions that indicate a problem with the power plant that does not diminish its ability to provide power to the telecommunication load. |
| RFA | Amber | Rectifier Fail Alarm | A rectifier module is not capable of supplying current or has detected an internal fault. |
| PMJ | Red | Power Major | Power Major is a summary of conditions that indicate a problem with the power plant that diminishes its ability to provide power to the telecommunication load. |
| RFAM | Red | Rectifier Fail Multiple | Multiple rectifier modules are not capable of supplying current or have detected an internal fault. |
| PCR | Red | Power Critical | Power Critical is a summary of conditions that indicate a problem with the power plant that diminishes its ability to provide power to the telecommunication load. |
| HVSD (HHVA) | Red | High Voltage Shutdown | The plant has attempted to shutdown one or more rectifiers to isolate the voltage source. |
| CFA | Red | Converter Fail Alarm | A converter module is not capable of supplying current or has detected an internal fault. |
| HVA | Red | High Voltage Alarm | The plant float voltage is in excess of the HVA threshold. |
| DFA | Red | Distribution Fuse Alarm | A distribution fuse or battery fuse or circuit breaker is open. |
| BOD | Red | Battery on Discharge | The plant float voltage is lower than the BOD threshold. |
| VLV (LLVA) | Red | Very Low Voltage | The plant float voltage is lower than the Very Low Voltage threshold. |
| Configurable | Amber | | User Configurable |
| Configurable | Amber | | User Configurable |

### 2.3.1 BATTERY ALARMS

Tables 2-2 through 2-6 define output alarms

**TABLE 2-2: BATTERY ALARMS**

| Item | Specifications |
|---|---|
| Battery On Discharge Alarm | Voltage threshold used to indicate the system is completely or partially operating on battery power has been reached. System batteries are discharging.<br>Alarm Initiation: The system voltage is lower or equal to the BOD setting.<br>Alarm Cleared: The system voltage is higher than the high limit of the BOD alarm threshold. |
| High Battery Temperature Alarm | Alarm asserted when the controller detects battery temperature to be in excess of the configured threshold. Battery thermal probes are the source of this temperature reading. If no thermal probes are used, battery high temperature is based on the integrated ambient temperature sensor.<br>Alarm Initiation: One of the battery temperature is higher or equal to the high battery temp alarm setting<br>Alarm Cleared: The battery temp is lower than the low limit of the high battery temp alarm threshold. |
| Temperature Probe Fail | Controller determines a temperature probe to be disconnected, defective or enabled without being plugged in.<br>Alarm Initiation: The temp probe has failed.<br>Alarm Cleared: The temp probe has resumed operating normally. |

### 2.3.2 POWER ALARMS

**TABLE 2-3: POWER ALARMS**

| Item | Specifications |
|---|---|
| Single AC Fail | Detection of a single rectifier reporting AC fail in the system.<br>AC fail signal is from individual rectifier/rectifier slot.<br>Alarm Initiation: Single AC fail (outside operating range of 90-275VAC)<br>Alarm Cleared: AC is back to normal. |
| Multiple AC Fail | Detection of multiple rectifiers reporting AC fail in the system.<br>AC fail signal from multiple rectifiers/rectifier slots.<br>Alarm Initiation: Multiple AC fail (outside operating range of 90-275VAC)<br>Alarm Cleared: AC is back to normal. |
| DC High Voltage Shutdown | Alarm Initiation: DC voltage is higher or equal to the setting of HVSD.<br>Alarm Cleared: The DC voltage is lower than the low limit of the HVSD threshold. |
| DC High Voltage | Voltage threshold during the Float Mode of operation used to indicate an abnormally high output DC voltage level is present. The controller does not issue commands to shut rectifier(s) down.<br>Alarm Initiation: DC voltage is higher or equal to the setting of HV.<br>Alarm Cleared: The DC voltage is lower than the low limit of the HV threshold. |

| Item | Specifications |
|---|---|
| DC Very High Voltage | A possible damaging Very High DC bus voltage threshold set for the Float Mode of operation has been reached. The controller will issue a command to shut any offending rectifier(s) off.<br>Alarm Initiation: DC voltage is higher or equal to the setting of HHV.<br>Alarm Cleared: The DC voltage is lower than the low limit of the HHV threshold. |
| DC Very Low Voltage (Low Low Voltage) | The system DC output voltage has reached a low voltage threshold generally set below the BOD threshold. This alarm is used to indicate that the battery reserve is depleting and the DC voltage is approaching a critically low output value.<br>Alarm Initiation: DC voltage is lower or equal to the setting of LLV.<br>Alarm Cleared: The DC voltage is higher than the high limit of the LLV threshold. |
| Single Rectifier Fail | Detection of a single rectifier failed in the system. A rectifier fail signal originates from an individual rectifier.<br>Alarm Initiation: Single RFA.<br>Alarm Cleared: With faulty rectifier removal. |
| Multiple Rectifier Fail | Detection of multiple rectifiers failed in the system. A rectifier fail signal originates from individual rectifier(s).<br>Alarm Initiation: Multiple RFA.<br>Alarm Cleared: With all faulty rectifiers removed |
| Fan Fail | One or more rectifiers has reported a failed fan<br>Alarm Initiation: One or more rectifier fan failures.<br>Alarm Cleared: Fan failure is recovered or rectifier replaced. |
| Rectifier Current Limit | Alarm Initiation: One or more rectifiers have reached current limit.<br>Alarm Cleared: No rectifier is current limited. |
| Rectifier Manual Off | Alarm Initiation: One or more rectifiers are manually turned off.<br>Alarm Cleared: No rectifier is manually turned off. |

### 2.3.3 DISCONNECT ALARMS

**TABLE 2-4: DISCONNECT ALARMS**

| Menu Item | Specifications |
|---|---|
| LVD 1 Fail | Controller has determined that LVD 1 has failed. The contactor did not open or close when expected or is asserting an alarm in the closed state.<br>Alarm Initiation: LVD 1 is failed.<br>Alarm Cleared: LVD 1 is normal. |
| LVD 2 Fail | Controller has determined that LVD 2 has failed. The contactor did not open or close when expected or is asserting an alarm in the closed state.<br>Alarm Initiation: LVD 2 is failed.<br>Alarm Cleared: LVD 2 is normal. |

### 2.3.4 DISTRIBUTION ALARMS

**TABLE 2-5: DISTRIBUTION ALARMS**

| Menu Item | Specifications |
|---|---|
| Distribution Fuse Alarm | Alarm Initiation: One or more distribution circuits have faulted.<br>Alarm Cleared: Clearing the alarm by replacing the fuse or resetting the breaker. |

**NOTE:** The Power Plant may be equipped with either electrical trip or mechanical trip breakers. Electrical trip breakers will alarm in a tripped condition, where mechanical trip breakers will alarm in a tripped or OFF position.

### 2.3.5 COMMUNICATION ALARMS

**TABLE 2-6: COMMUNICATIONS ALARMS**

| Menu Item | Specifications |
|---|---|
| Communication Fail | Alarm Initiation: Controller loses communication with multiple rectifiers or the distribution board. This alarm is masked for the rectifier if the AC fail or RFA alarms are detected prior to loss of communications in the failed rectifier.<br>Alarm Cleared: The alarm will be self cleared when it reaches the communication fail timeout if assigned as “one shot” alarm or latched if assigned as a latched alarm. See Section 2.7.7. |

### 2.3.6 PROGRAMMING ALARMS

Programming alarms cannot be performed through the Phoenix II front panel display. Connectivity through the RJ45 connection, a PC, USER or ADMIN permissions are required to customize alarm configurations, alarm set points, and outputs through the webpage interface. Refer to Section 3.

## 2.4 MAIN MENU

The MAIN MENU has 5 sub menus; the following sections define the menu and submenu options.

- 0 STATUS
- 0 ALARM
- 0 HISTORY
- 0 CONTROL
- 0 CONFIGURATION

## 2.4A STATUS MENU

The STATUS menu provides status level information for the following second level menus:

- 0 SYSTEM INFORMATION (SYSTEM INFO)
- 0 CONTROLLER INFORMATION (CONTLR INFO)
- 0 RECTIFIERS
- 0 CONVERTERS
- 0 BATTERY
- 0 DISCONNECT
- 0 NETWORK
- 0 SECURITY
- 0 ALARM SETPOINTS (AM SEPTS)
- 0 ENABLE / DISABLE INFORMATION (ENA/DTS INFO)
- 0 DERIVED CURRENT

### 2.4.1 STATUS (SYSTEM INFORMATION SUBMENU)

**TABLE 2-7: SYSTEM INFORMATION**

| Menu Item | Specifications |
|---|---|
| SITE ID | Displays site name (Site ID can be established (webpage only). |
| SYSTEM VOLT | Displays system output voltage(s). Dual voltage systems not equipped with the secondary power source will display 0.0 as a voltage output on the front panel display. |
| SYSTEM CURRENT | Displays real time system output current(s). Dual voltage systems not equipped with the secondary power source will display 0.0 as a current output on the front panel display. |
| AMBIENT TEMP | Displays temperature as through the integrated sensor within the Phoenix II. |
| CONVERTER VOLTS | Displays the converter output voltage. |
| CONVERTER CURRENT | Displays the output current of all installed converter modules. |
| DATE | Displays the current, MM/DD/YYYY, the format may be changed through the web interface or front panel display. |
| TIME | Displays the current time, HH:MM:SS, the format may be changed through the web interface or front panel display. |
| SYSTEM FIRMWARE REVISION | Displays the current firmware revision installed in the system. |

### 2.4.2 STATUS (CONTROLLER INFORMATION SUBMENU)

**TABLE 2-8: CONTROLLER INFORMATION**

| Menu Item | Specifications |
|---|---|
| CONTROLLER REV | Displays current controller revision. |
| PDU REV | Displays the distribution module circuit card revision. |
| PDU BOOT REV | Displays the distribution module boot revision. |
| U/I REV | Displays User Interface Version. |
| U/I BOOT REV | Displays User Interface boot revision. |
| WEB PAGE REV | Displays current web page revision. |

### 2.4.3 STATUS (RECTIFIER INFORMATION SUBMENU)

**TABLE 2-9: RECTIFIER INFORMATION**

| Menu Item | Specifications |
|---|---|
| TOTAL USAGE | The total capacity of the installed rectifier modules displayed in percentage. |
| TOTAL CAPACITY | The total capacity of the installed rectifier modules displayed in ADC. |
| TOTAL CURRENT | Sum of all rectifier output current. |
| RECT STATE | Per module position, capacity of the rectifier, output current, and if the rectifier is equipped or unequipped. Blank slots will be listed as unequipped. |
| ENERGY MANAGEMENT | This selection displays if the Energy Management feature is Active or Inactive. |

### 2.4.4 STATUS (CONVERTER INFORMATION SUBMENU)

**TABLE 2-10: CONVERTER INFORMATION**

| Menu Item | Specifications |
|---|---|
| TOTAL USAGE | The total capacity of the installed converter modules displayed in percentage. |
| TOTAL CAPACITY | The total capacity of the installed converter modules displayed in ADC. |
| TOTAL CURRENT | Sum of all converter output current. |
| CONV STATE | Per module position, capacity of the converter module, output current, and if the converter is equipped or unequipped. Blank slots will be listed as unequipped. |

### 2.4.5 STATUS (BATTERY INFORMATION SUBMENU)

**TABLE 2-11: BATTERY INFORMATION**

| Menu Item | Specifications |
|---|---|
| BATTERY CURRENT | Total current that is flowing into the batteries. |
| BATTERY TEMP | Displays battery string temperature using optional battery temp sensors. |
| TCOMP | Displays if TCOMP is active or is inactive. |
| HI BATT TEMP | Displays current battery temp if optional battery temp sensors are installed, or ambient temperature as monitored from the integrated temp sensor in the Phoenix II Controller. |
| TCOMP ADJ | Displays the amount of TCOMP adjustment that is being applied. |
| BCR | Displays if Battery Controlled Recharge is active or inactive. |
| BCR ADJ | The Phoenix II controller limits the battery current by clamping the voltage to the appropriate level. This feature displays the amount of the voltage has been changed. |

### 2.4.6 STATUS (DISCONNECT INFORMATION SUBMENU)

**TABLE 2-12: DISCONNECT INFORMATION**

| Menu Item | Specifications |
|---|---|
| LVD 1 | Displays, vacant or installed, and if it is enabled or disabled. |
| LVD 2 | Displays, vacant or installed, and if it is enabled or disabled. |

### 2.4.7 STATUS (NETWORK INFORMATION SUBMENU)

**TABLE 2-13: NETWORK INFORMATION**

| Menu Item | Specifications |
|---|---|
| IP ADDRESS | Current Static Address assigned to the Controller. Used for remote connectivity. |
| SUBNET MASK | 255.255.248.000 |
| GATEWAY | 010.001.001.001 |
| DHCP | Displays current setting (Static, Server, or Client) |

### 2.4.8 STATUS (SECURITY SUBMENU)

The Phoenix II controller is equipped with an added security feature that allows the user to grant or deny remote write/change access by enabling or disabling a physical switch found in the front panel Controller. This allows the user the ability to physically restrict the RJ45 access to read-only.

**TABLE 2-14: SECURITY**

| Menu Item | Specifications |
|---|---|
| SECURITY SW | Displays current state of physical security switch. In the ON position, controller configuration **can not** be changed through the Ethernet connection. In the OFF position, the ability to change system configurations through the Ethernet connection is available.<br>**Note: See section 3.4.1.7A for switch location and operation.** |

### 2.4.9 STATUS (ALARM SETPOINTS SUBMENU)

**TABLE 2-15: ALARM SETPOINTS**

| Menu Item | Specifications |
|---|---|
| HI AMB TEMP SETPOINT | Displays High System Temperature threshold. |
| LO AMB TEMP SETPOINT | Displays Low System Temperature threshold. |
| BOD | Displays Battery on Discharge threshold setpoint. |
| HI BAT TEMP | Displays high battery temperature threshold setpoint. |
| HIGH VOLTAGE | Displays high voltage threshold setpoint. |
| VERY LOW VOLTAGE | Displays very low voltage threshold setpoint. |
| PLT HVSD | Displays high voltage shutdown threshold setpoint. |
| TCA SET | Displays total current alarm setpoint. |
| DCA1 SET | Derived Channel 1 setpoint. |
| DCA2 SET | Derived Channel 2 setpoint. |
| DCA3 SET | Derived Channel 3 setpoint. |
| DCA4 SET | Derived Channel 4 setpoint. |
| DCA1 DELAY SET | Derived Channel 1 delay setpoint. |
| DCA2 DELAY SET | Derived Channel 2 delay setpoint. |
| DCA3 DELAY SET | Derived Channel 3 delay setpoint. |
| DCA4 DELAY SET | Derived Channel 4 delay setpoint. |

### 2.4.10 STATUS (ENABLE/DISABLE INFORMATION SUBMENU)

**TABLE 2-16: ENABLE/DISABLE INFORMATION**

| Item | Specifications |
|---|---|
| TCOMP | Displays Battery Thermal Compensation, ENABLED/ DISABLED<br>Factory Default= DISABLED. |
| BCR | Battery Controlled Recharged<br>Factory Default= DISABLED. |
| EPO1 | Displays Emergency Power Off status, ENABLED/DISABLED<br>Factory Default= DISABLED. |
| EPO2 | Displays Emergency Power Off status, ENABLED/DISABLED<br>Factory Default= DISABLED. |
| BATT PROBE 1 | Displays if the optional external temp probe is ENABLED/DISABLED<br>Factory Default= DISABLED. |
| BATT PROBE 2 | Displays if the optional external temp probe is ENABLED/DISABLED<br>Factory Default= DISABLED. |

### 2.4.11 STATUS (DERIVED CURRENT SUBMENU)

**TABLE 2-17: Derived Current**

| Item | Specifications |
|---|---|
| DERIVED CURRENT | Displays the current reading of shunts 1-4. |

### 2.4.12 STATUS (ALARM INFORMATION SUBMENU)

**From the alarm screen, the user can scroll through all active alarms.**

**TABLE 2-18: ALARM**

| ACTIVE ALARMS | | |
|---|---|---|
|  |  |  |

## 2.5 HISTORY MENU

The History submenu includes:

- Today LD (Load) Peak
- Today LD Hi Hr Average
- Alarm History
- STATS

**TABLE 2-19: History**

| Item | Specifications |
|---|---|
| TODAY LD PEAK | Today's load peak starting at midnight each day. |
| TODAY LD HI HR AVE | Today's average load starting at midnight each day. |
| ALARM HISTORY | The Phoenix II Controller will maintain an Alarm History log of all events that are mapped to an alarm extension device.<br>Once the maximum occurrences have been reached, the log will roll out (delete) the oldest entry. The alarm history log can maintain 100 records. Both the alarm and cleared condition are recorded separately as events.<br>The most current event is listed at the top of the event register. |
| STATS | Daily Peak Voltage, Load Current, and Derived Currents with Date and Time Stamp<br>Daily High hourly average Voltage, Load Current, and Derived Currents with Date and Time Stamp.<br>Daily Low hourly average Voltage, Load Current, and Derived Currents with Date and Time Stamp. |

### 2.5.1 HISTORY (ALARM HISTORY SUBMENU)

Table 2-20 provides examples of ALARM HISTORY events that would be logged with the associated event. The screen will display the alarm name, the condition of the alarm (Active or Alm Clrd) a date stamp (MM/DD/YY), a time stamp (HH:MM:SS) and the event number, based on the total of 100 recorded events (e.g. 1 of 100), in addition to the recorded event number it will be followed by a lower case letter #a or #c indicating the alarm activation (a) and when it was cleared (c), including the time and date stamp for each event. Assuming the condition is extinguished, both an ACTIVE and CLEARED event will be displayed in the history

In the following table are examples of alarm conditions that can occur and will be logged on the Alarm History screen of the User Interface.

**TABLE 2-20: ALARM LOG EXAMPLES**

| Alarm Log Examples | |
|---|---|
| 1. HI AMB TEMP | 12. HI BATT TEMP |
| 2. HI AMB TEMP CLRD | 13. TEMP PROB 1 FAIL |
| 3. AUX MJ ALM | 14. BATT RESERVE LO |
| 4. EPO | 19. ACF SINGLE |
| 5 COMMUNICATIONS FAILED | 20. ACF MULTIPLE |
| 6. PASSWORD DEFAULT | 21. HVSD |
| 7. PROCESSOR HALT | 22. RFA SINGLE |
| 8. SELF TEST FAIL | 23. RFA MULTIPLE |
| 9. RECT LOAD SHARE IMBALANCE | 24. PMJ |
| 10. ALM TEST ACTIVE | 25. PMN |
| 11. FAN FAIL | |

## 2.6 CONTROL MENU

The Control Menu allows the user to manage certain features as well as clear the various logs and stats.

The Control Menu has the following sub menus:

- RECT CONTROL
- CONV CONTROL
- LOAD DEFAULT
- CLR LAT ALM
- CLR HIS
- RELAY TEST
- DISCONNECT
- LAMP TEST

### 2.6.1 CONTROL (RECTIFIER CONTROL SUBMENU)

When entering the Rectifier Control sub menu and the Converter Control sub menu, the user will see MODULE 1 through MODULE 48 listed. The associated module slot is conveniently numbered on all installed power shelves.

The rectifier selection under the control menu allows the user to control the operation of each individual rectifier. The choices include Run or Standby. “RUN” indicates that a rectifier presently providing current and is part of the load share bus. “STANDBY” indicates that a rectifier is not providing current for the load, is not on the load share bus, but is connected to its AC feed.

