HELIOS
POWER SOLUTIONS

Your DC Power Solutions Partner

Instruction Manual
855-339-001

Rev 1.0
Nov 2019

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⚠ WARNING! – IMPORTANT SAFETY NOTICES

Risk of personal injury and property damage! You must exercise caution and follow the safety requirements listed below when using your Platinum Series power supply.

- The Platinum Series Power supply is intended for installation and use in a Restricted Access Location, such as a 19" equipment rack

- Installation, operation, and service to be conducted by qualified/trained service personnel only, with all wiring done in accordance with local electrical codes

- Ensure the power supply is operated from a standard 3-pin 120VAC or 240VAC 50 / 60Hz outlet with proper grounding connection

- Use 14AWG/1.5mm^2 or larger wiring for AC power and bonding connections

- Building power supply circuit must have a circuit breaker with maximum 20A rating for short circuit protection

- Ensure dc polarities and rated voltages are correct for both the load and battery connections to the unit

- Ensure all connections are properly tightened before powering up the unit to avoid over heating of connectors

- Disconnect all power sources (input power cord, and any external batteries) before attempting any service activity. Internal circuits can be energized with the power switch in the off position

- Battery current through the "+BAT" terminal and internal LVD relay must not exceed the maximum current limit rating of the Platinum Series power supply. Use a suitably rated over current protection device and disconnect in line with the "+BAT" terminal and external battery positive. Do not connect the "+BAT" terminal of multiple units in parallel

- Do not connect any battery when more than one Platinum Series Power supply is connected in parallel.

- Always consult with battery manufacturer and observe all battery manufacturer recommendations

1. PRODUCT DESCRIPTION

ICT Platinum Series DC power supplies provide high efficiency in a space-saving 1U rack mount design with power factor corrected AC input and extremely low noise output for powering wireless communications, broadband, and radio access equipment where high reliability is essential. The Platinum Series has the ability to function either as a standalone DC power supply or as a complete DC power system when using the optional Battery Backup feature. Standard TCP/IP based Ethernet monitoring with Smart Parallel operation for up to 9.6kW of combined output power and control, with optional battery backup, programmable charge parameters, and adjustable LVD provide full featured DC power capability.

Platinum Series Features:

- Up to 1600W in a space saving 1RU rack mount design with 90-93% typical efficiency over a broad power range

- Output voltage can be easily and accurately adjusted over standard battery operating voltage ranges using the Intelligent Power Control interface on the front panel

- Standard Ethernet port included for easy-to-use full featured remote monitoring and control of the power supply using its built-in web server, or via an SNMP management system

- Smart Parallel operation allows up to six Platinum Series power supplies to be quickly and easily connected in parallel for up to 9.6kW of nominal power output

- Power Factor Corrected wide range AC input for maximum flexibility, lowest supply current requirement, and economical operation

- Isolated design allows operation with positive or negative ground

- -30 to +70C operating temperature range

- Form C contacts for remote alarm signal

- Optional factory installed battery backup feature with battery current monitor, LVD contactor (on battery Positive lead) with adjustable voltage and charge rate set points, auto/manual equalize charge, and temperature compensated charge voltage with optional remote battery temperature sensor (ICT-TMP)

Model Numbers and Options:

Model	Watts (Max)	Input VAC	Output VDC	Output (A)	Description
ICT1600-12SC	1600	90-300	11.5 - 15.5	120	12VDC 120A Power Supply
ICT1600-24SC	1600	90-300	23.0 - 31.0	60	24VDC 60A Power Supply
ICT1600-48SC	1600	90-300	46.0 - 62.0	30	48VDC 30A Power Supply
ICT800-12SC	800	90-300	11.5 – 15.5	60	12VDC 60A Power Supply
ICT800-24SC	800	90-300	23.0 – 31.0	30	24VDC 30A Power Supply
ICT800-48SC	800	90-300	46.0 – 62.0	15	48VDC 15A Power Supply

Note: The dedicated Battery Backup feature with LVD option is designated by the suffix "B" (e.g. ICT1600-12SBC). The Australasian models are designated by the letter "A" (e.g. ICT1600-48SC).

2. INSTALLATION

2.1. Initial Inspection

Perform a quick physical check on the unit once it has been taken out of the box to confirm it has not been damaged in shipping, and then check for the included parts and accessories.

Your Platinum Series unit comes complete with:
- AC input wire clamp input connector plug (3pin), and 7 pin REMOTE connector plug
- DC output bus bar cover and mounting hardware (installed)
- Two (Three with "B" option) Bus bar bolts with locking nuts for output wiring
- Two rack mounting ears and hardware to mount to the power supply chassis (installed)
- Instruction Manual

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2.2. Back-up Battery

An external lead-acid battery with the same nominal voltage as the power supply may be connected directly in parallel with the output terminals, or to the +BAT terminal (on units with the LVD option "B") to provide a DC backup capability. **Use appropriate wire, over current protection and disconnect device as outlined in the Installation section.** Your load will then be instantly powered from the external battery if the AC input power should fail, and the battery will recharge from the supply output when the AC power returns. Choose your battery size (Ahr capacity) so that it can provide power to the connected loads for the duration of a typical loss of AC power.

For both battery configurations the external battery will be charged with a constant current (may be up to the supply output current setting) until the float voltage (supply output voltage setting) is reached, and then will be held at a constant float voltage as long as the Platinum Series power supply is powered on. The maximum battery charge current from the optional BAT port can be set independently from the main output current limit.

⚠ **WARNING!**

Potential for personal injury, or damage to property and equipment due to overcharging of the external battery!

The supply output voltage must be set to a voltage level suitable for the external battery used. Check the float voltage rating of your battery and set the supply output voltage accordingly before connecting the battery to the system.

The battery may be charged at a rate up to the maximum output current rating of the power supply. Ensure the battery used is capable of being charged at this rate.

Do not connect any battery when more than one Platinum Series Power supply is connected in parallel

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If the AC power fails during normal operation the battery will remain directly connected to the output through the LVD contactor and will power the load with no delay or transition time. As battery voltage falls to the LVD disconnect level (user adjustable) the LVD contactor will open to help protect the battery from excessive discharge. The contactor will re-close once the battery voltage rises again to the LVD Reconnect threshold (user adjustable) due to charging from either an

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external source, or from the unit when AC power is returned to the power supply.

Note that during battery operation with AC power off the front panel display backlight will shut off in a shorter time when not in use (approx. 1 minute) to help minimize power loss. All other control and communication functions will operate normally.

Use the optional battery temperature sensor (ICT-TMP) available from ICT to compensate the charge voltage so that hot batteries are not overcharged, and cold batteries receive adequate charge.

2.3. Installation

The ICT Platinum Series Power Supply is designed to be used in an industry standard 19" rack mount cabinet or other restricted access location. Insert the unit at the desired rack height, and secure using four standard rack nuts and bolts (not provided). After the unit is mounted, connect the load, battery, and supply wiring as outlined in the steps below. Refer to the back panel illustration in Figure1 for connector locations:
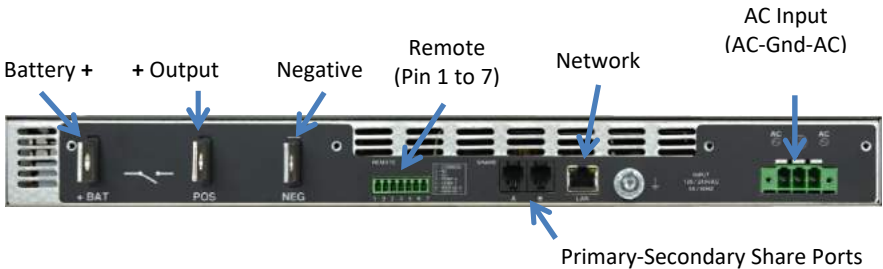
Figure 1: Back Panel Connectors ("SBC" model shown)

- Connect the positive side of the load to the "POS" busbar and the negative side of the load to the "NEG" busbar using suitable wire, ring-tongues and supplied hardware. Make sure to tighten the busbar hardware to properly secure the wires.

- If applicable, on units with the Battery Backup (LVD) option installed connect the POSITIVE of the backup battery to the "+BAT" busbar and the negative of the backup battery to the "NEG" busbar using suitable wire, over current protection (a fuse or circuit breaker in the battery positive lead), disconnect device and hardware.

⚠️**CAUTION!**
The internal LVD contactor ties the "+BAT" terminal to the power supply "POS" output.

When using the LVD option in a positive ground system do not ground the positive terminal of the battery. The system must only have a single ground connection, normally located at the distribution or load point. An additional ground connection at the battery will allow current to bypass the internal LVD contactor preventing disconnection of the battery during a low voltage event.

⚠️ **WARNING!**
Battery current through the "+BAT" terminal must not exceed the maximum current limit rating of the Platinum Series power supply. Connect the "+BAT" terminal to the external battery POSITIVE using a suitably rated over current protection and disconnect device.

Otherwise damage to the unit, load, battery, and personal injury may occur if the battery is inadvertently connected in reverse polarity, or the output circuit is over loaded or shorted.

- Connect a chassis bonding wire to the ¼ inch ground stud located on the back panel, if required, using 14AWG/1.5mm^2 or larger wire to bond the power supply chassis to the external rack system for the installation.

- Connect appropriately rated non-energized AC power wiring to the removable AC input connector terminal plug. (AC line or neutral to either outer connection, safety ground to the middle pin) using 14AWG/1.5mm^2 or larger wire. Secure the plug to the chassis by tightening the two captive retaining screws.

- Connect the unit to a properly grounded non-energized AC source capable of handling the rated Platinum Series input current. The building supply circuit must have a branch rated circuit breaker rated 20A or less.