**NOTE:** LINEAGE POWER recommends installing Rectifier Modules in adjacent / successive slots and installing converter modules in adjacent / successive slots to optimize maintenance activities.

**NOTE:** In the event, the remaining rectifiers are removed or fail to produce DC power, the standby unit will restore itself to “ON”.

**TABLE 2-21: RECTIFIER CONTROL**

| Item | Specifications |
|---|---|
| MODULE #1 | |
| RUN | Command places rectifier module in the ON state and will be providing current for the load. |
| STANDBY | Command places the rectifier in STANDBY Mode. The DC OK light on the rectifier will be blinking while the rectifier is in standby. STANDBY Mode removes the rectifier from the DC Bus but remains powered by the AC source. |
| MODULE #2 – MODULE # N | **Repeat for all rectifiers equipped in the system** |
| RUN | Command places rectifier module in the ON state and will be providing current for the load. |
| STANDBY | Command places the rectifier in STANDBY Mode. The DC OK light on the rectifier will be blinking while the rectifier is in standby. STANDBY Mode removes the rectifier from the DC Bus but remains powered by the AC source. |

### 2.6.2 CONTROL (CONVERTER CONTROL SUBMENU)

When entering the Converter Control sub menu and the Rectifier Control sub menu the user will see MODULE 1 through MODULE 48 listed. The associated module slot is conveniently numbered on all installed power shelves. If the Shelf is not installed or if a Slot is not equipped, the module numbers will still be listed and identified as unequipped.

The converter selection under the control menu allows the user to control the operation of each individual converter module. The choices include RUN or Standby. "RUN" indicates that a rectifier presently in "ON" and will provide output power. "STANDBY" indicates that a converter module in STANDBY mode and is not providing output power.

**NOTE:** PECO II recommends installing rectifier modules in adjacent / successive slots and installing converter modules in adjacent / successive slots to optimize ease of maintenance.

**NOTE:** In the event the remaining rectifiers fail to produce DC power or are removed from the system, any modules in STANDBY mode will automatically return to the "RUN" mode.

**TABLE 2-22: CONVERTER CONTROL**

| Item | Specifications |
|---|---|
| MODULE #1 | |
| RUN | Command places the converter module in the RUN state providing output current. |
| STANDBY | Command places the converter module in STANDBY, DC OK light on the converter module will be blinking while the converter is in standby. STANDBY removes the rectifier from the DC Output Bus but remains powered by the DC source. |
| MODULE #2 – MODULE # N | **Repeat for all Converter Modules equipped in the system.** |
| RUN | Command places the converter module in the RUN state providing output current. |
| STANDBY | Command places the converter module in STANDBY, DC OK light on the Converter Module will be blinking while the converter is in standby. STANDBY removes the converter from the DC Output Bus but remains powered by the DC source. |

### 2.6.3 CONTROL (LOAD DEFAULT SUBMENU)

**TABLE 2-23: LOAD DEFAULT**

| Item | Specifications |
|---|---|
| LOAD DEFAULT | Allows the user to re-load the factory configuration. |
| ENABLE | Re-loads factory configurations. In approximately 30 seconds the reload will be completed. Do not attempt to make further configuration changes during this time period. |
| DISABLE | Cancels the command. |

### 2.6.4 CONTROL (CLEAR LATCHED ALARM SUBMENU)

**NOTE: The PHOENIX II latches the following alarms: HVSD, excessive LOGIN attempts, CLOCK CHANGED, LIMITED RECHARGE, and HIS CLRD. This feature is to ensure these items are properly resolved or recognized prior to clearing the alarm. To clear a latched alarm the user must use the CLR LAT ALM feature.**

**TABLE 2-24: CLEAR LATCHED ALARM**

| Item | Specifications |
|---|---|
| CLR LAT ALM | Allows the user to clear all latched alarms. |
| YES | Clears all latched alarms. |
| NO | Cancels the command. |

### 2.6.5 CONTROL (CLEAR HISTORY SUBMENU)

The CLR HIS screen found in the CONTROL menu will allow the user to clear the various history logs. The CLEAR HISTORY requires Admin login privileges.

**TABLE 2-25: CLEAR HISTORY**

| Item | Specifications |
|---|---|
| ALM HIS | Selecting YES in this menu will clear all records in this log.<br>Selecting NO cancels the command. |

### 2.6.6 CONTROL (CLEAR STATISTICS LOG SUBMENU)

The Phoenix II controller provides an extensive array of statistics logs. These logs are viewable through the web page interface. The logs are a beneficial feature used to analyze conditions that have occurred in the history of the site. Each log is time stamped and dated to provide a recorded history of the events associated to the log.

**TABLE 2-26: CLEAR STATISTICS LOG**

| Item | Specifications |
|---|---|
| CLR STAT LOG | Allows the user to gain access to the following history logs. |
| LOAD LOG | Selecting **YES** in this menu will clear all records in this log. |
| HI BATT TEMP | Selecting **YES** in this menu will clear all records in this log. |
| AMB TEMP LOG | Selecting **YES** in this menu will clear all records in this log. |
| TREND LOG | Selecting **YES** in this menu will clear all records in this log. |
| ALL STAT LOG | Selecting **YES** in this menu will clear all records in all the above stated logs. |

### 2.6.7 CONTROL (ALARM RELAY TEST SUBMENU)

The alarm relay test exercises the alarm relay(s) using front panel controls. This test is designed to serve as a "handshake" test between the installed power plant and a remote alarm monitoring center.

The relay status LED for each relay will illuminate when the test is performed.

The Test Timeout or "walk away" feature can be set from 1 to 15 minutes so any alarm being extended during a test will automatically be cleared if left unattended. The factory default for the walk away feature is 5 min.

**NOTE:** The alarm relay test **cannot** be exercised while the plant is in alarm. If the power plant goes into alarm during an alarm test, the test will be aborted.

**NOTE:** This test exercises the alarm relays and extends the wired alarms to the alarm center. This test does not create a real event condition.

**TABLE 2-27: ALARM RELAY TEST**

| Item | Specifications |
|---|---|
| ALRM RELAY TST | **Test Steps:**<br>Scroll to Alarm Test (Off)<br>Scroll to the relay to be tested<br>Press Save<br>The alarm will be extended<br>Repeat for all relays to be tested<br>After all alarms have tested, scroll to "OFF"<br>Press Save (Alarm test will be stopped)<br>The status LED for the relay being tested will illuminate when activated.<br>The user may also watch the relay activate through the webpage.<br>**NOTE: The CPU FAIL LED does not illuminate during this test.** |

### 2.6.8 CONTROL (DISCONNECT SUBMENU)

This function allows the user to control the state of the LVD, if equipped. The LVD must be ENABLED from the CONFIG menu to change the status of the LVD.

**TABLE 2-28: DISCONNECT**

| Item | Specifications |
|---|---|
| LVD1 | Allows access to control features of the LVD. |
| OPEN | This command will force open the LVD, removing power from the DC output bus. An event (alarm) will be displayed regardless of the equipment configuration. |
| CLOSE | This command will manually force close the LVD. |
| AUTO | This command will allow the LVD to automatically open or close determined by the open and close set-point voltages established through the web page CONFIG screen. |
| LVD2 | Allows access to control features of the LVD 2. |

| Item | Specifications |
|---|---|
| OPEN | This command will force open the LVD, removing power from the DC output bus. An event (alarm) will be displayed regardless of the equipment configuration. |
| CLOSE | This command will manually force close the LVD. |
| AUTO | This command will allow the LVD to automatically open or close determined by the open and close setpoint voltages established through the web page CONFIG screen. |

**CAUTION: When configuring the LVD, ensure the control feature of the LVD is positioned in AUTO or CLOSED. If the LVD is set to OPEN in the CONTROL Menu, it will open immediately, once the LVD CONFIG has been accepted, energized equipment will be disconnected from the power system load center.**

### 2.6.9 CONTROL (LAMP TEST SUBMENU)

**TABLE 2-29: LAMP TEST**

| Item | Specifications |
|---|---|
| LAMP TEST | Illuminates all LEDS on the face of the system for a total of 10 seconds. |
| YES | This command illuminates LEDS found on all active rectifiers and the controller. |
| NO | Cancels test sequence. |

## 2.7 CONFIG (CONFIGURATION) MENU

The Configuration Menu allows the user to configure equipment, activate features and change set-points found in the power system. On screen confirmation will validate change made.

The Configuration menu consists of the follow menu options:

- Float
- Shunt Monitor
- Rectifier
- Battery
- Disconnects
- Alarms
- System
- Network
- Calibration

There are 2 sub menus under Config Float:

- FLOAT VOLT
- FLOAT SETPTS

### 2.7.1 CONFIG (FLOAT SETTINGS SUBMENU)

**TABLE 2-30: FLOAT SETTINGS**

| Item | Specifications |
|---|---|
| FLOAT VOLT | Allows the user to manually adjust system float voltage set-point.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 42.00 to 58.00 VDC in 0.01 VDC increments |
| FLOAT SETPTS | Float Setpts opens up additional setpoint adjustments listed below. |
| HVSD | High Voltage Shutdown. Allows the user to manually adjust the HVSD shutdown point.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01 VDC increment |
| HV | High voltage alarm. This alarm indicates an abnormally high output voltage but does not shut the unit down. The user can manually adjust this value.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01 VDC increment |
| BOD | Battery on discharge. This alarm occurs when the system is operating either completely or partially on battery power. The user can manually adjust this value.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01 VDC increment |
| VLV | Very low voltage alarm. Alarm indicates an imminent system shutdown due to discharging batteries or low output voltage. The user can manually adjust this value.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01VDC increment |

### 2.7.2 CONFIG (SHUNT MONITORS SUBMENU)

The Phoenix II controller can monitor up to 4 shunts providing DC current values for each in a separate channel.

The Phoenix II controller sums the current output from all installed rectifiers that are in the RUN mode and supplies a total plant current reading without additional shunts. In this case, 4 external shunts can be monitored.

If the power plant is equipped with 2 optional Load Shunts, two external shunts can also be monitored.

If the Power Plant is equipped with the optional battery shunt, 3 external shunts can be monitored.

The user can monitor specific distribution loads as part of the cumulative total of the system.

**TABLE 2-31: SHUNT MONITORS**

| Item | Specifications |
|---|---|
| SHUNT A, B, C, D | The following features are available for each one of the 4 shunt monitoring positions. The default condition for Shunt A and B is BATTERY. The default for C and D is None. |
| TYPE | The user may designate the SHUNT as a BATTERY, BRANCH, LOAD or NONE.<br>Factory Default = BATTERY |

| Item | Specifications |
|---|---|
| AMPERAGE | Range: 0 to 9999 ADC in 1 ADC increment<br>Factory Default = 1000 ADC |
| MILLIVOLT | The preset value is 50 millivolts. This feature allows the user to change the value.<br>Mnemonic: SHUNT A, B, C or D<br>Range: 0 to 200 mv in 1 mv increment<br>Factory Default = 50 mv |
| DERIVED CURRENT | This submenu allows the user to assign the channel number to the appropriate shunt. |

### 2.7.3 CONFIG (RECTIFIERS SUBMENU)

The rectifier configuration screen provides the user additional features that can be customized.

The setpoint is the threshold percentage of all installed rectifiers. When this threshold is exceeded, the limited recharge (LMR) LED on the front panel will illuminate. If this event has been programmed to a relay, an alarm will be extended.

**TABLE 2-32: RECTIFIERS**

| Item | Specifications |
|---|---|
| RECT CL | Current Limit. Controls the rectifier current limit values based on percentages. The user may adjust this limit to reduce rectifier output current.<br>Range: 30 to 110 % in 1 % increments<br>Factory Default = 110 % |
| LTG RCHG SETPT (REDUNDANCY LOSS) | This feature displays the limited recharge (Redundancy Loss) setpoint.<br>ENABLED: The setpoint is the threshold percentage of the power plant load divided by the current generated by all installed rectifiers.<br>When active, the plant load has exceeded the programmed percentage of the total rectifier capacity set for this alarm. Rectifier capacity may be inadequate for recharging batteries in an acceptable period of time following an extended battery discharge. This LMR condition will be expressed in the alarm menu and the Amber LMR LED on the front panel will be illuminated. If this event has been programmed to a relay, an alarm will be extended to the alarm center.<br>Range: 30% to 100% in 1% increments<br>Factory Default: 80% |
| IMB ALM ENA/DIS | This feature enables or disables the current imbalance alarm feature.<br>Factory Default = DISABLED |
| IMB ALM SETPT | This is a threshold alarm with the setpoint being designated as a percentage difference of the output current between rectifiers.<br>Range: 5% to 10% in 1% increments<br>Factory Default = 5% |
| RECTS PER SHELF | This setting is used when the Phoenix II controller is used with a system that has less than 4 module slots (e.g. 19 inch rectifier / converter shelf). |

| Item | Specifications |
|---|---|
| RECT EQUIPED | This feature allows the user to configure the power plant to extend an alarm if a rectifier is added or removed. By setting the number of equipped rectifiers to the actual number equipped in the power plant any addition or removal will create an alarm.<br>**A setting of 0 provides full plug and play module additions and removals with no additional controller configuration changes.**<br>Range 0 – 48 in 1 module increments<br>Factory Default = 0 |
| Energy Management | This feature enables or disables the energy management feature.<br>The purpose of this feature is to increase the overall efficiency of the power plant while maintaining the readiness of the plant to supply output to the load as needed. The Phoenix II calculates the number of rectifiers needed to satisfy the existing load and places the remaining rectifiers in hot standby. These rectifiers are still energized from their AC source but are not contributing output to the equipment load requirements.<br>To maintain the readiness of the rectifiers, all rectifiers will be put in RUN mode for a 24 hour period every 30 days.<br>In a BOD event, the feature is terminated and returned to a disabled condition.<br>Factory Default = Disabled |

### 2.7.4 CONFIG (CONVERTER SUBMENU)

The converter configuration screen provides additional customizable features for the user.

**TABLE 2-33: CONVERTERS**

| Item | Specifications |
|---|---|
| CONVERTERS | |
| COVT CL | Current Limit. Controls the converter module's current limit values based on percentages. The user may adjust this limit to reduce converter output current.<br>Range: 30% to 100 % in 1 % increments<br>Default: 100 % |
| CVTRS PER SHELF | This setting is used when the Phoenix II controller is used with a system that has less than 4 module slots (e.g. 19 inch rectifier / converter shelf) |

### 2.7.5 CONFIG (BATTERIES SUBMENU)

**TABLE 2-34: BATTERIES - TCOMP**

| TCOMP Sub Menu | This selection opens up the following sub menu items |
|---|---|
| TCOMP ENA/DIS | When enabled, the Phoenix II controller will activate TCOMP using the highest measured temperature from either of the external temp probes. If no temperature probes are installed, the Integrated Ambient Temperature sensor measurement will be used.<br>ENABLE activates the function while DISABLE will deactivate the function.<br>**LINEAGE POWER does not recommend enabling TCOMP without battery temperature probes.** .<br>Factory Default = Disable |

| TCOMP Sub Menu | This selection opens up the following sub menu items |
|---|---|
| TCOMP COEF | Temperature Compensation. Coefficient Is a change to the float voltage set point as a function of temperature. The amount of change is the coefficient. Approx 3Mv per degree C per battery cell. These values may change per manufacturers' data tables.<br>Range: 0 (0) to 133 (240)mV/°F (mV/°C) in 1 mV/°F (mV/°C) Increments<br>Factory Default = 36 mV/°C for 24V battery strings |
| NOMINAL TEMP | Nominal Battery Temperature. This value is a nominal value established by the battery industry to determine battery life expectancy. A degree change will change the amount of TCOMP. This value should not be changed without the consent or direction of the battery manufacturer.<br>Range: 68 (20) to 86 (30) 0F (0C) in 1 0F (0C) increment<br>Factory Default = 77 (25) 0F (0C) |
| HIGH TEMP SET | High temperature alarm. The alarm clears when the temperature drops to 20°F below the set threshold.<br>Range: 86 (30) to 185 (85) 0F (0C) in 1 0F (0C) increment<br>Factory Default = 131 F (55C) |

**TABLE 2-35: BATTERIES – CONTROLLER RECHARGE**

| Controlled Recharge Sub Menu | This selection opens up the following sub menu items |
|---|---|
| ENABLE / DISABLE | This feature enables or disables the controlled recharge function<br>Factory Default = disabled |
| RECHARGE LIMIT | This feature allows the user to provide a total current limit to the amount of current flowing into the batteries<br>Range 0A – 1000A<br>Factory Default = 500A |
| MIN V OUT | This feature allows the user to specify the lowest voltage that the power plant will supply while recharging the attached battery strings<br>Range 23V to 25V<br>Range 47V to 49V<br>Factory Default = 48V |
| BATT PROBE 1 & 2 | This submenu allows the user to enable or disable Temperature Probes 1 & 2<br>Factory Default = Disabled |

### 2.7.6 CONFIG (DISCONNECTS SUBMENU)

The Phoenix II can be equipped with Low Voltage Disconnects (LVD) or Low Voltage Battery Disconnects (LVBD). The LVD option can be used to shed either Load A, Load B, or both to protect batteries from discharging to an unrecoverable level. The LVBD is intended for use in battery maintenance. Set-points can be established to allow the LVD to engage or disengage at certain voltage levels.

Additionally, the LVD's may also be configured for activation by a remotely mounted Emergency Power-Off (EPO) switch. The EPO feature is not available without the LVD option.

**CAUTION: Ensure that the Control feature of the LVD is in either the AUTO or CLOSED mode prior to configuring the LVD. If the LVD is set to the OPEN mode, the LVD will immediately activate dropping any equipment energized from that load center of the power plant.**

**TABLE 2-36: DISCONNECTS**

| Item | Specifications |
|---|---|
| DISCONNECTS | This selection opens up the following menu items: |
| LVD1 | Mnemonic: LVD1<br>Range: Enable / Disable<br>DISC SETPT<br>RCNT SETPT<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01 VDC increment<br>Factory Default = Disable |
| LVD2 | Mnemonic: LVD2<br>Range: Enable / Disable<br>DISC SETPT<br>RCNT SETPT<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01 VDC increment<br>Factory Default = Disable |
| EPO1 and EPO2 | Emergency Power Off: The user may select to ENABLE or DISABLE the EPO switch from this menu. A customer provided external EPO switch must be installed for the feature to work as intended.<br>If the EPO is wired and the EPO is ENABLED in the controller, the EPO is the highest form of disconnect and will force the LVD disconnect open anytime the customer provided EPO switch is activated.<br>Factory Default = Disable<br>See the installation manual for EPO wiring. |
| LVD DLY TIMER | The LVD Delay Timer settings delays the operation of the disconnect for a set amount of time to avoid inadvertent disconnects.<br>Factory Default = 30 seconds |

### 2.7.7 CONFIG (ALARMS - SPECIAL CONDITIONS SUBMENU)

As stated in 2.6.4, certain events are coded as latched events; however for a higher level of diagnostics the user may customize alarm events as “Special conditions”. These conditions are considered Latched due to the event or “One-Shot” that will reset after the event. The “special condition” can be used with any recordable event found in the controller. Additionally, the user may customize each “special condition” with the feature set listed in table 2-35.

The following list is examples of conditions the user may elect to create “special condition” for.