2.4. Remote Control and Monitoring Connections

Make connections to the removable 7 pin cage clamp style REMOTE connector for the following functions:

Pin Number	Name	Note
1	Common	Alarm Output common
2	NC	Alarm normally closed (Alarm state)
3	NO	Alarm normally open (Alarm state)
4	Temp	Battery temp sensor (either lead)
5	Temp	Battery temp sensor (either lead)
6	SD **+**	Remote shut down (+2.0 to +15V)
7	SD **-**	Remote shut down (Return)

CAUTION!
Ensure unit is off and power is disconnected prior to making connections to the REMOTE connector terminals to avoid damaging the power supply or connected devices.

- Connect external alarm monitoring input wiring to the Alarm Output contacts on the REMOTE connector to enable the internal Alarm relay contact closure to flag an external monitoring system for a power supply fault condition. (See section 5.5 Alarm Setup, for details on which fault conditions will trip the Alarm Output contacts).

- Connect the optional remote battery temperature monitor probe (ICT-TMP) (for use on optional "B" LVD equipped models) to pin 4 and 5, to automatically compensate the charging voltage according to the battery temperature. Apply the probe body to the side of the middle battery case using the provided adhesive backed clamp. (note that the compensation level must be set via the Battery Configuration page on the Network Utility or the front Battery Settings screen to activate)

- Connect external Remote Shutdown control lines (TTL compatible signal) to the REM SD+ (pin 6) and REM SD- (pin 7) terminals of the "REMOTE" connector if external on/off control of the power supply output is required. (Hi = output off, Lo = output on) (Does not alter the state of the Battery contactor on units with the LVD option)

3. FRONT PANEL CONTROL

Power up the unit:
- Energize the external AC source, and push the front panel "ON" switch to power up the unit, then close the backup battery disconnect device if an external battery is used.

- Check that the front display is on, and an initial start-up screen appears, which is then replaced with the system status screen shown below.

The Intelligent Power Control panel on the front of the Platinum Series power supply allows you to view the status of the unit, and modify the power supply settings.

The Control Panel consists of the following:

Figure 2: Front Panel Display and Control

3.1. Control Panel Keys and Controls

Up/Down ▲▼ Keys: Use to scroll through the Control Panel screens and menu items.

When modifying the value for a setting, use these keys to increase or decrease the value.

Enter ↵ Key: Press to select a screen for adjustment, or to enter a new value after adjustment.

When modifying the value for a setting, pressing the Enter key will save the selected value for that setting.
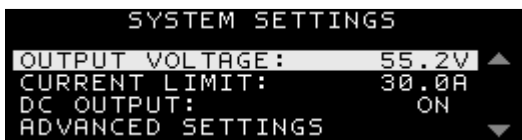
Back X Key: Press to return to the previous higher level menu item, or to exit from a setting without making any change.

- *For a detailed description of the Control Panel screens and menus, see the* <u>Control Panel Menus</u> *section.*

3.2. Setting the DC Output

To set the output voltage, current limit, and enable the output, do the following:

1. Use the Up/Down keys on the Control Panel to scroll to the <u>System Status</u> screen, and then press the <u>Enter</u> key. The <u>System Settings</u> screen will appear.

```
        SYSTEM SETTINGS
 OUTPUT  VOLTAGE:      55.2V ▲
 CURRENT  LIMIT:       30.0A
 DC  OUTPUT:             ON
 ADVANCED  SETTINGS          ▼
```

2. Using the Up/Down keys, scroll to the <u>Output Voltage</u> line, and then press the <u>Enter</u> key.

```
      SET  OUTPUT  VOLTAGE

   ▲
      55.2  VOLTS
   ▼
        ⏎:SET     ☒:CANCEL
```

3. Using the Up/Down keys, adjust the output voltage set point to the desired voltage, and then press the <u>Enter</u> key.

4. Using the Up/Down keys, scroll to the <u>Current Limit</u> line, and then press the <u>Enter</u> key.

```
      SET  CURRENT  LIMIT

   ▲
      30.0  AMPS
   ▼
        ⏎:SET     ☒:CANCEL
```
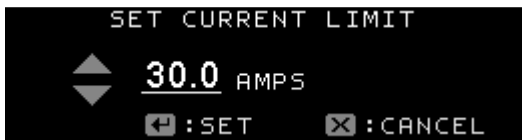
5. Using the Up/Down keys, adjust the current limit set point to the desired current, and then press the <u>Enter</u> key.

6. Using the Up/Down keys, scroll to the DC Output line, and then press the Enter key.


```
       TURN  OUTPUT  ON/OFF

  ▲     [■]  ON
  ▼     [ ]  OFF

       ⏎ : SET      ✖ : CANCEL
```
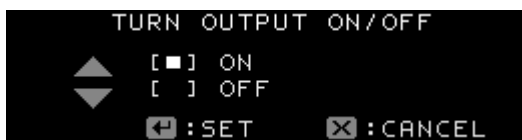
7. Using the Up/Down keys, change the DC output setting to <u>On</u>, and then press the <u>Enter</u> key. The DC output will now be enabled, with the output voltage and current limit set as entered above.

8. Press the <u>Back</u> key to return to the System Status screen.

3.3. Control Panel Menus
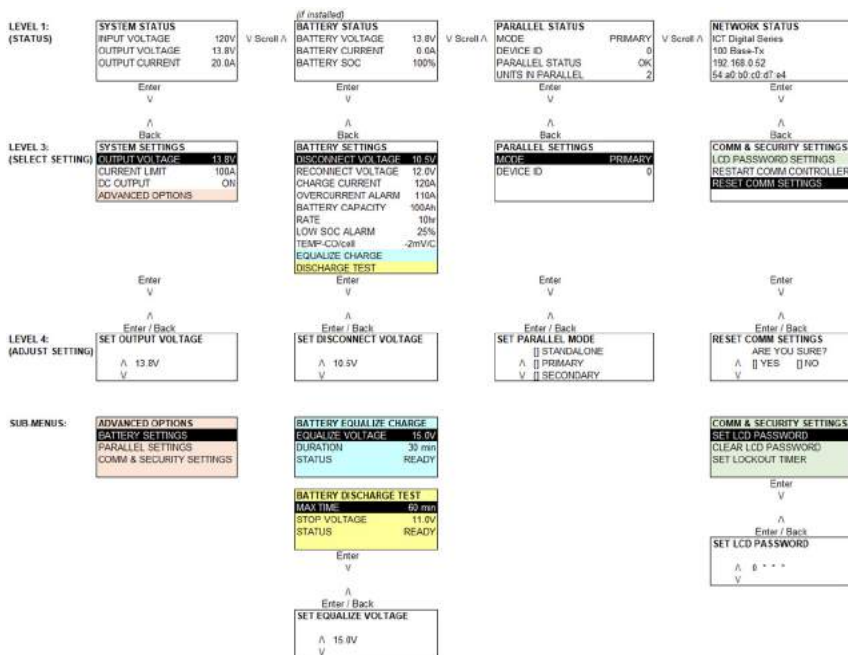
Note: At any time Press the BACK key to return to the previous Screen.

SYSTEM STATUS SCREEN

```
      SYSTEM STATUS
 INPUT:  115V  CURRENT:   0.0A
 OUTPUT: 55.2V  □□□□□□□□□
```

The System Status screen allows you to monitor the input and output status of the power supply.

Input Voltage: Displays the AC input voltage. Voltage display will blink during an AC voltage failure. The Value can range from 100-265 VAC

Output Voltage: Displays the DC output voltage. Voltage display will blink during an output voltage failure.
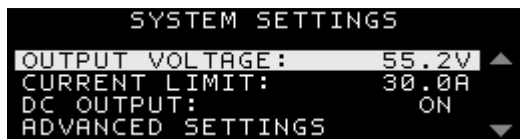
Output Current: Displays the output current. Current display will blink when the power supply is in current limit.

SYSTEM SETTINGS SCREEN

```
       SYSTEM SETTINGS
 OUTPUT VOLTAGE:        55.2V ▲
 CURRENT LIMIT:         30.0A
 DC OUTPUT:               ON
 ADVANCED SETTINGS           ▼
```

From the System Status screen, press Enter to move to the System Settings screen.

The System Settings screen allows you to modify the output settings of the power supply.

Output Voltage: Modifies the power supply output voltage. The Range of Output Voltage is 11.5 – 15.5 V (12V model, for other models, see table 3)

Current Limit: Modifies the power supply output current limit. The Range of Current Limit is 25A – 120A (12V model, for other models, see table 3)

DC Output: Allows you to turn the DC Output On or Off. (Battery contactor will open when output set to Off on units with LVD option)

BATTERY STATUS SCREEN


```
    BATTERY STATUS
BATTERY: 55.0V │ CURRENT:   0.0A
     ☒ LVD     │
       OPEN    │ □□□□□□□□
```

The Battery Status screen is available when the Battery Backup
option ("B") is installed. View this screen to see the battery Voltage,
the battery Current (+ for charging, - for discharging), and if the
battery is Connected via the LVD contactor.

BATTERY SETTINGS SCREEN


```
   BATTERY SETTINGS    ■2 3
DISCONNECT VOLTAGE: 42.0V ▲
RECONNECT VOLTAGE:  48.0V
CHARGE CURRENT:       30A
OVERCURRENT ALARM:    -- ▼
```

From the Battery Status screen, press Enter to move to the Battery
Settings Screen.

The Battery Settings screen is available when the Battery Backup
option ("B") is installed. These settings allow you to adjust the battery
Low Voltage Disconnect (LVD) points, configure the battery
maximum charge current, float voltage temperature compensation,
Equalize charge settings and Discharge test settings.