- Battery Test Fail
- Clock Change
- High Voltage Shutdown
- Password Reset/Change
- Excess Login Attempts
- History Cleared
- Self Test Failed
- Alarm Test Abort
- Configuration Change

**TABLE 2-37: ALARMS**

| Item | Specifications |
|---|---|
| ALM DLY TIMER | The Alarm Delay Timer function allows the user to determine how long an Event needs to be true before extending an alarm. The intent is to prevent short term conditions from generating “nuisance” alarms.<br>Factory Default = 5 seconds |
| ONE-SHOT TIMER | Allows the user to configure “special conditions” as a condition that is present on the system for a configurable time before self clearing.<br>Range 1 to 60 minutes<br>Factory Default = 5 minutes |
| RELAY TEST | This feature allows the user to set the allowable time for a relay test to remain active without user intervention. (Walk away protection)<br>Range 1 to 60 minutes<br>Factory Default = Time Out 5 minutes |
| ALM MODE | The Alarm Mode function allows the user to determine if the alarm state is Test Mode or Normal Mode.<br>Factory Default = Normal Mode |
| LAT ALM ENABLE | This feature allows the user to configure “special conditions” as either One Shot or Latched<br>Factory Default = ONESHOT |

### 2.7.8 CONFIG (SYSTEM SUBMENU)

**TABLE 2-38: SYSTEM**

| Item | Specifications |
|---|---|
| **SYSTEM** | This menu selection opens up the following menu options |
| SYSTEM DATE | The DATE submenu allows the user to change the power plant to the current month / day / year.<br><br>After scrolling to the correct month and pausing for 5 seconds, the blinking selection position itself over the next field. Scroll to SAVE to complete change.<br>System Format submenu allows the user to select the day, month, and year display format.<br>DD/MM/YYYY<br>YYYY/DD/MM<br>Factory Default = MM/DD/YYYY |
| TIME | The Time submenu allows the user to adjust the power plant to the current Time.<br>After scrolling to the correct hour and pausing for 5 seconds, the blinking selection position itself over the next field. Scroll to SAVE to complete change.<br>The Format submenu allows the user select the hour, minute, and seconds display format between 12 and 24 hour formats.<br>Factory Default = 12 HR |
| TEMP UNIT | The Temp unit submenu allows the user to select Celsius (degrees C) or Fahrenheit (degrees F) throughout the Phoenix II.<br>Factory Default = C |

| Item | Specifications |
|---|---|
| HI AMB T SET | The High Ambient Temperature Set feature allows the user to select the high temperature threshold.<br>Factory Default = 40 C |
| LOW AMB T SET | The Low Ambient Temperature Set feature allows the user to select the low temperature threshold.<br>Factory Default = 10 C |
| TCA SET | The Total Current Alarm set point allows the user to select the total current threshold.<br>Factory Default = 2000A |
| DCA1 SET | DCA1 sets the Derived Channel 1 shunt setting<br>Factory Default = 1000A |
| DCA2 SET | DCA2 sets the Derived Channel 2 shunt setting<br>Factory Default = 1000A |
| DCA3 SET | DCA3 sets the Derived Channel 3 shunt setting<br>Factory Default = 1000A |
| DCA 4 SET | DCA4 sets the Derived Channel 4 shunt setting<br>Factory Default = 1000A |
| DCA1 DLY SET | DCA1 Delay Set allows the user to set the delay setpoint for Derived Channel 1<br>Factory Default = 10 seconds |
| DCA2 DLY SET | DCA2 Delay Set allows the user to set the delay setpoint for Derived Channel 2<br>Factory Default = 10 seconds |
| DCA3 DLY SET | DCA3 Delay Set allows the user to set the delay setpoint for Derived Channel 3<br>Factory Default = 10 seconds |
| DCA4 DLY SET | DCA4 Delay Set allows the user to set the delay setpoint for Derived Channel 4<br>Factory Default = 10 seconds |
| BRIGHTNESS | Screen brightness. No password required. Available for U/I module only.<br>Range: 1 to 10 in 1 increment<br>Factory Default = 5 |
| CONTRAST | Screen contrast. No password required. Available for U/I module only.<br>Mnemonic: CONTRAST<br>Range: 1 to 10 in 1 increment<br>Factory Default = 5 |

### 2.7.9 CONFIG (NETWORK SETTINGS SUBMENU)

**TABLE 2-39: NETWORK SETTINGS**

| Item | Specifications |
|---|---|
| **NETWORK** | This selection opens up the following menu options. |
| IP ADDRESS | Internet protocol address<br>By scrolling to the current setting the first octet will start blinking. Scroll to the proper setting. By pausing for 5 seconds the blinking curser will move to the next octet. Scroll to SAVE and press to accept IP address.<br>**Apply Network CFG must be accepted before any changes will activate.**<br>Range: 0.0.0.0 to 255.255.255.255 |

| Item | Specifications |
|---|---|
| | Factory Default = 192.168.1.1 |
| SUBNET MASK | Subnet mask.<br>By scrolling to the current setting the first octet will start blinking. Scroll to the proper setting. By pausing for 5 seconds the blinking curser will move to the next Octet. Scroll to SAVE and press to accept SUBNET MASK<br>**Apply Network CFG must be accepted before any changes will activate.**<br>Range: 0.0.0.0 to 255.255.255.255<br>Factory Default = 255.255.255.0 |
| GATEWAY | By scrolling to the current setting the first octet will start blinking. Scroll to the proper setting. By pausing for 5 seconds the blinking curser will move to the next octet. Scroll to SAVE and press to accept the GATEWAY setting.<br>**Apply Network CFG must be accepted before any changes will activate.**<br>Range: 0.0.0.0 to 255.255.255.255<br>Factory Default = 0.0.0.0 |
| DHCP | Range: STATIC / CLIENT / SERVER<br>**Apply Network CFG must be accepted before any changes will activate.**<br>Factory Default = SERVER |
| SERVER | DHCP Server. While in SERVER mode, the RJ45 connector serves as the local Craft port and allows the user to access the web pages utilizing a standard web browser. To access the web pages, connect a CAT5 cable from the user's PC to the RJ45 connector clearly marked and located on the top center of the load distribution area. When choosing this, the user must also manually assign Subnet Mask and Gateway and IP address. **NOTE: To avoid network conflicts, do not connect the Phoenix II controller directly to the host while DHCP is set to Server.** |
| CLIENT | Used when the Phoenix II controller would automatically ask and receive its IP address from the DHCP server. |
| STATIC | Used when the Phoenix II controller would have an IP address manually assigned. Most commonly used with this type of ancillary device when connected to an Ethernet network for remote access. When choosing this, user must also manually assign Subnet Mask and Gateway and IP address. |
| **APPLY NETWORK CFG** | **This feature initiates a controller soft reboot to accept any changes to network settings. It does not affect output to equipment loads.** |

### 2.7.10 CONFIG (CALIBRATION SUBMENU)

**TABLE 2-40: CALIBRATION**

| Item | Specifications |
|---|---|
| PLANT VOLTAGE | Plant Voltage calibration function allows the user to adjust the displayed voltage value to a measured value.<br>The CAL Value submenu shows the user the "offset" voltage that was used to adjust the displayed voltage with the measured voltage. |
| SHUNT A | The shunt calibration function allows the user to adjust the displayed voltage value to a measured value. |
| SHUNT B | The shunt calibration function allows the user to adjust the displayed voltage value to a measured value. |

| Item | Specifications |
|---|---|
| SHUNT C | The shunt calibration function allows the user to adjust the displayed voltage value to a measured value. |
| SHUNT D | The shunt calibration function allows the user to adjust the displayed voltage value to a measured value. |
| AMBIENT TEMP | This feature allows the user to adjust the ambient temperature reading to a measured value in the power plant location. |
| AMBIENT TEMP CAL VALUE | This features allows the user to see how many degrees the Ambient Temperature has been adjusted.<br>Factory Default = -8 degrees C |

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# SECTION 3: WEBPAGE NAVIGATION

## 3.1 ACCESSING THE PHOENIX II CONTROLLER WEBPAGES

The Power Plant's RJ45 connection serves as both remote Ethernet and Craft access port to the Phoenix II controller. The Phoenix II web pages can be accessed via standard Internet browsers to provide the user graphical access to all Phoenix II features including alarm programming, alarm relay set up, password management, and battery.

**CAUTION: To avoid network conflicts, do not connect the Phoenix II controller directly to the host network while DHCP is set to Server.**

**NOTE: The host PC must have the Java™ application v 1.6 or greater installed to view the Phoenix II web pages. Visit www.java.com/en to download this free application.**

**NOTE: A Quick Start Guide is provided that supports the most commonly used functions.**

**NOTE: When changing set points, click on the set radio button. Depressing the Return key on the keyboard may give unexpected results.**

### 3.1.1 CONNECTING TO THE CONTROLLER LOCALLY WHEN THE PHOENIX II IS NOT NETWORKED

- Navigate through the controller to ensure the unit is set to DHCP **SERVER** (MAIN MENU → CONFIG → NETWORK → DHCP select SERVER).
- Verify that the computer being used to connect to the Phoenix II controller is set to client mode. (This is the normal setting for most computers used on a Network).
- Connect the PC to Power System's RJ45 (10/100 Base-T) connection using a standard or crossover CAT5 (or better) cable.
- Input the Phoenix II **Factory default IP address 192.168.1.1** in the command line of Internet Explorer or other standard web browser.
- The webpage System Status screen will appear.

**NOTE: The factory default setup is the RJ45 connector is configured as a local craft port.**

### 3.1.2 CONNECTING TO THE CONTROLLER LOCALLY WHEN THE PHOENIX II IS NETWORKED ON THE ETHERNET

- Navigate through the controller to ensure the unit is set to STATIC (CONFIG,/NETWORK/DHCP, select STATIC) and assign IP address
- Through the controller screen on the front panel of the Phoenix II, validate the existing IP Address, (STATUS/NEWORK/IP ADDRESS), this will be the address to place in the browser on the PC to be connected to the controller. **The Factory default IP address is 192.168.1.1.**
- Input the Phoenix II IP address in the command line of Internet Explorer or standard web browser.
- The webpage welcome screen will appear.

## 3.2 LOG IN SCREEN

If no login is performed, the controller will be in view only mode. A user level and password are required to log into the Phoenix II controller's WebPages to perform any configuration changes.

| | |
|---|---|
| **Default User Level:** | **ADMIN (all capital letters)** |
| **Default Password:** | **9999** |
| **Default User Level:** | **USER(all capital letters)** |
| **Default Password:** | **3333** |

**NOTE: All user levels and passwords are case sensitive.**

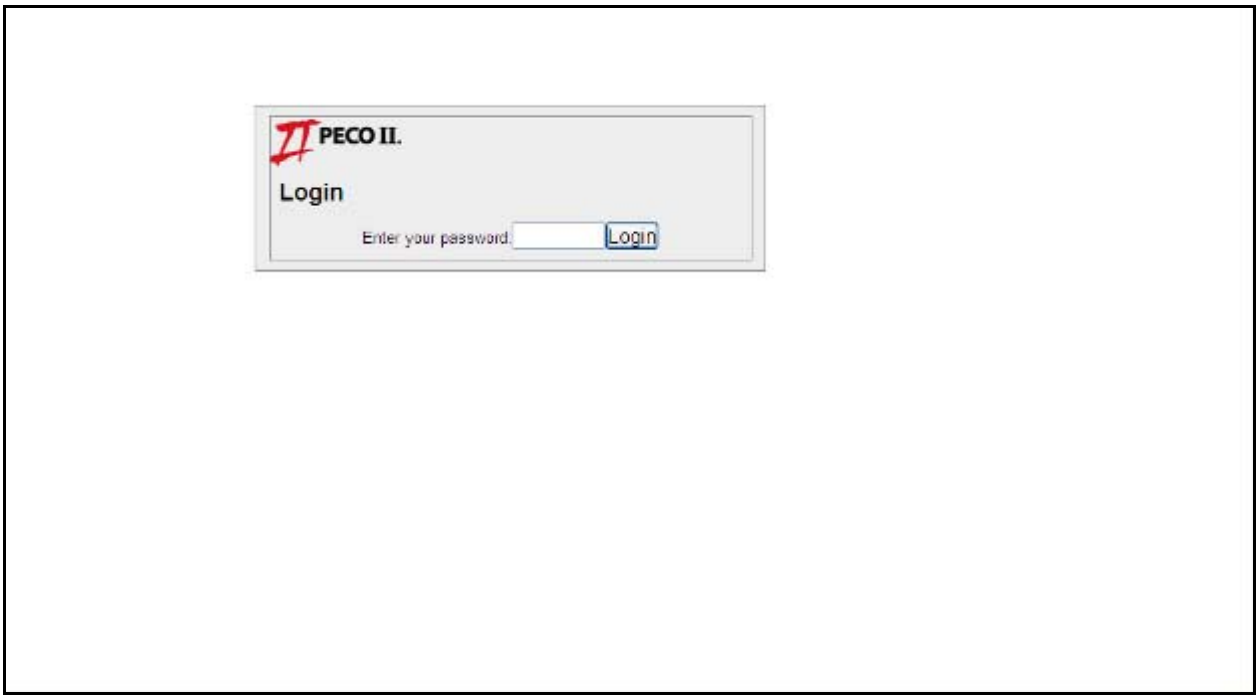



**FIGURE 3-1: LOG IN SCREEN**

## 3.3 SYSTEM STATUS SCREEN

Once connectivity is established through the RJ45 jack the Phoenix II controller will open the primary webpage displaying the various screens and selections available to the user. The screen is an active display into the controller and provides real time information. The primary screen is divided into three specific areas; **Dashboard Header, Menu Tabs, and the Alarm Section.**

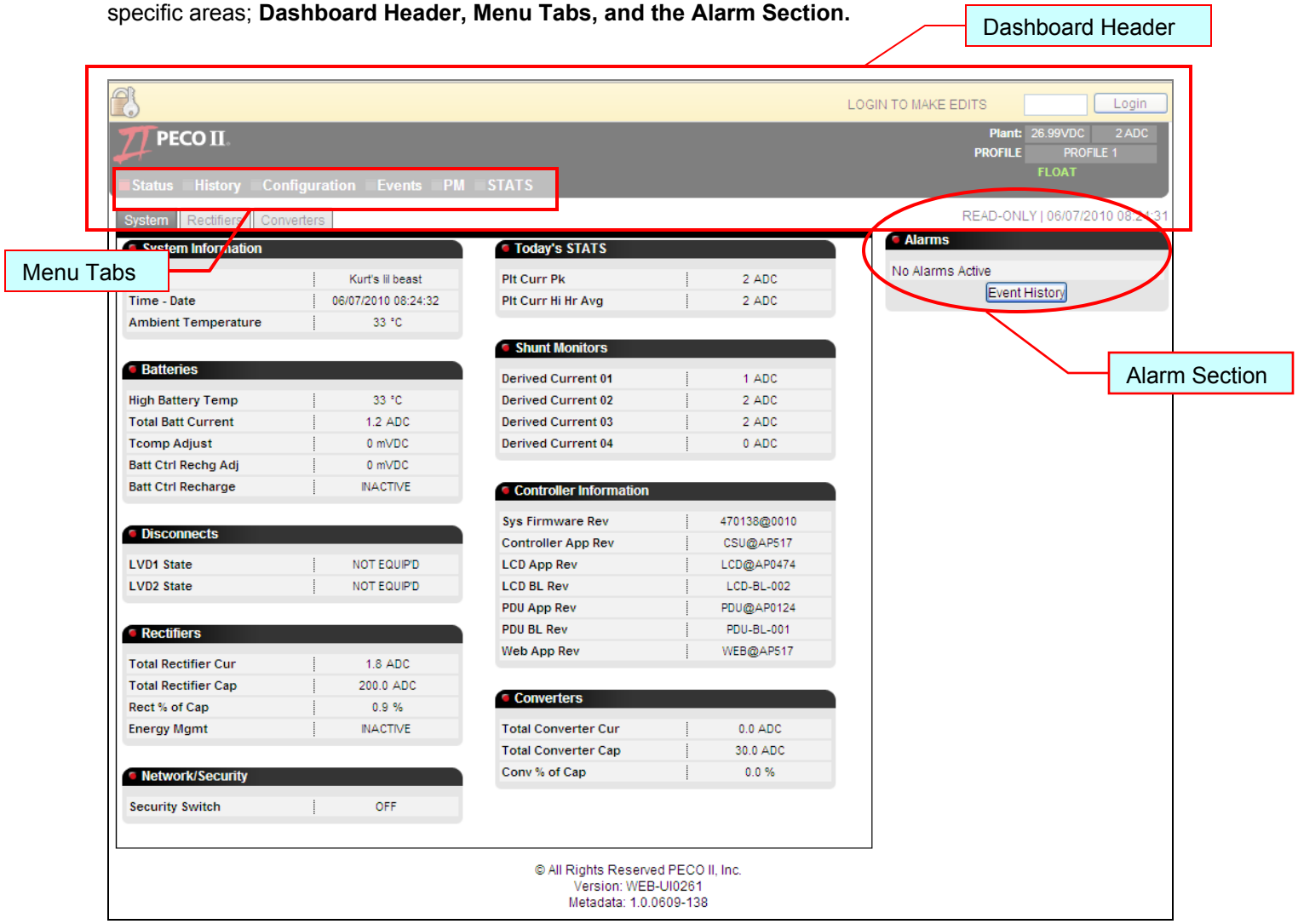



**FIGURE 3-2: SYSTEM STATUS SCREEN**

### 3.3.1 DASHBOARD HEADER

Within any session, the dashboard header, Figure 3-3 will always be present. There are three primary menu topics (**Status, History, Configuration, Events, PM, and STATS**). A red button will be displayed next to the menu topic currently being displayed. Each menu topic reveals a different set of menu tabs immediately below the menu topic. Using the cursor, the user may move throughout the web pages by selecting the appropriate menu topic and menu tabs. Additionally within the dashboard header the user status includes a banner alerting the user of view only status and instant login access found below the status condition. Once the user has logged in, this banner will disappear. The dashboard header provides system status conditions on the right side of the display.

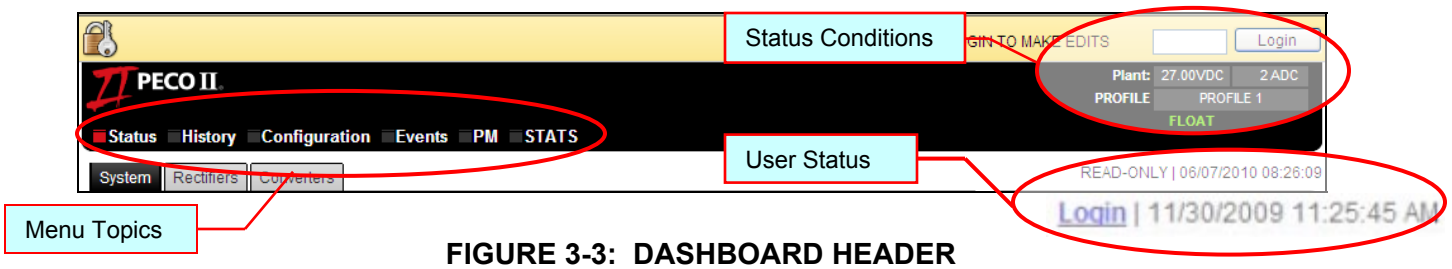



**FIGURE 3-3: DASHBOARD HEADER**

- **Menu Topics**: The menu topics section provides access to each of the 3 major topics found in the controller menu. Use the cursor to select the menu topic. After selecting a menu topic, a list of menu tabs displays with additional sub-topics that are related to the main menu topic.
    - **Status:**
        - Power Plant set-points
        - Rectifier and Converter menu tabs
    - **History:**
        - Alarm History
    - **Configuration:** Each of the following menu tabs will display various conditions and options available to the user for configuration setup and monitoring.
        - System
        - Batteries
        - Communications
        - Capacity
        - Auxiliary inputs
        - Security settings
    - **Events:** Each screen allows customization of any reportable event
        - Alarms and alerts
            - Condition severity
            - Method of reporting
            - Output path of the event
    - **Preventative Maintenance (PM):**
        - Alarm Test
    - **Stats**
        - Plant Voltage
        - Plant Current
        - Derived Channels 1-4

- **User Status**: The user status is found in two parts on the dashboard header. A “View Only” flag will be displayed at the top of the dashboard until the login status is changed to “**USER**” or “**ADMIN**”. At any time the user may login or change their status by clicking the login button found below the status conditions. In addition to this login status, the controller time and date is displayed. This is the current time and is refreshed every 7 seconds. This user status button may be used to log out at anytime.
- **Status Conditions**: Status conditions provide a view of various system settings, configurations, and outputs giving the user a real-time view of the power plants operating condition.
  - **Plant:** Voltage and Current is displayed as a real time value
  - **Float/Equalize:** This indicator will toggle between one of the two values indicating this plant condition. (The automatic equalize function is not currently available.)
  - **INACTIVE/TCOMP:** This indicator relates only to temperature compensation. TCOMP will be displayed when the feature is active. This feature will augment the system voltage based on temperature
- **Alarms:** The alarm window is part of the Dashboard screen and will be present in all sessions. Active alarms will be presented as shown in Figure 3-4. Using the Event History radio button, the user may review the history of current or previous alarm conditions, both active and cleared conditions.

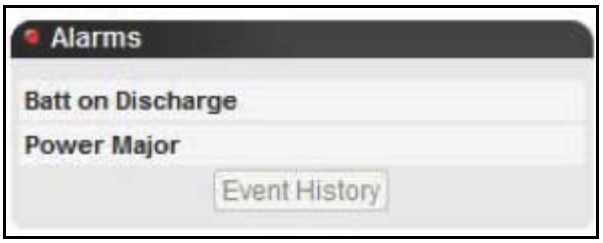



**FIGURE 3-4: ALARMS**

## 3.4 STATUS

The STATUS menu topic consists of eight sub-menus. As an analytical tool, the user can review these various set points and configurations as a way to determine how the system reacted to existing conditions.

- System Information
- Batteries
- Disconnects
- Rectifiers
- Shunt Monitors
- Controller Information
- Network Security
- Converters

All system status points can be viewed within the STATUS sub-menus

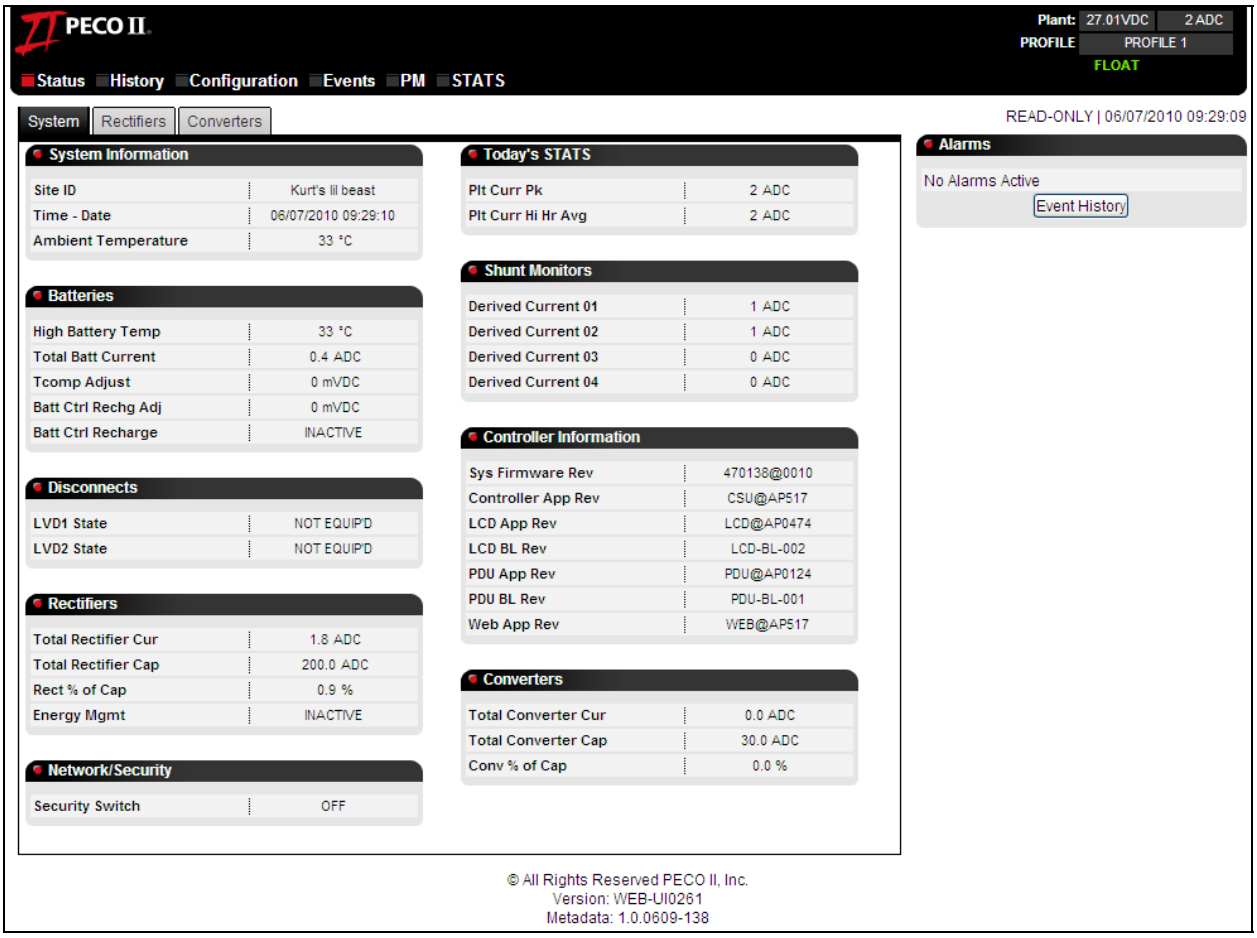



**FIGURE 3-5: STATUS MENU TOPIC**

## 3.4.1 STATUS (SYSTEM TAB)

### 3.4.1.1 STATUS (SYSTEM TAB - SYSTEM INFORMATION)

The system information provides **Ambient Temperature** at the system level. This value is based on a temperature sensor integrated into the Phoenix II controller.

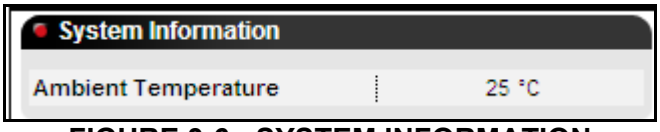



**FIGURE 3-6: SYSTEM INFORMATION**

### 3.4.1.2 STATUS (SYSTEM TAB – BATTERIES)

The battery status screen displays the condition of the batteries based on settings, values and test conditions.

| Item | Specifications |
|---|---|
| HIGH BATT TEMP | This is a recorded value based on the highest battery temperature recorded by the system controller. |
| TOTAL BATTERY CURRENT | This is a summation value determined during the setup procedure based on total number of battery strings + battery AH. |
| BATTERY TEMPERATURE COMPENSATION (TCOMP) | When enabled, the Phoenix II controller will activate TCOMP using the highest measured temperature from either of the external temp probes. If no temperature probes are installed, the Integrated Ambient Temperature sensor measurement will be used.<br><br>ENABLE activates the function while DISABLE will deactivate the function.<br><br>**LINEAGE POWER does not recommend enabling TCOMP without battery temperature probes.** .<br><br>Factory Default = Disable |
| TCOMP ADJUST | Displays the amount of TCOMP adjustment that is being applied |
| BATT CTRL RECHG ADJ | The Phoenix II controller limits the battery current by clamping the voltage to the appropriate level. This feature displays the amount of the voltage has been changed.<br>Range = 0 mVDC to 1000 mVDC<br>Factory Default = 0 mVDC |
| BATT CTRL RECHARGE | Displays if the Battery Controlled Recharge feature is Enabled or Disabled<br>Factory default = Disabled |

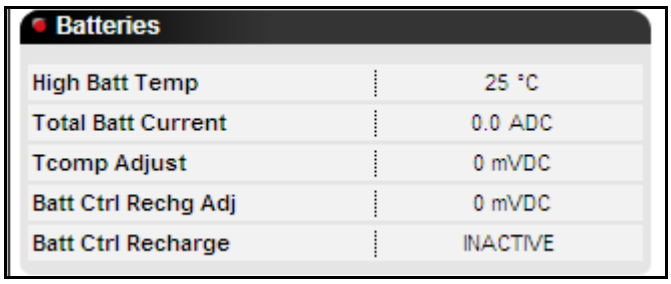



**FIGURE 3-7: BATTERIES**

### 3.4.1.3 STATUS (SYSTEM TAB – DISCONNECTS)

| Item | Specifications |
|---|---|
| LVD 1 STATE | Equipped or Not Equipped |
| LVD 2 STATE | Equipped or Not Equipped |

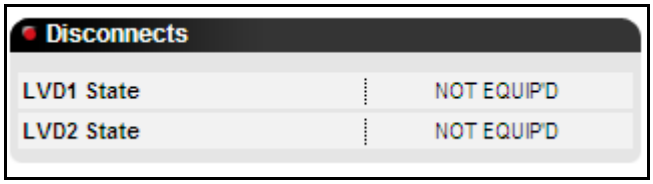



**FIGURE 3-8: DISCONNECTS**

### 3.4.1.4 STATUS (SYSTEM TAB – RECTIFIERS)

The rectifier status screen displays the rectifier values as equipped within this system configuration.

| Item | Specifications |
|---|---|
| TOTAL RECTIFIER CUR | Displays total rectifier (system) output current |
| TOTAL RECTIFIER CAPACITY | Number of rectifier * rectifier rating = total rectifier capacity |
| RECTIFIER % OR CAPACITY | Total rectifier current / total rectifier cap = % of available capacity |
| ENERGY MGMT | Displays if the Energy Management feature is enabled or disabled<br>Factory Default = Disabled |


**FIGURE 3-9: RECTIFIERS**

### 3.4.1.5 STATUS (SYSTEM TAB – SHUNT MONITORS)

| Item | Specifications |
|---|---|
| DERIVED CHANNEL 01 | Displays current reading from shunt monitor labeled Channel 01. |
| DERIVED CHANNEL 02 | Displays current reading from shunt monitor labeled Channel 02. |
| DERIVED CHANNEL 03 | Displays current reading from shunt monitor labeled Channel 03. |
| DERIVED CHANNEL 04 | Displays current reading from shunt monitor labeled Channel 04. |

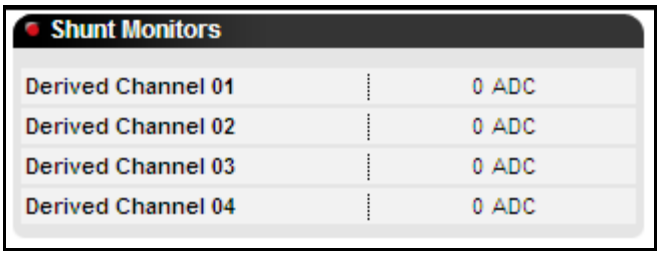



**FIGURE 3-10: SHUNT MONITORS**

### 3.4.1.6 STATUS (SYSTEM TAB – CONTROLLER INFORMATION)

The Controller information section of the status screen provides the listed versions, releases and revisions of both the controller software and hardware. This information is populated automatically by the controller. Anytime the controller is updated or replaced, these numbers will update accordingly.

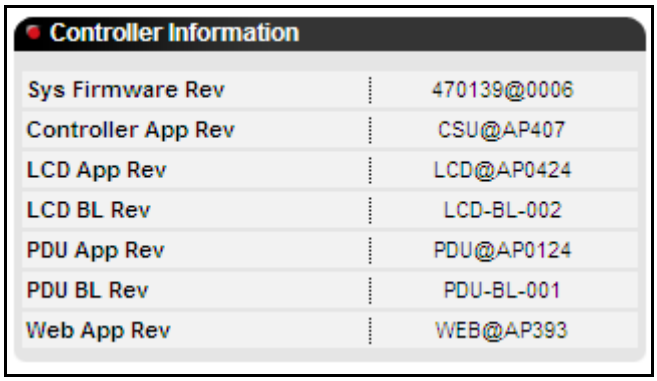



**FIGURE 3-11: CONTROLLER INFORMATION**

### 3.4.1.7 STATUS (SYSTEM TAB – NETWORK SECURITY)

The Phoenix II controller is equipped with an added security feature that allows the user to grant or deny remote write/change access by enabling or disabling a physical switch. Enabling the switch restricts the RJ45 access to read-only. See 3.4.1.7A for switch location and operation.


**FIGURE 3-12: NETWORK SECURITY**

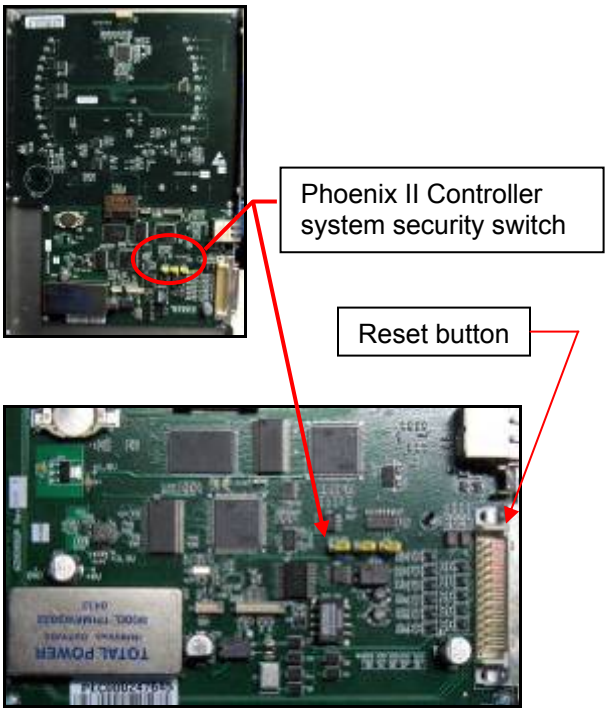
### 3.4.1.7A SECURITY SWITCH

## PHOENIX II CONTROLLER SECURITY SWITCH

- The Phoenix II controller security switch is accessed through the opening on the back of the controller cover.
- When facing the back panel of the controller **using a nonmetallic probe** gently slide the **left most switch** from right to left to place the Phoenix II controller in view only mode when accessed remotely.
- Moving the switch back to the right will disable the remote security.
- By moving the switch to the on position, remote users will not be able to change system set-points and configurations even if logged in.
- After enabling or disabling the security switch, the Phoenix II controller will require a reset. The reset button is located between the RJ45 connector and the 25 pin connector located on the side of the controller. No setpoints will be altered during a reset.

**NOTE: Using a metallic probe to activate the security stitch can damage the controller circuit boards and will void the controller warranty.**


**Controller Back Panel**




**Phoenix II Security Switch**

### 3.4.1.8 STATUS (SYSTEM TAB – CONVERTERS) (OPTIONAL)

When equipped with converters, current and capacity values will be displayed.

| Item | Specifications |
|---|---|
| TOTAL CONVERTER CURRENT | Displays the total converter (system) output current |
| TOTAL CONVERTER CAPACITY | Number of converters * converter rating = total converter capacity |
| CONVERTER % OF CAPACITY | Total converter current/total converter cap = % of available capacity |

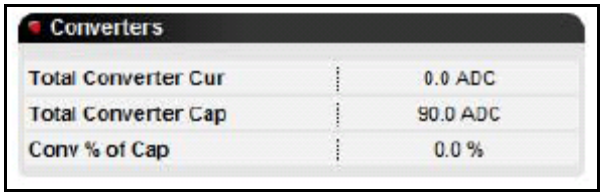



**FIGURE 3-13: CONVERTERS**

### 3.4.2 STATUS (RECTIFIERS TAB)

The rectifier tab provides access to all rectifiers currently online and in service. From this screen, the user may elect to place any of the listed rectifiers in standby mode by selecting the STANDBY radio button, once selected the **Status** will change from RUN to STANDBY. While in STANDBY, the rectifier will still be energized from the AC circuit but will not be supplying DC output to the load bus.

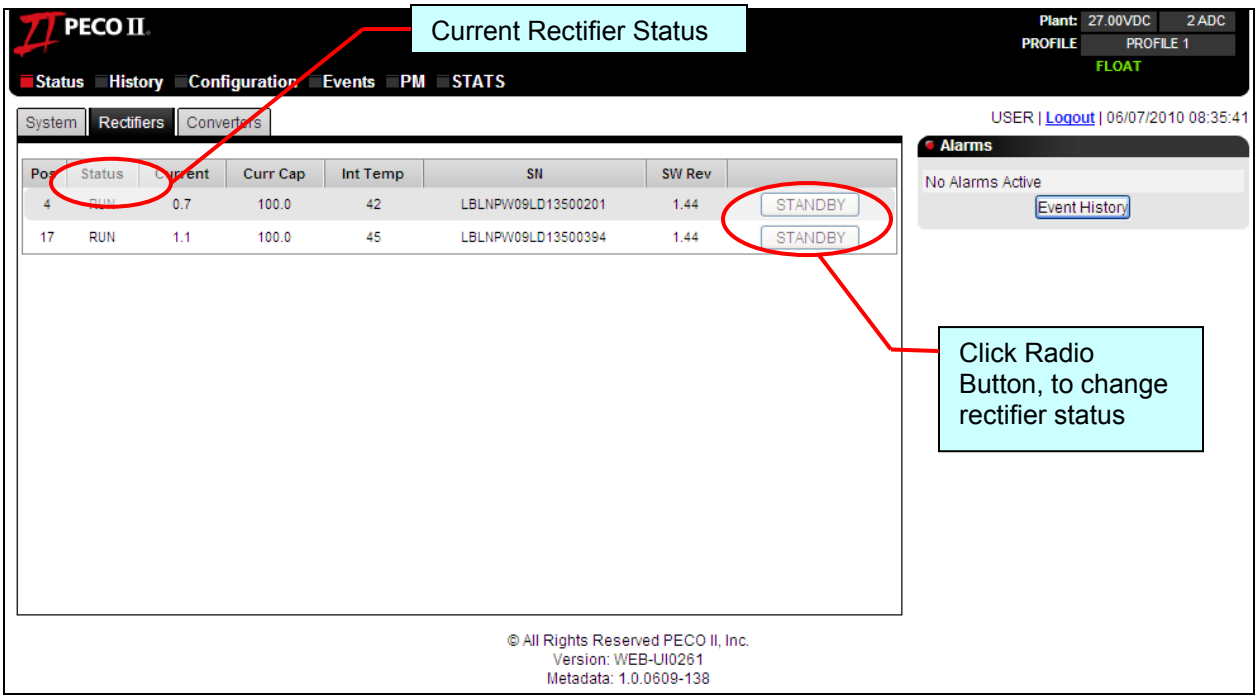



**FIGURE 3-14: RECTIFIERS**

### 3.4.3 STATUS (CONVERTERS TAB) (OPTIONAL)

The converter tab provides access to all converters currently installed and in service. From this screen, the user may elect to place any of the listed converters in standby mode by selecting the STANDBY radio button, once selected the **Status** will change from RUN to STANDBY. While in STANDBY, the converter module will still be energized but will not be supplying output current to the load bus.