> **Disconnect Voltage:** Modifies the battery disconnect voltage.
> If the battery voltage drops below the disconnect voltage when
> in battery back-up mode, the battery relay will open and
> disconnect the battery. There will be a 3 second delay until the
> voltage disconnects. The Range of the Disconnect Voltage is
> 10 – 11.5V. (12V model)

> **Reconnect Voltage:** Modifies the battery reconnect voltage
> when in back-up mode. If the battery voltage rises above the

reconnect voltage while the battery is disconnected, the battery relay will close and reconnect the battery. There will be a 3 second delay until the voltage connects. The Range of the Reconnect Voltage is 11.5 - 13.0V. (12V model). The battery will automatically be reconnected after an AC power failure to ensure the battery quickly recharges.

Charge Current: Set the maximum charge current used to re-charge the battery according to the battery manufacturer's recommendations. Default level is equal to the maximum current limit setting for the unit.

Over Current Alarm: Set the maximum current to be drawn from the battery. The Battery Over Current alarm will be triggered if this level is exceeded.
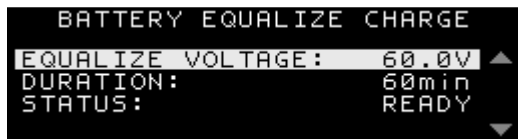
Battery Capacity: Set the Battery Capacity Rating (Ah).

Battery Discharge Rate: Set the Battery discharge rate (hrs) used for capacity spec. (typically either 10 or 20hrs)

Low SOC Alarm: Set the Low Battery State of Charge Alarm. If the Battery State of Charge drops below this level while discharging the alarm will be triggered.

TEMP-CO/cell: Set the float voltage temperature compensation (-mV/cell/°C), when using the optional remote temperature sensor (ICT-TMP) Typically use -4mV/cell/°C (i.e. compensates charge V at -24mV/°C for a 12V battery) for lead-acid AGM type batteries. Check the battery data sheet for the manufacturer's recommendations before setting. Default value is 0mV/°C, or no compensation.

 Equalize Charge


```
BATTERY EQUALIZE CHARGE
EQUALIZE VOLTAGE:      60.0V ▲
DURATION:              60min
STATUS:                READY
                             ▼
```

The Equalize Charge can be used on flooded lead-acid batteries to apply a higher than normal charge voltage to a fully charged battery for a limited time to help force all cells to the same state of charge, and prevent stratification of the electrolyte in each cell.

Configure the **Battery Equalize Charge** voltage, duration, and automatic repeat interval if desired <u>when using flooded lead-acid type batteries only</u>. The system will step up the output voltage to the Equalize Voltage for the Equalize Duration time whenever the Equalize Status is set to Enable (or automatically each interval time when an Interval is set) once the battery is fully charged.

⚠️ **WARNING!**

Potential for personal injury, or damage to property and equipment due to overcharging of the external battery!

Use Equalize charge on flooded lead-acid batteries only. Refer to Battery manufacturer's instruction manual. Do not use this feature on any type of sealed battery.

Ensure the battery compartment is well ventilated to avoid any risk of explosion!

Do not exceed the Equalize voltage setting recommended by the battery manufacturer.

Always consult with battery manufacturer and observe all battery manufacturer recommendations.

Voltage: Set the Equalize voltage level recommended by the battery manufacture. (Use with flooded lead-acid batteries only! Always consult with battery manufacturer and observe all battery manufacturer recommendations.)

Duration: Set the maximum time (in minutes) for the equalize charge to be applied, as recommended by the battery manufacturer.

Status: Set to Start, to begin an equalize charge when the battery is fully charged. (Status will be READY if battery is fully charged. Status will show IN PROGRESS when the equalize charge is occurring)

Discharge Test

Configure the Battery **Discharge Test** to check on the battery's ability to power the system for a set duration. Set Max Discharge Time and minimum Discharge Voltage Limit. Each time the test is run the output voltage from the power supply will be reduced so that the external battery will power the system load until either the Max Discharge Time limit or the minimum Discharge Voltage Limit is hit. A **Discharge Test Complete** notification (on the front display and with an e-mail if messaging is configured via the Network GUI) will indicate a **Test Failure** if the minimum Discharge Voltage Limit is hit before the Max Time limit, as the battery was not able to power the load for the desired duration.

NOTE:

This test must only be done when AC power will be present during the test and for adequate time after the test to allow for a full re-charging of the battery. Otherwise the battery may not have sufficient remaining capacity to power the load during an AC power outage.

Max Time: Set the maximum time duration (in minutes) for the Discharge Test.

Stop Voltage: Set the minimum Discharge Voltage Limit. If this Voltage Limit is hit before the Max Discharge Time limit, the test will fail, as the battery was not able to power the load for the desired duration.

Status: Set to Start, to begin a discharge test when the battery is fully charged. (Status will be READY if battery is fully charged. Status will show IN PROGRESS when the discharge test is occurring)

PARALLEL STATUS SCREEN

```
    ↕      PARALLEL  STATUS
  MODE:                STANDALONE
  DEVICE  ID:                   0
```
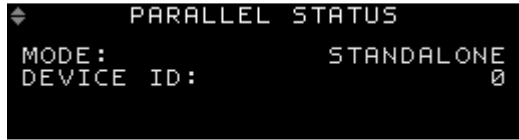
The Parallel Status screen shows the currently configured Parallel settings. If parallel operation is active, the status and total number of parallel units is displayed on this screen. Up to 6 Units can be connected in parallel. See the **Smart Parallel Operation** section for more information on configuring the parallel settings.

PARALLEL SETTINGS SCREEN

```
         PARALLEL  SETTINGS
  MODE:                STANDALONE  ▲
  DEVICE  ID:                   0

                                   ▼
```
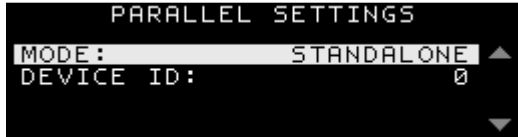
From the Parallel Status screen, press Enter to move to the Parallel Settings Screen.

See the **Smart Parallel Operation** section for more information on configuring the parallel settings.

Mode: Modifies the parallel mode setting. It has 3 options:
> Standalone: Single Unit.
> Secondary and Primary: Parallel Units, select one unit in a set as the Primary, set others as Secondary

Device ID: Modifies the parallel device ID setting. Ranges from 0 – 5. Give each unit in a parallel set a unique ID number.

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ALARM HISTORY SCREEN

```
  ‡          ALARM HISTORY
AC Input Failure
Set: 07/10/19 13:08:38
Alarm is ACTIVE
```

Scroll through the Alarm History screens to see the log of the 20 most recent alarm events. Shows the alarm description, date, and time when set, and cleared.

Note: The system date and time are normally set by the network. These may be manually set, see Network GUI Operation, Communication Basic Setup section.

NETWORK STATUS SCREEN

```
  ‡          NETWORK STATUS
ICT Platinum Series
100 Base-Tx
192.168.0.180
04:91:62:2D:D3:24
```

View the Network Status Screen to check the network connectivity, IP address of the system, and the assigned MAC address.

COMM & SECURITY SETTINGS SCREEN

```
    COMM & SECURITY SETTINGS
LCD PASSWORD SETTINGS        ▲
RESTART COMM CONTROLLER
RESET COMM SETTINGS
                             ▼
```

From the Network Status Screen, press Enter to move to the Comm & Security Settings Screen.

LCD Password Settings

```
LCD PASSWORD SETTINGS
SET LCD PASSWORD          ▲
CLEAR LCD PASSWORD
SET LOCKOUT TIMER
                         ▼
```

The LCD Password Settings screen allows you to set a Control Panel menu password to prevent unauthorized changes to the power supply settings. After the Control Panel menu password is set, you will be prompted for the password when attempting to change the power supply settings.

The Control Panel menu password is a four-digit password that is entered one digit at a time. When entering the password, use the Up/Down keys to set the value for selected digit, then press the enter key to select the next digit.

```
SET LCD PASSWORD

▲
      0  *  *  *
▼
        ⏎:SET      ⊠:CANCEL
```

- *If you lose the Control Panel menu password, see the* **Control Panel Menu Password Reset** *section for instructions on how to clear the password*

Set LCD Password: Allows you to set the Control Panel menu password.

Clear LCD Password: Allows you to clear the Control Panel menu password.

Set Lockout Timer: Allows you to set the Lockout Timer for the Control Panel menu password between 0 - 60min. When the Lockout Timer is enabled, it sets the amount of time it will take for you to be locked out of the Control Panel settings and need to enter the password. Setting the Lockout Timer to 0 minutes disables the timer completely. The default factory setting is 15 min.

Restart Comm Controller: Restarts the Communications Controller without affecting any of the device settings and without interrupting DC power to the output terminals.

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Reset Comm Settings: Resets the Web server Administrator password, IP address, and port settings to the original factory default values. See the Administrator Password / IP Address Reset section for more information.

3.4. Control Panel Menu Password Reset

This procedure clears the Control Panel menu password and allows you to set a new password if needed. To clear the password, do the following:

1. Turn the Power Switch to the OFF position.

2. Press and hold down the Back and Enter keys. Turn the Power Switch to the ON position while holding the keys down. Continue holding the keys down for 15 seconds until the System Status screen is displayed on the Control Panel display.

3. Release the Back and Enter keys. You will no longer be prompted for a password on any of the Control Panel screens.

4. In order to set a new password, go to the LCD Password Settings screen.

3.5. Administrator Password / IP Address Reset

This procedure resets the Administrator password, IP address, and port settings to the original factory default values. The Standard User password is not affected. To reset, do the following:

1. In the Control Panel menu on the front of the power supply, go to the Comm & Security Settings screen.

2. Scroll down to Reset Comm Settings and press the Enter key.

3. Select Yes, and then press the Enter key.

4. After reset is complete, go to the Network Status screen in the Control Panel menu to view the new IP address of the power supply.

4. SMART PARALLEL OPERATION

If your load requires more power than can be supplied by a single ICT Platinum Series power supply, two or more power supplies (maximum 6) of the same output voltage rating can be connected in parallel in a Primary-Secondary configuration to increase the power available, using the SHARE ports on the back of the units.

⚠ **WARNING!**
Do not use the Battery Backup/LVD option "BAT" terminal on units connected in parallel, as there is a risk that the potential current could be higher than the rating of the internal low voltage disconnect relay.

Otherwise damage to the unit, load, and/or personal injury may occur if the battery output current through the BAT terminal exceeds the rating for an individual supply.

⚠ **CAUTION!**
Do not connect power supplies of different output voltage ratings in parallel, as this may cause damage to equipment or connected load.

Up to six power supplies of the same output voltage rating can be connected in parallel to provide up to six times the total output power capability of a single unit. An optional bus bar set (ICT-PAR) is available to simplify connection of two units in parallel. When multiple power supplies are operating in parallel, they should all be connected together through the RS485 SHARE interface ports (located on the back panel) using optional ICT-JMP jumper cables. This will allow the units to share output current more equally, and allow for the external network connection of the combined units using a single Ethernet port on the Primary. One of the units will operate as a Primary, and the remaining units are Secondaries, with the combined settings controlled by the Primary.

Each Secondary unit displays its own output current and voltage on the System Status screen in its Control Panel menu.

If you are running a single, standalone power supply, the Parallel Mode setting must be set to Standalone.

4.1.   SHARE Interface Connector

The RJ-11 connectors for the RS485 serial interface are located on the back of the power supply and are labeled SHARE "A" and "B". See figure 3. Parallel units must be connected together in a daisy-chain manner with a RJ-11 four-wire straight-through cable. A short (4 inch) RJ-11 connector cable suitable for interconnecting stacked power supplies is available from ICT, part number "ICT-JMP".
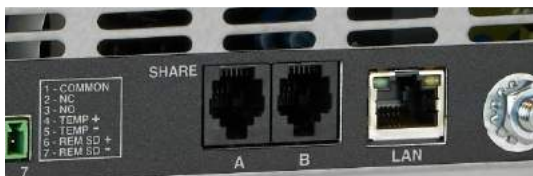

Figure 3:   Back panel SHARE connections

4.2.   Configuring the Power Supplies for Parallel Operation

Before connecting the power supplies together, they should all be configured for parallel operation. To do this:

1. Power each unit up independently. In the Control Panel menu, scroll to the Parallel Status screen and press Enter to move to the Parallel Settings screen.

2. Scroll to the Parallel Mode setting and press Enter. Scroll and choose a parallel mode setting, then press Enter. One unit must be configured as a Primary, and the remaining units must be set to Secondary. If more than one unit is configured as a Primary, the units will not operate in parallel correctly.

    Since the Secondary units will be controlled by the Primary, set the unit you would like to use to set the Output Voltage and Current Limit as the Primary unit. You will be unable to set the Output Voltage or Current Limit from any of the Secondary units once they are configured as Secondaries.

3. Scroll to the Device ID setting and press Enter. Scroll and choose a unique device ID number for each unit, then press Enter. If more than one unit is assigned the same device ID number, the units will not operate in parallel correctly.

NOTE:
Although not recommended, it is possible to connect up to six Platinum Series power supplies in parallel without using the Smart Parallel feature. It is important that the parallel-connected power supplies generally share the load equally. In order to achieve this, the size and length of the connecting wires should be sized appropriately and of the same gauge, and the wire lengths between the power supplies should be virtually identical. To ensure proper load balancing without using the Smart Parallel feature, use a voltmeter to independently measure the output voltage of each power supply with the load connected, then adjust the output voltage level of each power supply using the Intelligent Power Control interface on the front of the Platinum Series power supply until the outputs are within +/- 1% of each other.

4.3. Connecting the Power Supplies in Parallel

⚠️ **WARNING!**
Do not use the Battery Backup/LVD option "BAT" terminal on units connected in parallel, as there is a risk that the potential load current could be higher than the rating of the internal low voltage disconnect relay.

Otherwise damage to the unit, load, and/or personal injury may occur if the battery output current through the "BAT" terminal exceeds the rating for an individual supply.

Figure: 4 Back Panel Parallel Connections

1. After configuring each power supply for parallel operation, turn the Power Switch on all units to the OFF position.

2. Connect the positive terminals (labeled "POS") of each unit together at a common positive load point using the optional ICT-PAR parallel straps (shown above). See figure 4.

3. Connect the negative terminals (labeled "NEG") of each unit together at a common negative load point using the other ICT-PAR parallel strap (as shown above).

4. Using a RJ11 four-wire straight-though cable (Optional accessory part no. ICT-JMP), connect the SHARE "A" terminal on the first unit to the SHARE "B" terminal on the second unit. If there will be more than two units operating in parallel, repeat this step for each unit, as shown in Figure 4 above.

5. Turn the Power Switch on all units to the ON position, no load connected. The Parallel Status screen in the Control Panel menu on each unit will now display the number of units connected together through the SHARE interface. If any of the units were not configured correctly for parallel operation, a "Parallel Configuration Error" warning will be displayed on the Control Panel display.

6. In the Primary unit's Control Panel menu, go to the System Settings screen. The Output Voltage, Current Limit, and Output Enable of all units are set in unison here. The Output Settings screen on all of the Secondary units will be locked out.

4.4.   Advanced Parallel Operation with TCP/IP Ethernet Connection

View the following settings and information on the <u>Device Setup</u> page using a TCP/IP Ethernet connection to a unit: (see section 5)

Parallel Mode: This field sets the Parallel Mode of the power supply to <u>Primary</u>, <u>Secondary</u>, or <u>Standalone</u>. The Parallel Mode can also be set from the Control Panel.

Device ID: This field sets the unique Device ID (number between 0 and 5) for parallel operation of the power supply. The Device ID can also be set from the Control Panel.

Send Secondary Alarm Emails: If this box is checked while this power supply is operating as Primary unit, the Primary will send out alarm notification e-mails when an alarm occurs on a Secondary unit. This feature is useful if your site has a limited number of Ethernet network ports available and you only connect the Primary unit to the Ethernet network.

- This box will have no effect if the unit is configured as a Secondary or Standalone unit

- If this feature is enabled, check the <u>Send E-mail</u> boxes on the Primary unit's <u>Alarm Setup</u> page for the alarms you wish to receive e-mail notifications for

Parallel Errors: Displays any errors or alarm conditions related to the serial SHARE interface that are currently active.

4.5. Changing a Power Supply Back To a Standalone Unit

To release a unit from parallel operation and change it back to a Standalone unit, do the following:

1. Turn the Power Switch on all parallel units to the OFF position.

2. Disconnect the connections to the positive terminal (labeled "POS"), negative terminal (labeled "NEG"), and SHARE interface (labeled "A" and "B").

3. Turn the unit's Power Switch to the ON position.

4. In the front Control Panel menu, go to the <u>Parallel Settings</u> screen.

5. Scroll to the <u>Parallel Mode</u> setting and press <u>Enter</u>. Scroll and choose <u>Standalone</u> as the parallel mode setting, then press <u>Enter</u>.

6. The unit is now configured as a Standalone unit. If the unit was previously configured as a Secondary unit, the <u>System Settings</u> Control Panel screen will now be unlocked. Note that when the <u>Parallel Mode</u> setting (Standalone/Primary/Secondary) is changed to a different setting on a unit, the DC Output of that power supply will automatically be turned OFF if it is currently enabled. You will need to verify the output voltage/current settings, and then manually enable the output.

5. TCP/IP WEB BASED UTILITY

Use the embedded Web server via an Ethernet connection to monitor the status of the power supply, and change the power supply's settings and configuration when the unit is powered from the AC line or an external back-up battery.

The embedded Web server provides a full featured interface to the power supply that can be easily accessed through a standard Web browser on any network-connected computer. There is no additional software to install or configure.

Follow these steps to access the Platinum Series embedded Web server from a browser. The recommended web browsers to use with this power supply are Microsoft Edge, Microsoft Internet Explorer, Mozilla Firefox or Google Chrome.

1. Start your Web browser.
2. Enter the IP address of the power supply in the location/address field of the browser.
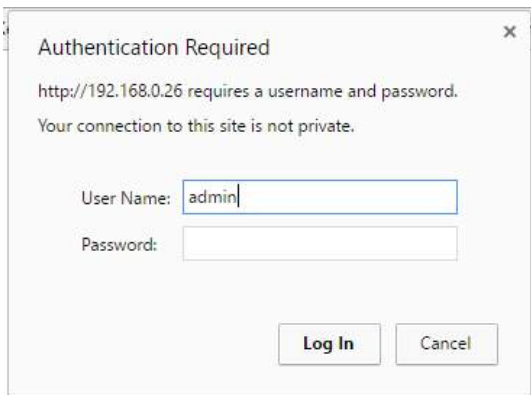

If the power supply is connected to a network with a DHCP server, the power supply will be assigned an IP address automatically. The current IP address of the power supply can be found on the Network Status screen on the front panel (see the Control Panel Menus section for more information). If the power supply is not connected to a network with DHCP, it will use a default IP address of **192.168.0.180**.

You can also find the IP address of any ICT unit connected to a network by running the ICT IP Address Discovery Utility app on any Windows based computer connected to the same network. This tool is available for download on the ICT Website:

http://www.ict-power.com/tools-utilities/

3. Enter your user name and password. The default Administrator user name is <u>admin</u>, and there is no password by default.