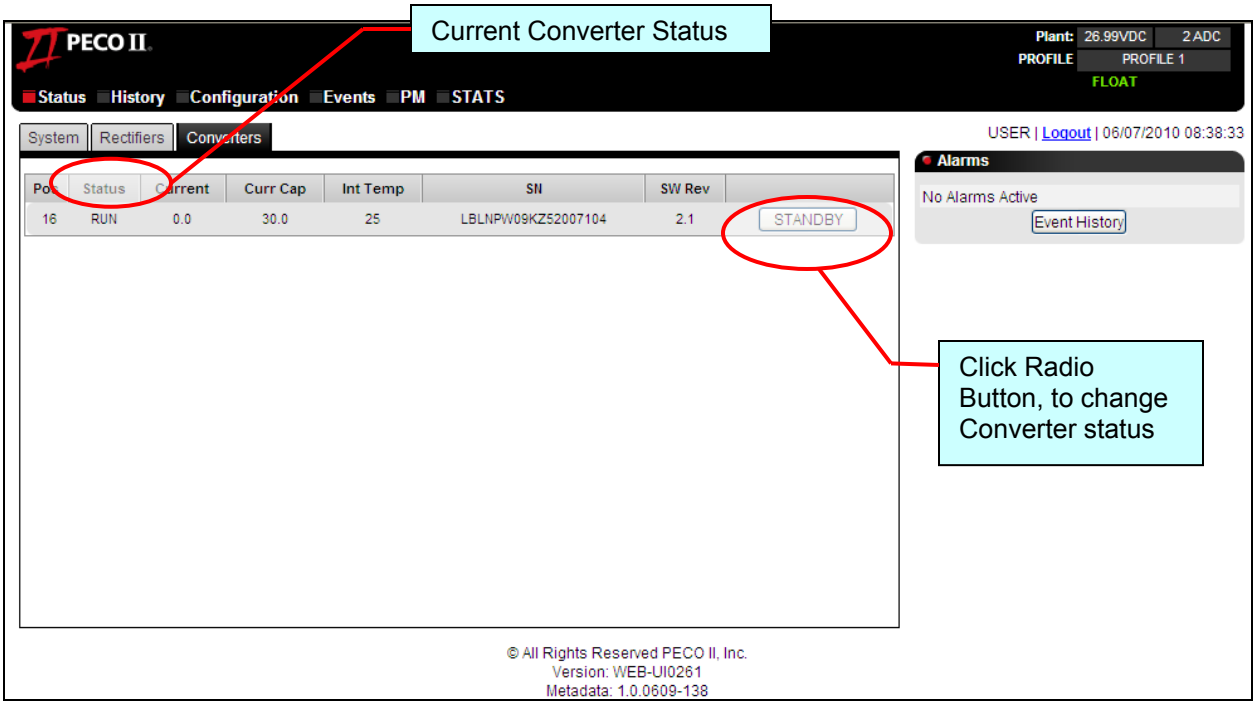



**FIGURE 3-15: CONVERTER SCREEN**

## 3.5 HISTORY

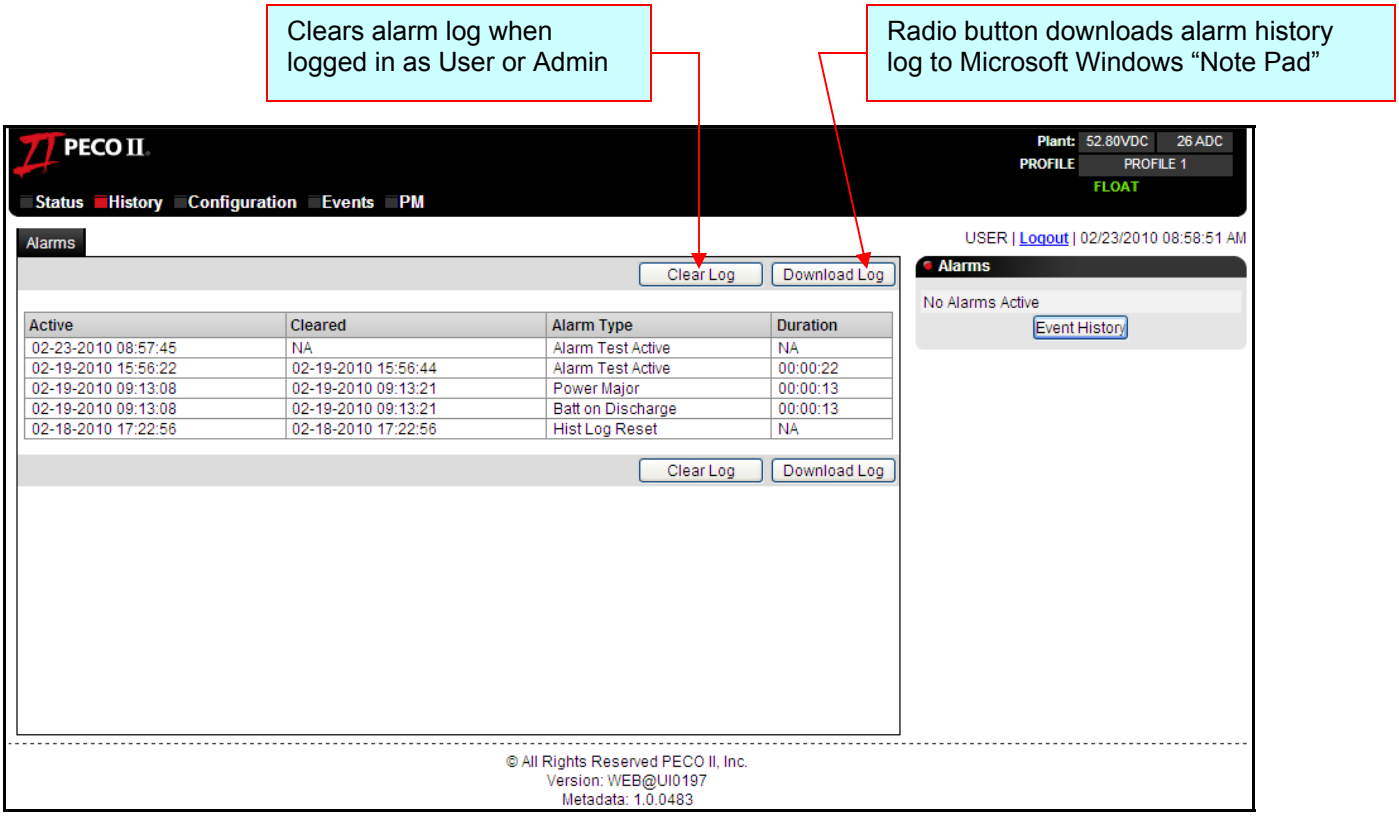



**FIGURE 3-16: ALARM HISTORY**

| Item | Specifications |
|---|---|
| ACTIVE | Displays MM/DD/YYYY, HH:MM:SS that the alarm was initiated. |
| CLEARED | Displays MM/DD/YYYY, HH:MM:SS that the alarm was cleared. |
| ALARM TYPE | Displays the alarm type. |
| DURATION | Displays the HH:MM:SS that the alarm was active |
| CLEAR LOG | Clicking the Clear Log radio button clears the log if logged in as either User or Admin. |
| DOWNLOAD LOG | This feature downloads the alarm log to windows Note Pad and is available for printing. The log can be downloaded in view only mode. |

## 3.6 CONFIGURATION

The CONFIGURATION menu topic consists of five menu tabs. Each tab represents a section of the controller. Clicking on any one of the five tabs will display the current set points of the chosen tab. Configurations have been established by the manufacturer but are easily adjusted within the menu topic.

- o System
- o Batteries
- o Communications
- o Capacity
- o Security

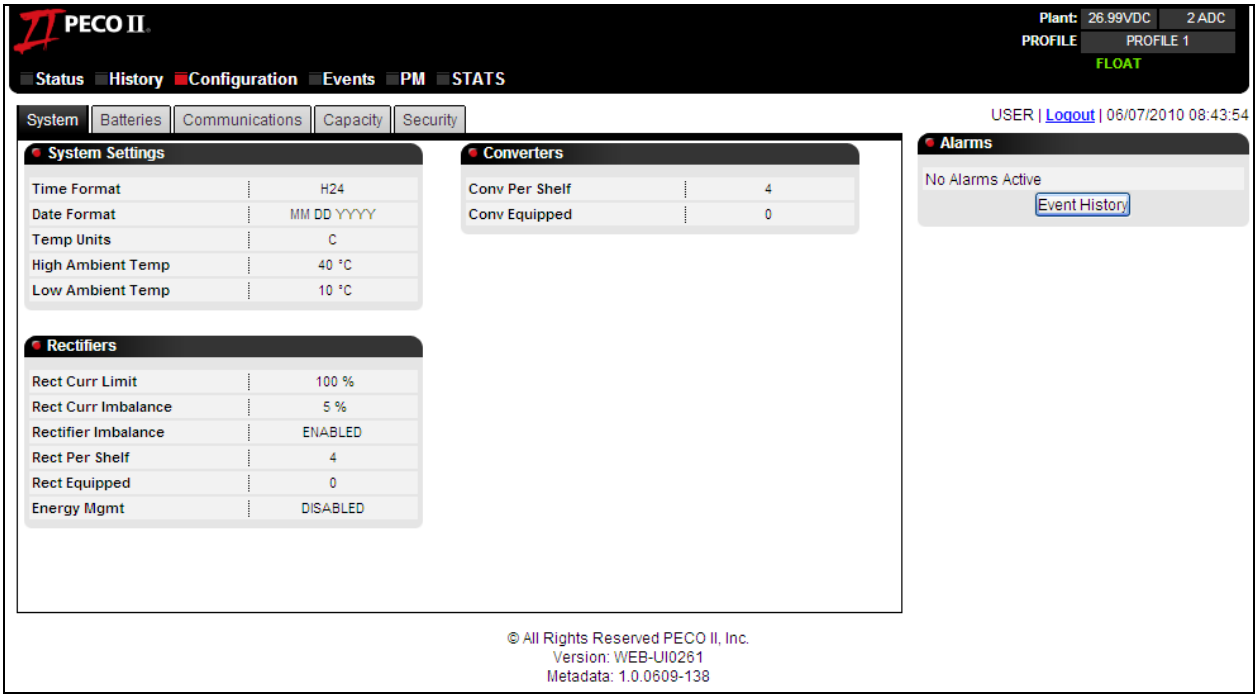



**FIGURE 3-17: CONFIGURATION MENU TOPIC**

**NOTE: When changing set points, click on the set radio button. Depressing the Return key on the keyboard of the computer may give unexpected results using certain browsers.**

### 3.6.1 CONFIGURATION (SYSTEM TAB)

#### 3.6.1.1 CONFIGURATION (SYSTEM TAB - SYSTEM SETTINGS)

The SYSTEM SETTINGS allows the adjustments to the time format, date format, as well as changing the temperature scale between Centigrade and Fahrenheit. These are global settings; changes will be reflected throughout the Phoenix II controller.

| Item | Specifications |
|---|---|
| TIME FORMAT | Both 12 and 24 hour clocks are available<br>Factory Default= 12H |
| DATE FORMAT | The user may change the date format from MM-DD-YYYY to DD-MM-YYYY<br>Factory Default= MM-DD-YYYY |
| TEMP UNITS | The user may choose between Centigrade and Fahrenheit.<br>Factory Default= C |
| HIGH AMBIENT TEMP | Displays the High Ambient Temperature setpoint. |
| LOW AMBIENT TEMP | Displays the Low Ambient Temperature setpoint. |

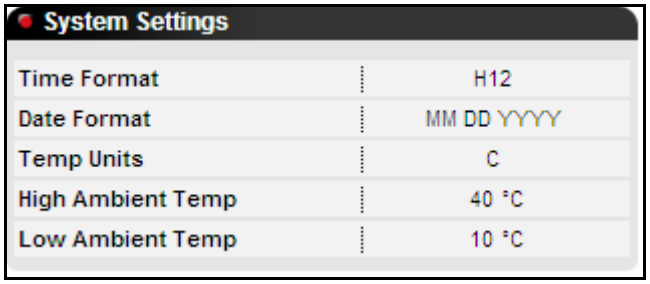



**FIGURE 3-18: SYSTEM SETTINGS**

#### 3.6.1.2 CONFIGURATION (SYSTEM TAB – RECTIFIERS)

This rectifiers section allows for global changes to the all rectifiers currently online as well as future rectifiers as they are activated and placed on line.

| Item | Specifications |
|---|---|
| **RECTIFIERS** | |
| RECT CL | Current Limit. Controls the rectifier current limit values based on percentages. The user may adjust this limit to reduce rectifier output current.<br>Range: 30 to 110 % in 1 % increments<br>Factory Default = 110 % |
| IMB ALM SETPT | This is a threshold alarm with the setpoint being designated as a percentage difference of the output current between rectifiers. If a rouge rectifier has output current over the configured setpoint the rectifier shuts down. After 10 seconds, the rectifier restarts. If the imbalance persists, the rectifier latches in the shut down mode.<br>Range: 5% to 10% in 1 % increments<br>Factory Default = 5% |
| IMB ALM ENA/DIS | This feature enables or disables the current imbalance alarm feature<br>Factory Default = DISABLED |
| RECTS PER SHELF | This setting is used when the Phoenix II controller is used with a system that has less than 4 module slots (e.g. 19 inch rectifier / converter shelf) |
| RECT EQUIPPED | This feature allows the user to configure the power plant to extend an alarm if a rectifier is added or removed. By setting the number of equipped rectifiers to the actual number installed in the power plant any addition or removal will create an alarm.<br>**A setting of 0 provides full plug and play module additions and removals with no additional controller configuration changes.**<br>Range 0 – 48 in 1 module increments<br>Factory Default = 0 |
| ENERGY MGMT | This feature enables or disables the energy management feature.<br>The purpose of this feature is to increase the overall efficiency of the power plant while maintaining the readiness of the plant to supply output to the load as needed. The Phoenix II calculates the number of rectifiers needed to satisfy the existing load and places the remaining rectifiers in hot standby. These rectifiers are still energized from their AC source but are not contributing output to the equipment load requirements.<br>To maintain the readiness of the rectifiers, all rectifiers will be put in RUN mode for a 24 hour period every 30 days.<br>In a BOD event, the feature is terminated and returned to a disabled condition.<br>Factory Default = Disabled |

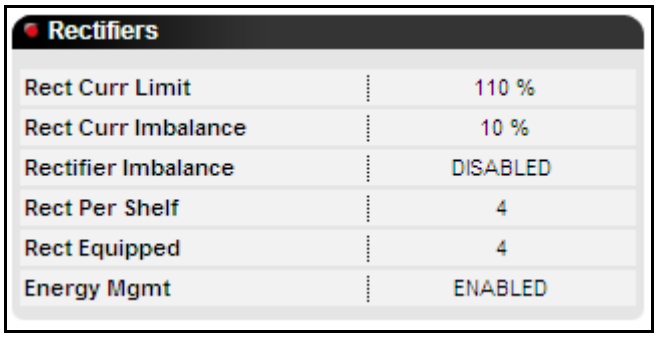



**FIGURE 3-19: RECTIFIERS**

### 3.6.1.2A CURRENT LIMIT / CONSTANT POWER RECTIFIERS

All rectifiers used in this industry float charge stationary batteries. They spend >95% of their life providing a constant voltage to the load and the parallel-connected battery string(s).

The chart below shows a load line for a typical 50-amp rectifier and a load line for a constant power 2700W rectifier. The vertical axis is output (float) voltage; the horizontal axis is output current. As can be seen from the chart, the rectifier regulates its output (float) voltage at 54.0 volts for any output current up to 55 amps, thereby providing a constant voltage (pink plot line). If the load tries to draw more than 55 amps, the rectifier changes to constant current mode, meaning the rectifier will limit its output current to 55 amps, regardless of how low the load resistance becomes. In this example the rectifier has two modes, constant voltage and constant current.

The second plot on the chart below again shows the constant voltage mode; however, a 2700W constant power mode is added. As before, the output voltage is constant until the load attempts to draw more than 2700 watts (dark blue plot line). At this point the rectifier changes to a constant power mode. If the rectifier maintained a true constant power mode it would follow the dark blue plot line and produce 60 amps at 45 volts. Extending the plot below 45 volts, the rectifier would be capable of producing, say, 100 amps at 27 volts! (2700W) This output current would certainly stress the output connector and the output components in the rectifier!

A practical implementation of constant power actually incorporates all three modes discussed so far. As can be seen by the yellow plot line in the chart below, the rectifier changes from constant power to constant current at a level that protects the output components. In this example, the rectifier changes to constant current mode when the output current reaches 55 amps.

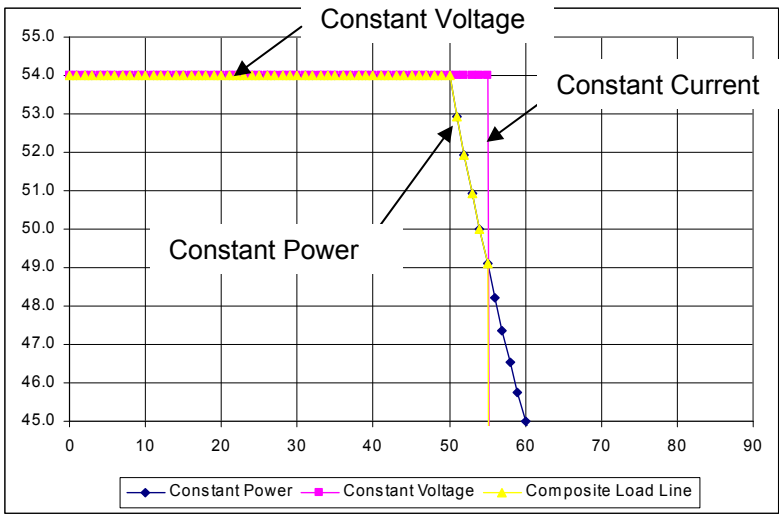



**FIGURE 3-20: CONSTANT POWER RECTIFIER OUTPUT**

### 3.6.1.3 CONFIGURATION (SYSTEM TAB – CONVERTERS) (OPTIONAL)

| Item | Specifications |
|---|---|
| CONV PER SHELF | This input is used to dictate how many converter modules can be installed per shelf. If the Phoenix II is utilized with a 19 inch shelf, the input would be 3 Conv per shelf.<br>Range = 1-8 |