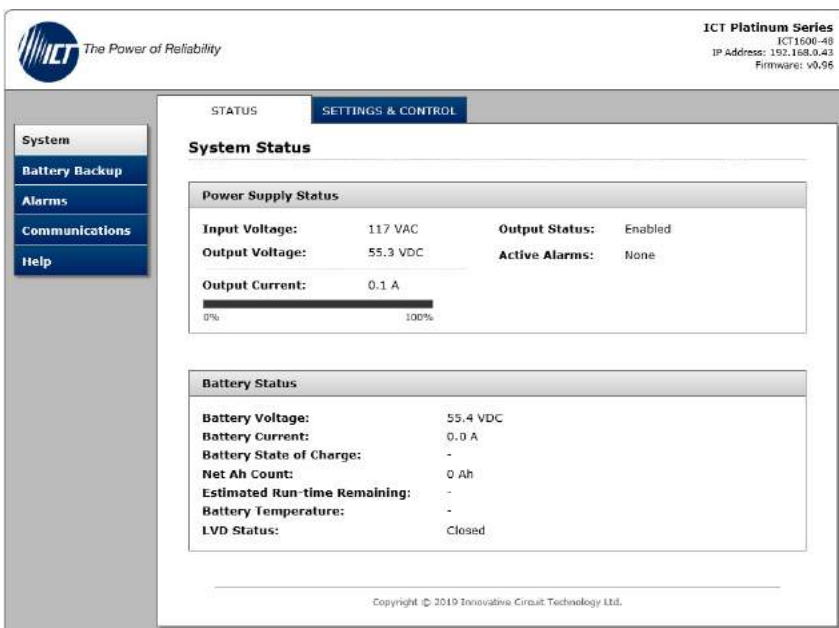4. Once connected, the System Status page will appear in your browser window.

5.1. System

The System Status page provides information on the input voltage, DC output enable status, output voltage, output current (of unit, and output of total system and number of parallel units if connected), and alarm conditions.

View the Battery Status section of this page to check the battery voltage, battery current (+ for charging, - for discharge), battery state of charge, net amp-hour count, estimated run-time remaining (if the power supply is running on battery backup), battery temperature (if the optional ICT-TMP sensor is installed), and status of the LVD battery contactor (connected, or disconnected).

Click on the **Settings & Control** Tab to Enable or Disable the supply output and adjust the output voltage and current limit settings.

DC Output Status: Controls and indicates the output status of the power supply.

- The output **ON/OFF** buttons will enable or disable the DC output and optional battery LVD contactor.

- The **Auto-Restart** button will disable the supply output for the Restart Delay period (see below) when clicked. This feature can be useful when equipment powered by the unit must be remotely power cycled to reboot operation.

NOTE: Using the ON/OFF or Auto-Restart button on a unit configured as a Parallel Primary will cause all Parallel units in a set to disable their output, but will have no effect if used on a unit configured as a Parallel Secondary.

Output Settings: Used to change the output voltage or current limit of the supply. To save any changes to the output settings, click on Save Settings at the bottom of the page.

- **Output Voltage:** This field sets the DC output voltage of the power supply within the allowable range.

- **Current Limit:** This field sets the DC output current limit of the power supply within the allowable range.

Auto-Restart Delay: Set delay time (5 to 240s) that output will remain off when output is remotely disabled using the Auto-Restart button. The unit will then automatically restart after the Restart Delay period.

5.2. Battery Backup

Select the Battery Backup page (**STATUS** tab) on units with the optional Battery/LVD port (SBC suffix units) to observe the status of the external battery. You may check battery voltage, battery current (+ is charging, - is discharging), temperature (if ICT-TMP probe installed), Net Ah count (approximate Ah discharged from the battery, where 0Ah denotes full charge), the estimated run time remaining at the current load when in back-up mode, approximate battery state of charge in %, and the status of the LVD (connected, or disconnected).

Click on the **Settings & Control** tab to set all battery related parameters on units with the optional Battery/LVD port (SBC suffix units). Click the Save Settings button after making changes to this page.

Output Voltage Control: automatically adjust the output voltage of the power supply according to the battery temperature, when the optional temperature probe (ICT-TMP) is installed.

- **Temperature Coefficient/cell:** set the desired temperature change in -mV/°C per cell, according to the battery manufacturer's recommendations. The default setting of 0mV disables the compensation. (A typical lead-acid compensation value is -4mV/°C/cell, which is -24mV/°C for a 12V battery)

Battery Charge Current Limit: Limit the maximum battery charge current provided through the optional Battery LVD port, while still allowing the full rated current to be drawn from the main output.

- **Charge Current Limit:** Set the maximum charge current (A) as recommended by the battery manufacturer. Default is the maximum current rating for the unit.

Equalize Charge: Adjust the various Equalize Charge settings to either manually or automatically apply a high Equalize voltage to a fully charged flooded-lead-acid battery for a set time duration as recommended by the battery manufacturer. This will help force an equal state of charge on all battery cells, and help prevent stratification of the battery electrolyte.

⚠️ **WARNING!**

Potential for personal injury, or damage to property and equipment due to overcharging of the external battery!

Use Equalize charge on flooded lead-acid batteries only. Refer to Battery manufacturer's instruction manual. Do not use this feature on any type of sealed battery.

Ensure the battery compartment is well ventilated to avoid any risk of explosion!

Do not exceed the Equalize voltage setting recommended by the battery manufacturer.

Always consult with battery manufacturer and observe all battery manufacturer recommendations.

- **Equalize Voltage:** Set the Equalize charge voltage recommended for your battery.

- **Equalize Duration:** Set the duration of a full Equalize charge, in minutes.

- **Equalize Interval:** Set an interval (in days) for a recurring automatic Equalize charge cycle. The default of 0 days disables automatic Equalize charging. Set an interval of up to 180 days to initiate an automatically recurring Equalize charge. NTP Time Synchronization must be enabled on the Communications Basic Setup page to enable automatically recurring Equalize charges.

- **Start Time:** Set the time of day for automatically recurring Equalize charges to start. The time of time must be entered using 24-hour time format. NTP Time Synchronization must be enabled on the Communications Basic Setup page to enable automatically recurring Equalize charges.

Note that an Equalize Charge can only be initiated when the battery is fully charged. If the power supply is unable to start an Equalize charge at the selected Start Time, it will attempt again at the same time next day.

- **Equalize Status:** This box indicates if the battery is fully charged and ready for an equalize charge. "Not Ready" indicates the battery is not fully charged, and an equalize charge cannot be initiated. When "Ready" the Manual Equalize button may be clicked to start a single Equalize cycle.

- **Last Equalize Charge:** Indicates the date and time of the last Equalize charge.

- **Charge Time:** Indicates the duration of the last Equalize charge cycle, in minutes.

- **Next Equalize Charge:** The scheduled date and time of the next Equalize charge, if an Equalize Interval has been set.

Configure Battery: The power supply will use this information to help determine the battery state of charge, and remaining battery capacity when in use.

- **Battery Capacity:** Set the Battery Capacity Rating in Ah (50 to 1000 Ah) of the total battery pack connected to the power system.

- Discharge **Rate:** Set the Battery discharge rate (hrs) used by the battery manufacturer to determine the battery capacity. (typically either 10 or 20hrs)

LVD Settings: Set the battery Low Voltage Disconnect and Re-connect thresholds and LVD alarm functions here, for units with the optional LVD battery port.

- **Disconnect Voltage:** Set the battery voltage level that will trigger the opening of the battery Low Voltage Disconnect relay.

- **Reconnect Voltage:** Set the battery voltage that will trigger the re-closing of the LVD relay (must be 1.5V > than the disconnect voltage)

- **Activate Alarm Form C Contact:** Tick this box to have the back-panel Form-C relay trigger whenever the LVD relay opens.

- **Send E-mail:** Tick this box to have the unit send an e-mail to the address configured in the Network Setup page whenever the LVD is triggered.

Battery Over-current Alarm: Set the battery over current alarm threshold and actions here.

- **Over-Current Threshold:** Set the battery over current threshold that will trigger a battery over-current alarm. Disable the alarm by setting a threshold of 0 Amps.

- **Activate Alarm Form-C Contact:** Tick this box to have the back-panel Form C relay trigger whenever this over-current threshold is hit.

- **Send E-mail:** Tick this box to have the unit send an e-mail to the address set up in the Network Setup page whenever the Battery Over-current Alarm is triggered.

Battery Low SOC Alarm: Set the battery low state of charge alarm threshold and actions here.

- **SOC Threshold:** Set the battery low state of charge alarm threshold that will trigger when the battery state of charge falls below the set level. Disable the alarm by setting the threshold to 0%.

- **Activate Alarm Form-C Contact:** Tick this box to have the back-panel Form C relay trigger whenever this low state of charge threshold is hit.

- **Send E-mail:** Tick this box to have the unit send an e-mail to the address set up in the Network Setup page whenever the Battery Low SOC Alarm is triggered.

Battery Discharge Test: Configure the Battery Discharge Test settings in this section, so that you may either manually or automatically perform a partial discharge test to gauge the relative capacity of the external battery. Each time the test is run the output voltage from the power supply will be reduced so that the external

battery will power the system load until either the Max Discharge Time limit or the minimum Discharge Voltage Limit is hit. A **Discharge Test Complete** notification (on the front display and with an e-mail if messaging is configured via the Network GUI) will indicate a **Test Failure** if the minimum Discharge Voltage Limit is hit before the Max Time limit, as the battery was not able to power the load for the desired duration. You should generally limit the depth of discharge to no more than 50% of the nominal battery capacity to avoid stressing the battery due to a deep discharge.

NOTE:

This test must only be done when AC power will be present during the test and for adequate time after the test to allow for a full re-charging of the battery. Otherwise the battery may not have sufficient remaining capacity to power the load during an AC power outage.

- **Set Discharge Time:** Set the maximum time duration (in minutes) for the Discharge Test.

- **Set Discharge Voltage Limit:** Set the minimum Discharge Voltage Limit. If this Voltage Limit is hit before the Max Discharge Time limit, the test will fail, as the battery was not able to power the load for the desired duration.

- **Discharge Test Interval:** Set the Discharge Test Interval (days) to have the system automatically initiate a discharge test every interval, once the battery reaches 100% SOC. Set this interval to 0 days to disable the automatic Discharge Test (default setting). NTP Time Synchronization must be enabled on the Communications Basic Setup page to enable automatic Discharge Tests.

- **Start Time:** Set the time of day for automatic Discharge Tests to start. The time of time must be entered using 24-hour time format. NTP Time Synchronization must be enabled on the Communications Basic Setup page to enable automatic Discharge Tests.

  You may alternatively manually initiate a Battery Discharge Test of a fully charged battery by clicking on the Manual Discharge Test button. (The status box will show that the discharge test is Not Ready if the battery SOC is less than 100%)

Observe the saved information regarding the most recent discharge test shown here, with fields for days since the **Last Battery Discharge Test**, **Status** (Pass or Fail), **Discharge Time**, **End Voltage** at the completion of the test, and the **Amp Hours Discharged** during the test. The scheduled date and time until the next automatically repeating test will also be shown if this feature has been enabled.

5.3. Alarms

Select the Alarms page (**STATUS** tab) to view the status of currently active alarms as well as the alarm history.

Click on the **SETTINGS & CONTROL** tab to configure the actions to be taken when power alarms are triggered. To save any changes to the alarm settings, click on Save Settings at the bottom of this page.

The e-mail settings on the **Network Setup** page must be configured correctly before any e-mail notifications can be sent.

DC OUTPUT FAILURE ALARM
The alarm latches the output off, and clears when the DC output is manually re-enabled.

- **Activate Alarm Form C Contact:** If this box is checked, the alarm form "C" contacts on the power supply will indicate a fault condition when the Output Voltage or current rises above approximately 110% of the max-rated output.

- **Send E-mail:** If this box is checked, an e-mail alarm notification will be sent when a DC output failure occurs.

AC INPUT FAILURE/SYSTEM FAILURE ALARM
The alarm latches the output off when the AC voltage fails, and automatically clears when the AC input voltage rises above approximately 100Vac for 3 seconds, and any internal fault is resolved.

- **Activate Alarm Form C Contact:** If this box is checked, the alarm form "C" contacts on the power supply will indicate a fault condition when the AC input voltage falls below approximately 90Vac, or there is an internal power supply

fault. (Note: The form C contact will be activated any time the unit completely loses AC power, regardless of this setting.)

- **Send E-mail:** If this box is checked, an e-mail alarm notification will be sent when the AC input is out of range.

OVER-TEMPERATURE ALARM
The alarm latches the output off, and automatically clears when the internal temperature falls to within a normal operating range.

- **Activate Alarm Form C Contact:** If this box is checked, the alarm form "C" contacts on the power supply will indicate a fault condition when an internal or battery over-temperature limit is exceeded.

- **Send E-mail:** If this box is checked, an e-mail alarm notification will be sent when an over-temperature failure occurs.

FAN FAILURE ALARM
This alarm provides a notification when an internal fan failure occurs, and does not affect the power supply output state.

- **Activate Alarm Form C Contact:** If this box is checked, the alarm form "C" contacts on the power supply will indicate a fault condition when a fan failure occurs.

- **Send E-mail:** If this box is checked, an e-mail alarm notification will be sent when a fan failure occurs.

PARALLEL UNIT OFFLINE ALARM
This alarm does not affect the power supply output state.

- **Activate Alarm Form C Contact:** If this box is checked, the alarm form "C" contacts on the power supply will indicate a fault condition if communications is lost between any units connected together through the serial interface. This setting has no effect if parallel operation is not active.

- **Send E-mail:** If this box is checked, an e-mail alarm notification will be sent if communications is lost between any units connected together through the RS485 interface. This setting has no effect if parallel operation is not active.

5.4. Communications

Select the Communications page to configure the Basic system parameters, Network settings, E-mail settings, User setup, and Maintenance functions.

Select the **BASIC SETUP** tab to configure the name of the supply, configure the parallel operation settings, and set the date and time and data-logging function of the power supply. Click on the Save Settings button to record any changes made to parameters on this page.

Device Name: Enter a unique descriptive name for the power supply if desired. This name will be used in all alarm e-mails. The model and hardware version are also shown here.

Parallel Operation: Configure the unit as the primary, or a secondary unit within parallel connected sets. Also set a unique ID number for each parallel unit (required) and enable parallel secondary unit alarm e-mails if desired. See section 4.4 Advanced Parallel Operation with TCP/IP Ethernet Operation for more information.

- **Parallel Mode:** Select Stand-alone, Primary or Secondary mode here, to configure the mode of operation of the supply. The default setting is for Stand-alone mode.

- **Device ID:** Set a unique device ID (0 to 5) for units to be used in a parallel array. Each unit is a set must have a unique address set here, or a Parallel Error will be indicated.

- **Send Secondary Alarm E-mails:** Tick this box on Primary units to have the Primary forward all alarm e-mails from the connected Secondary supplies. Use this feature to monitor all units in a parallel set with a single Ethernet connection made to the primary unit only.

Date and Time Settings: Check the current system date and time here, and configure automatic or manual calendar and time settings.

- **Synchronize with NTP Server:** Tick this box to have the unit derive its calendar and time setting from the active network connection.

- **NTP Server:** Choose a server (e.g. time.nist.gov) to be used for network time settings.

- **Time Zone:** Set the time zone the unit is operating in, to ensure correct local time is used for all power supply operations. (e.g. North American Pacific Time is GMT-8:00 hours)

- **Set Time Manually:** Tick this box to manually set the date and time used by the unit, if desired, then enter the correct local time and date in the boxes provided.

Data Logging: Enable data Logging by selecting Enabled in the drop down menu, to record up to the last 30 days of voltage, current and alarm data, recorded once per minute.

Click on the Download Log (CSV) button to store the CSV format log file on your computer for further analysis.

5.5. Network Setup

The **NETWORK SETUP** tab allows you to configure the network settings of the power supply. To save any changes to the network settings, click on Save Settings at the bottom of this page. (The power supply will then reboot)

Network: Configure the basic network settings here.

- **MAC Address:** Displays the unique MAC address assigned to the power supply.

- **Enable DHCP:** Turn on this setting if your network is using a DHCP server to automatically assign IP addresses (DHCP is enabled by default). To manually assign a Static IP address to the power supply, uncheck the **Enable DHCP** box and then set the following settings:

    - **IP Address:** Specify a unique IP address for the power supply.

- **Subnet Mask:** Specify the mask for the subnet the power supply is located on.

- **Gateway:** Specify the IP address of the default router (gateway) used for connecting attached devices to different networks.

- **Primary DNS:** Specify the IP address of the Primary DNS Server for your network.

- **Secondary DNS:** Specify the IP address of the Secondary DNS Server for your network.

Web Server: Configure the unit's internal Web Server port parameters here. The Web server port numbers can be changed to any port within the range 1 – 65565.

NOTICE!
Changing these ports may affect your ability to access the power supply.

- **HTTP Port:** Allows you to change the HTTP port number. This port is used for HTTP traffic between the power supply and Web browser. The default HTTP port is **80**. If you change the HTTP port to a number other than 80, you will have to append the new port number to the URL used to access the power supply (e.g. **http://192.168.0.180:8000** for IP address **192.168.0.180**, port **8000**).

- **HTTPS Port:** Allows you to change the HTTPS port number used by the power supply. HTTPS (HTTP secure) is a protocol used to encrypt the traffic between Web browsers and servers. The default HTTPS port is **443**.

SNMP: Configure these settings to use SNMP based monitoring. SNMP (Simple Network Management Protocol) is an industry standard protocol for network management software, and enabling the SNMP function will allow standard SNMP management software to connect to the SNMP agent running on the power supply. Read real time system information such as battery voltage, output current, and then have the unit send SNMP traps to the external management software when an alarm or fault occurs.

The information available from the SNMP agent is described in a MIB (Management Information Base) file, which can be downloaded from the link at the bottom of the SNMP box on this GUI page, or on the Help page. The unique Platinum Series MIB file must then be imported into your external SNMP management software.

- **Enable SNMP:** Check this box to enable the SNMP agent.

- **SNMP Version:** Sets the SNMP version (**v1**/**v2c**, **v3**, or **All**) supported by the SNMP agent. If All is selected, all SNMP versions will be supported simultaneously. The appropriate settings for the selected SNMP version will need to be configured.

- **Enable SNMP Write Access:** Check this box to allow remote SNMP control of the power supply output. If this box is unchecked, all information available from the SNMP agent will be read-only.

- **SNMP Contact Information:** Assign contact information, such as an operator name and phone number for the panel, which can be read via SNMP queries. This information is optional.

SNMPv1/v2c Settings:

- **Read Community:** Enter the community string/password for read-only SNMP access. The default read community string is "public".

- **Write Community:** Enter the community string/password for read-write SNMP access. The default write community is "write".

NOTE:
The community strings should be changed to unique passwords before enabling SNMP, as the defaults are well known.

SNMPv3Settings:

- **User Name:** Enter the user name for SNMPv3 access.

- **Authentication Protocol:** Select the SNMPv3 authentication protocol (**None**, **MD5**, or **SHA**).

- **Authentication Password:** If an authentication protocol is selected, enter the authentication password.

- **Privacy Protocol:** Select the SNMPv3 privacy protocol (**None**, or **AES**).

- **Privacy Password:** If a privacy protocol is selected, enter the privacy password.

SNMP Trap Settings:

- **Trap Community:** Assign the community string/password that will be sent with all traps. Some trap receivers are able to filter based on Trap Community.

- **Trap IP Addresses:** Assign the IP address for up to two devices that will receive SNMP traps from the panel.