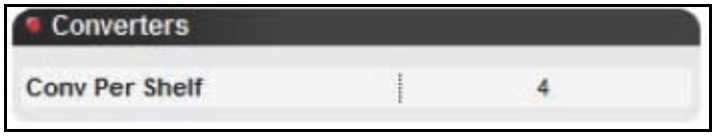



**FIGURE 3-21: CONVERTERS**

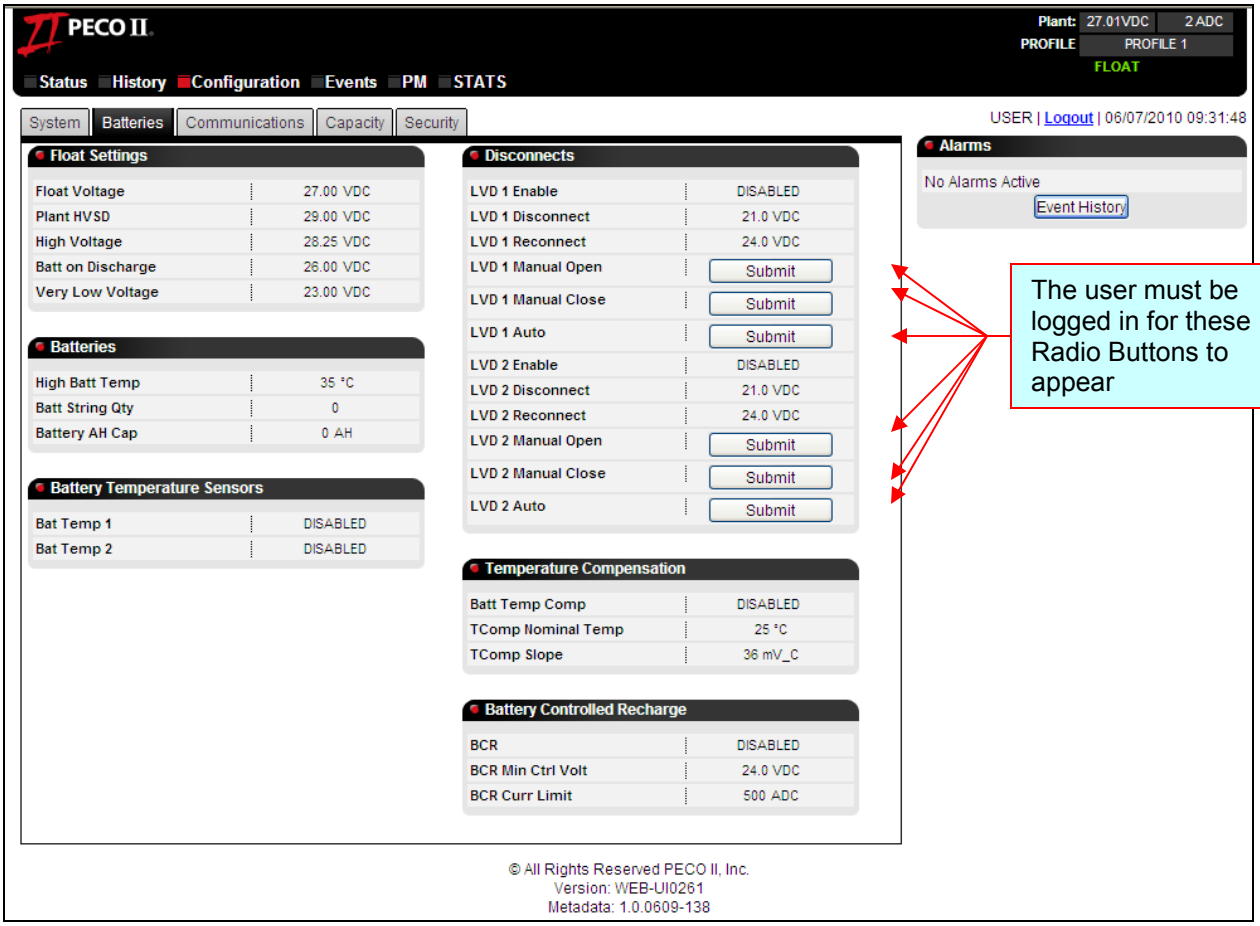



**FIGURE 3-22: BATTERY MENU TAB**

**CAUTION**: Clicking the **Manual Open** radio button will open the corresponding load LVD dropping any attached equipment loads.

### 3.6.2 CONFIGURATION (BATTERIES TAB)

The BATTERIES menu tab allows the configuration of battery settings. The user may customize these settings for specific applications or retain the factory defaults.

Consult the end users standards and conventions as well as battery manufacturer's documentation to ensure that there are no battery warranty infringements.

### 3.6.2.1 CONFIGURATION (BATTERIES TAB - FLOAT SETTINGS)

The FLOAT SETTINGS window allows for customization of battery and system set points critical to proper battery operation.

| Item | Specifications |
|---|---|
| FLOAT VOLT | Allows the user to manually adjust system float voltage set-point.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 42.00 to 58.00 VDC in 0.01 VDC increments |
| HVSD | High Voltage Shutdown. Allows the user to manually adjust the HVSD shutdown point.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01 VDC increment |
| HV | High voltage alarm. This alarm indicates an abnormally high output voltage but does not shut the unit down. The user can manually adjust this value.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01 VDC increment |
| BOD | Battery on discharge. This alarm occurs when the system is operating either completely or partially on battery power. The user can manually adjust this value.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01 VDC increment |
| VLV | Very low voltage alarm. Alarm indicates an imminent system shutdown due to discharging batteries or low output voltage. The user can manually adjust this value.<br>Range: 20.00 to 30 VDC in 0.01 VDC increments<br>Range: 40.00 to 60.00 VDC in 0.01VDC increment |

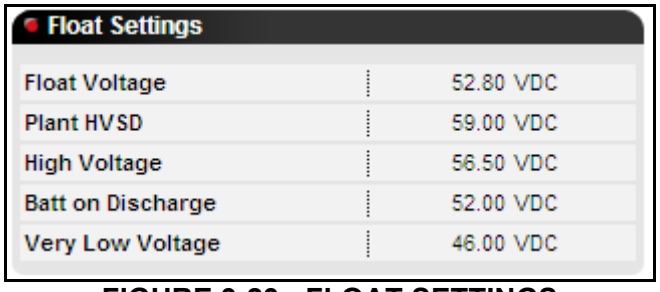



**FIGURE 3-23: FLOAT SETTINGS**

#### 3.6.2.1A SELECTIVE HIGH VOLTAGE SHUTDOWN (HIGH VOLTAGE SHUTDOWN)

As the controller recognizes the system is exceeding the HVSD threshold, the controller begins a shutdown sequence:

- Rectifier(s) carrying more than 10% of their rated capacity are identified. A rogue rectifier will ignore forced load share and attempt to consume the largest amount of plant load.
- The identified rectifier(s) are placed in standby mode.
- After a timeout of 5-10 seconds, it restarts the rectifier(s).
- After 2 attempts the rectifier(s) will latch in standby mode.

#### 3.6.2.2 CONFIGURATION (BATTERIES TAB - DISCONNECTS (OPTIONAL)

The Phoenix II Controller can monitor up to 2 Low Voltage Disconnects (LVD's). When the power system is equipped with a LVD, the DISCONNECT section provides disconnect and reconnect set points for each LVD. The LVD must be **enabled** within the Phoenix II.
Controller to allow for the disconnect feature to operate.

This screen also allows the user to manually open, close, or place into automatic either installed load LVDs.

| Item | Specifications |
|---|---|
| LVD1 | Allows access to control features of the LVD.<br>Factory Default= 21.00<br>Reconnect = 24.00<br>Factory Default= 42.00<br>Reconnect = 50.00 |
| OPEN | This command will force open the LVD, removing power from the DC output bus. An event (alarm) will be displayed regardless of the equipment configuration.<br>**The user must be logged in for this feature to be available.** |
| CLOSE | This command will manually force close the LVD.<br>**The user must be logged in for this feature to be available.** |
| AUTO | This command will allow the LVD to automatically open or close based on the open and close set-point voltages established through the web page CONFIG screen<br>**The user must be logged in for this feature to be available.** |
| LVD2 | Allows access to control features of the LVD 2.<br>Factory Default= 21.00<br>Reconnect = 24.00<br>Factory Default= 42.00<br>Reconnect = 50.00 |
| OPEN | This command will force open the LVD, removing power from the DC output bus. An event (alarm) will be displayed regardless of the equipment configuration.<br>**The user must be logged in for this feature to be available.** |
| CLOSE | This command will manually force close the LVD.<br>**The user must be logged in for this feature to be available.** |
| AUTO | This command will allow the LVD to automatically open or close based on the open and close setpoint voltages established through the web page CONFIG screen.<br>**The user must be logged in for this feature to be available.** |

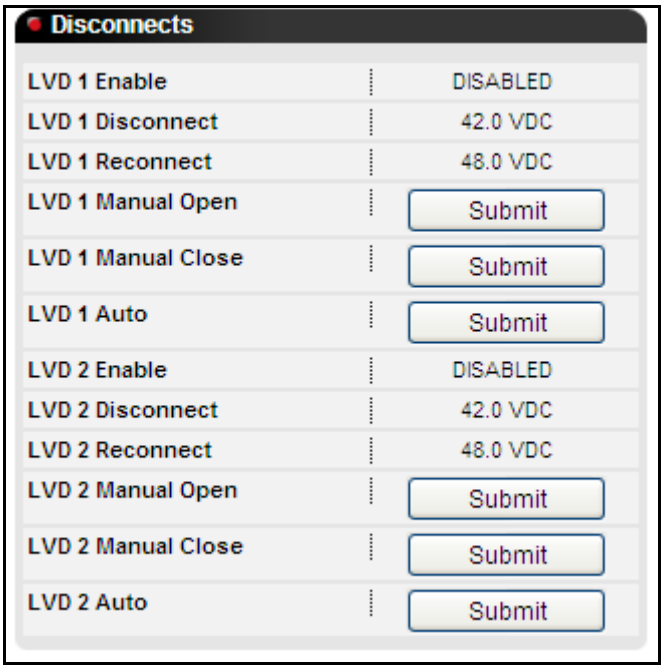



**FIGURE 3-24: DISCONNECTS**

**CAUTION: When configuring the LVD, ensure the control feature of the LVD is in AUTO or CLOSED mode. If the LVD is set to OPEN in the CONTROL Menu, it will open immediately, once the LVD CONFIG has been accepted, energized equipment will be disconnected from the power system load center.**

#### 3.6.2.3 CONFIGURATION (BATTERIES TAB - BATTERY HIGH TEMP)

Battery values may be adjusted in this section.

| Menu Item | Specifications |
|---|---|
| HI BATT TEMP | Displays the High Battery Temperature set point |

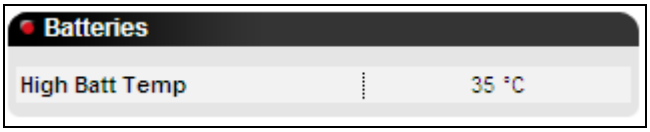



**FIGURE 3-25: BATTERY HIGH TEMP**

#### 3.6.2.4 CONFIGURATION (BATTERIES TAB - BATTERY TEMP PROBES)

| Menu Item | Specifications |
|---|---|
| BATTERY TEMP SENSOR PROBE 1 AND 2 | Enables or disables Battery Temperature P-robes 1 and 2 |

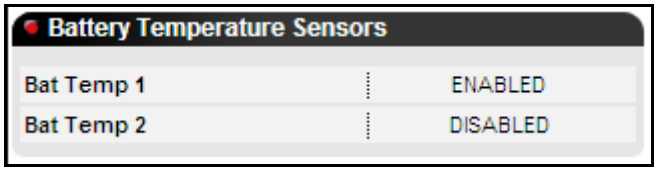


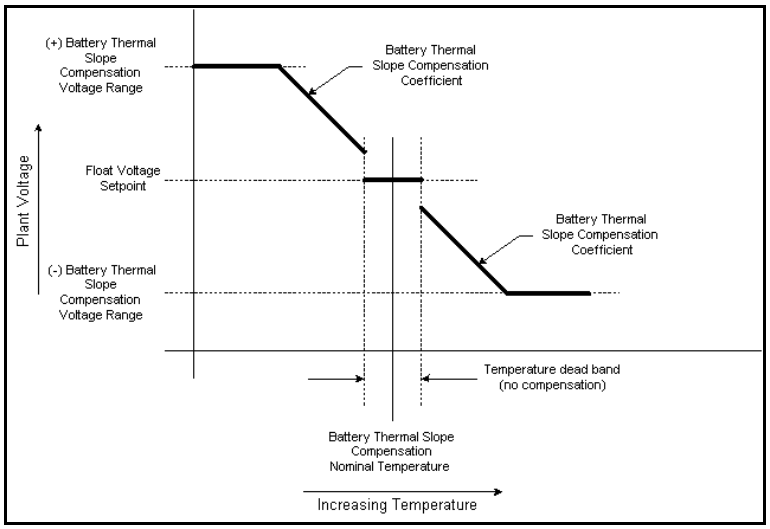

**FIGURE 3-26: BATTERY PROBES**

### 3.6.2.4A TEMPERATURE COMPENSATION (TCOMP)

TCOMP is designed to automatically adjust the plant's float voltage as an inverse function of the temperature of a (temp probe) reference cell in the battery string being charged or utilizing the ambient temperature measurement being monitored by the Phoenix II controller. The greater of the two temperatures will be used to initiate TCOMP.

Float voltage compensation is continuous for temperatures in the range of 10 to 65°C (50 to 149°F). Thermal compensation, in response to a measured temperature below this range, will not force the float voltage higher than one (1) volt above the uncompensated float voltage. In response to a measured temperature above this range, the battery thermal compensation will not force the float voltage lower than five (5) volts below the uncompensated float voltage.

When used, the optional battery temperature probe must be attached to the 2nd (numbered right to left) negative battery terminal. Refer to the Power Plant Installation Manual for temperature probe installation.




| Menu Item | Specifications |
|---|---|
| TCOMP | Displays if Temperature Compensation is Enabled or Disabled. |
| TCOMP Nominal Temp | When TCOMP is enabled this feature dictates the temperature threshold that will allow TCOMP to provide automatic voltage adjustments based on increased battery temperature.<br>**Normally used with VRLA batter products.**<br>Factory Default = 25 Degrees C |
| TCOMP Slope | Displays the mV per cell of temperature compensation.<br>The TCOMP Slope is a factory set value based on industry standards.<br>**LINEAGE POWER does not recommend adjusting the factory default configuration.** |

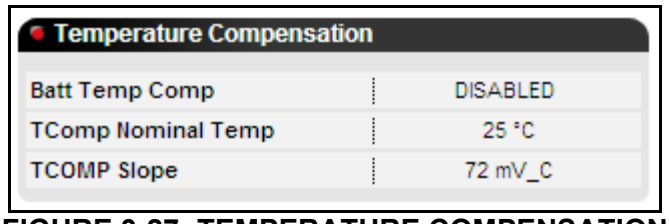



**FIGURE 3-27: TEMPERATURE COMPENSATION**

### 3.6.2.5 CONFIGURATION (BATTERIES TAB – BATTERY CONTROLLED RECHARGE)

| Menu Item | Specifications |
|---|---|
| BCR | Displays if the Battery controlled recharge feature is Enabled or Disabled<br>Factory Default = Disabled |
| BCR Min Ctrol Voltage | This feature allows the user to set the output voltage offset This is the minimum output voltage used to limit the battery recharge current.<br>Range = 47V to 49V<br>Range = 23V to 25V<br>Factoryu Default = 48V<br>Factory Default = 24V |
| BCR CURRENT LIMIT | This feature allows the user to establish the maximum amount of current that will be supplied to the batteries while recovering from a battery on discharge (BOD) event.<br>Range = 1A to 1000A<br>Factory Default = 500A |

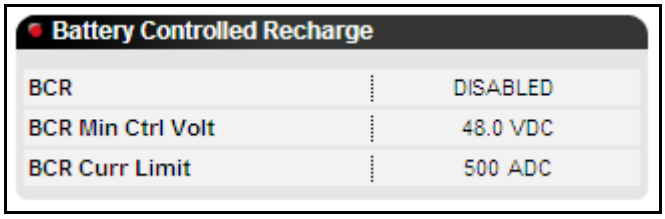



**FIGURE 3-28: BATTERY CONTROLLED RECHARGE (BCR)**

### 3.6.3 CONFIGURATION (COMMUNICATIONS TAB)

The communications tab provides access to all network connectivity settings.

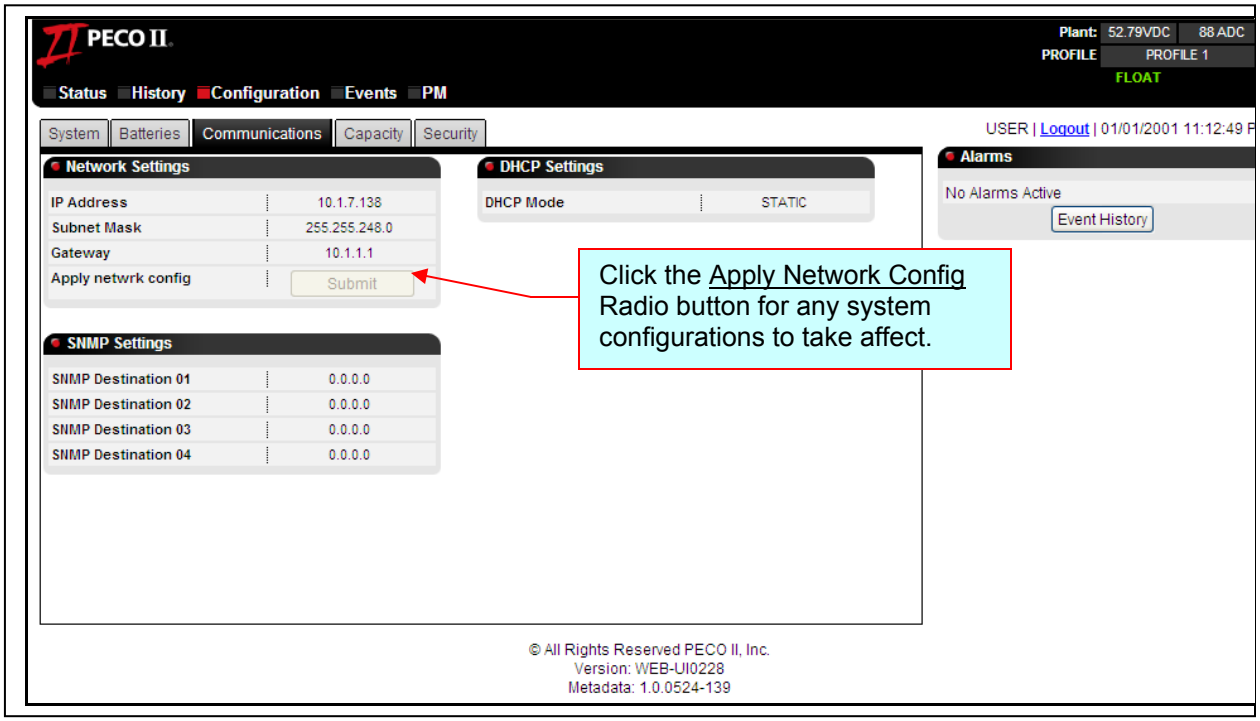



**FIGURE 3-29: COMMUNICATIONS MENU TAB**

#### 3.6.3.1 CONFIGURATION (COMMUNICATIONS TAB - NETWORK SETTINGS)

The Phoenix II Controller's factory default IP address is 192.168.1.1. Network setting shall be adjusted by the user dependant on local network configuration. Setup and usage is explained in Section 3.1

| Menu Item | Specifications |
|---|---|
| IP ADDRESS | Factory Default = 192.168.1.1 |
| SUBNET MASK | Factory Default = 255.255.255.0 |
| GATEWAY | Factory Default = 0.0.0.0 |
| **APPLY NETWORK SETTINGS** | **This feature loads any changes to the factory default settings into the firmware. Changes will not take affect until the ACCEPT command has been accepted.** |

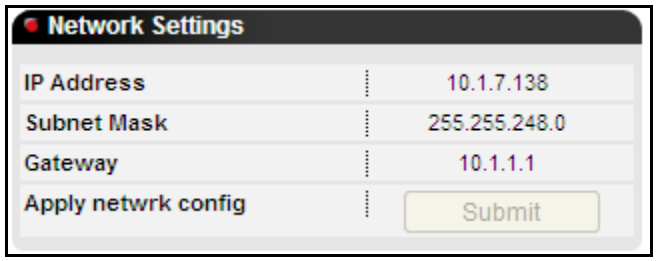



**FIGURE 3-30: NETWORK SETTINGS**

**CAUTION: Any Network configuration changes will require the user to reinitiate WEB browser communication with the Phoenix II controller.**

### 3.6.3.2 CONFIGURATION (COMMUNICATIONS TAB - SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP) SETTINGS)

SNMP settings define the destination location of where the SNMP trap will be sent.