5.6. Email Setup

The ICT Platinum Series is capable of sending email alarm notifications to multiple email addresses. Configure these settings on the **EMAIL SETUP** tab if you would like to receive e-mail alarm notifications from the power supply. The information for the following settings is available from your Network Administrator or Internet Service Provider (ISP). Click the Save Settings button to save any changes made to this page.

- **SMTP Server:** The name or IP address of your SMTP server used for sending outgoing e-mail.

- **SMTP Port:** The port used by your SMTP server. The standard port used by most SMTP servers is **25**.

- **SMTP Server requires SSL:** Check this box if your SMTP server requires an encrypted SSL connection.

  This box should normally be check if the SMTP port used by the SMTP server is **465**.

If the SMTP server uses STARTTLS (normally port **587**), this box should be unchecked.

- **Sender E-mail Address:** Enter the e-mail address you wish to appear as the sender of the e-mail notifications.

- **Recipient E-mail Address(es):** Enter an e-mail address that will receive the e-mail notifications. This field can also be used to send a text message notification to a cell phone. See the Text Message Alarm Notifications section for more information. Multiple e-mail addresses can be included on this line, separated by a comma.

- **SMTP User Name:** If your SMTP server requires a user name and password, enter the user name here. Leave this field blank if your SMTP server does not require authentication.

- **SMTP Password:** If your SMTP server requires a user name and password, enter the password here. Leave this field blank if your SMTP server does not require authentication.

- **Minimum E-mail Interval:** Specify a minimum interval required between e-mail notifications. (Default 1 minute, range 0 to 60 minutes) This time interval is used to prevent an un-intended flood of e-mail alarm notifications that could occur when an alarm limit is incorrectly configured, for example.

5.7. User Setup

The **USER SETUP** tab allows you to configure passwords for up to 10 users to access the power supply. To save any password changes, click on Save Settings at the bottom of this page.

The unit has no password assigned by default, so an Administrator password should be assigned to your panel for improved security.

NOTICE!
Please record your password. If the Administrator password is lost, the power supply must be reset to return the password to

the default setting. See the <u>Password Reset</u> section for more information.

Select a User to Edit or Add a New User: Choose which of the user accounts to edit, or add a new user. Set the access level to be appropriate for the amount of control each user requires.

- **Administrator:** This level has full access to the panel settings, and can set up users and change passwords ("admin" is the default user)

- **Control:** User has read-only access to the panel, but can enable or disable the output, and change some of the basic settings. Cannot change passwords or network settings.

- **View-Only:** User can only view status, cannot change any settings

New Password: Allows you to change the password for the selected user.

Confirm New Password: When changing a password, you must re-enter the new password here to confirm.

Administrator Password: Enter the current Administrator password here to confirm changes.

5.8. Maintenance

The **MAINTENANCE** tab allows you to reset the power supply communications, restore the power supply communications and alarm settings to the factory default settings, and send a test e-mail to verify email connections using the Web server interface screen.

Reset Communications
Pressing the <u>Reset</u> button will reset the communications controller on the power supply without interrupting DC power to the output terminals. All existing settings will be maintained.

Restore Factory Default Settings
Pressing the <u>Restore</u> button will restore <u>ALL</u> communications and alarm settings to the original factory default values, including all passwords. If you only want to reset the IP address and Administrator

password of the power supply, see the <u>Administrator Password / IP Address Reset</u> section.

Export And Import Settings
The <u>Manage Settings</u> button will take you to the Export and Import Settings page, where you may export all the system settings (other than the Administrator password, Network and Web Server settings) to an encrypted **.cfg** file on the local computer. Use <u>the Import Settings</u> section on other systems to locate this file and then import it to any other Platinum Series unit you are logged in to, greatly simplifying the configuration of multiple identical units.

Firmware Update
Download the latest Platinum Series firmware file from the ICT website (ict-power.com) to your local computer. De-compress this file then press the <u>Update Firmware</u> button, and link to this file. Update the firmware on the power supply by clicking the <u>Update Now</u> button. Do not remove AC power during the update process!

Send Test E-Mail
Pressing the <u>Send Test E-mail</u> button will send test e-mail to the specified recipient using the e-mail settings on the <u>Network Setup</u> page.

Ping Diagnostics Tool
Use this feature to verify connectivity of any network connected device. Enter the hostname or IP address of the target device, and then click the <u>Ping</u> button to check if the device is active.

5.9.   Router Configuration

This section explains how to set up the embedded Web server interface behind a router and enable remote access to the panel over the Internet.

A router allows multiple PCs to share a single Internet connection. To enable access to the Web server over the Internet, you will need to configure your router to forward incoming remote data to the local IP address of your power supply.
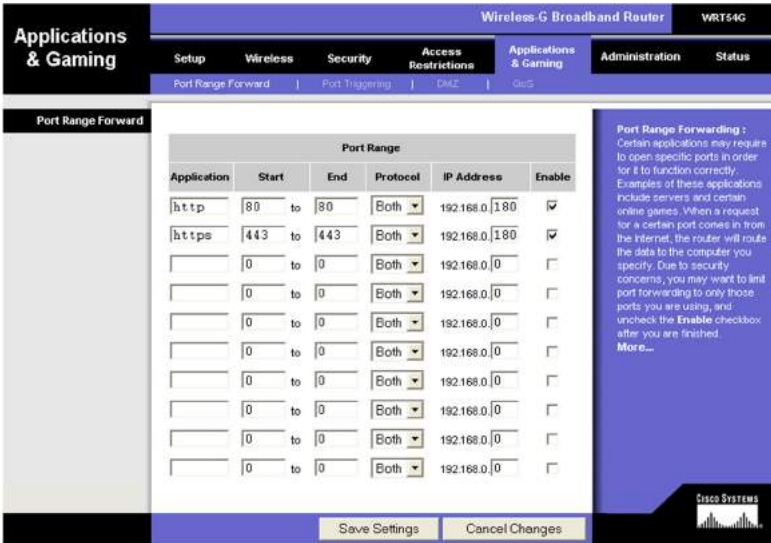
The following steps use a Linksys WRT54G router as an example:

1. Log in to your router and go to the port-forwarding screen. In the Linksys WRT54G, this is located in the <u>Applications and Gaming</u> tab. The location of port forwarding may be different on other routers (consult your router manual for instructions).

2. To configure HTTP forwarding, following these steps:

   a. Enter a unique name in the <u>Application</u> field.
   b. Enter the HTTP port number that the power supply is using in the **Start** and **End** fields. If you are using the default power supply port settings, the port number is **80**.
   c. Select <u>Both</u> under <u>Protocol</u> (TCP and UDP).
   d. Enter the local IP address of the power supply (e.g. **192.168.0.180**) in the <u>IP Address</u> field. The current IP address of the power supply can be found on the <u>Network Status</u> screen (see the <u>Control Panel Menus</u> section for more information).
   e. Check <u>Enable</u>, and then click on <u>Save Settings</u>.

NOTE: Many ISP's block access to port 80. If your ISP does block port 80, you will need to change the HTTP port the panel uses from 80 to something else, such as 8000. Valid port numbers are in the range of 1 - 65535. See the <u>Network Setup</u> section for instructions on how to change the power supply network ports.
You will also need to change the HTTP port number from 80 to something else if your local network already contains another device using port 80 such as another panel or a Web server.

3. To configure HTTPS forwarding, repeat steps 2a – 2e with the HTTPS port number that the panel is using. If you are using the default panel port settings, the HTTPS port number is 443.

Wireless-G Broadband Router   WRT54G

Applications & Gaming

Setup | Wireless | Security | Access Restrictions | Applications & Gaming | Administration | Status

Port Range Forward | Port Triggering | DMZ | QoS

Port Range Forward

Port Range

Application	Start		End	Protocol	IP Address	Enable
http	80	to	80	Both ▼	192.168.0.180	☑
https	443	to	443	Both ▼	192.168.0.180	☑
	0	to	0	Both ▼	192.168.0.0	☐
	0	to	0	Both ▼	192.168.0.0	☐
	0	to	0	Both ▼	192.168.0.0	☐
	0	to	0	Both ▼	192.168.0.0	☐
	0	to	0	Both ▼	192.168.0.0	☐
	0	to	0	Both ▼	192.168.0.0	☐
	0	to	0	Both ▼	192.168.0.0	☐
	0	to	0	Both ▼	192.168.0.0	☐

Port Range Forwarding :
Certain applications may require to open specific ports in order for it to function correctly. Examples of these applications include servers and certain online games. When a request for a certain port comes in from the Internet, the router will route the data to the computer you specify. Due to security concerns, you may want to limit port forwarding to only those ports you are using, and uncheck the **Enable** checkbox after you are finished. More...

Save Settings   Cancel Changes

CISCO SYSTEMS

4. Before you can access the panel over the Internet, you will need to know the WAN IP address of the router, which is assigned by your ISP. With the Linksys WRT54G router, this information is available in the Status tab, listed as "IP Address".

NOTICE! If you are using a Dynamic IP address, your WAN IP Address may change from time to time without warning, depending on your ISP. You may want to obtain a Static IP address from your ISP, which will be more convenient to use to access the panel from a remote location. A Static IP address is a fixed IP address that will not change. Alternatively, if a Static IP address is not available, you can use a Dynamic DNS service such as Dyn (see **www.dyn.com**).

To access the panel over the Internet, type the WAN IP Address of the router in the location/address field of your browser, followed by a colon and the HTTP port number that the panel is using (e.g. **http://209.123.10.33:8000** for IP Address **209.123.10.33**, Port **8000**).

ICT Distribution Panel - Windows Internet Explorer

http://209.123.10.33:8000

File Edit View Favorites Tools Help

5.10. Text Message Alarm Notifications

The Platinum Series Power Supply can send text message alarm notifications to a cell phone by sending the alarm e-mail to an address at the mobile phone provider. On the Network Setup page, enter the address for your phone in one of the Recipient E-mail Addresses field. For example, to send a text message to an AT&T phone, enter cellnumber@txt.att.net, replacing cell number with your 10-digit cell phone number.

Here are some address formats for other mobile phone providers:

AT&T	*cellnumber*@txt.att.net
Verizon	*cellnumber*@vtext.com
T-Mobile	*cellnumber*@tmomail.net
Virgin Mobile	*cellnumber*@vmobl.com
Nextel	*cellnumber*@messaging.nextel.com
Bell Mobility	*cellnumber*@txt.bell.ca
Rogers	*cellnumber*@pcs.rogers.com
Telus	*cellnumber*@msg.telus.com
Virgin Mobile (Can)	*cellnumber*@vmobile.ca

5.11. Network Troubleshooting

I am unable to access the embedded Web server:

• Check that you are using the correct IP address to access the power supply's embedded Web server by viewing the Network Status screen on the Control Panel display (see the Control Panel Menus section for instructions on how to access the Network Status screen). The IP address for the power supply may have changed if DHCP is enabled.

• If the Network Status screen on the Control Panel display shows Network Not Connected, check the network cable connections to the power supply and the network.

• Ensure that you are using the correct type of network cable. An industry standard "crossover" cable should be used for

connecting directly to a computer, and a "straight-through" cable should be used for connecting to a network.

- Ensure the network card settings on your computer are appropriate for accessing the IP address of the power supply. To access a power supply with the default IP address of 192.168.0.180, typical network settings for your computer are:

  - o **IP Address:** 192.168.0.100
  - o **Subnet Mask:** 255.255.255.0
  - o **Gateway:** 192.168.0.1

- If the HTTP port of the power supply has been changed, you must append the port number to the URL used to access the panel. See the Administrator Password / IP Address Reset section for instructions on how to reset the port number to the default setting.

- If your network switch allows you to manually configure port speed and duplex settings, turn-on "Auto Negotiation" for the switch port that the panel is connected to.

I am not receiving e-mails from the power supply:

- On the Communications / Email Setup page, ensure the SMTP Server field is the correct address for your e-mail provider, and the SMTP Port is correct. (Port should be 25 for most servers).

- If your SMTP server requires SSL encryption, ensure that the SMTP Server requires SSL checkbox is checked. Otherwise, this box must be left unchecked.

- There must be valid e-mail addresses in the Recipient E-mail Address and Sender E-mail Addresses fields. Do not enter more than one e-mail address in the Sender field.

- If your SMTP server requires authentication, ensure that the SMTP User Name and SMTP Password fields are entered correctly. If no authentication is required, leave these fields blank.

- Verify your e-mail settings by going to the Communications / Maintenance page and clicking on the Send Test E-mail button to send a test e-mail. The Send Test E-mail page will display an error message if the power supply unable to send the e-mail.

- Verify that the <u>Send E-mail</u> checkboxes are ticked for any alarm conditions for which you wish to receive e-mail notifications.

I forgot my password for the embedded web server:

- See the <u>Administrator Password / IP Address Reset</u> section for instructions on how to reset the password.

I forgot my password for the Control Panel Menu:

- See the <u>Control Panel Menu Password Reset</u> section for instructions on how to reset the password.

Troubleshooting Parallel Operation alarms and errors:

Alarm message:	Possible Cause:
Parallel Unit Offline	A unit connected to the RS485 bus has lost power. A RS485 data cable has been unplugged or damaged. A communications reset has been done to a unit connected to the RS485 bus. The alarm will be cleared as soon as the unit comes back online. DC power to the output terminals is not interrupted during a communication reset.
Parallel Configuration Error	Multiple units connected to the RS485 bus are assigned the same Device ID. Multiple units connected to the RS485 bus are configured as a Primary unit.
Parallel Data Error	Multiple units connected to the RS485 bus are configured as a Primary unit. A RS485 data cable has been unplugged or damaged. The RS485 bus is picking up electrical interference from another source.

| Parallel Invalid Product | A product with a different output voltage rating is connected to the RS485 bus. |

6. PRODUCT SPECIFICATION

Table 2: Product Specification for all models

Input Voltage	90- 300VAC, 50 or 60Hz Derate 2% / VAC < 100VAC
Input Power Factor	0.99 Typical
Line Regulation	0.1%
Load Regulation	0.5%
Current Limit	nominal max limit
Grounding	Positive ground, negative ground, or floating output allowed
Operating Temperature Range	-30°C to 70°C[1]
Storage Temperature	-40°C to 70°C
EMI	Meets FCC part 15 and CE class B limits[2]
Safety	Meets C/UL/EN 60950-1 standard
Efficiency	90% - 93% typical
Alarm Relay	Form-C (0.5A, 125Vac max)
Remote Shutdown (isolated)	External 2V-12V will disable supply output

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[1] Derate maximum output 2% per degree C above 50°C ambient

[2] This device complies with Part 15 of the FCC Rules, class B limits. Operation is subject to the following 2 conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including any interference that may cause undesired operation

Table 3: Model Ratings

Rating	12V 120A	12V 60A	24V 60A	24V 30A	48V 30A	48V 15A
Model	ICT1600 - 12SC	ICT800 - 12SC	ICT1600 - 24SC	ICT800 - 24SC	ICT1600 - 48SC	ICT800 - 48SC
Output Voltage adjustment range	11.5V-15.5V	11.5V-15.5V	23.0V – 31.0V	23.0V – 31.0V	46.0V – 62.0V	46.0V – 62.0V
Default Output Voltage	13.8V	13.8V	27.6V	27.6V	55.2V	55.2V
Output Current Limit adjustment range	25 - 120A	13 – 60A	10 - 60A	5 – 30A	5 - 30A	2.5 – 15A
Default Output Current Limit	120A	60A	60A	30A	30A	15A
Output V Noise (mV rms)	30	30	30	30	60	60
Input Current max at 100Vin (rms)	18A (<16A @ 120V)	9A	18A (<16A @ 120V)	9A	18A (<16A @ 120V)	9A
Max Output Voltage for full current out	13.5V	13.5V	27V	27V	54V	54V
LVD Disconnect range (Option)	10.0-11.5V	10.0-11.5V	20.0-23.0V	20.0-23.0V	40.0-46.0V	40.0-46.0V
LVD Reconnect range (Option)	11.5-13.0V	11.5-13.0V	23.0-26.0V	23.0-26.0V	46.0-52.0V	46.0-52.0V
Output Power Limit	1600W	800W	1600W	800W	1600W	800W

7. LIMITED WARRANTY

The warranty period on ICT products is two (2) years from date of purchase from an authorized ICT reseller or OEM with valid proof of purchase, or from date of shipment from the ICT manufacturing facility. The warranty period for a repaired product or part is ninety (90) days or the remainder of the unexpired term of the new product warranty period, whichever is greater. Repair or replacement of a defective product or part does not extend the original warranty coverage period.

ICT Limited Warranty is only intended for the benefit of the original purchaser and user of this product. This Warranty is not transferable or assignable without the prior written permission of ICT. ICT's sole obligation and liability under this warranty is limited to either repairing or replacing defective products at the sole discretion of ICT. When repairing or replacing the products, ICT may use products or parts that are new, equivalent to new or re-conditioned. Parts repaired or replaced during the warranty period will be under warranty for the remainder of the warranty period.

No claim will be accepted unless written notice of the claim is received by ICT in accordance with ICT's Return Material Authorization (RMA) procedure, as soon as reasonably possible after the defect is discovered. A valid product serial number must be provided with the RMA claim to prove eligibility. The RMA form is available on the ICT website at www.ict-power.com/support/warranty-repair/.

The Purchaser shall at their own risk and cost return the defective product to ICT's factory or designated repair center once an RMA is issued by ICT. Return of the products to the customer after repair is completed shall be prepaid by ICT unless otherwise mutually agreed between the parties. Products shipped to ICT which have incurred freight damage will not be covered by this Warranty and any repairs or replacement parts, components or products needed will be invoiced in the full current price amount and returned freight collect to Purchaser. It is the Purchaser's responsibility to check the product upon receipt for any damage during shipping and to contact the carrier or shipper regarding such damage. Product that is returned as defective, which is determined to operate within published specifications will be returned to the Purchaser freight collect.

ICT assigns to Purchaser any warranties which are made by manufacturers and suppliers of components of, or accessories for, the ICT product and which are assignable. ICT makes no representations as to the effectiveness or extent of such warranties, assumes no responsibility for any matters which may be warranted by such manufacturers or suppliers and extends no additional coverage under this Warranty to such components or accessories.

In no event shall ICT be liable for any special, indirect or consequential damages such as, but not limited to, loss of use, business or goodwill, loss of revenue, or loss of profits, which may result, either directly or indirectly, from defects in products provided by ICT.

This Warranty will be void if the product has been subjected to misuse, neglect, accident, exposure to environmental conditions not conforming to the products' limits of operation, improper installation or maintenance, improper use of an electrical source, defects caused by sharp items or by impact pressure, a force majeure event, has been modified or repaired by anyone other than ICT or its authorized representative, has been subjected to unreasonable physical, thermal or electrical stress, improper maintenance, or causes external to the unit including but not limited to general environmental conditions such as rust, corrosive atmospheres, sustained temperatures outside the specified operating range of the equipment, exposure to power surges and/or electrical surges, improper grounding, mold or dust, animal or insect damage, water damage or immersion in liquid of any kind, or if the serial number has been altered, defaced, or removed.

ICT does not control the installation and use of any ICT product. Accordingly, it is understood this does not constitute a warranty of performance or a warranty of fitness for a particular purpose. This Warranty represents the entire agreement between ICT and Purchaser with respect to the subject matter herein and supersedes all prior verbal or written communications, representations, understandings or agreements relating to this subject.

Helios Power Solutions