- **SNMP Destinations 01-04:** Enter the user defined SNMP destination in each of the four fields; this will create the path and destination of the 4 SNMP events.

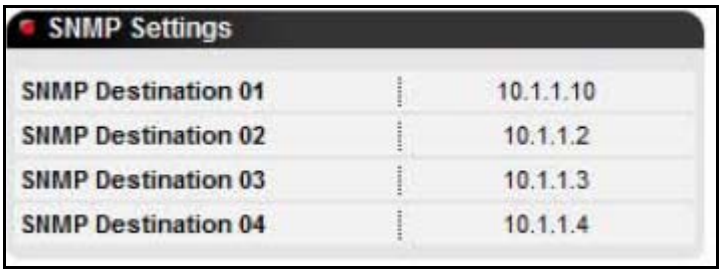



**FIGURE 3-31 SNMP SETTINGS**

### 3.6.3.3 CONFIGURATION (COMMUNICATIONS TAB - DYNAMIC HOST CONFIGURATION PROTOCOL (DHCP) SETTING)

DHCP determines the connectivity relation between the Phoenix II Controller and the network.

| Menu Item | Specifications |
|---|---|
| DHCP MODE | DHCP determines the connectivity relation between the Phoenix II Controller and the network.<br>STATIC: Allows the controller to be remotely accessible via the Ethernet connection and an IP address is being randomly assigned.<br>SERVER: Used in stand alone mode when RJ45 jack is used as simply a craft access point.<br>Factory Default = SERVER |
| SUBNET MASK | Factory Default = 255.255.248.0 |
| GATEWAY | Factory Default = 10.1.1.1 |
| **APPLY NETWORK SETTINGS** | **This feature loads any changes to the factory default settings into the firmware. Changes will not take affect until the ACCEPT command has been accepted.** |

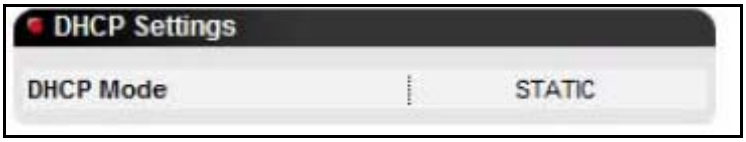



**FIGURE 3-32: DHCP SETTING**

### 3.6.4 CONFIGURATION (CAPACITY TAB)

The CAPACITY screen allows adjustments to capacity alarm conditions, optional shunts and derived channels.

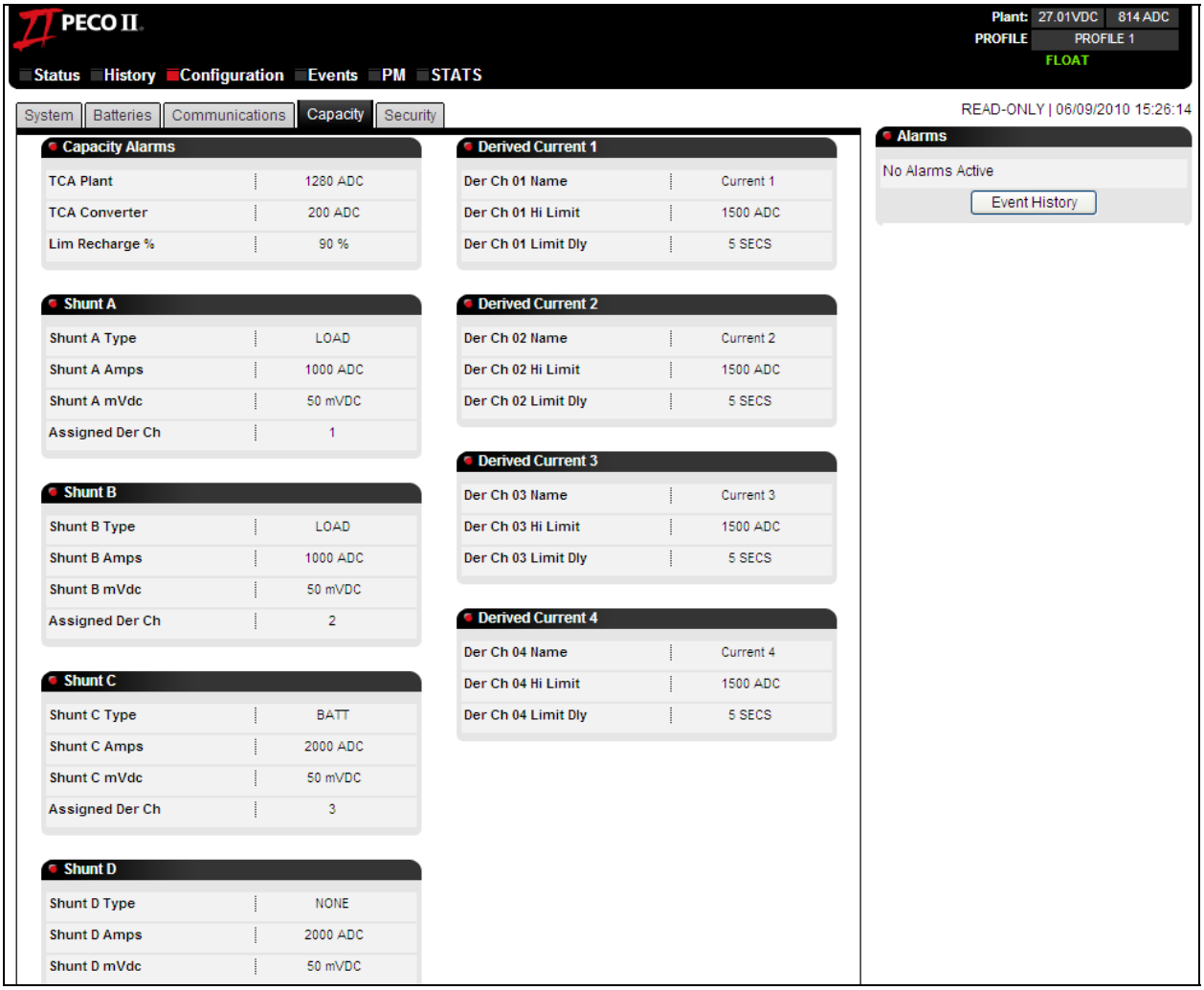



**FIGURE 3-33: CAPACITY MENU TAB**

### 3.6.4.1 CONFIGURATION (CAPACITY TAB - CAPACITY ALARMS)

The CAPACITY ALARMS section allows an alert to be set indicating a capacity limitation or threshold as been reached.

| Item | Specifications |
|---|---|
| TCA CURRENT LIMIT | This feature displays the Total Current Limit of the power plant and the TCA for the converter output distribution panel.<br>Factory Default = 2000A |
| LTG RCHG SETPT (REDUNDANCY LOSS) | This feature displays the limited recharge (Redundancy Loss) setpoint.<br>ENABLED: The setpoint is the threshold percentage of the power plant load divided by the current generated by all installed rectifiers.<br>When active, the plant load has exceeded the programmed percentage of the total rectifier capacity set for this alarm. Rectifier capacity may be inadequate for recharging batteries in an acceptable period of time following an extended battery discharge. This LMR condition will be expressed in the alarm menu and the Amber LMR LED on the front panel will be illuminated. If this event has been programmed to a relay, an alarm will be extended to the alarm center.<br>Factory Default: 80% |

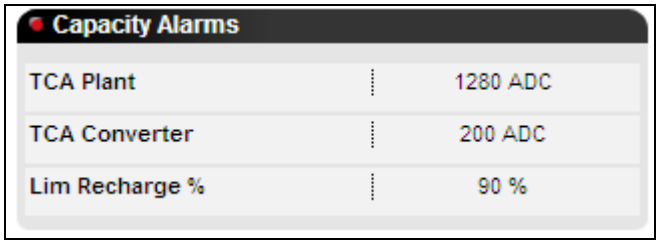



**FIGURE 3-34: CAPACITY ALARMS**

### 3.6.4.2 CONFIGURATION (CAPACITY TAB - SHUNT MONITORS / DERIVED CHANNELS) (OPTIONAL EQUIPMENT)

The Phoenix II controller can monitor up to 4 optional shunts providing DC current values for each channel. If the power plant is equipped with optional Load Shunts, two external shunts can also be monitored. If the Power Plant is equipped with the optional Battery shunt, three external shunts can be monitored. The user can monitor specific distribution loads as part of the cumulative total of the system.

The following are configuration options:

1. Branch Current Measurements.
    - Single Ended Current Measurement with high threshold and “condition true” delay.
2. Existing Equipment Branch Currents.
    - Single Ended Current Measurement with high threshold and “condition true” delay.
3. Existing Equipment Main Shunts.
    - Single Ended Current Measurement with high threshold and “condition true” delay.
    - Sum to produce Load Current.
4. Battery Charge/Discharge Currents.
    - Double Ended Current Measurement with high threshold and “condition true” delay.
    - Sum to produce Battery Current.
    - This table defines measurement sources.

- $I_{rectifier}$ I is the sum of currents reported by rectifiers
- $I_{battery}$ I is the sum of currents measured by battery shunts
- $I_{load} = I_{rectifier} I - I_{battery} I$
- When $I_{rectifier}$ I is zero, $I_{load} = -I_{battery}$ I
  - (Follows the math)
- When $I_{battery}$ I is zero, $I_{load}$ I = $I_{rectifier}$ I
  - (Follows the math)

If the Load shunt or Battery shunt options are provided, the Phoenix II controller will be factory configured.

**3.6.4.3 CONFIGURATION (CAPACITY TAB - SHUNT A, B, C & D) (OPTIONAL)**
The optional SHUNT section allows profile definitions and set point adjustments. (X= Shunt A- D)

| Item | Specifications |
|---|---|
| SHUNT TYPE | Options are: None, Battery, Branch or Load.<br>Factory Default = None |
| SHUNT AMP | This is the size of the shunt that is to be monitored.<br>Range = 1A to 3000A |
| SHUNT mVDC | This is the output Voltage monitoring shunt.<br>Range = 25mVDC to 80mVDC |
| ASSIGNED DER CH | This is the user assigned channel.<br>Range = Chan 0 to Chan 4 |


**FIGURE 3-35: SHUNT A**

**3.6.4.4 CONFIGURATION (CAPACITY TAB - DERIVED CURRENT 1, 2, 3 & 4)**
The optional SHUNT section allows profile definitions and set point adjustments.

| Item | Specifications |
|---|---|
| DER CH NAME | This is the channel name assigned by the user. |
| DER CH HIGH LIMIT | This the high Amperage limit of the shunt.<br>Range = -5000A to 5000A |
| DER CH LIMIT DLY | This is the user defined time limit that is used in conjunction with the High Current Alarm set point. The delay time setting is utilities to avoid nuisance alarms.<br>Range 0 seconds to 3600 seconds |

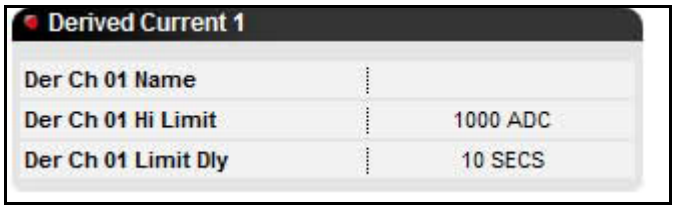



**FIGURE 3-36: DERIVED CURRENT 1, 2, 3 & 4**

### 3.6.5 CONFIGURATION (SECURITY TAB)

The SECURITY Menu Tab allows for changes in password protection for webpage access. Admin privileges are required to make these changes.

| Item | Specifications |
|---|---|
| VIEW ONLY | The View only mode does not require a password. In this mode the user can see all setpoints, login and related configuration information. No configuration management is available in this mode. |
| USER PASSWORD | The User Password grants write permissions for configuration and alarm setpoints. The password can consist of 4 numbers.<br>**Factory Default USER Password = 3333** |
| ADMIN PASSWORD | The Administration Password grants write permissions for configuration and alarm setpoints, the ability to set passwords, and the ability to clear latched alarms.<br>The password can consist of 4 numbers.<br>**Factory Default Admin Password = 9999** |

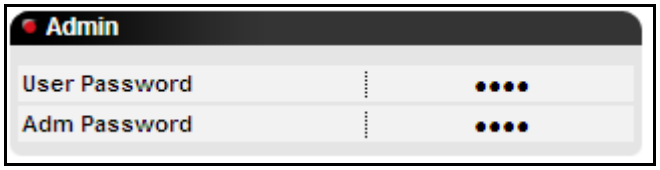



**FIGURE 3-37: SECURITY PASSWORDS**

#### 3.6.5.1 CONFIGURATION (SECURITY TAB – SESSION SETTINGS)

| Item | Specifications |
|---|---|
| SYSTEM TIMEOUT | This feature allows the user to set a Login Timeout length.<br>Range = 1 min to 20 min<br>Factory Default = 20 min |

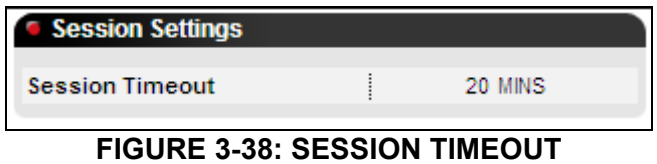



**FIGURE 3-38: SESSION TIMEOUT**

# 3.7 CONDITIONS, EVENTS, AND ALARMS

## 3.7.1 EVENTS (SYSTEM TAB)

The EVENTS menu topic consists of five sub-menus. In the EVENTS menu the user can determine which events and/or condition are reported as alarms, the severity of these alarms, or if the event or condition is logged only. Each sub-menu provides a list of events. Events can be routed to Email, SNMP and relay outputs by placing a mark in the associated check box. Additionally the user will define the event as a major, minor, or critical. Events may also be routed to any of the 10 relay outputs. A check mark must be placed in the appropriate box to route the event.

Relays 1 and 2 are failsafe relays are held open and will close on alarm. LINEAGE POWER recommends using these for power loss events like AC fail. Each relay can be field wired as close on alarm or open on alarm. See installation manual for alarm wiring.

Power Critical, Power Major, and Power Minor are summing alarms. Multiple events may be assigned via the check box (see below) to be extended as one or all if the assigned events become true.

LINEAGE POWER recommends the following process:

- Determine severity of all events or conditions that will be extended to the Alarm Center (Critical, Major, Minor).
- Determine and assign all events or conditions that that will be extended as part of the three summing alarms (Power Critical, Power Major, or Mower Minor).
- Determine and assign all events or conditions that will be extended as discrete alarms.
- Determine and assign all events or conditions that will not be extended as alarms but need to be recorded in event logs.

Events that are not assigned as alarms will still illuminate the LEDs on the front panel display.

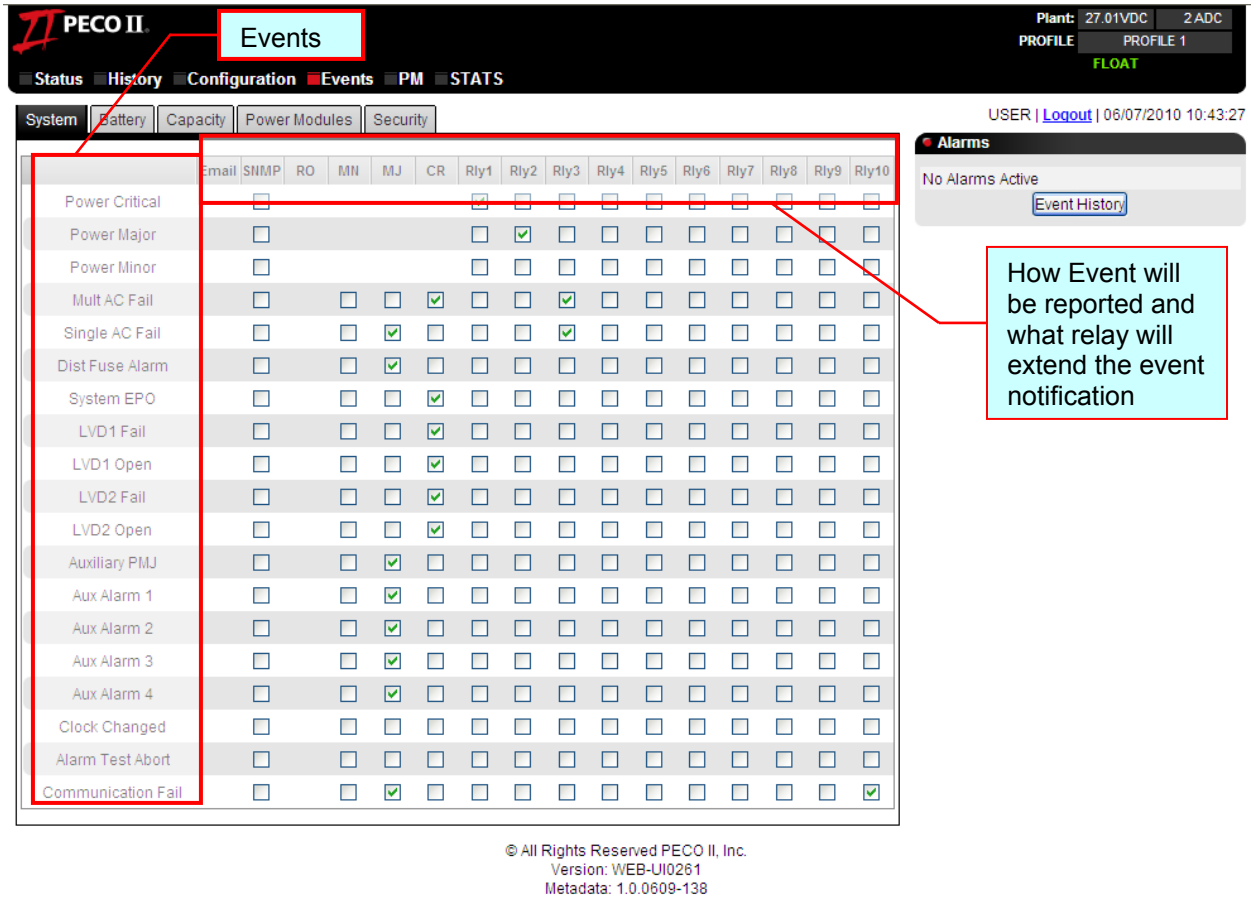



**FIGURE 3-39: EVENTS MENU TOPIC**

### 3.7.2 EVENTS (BATTERY TAB)

The Battery tab provides access to all battery related events.

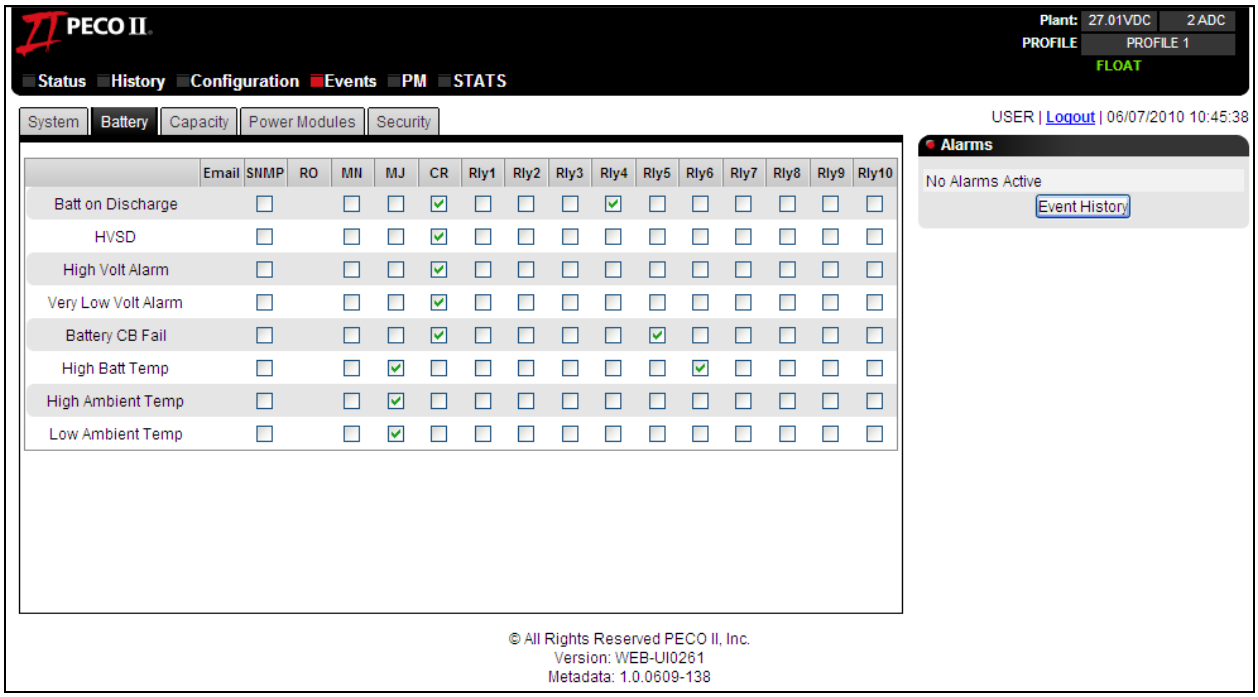



**FIGURE 3-40: BATTERY**

### 3.7.3 EVENTS (CAPACITY TAB)

The Capacity tab provides access to all system capacity related events.

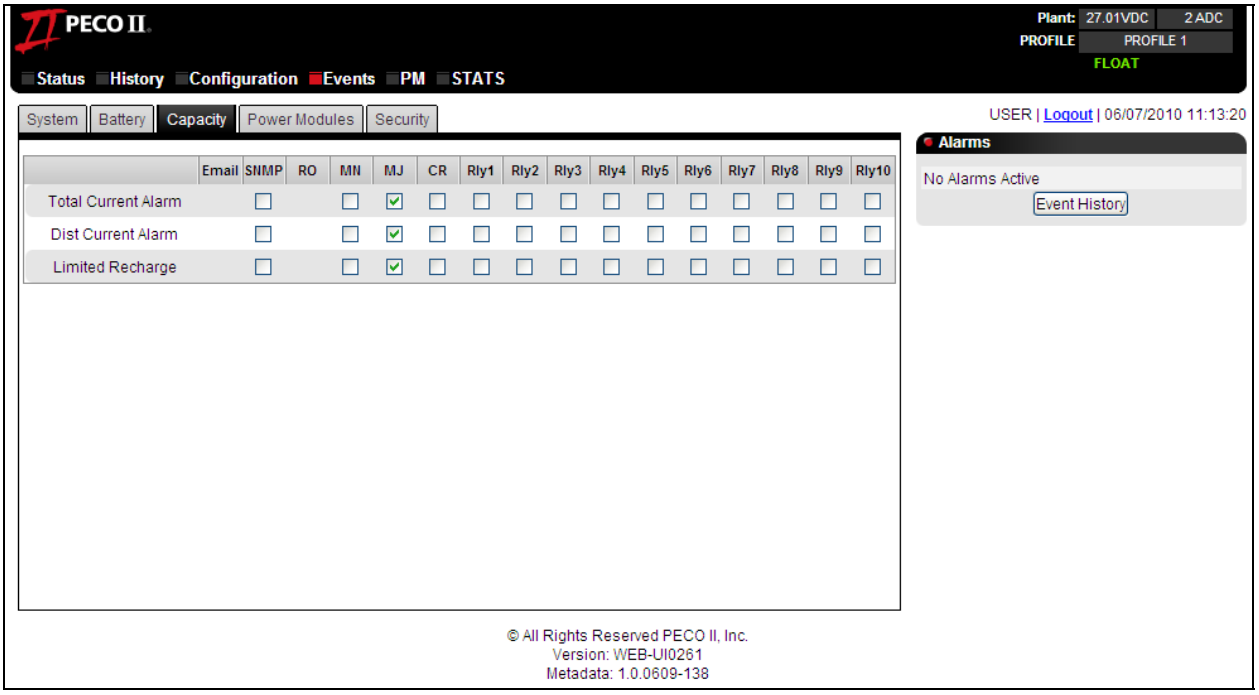



**FIGURE 3-41: CAPACITY**

### 3.7.4 EVENTS (POWER MODULES TAB)

The Power Modlues tab provides access to rectifier and converter related events.

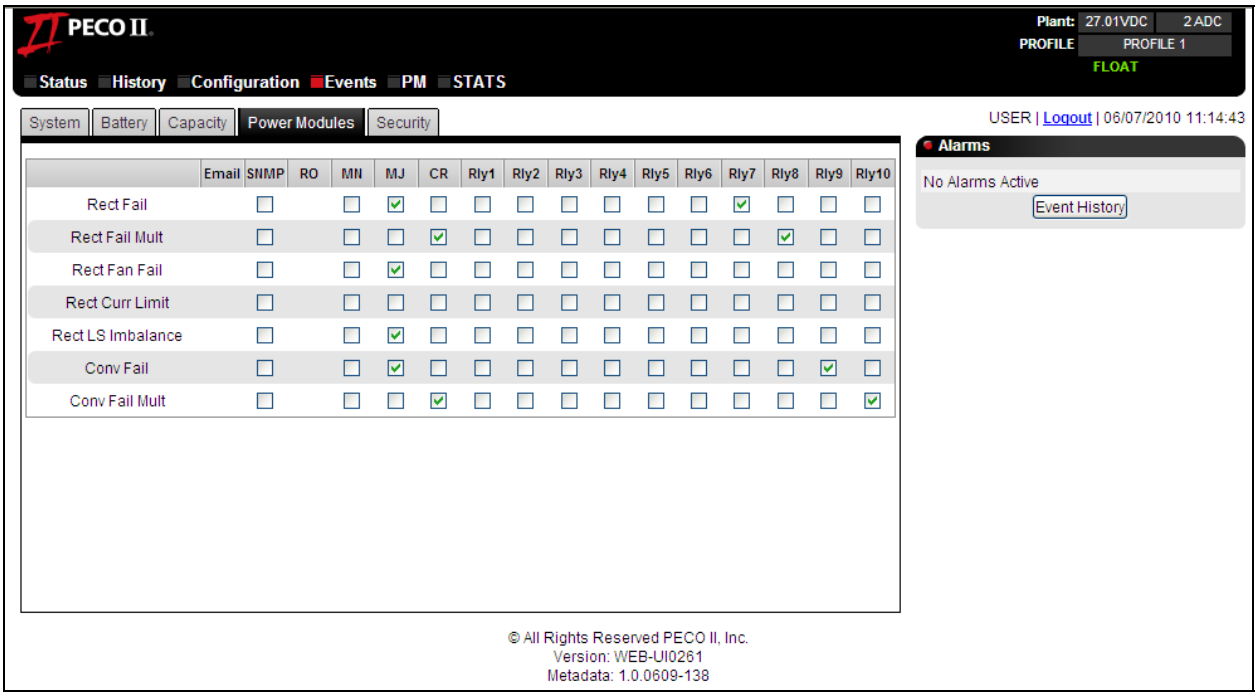



**FIGURE 3-42: POWER MODULES**

### 3.7.5 EVENTS (SECURITY TAB)

The Security tab provides the user the ability to alarm a History Log Reset event.

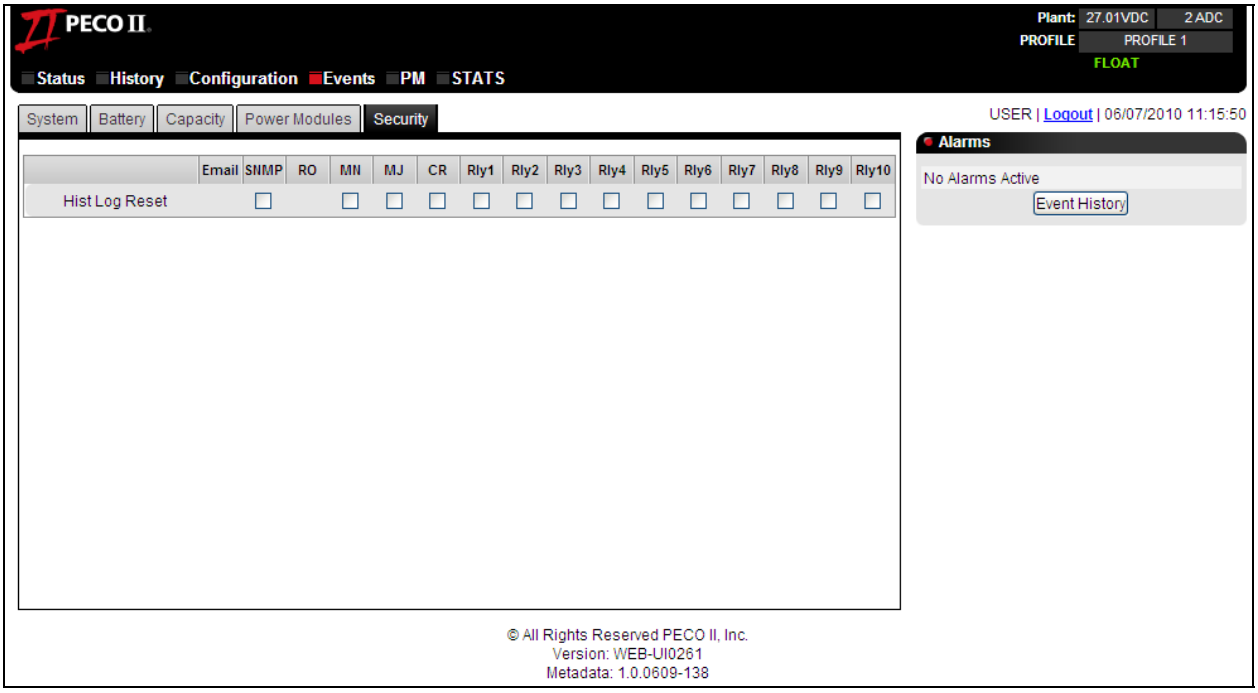



**FIGURE 3-43: SECURITY**

## 3.8 PREVENTITIVE MAINTAINENCE (PM)

The PM tab provides the user access to the alarm relay test and the alarm test walk away duration setpoint.

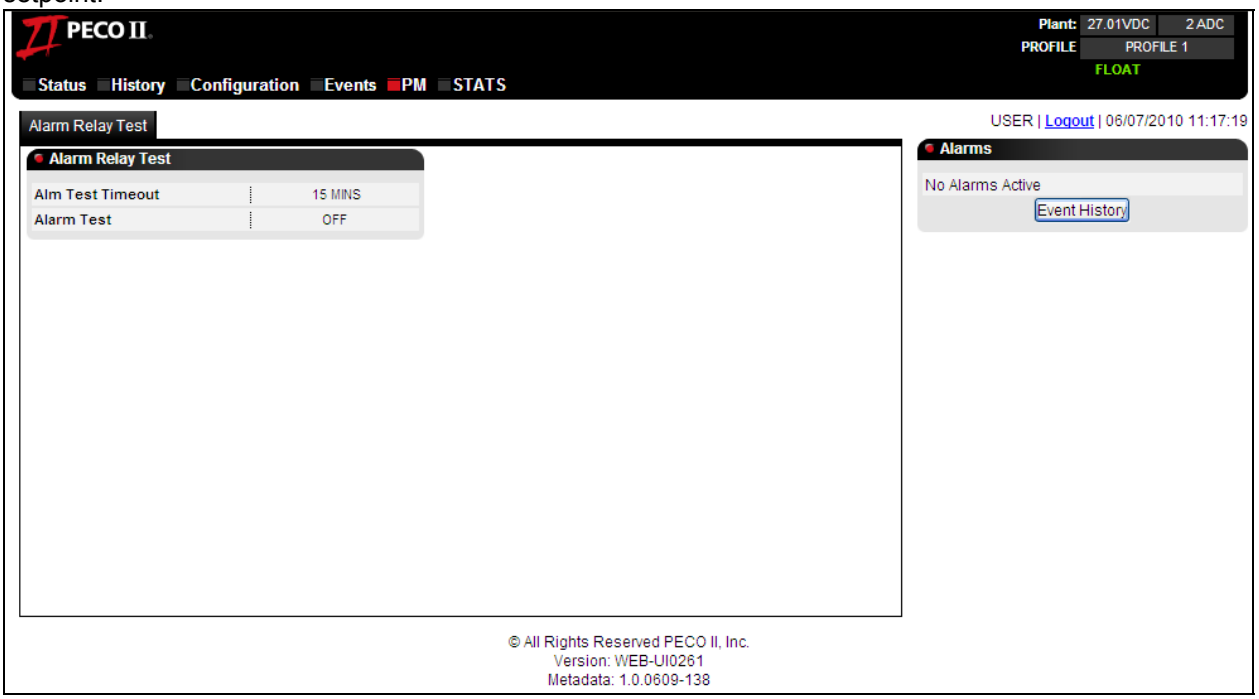



**FIGURE 3-44: PREVENTITIVE MAINTAINENCE**

### 3.8.1 PM (ALARM RELAY TEST TAB)

| Item | Specifications |
|---|---|
| ALARM TEST TIMEOUT | The Test Timeout or “walk away” feature can be set from 1 to 15 minutes so any alarm being extended during a test will automatically be cleared if left unattended.<br>Range = 1 to 15 minutes |
| ALARM TEST | The alarm relay test exercises the alarm relay using web interface. This test is designed to serve as a “handshake” test between the installed power plant and a remote alarm monitoring center. The actual plant condition is not being replicated.<br>The relay status LED for each relay will illuminate when the test is performed.<br>**User or Admin login is required to activate the alarm relay test.**<br>Range = 0 to 10 Form C contacts |

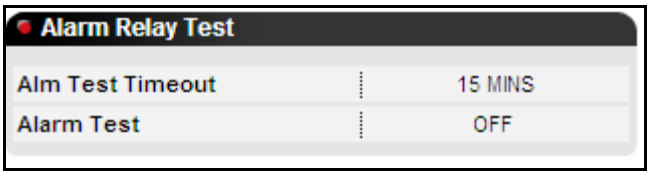



**FIGURE 3-45: ALARM RELAY TEST**

**NOTE:** The alarm relay test **cannot** be exercised while the plant is in alarm. If the power plant goes into alarm during an alarm test, the test will be aborted.

**NOTE:** This test exercises the alarm relays and extends the wired alarms to the alarm center. This test does not create a real event condition.

## 3.9 STATS

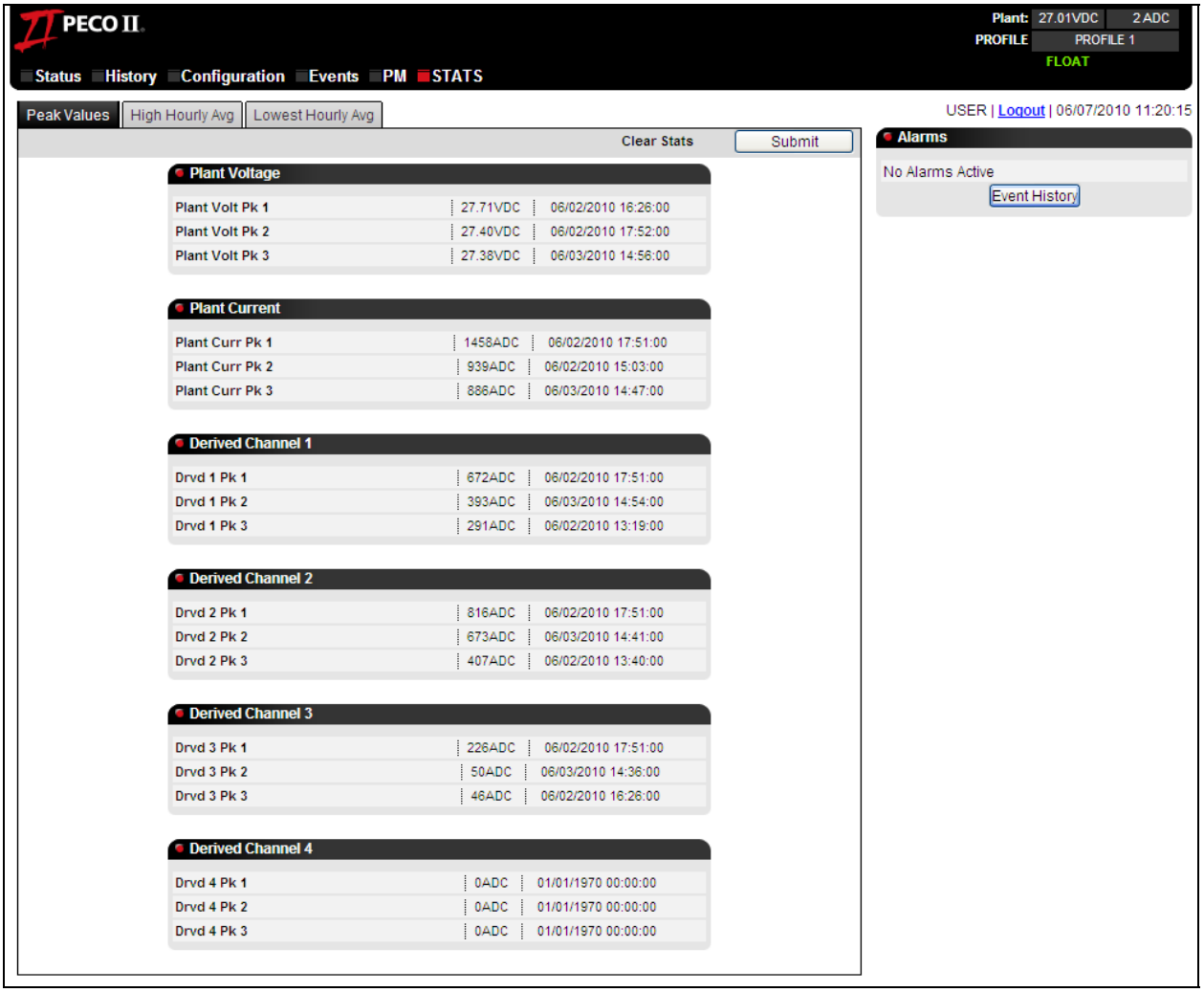



**FIGURE 3-46: STATS**

### 3.9.1 STATS

| Item | Specifications |
|---|---|
| PLANT VOLTAGE | Three Peak Values with date and time stamp.<br>Three highest hourly averages updated on the hour with date and time stamp.<br>Three lowest hourly averages updated on the hour with date and time stamp. |
| PLANT CURRENT | Three Peak Values with date and time stamp.<br>Three highest hourly averages updated on the hour with date and time stamp.<br>Three lowest hourly averages updated on the hour with date and time stamp. |
| DERIVED CHANNEL 1-4 | Three Peak Values with date and time stamp.<br>Three highest hourly averages updated on the hour with date and time stamp.<br>Three lowest hourly averages updated on the hour with date and time stamp. |