1500W Sine Wave Series
Inverter
INSTRUCTION MANUAL
855-151-000

Models:
ICT1500-12SW    ICT1500A-12SW
ICT1500-24SW    ICT1500A-24SW
ICT1500-48SW    ICT1500A-48SW
**WARNING**

Risk of serious personal injury or damage to equipment and property! Always observe the following:

- Use an appropriately rated over-current protection device in line with the main battery connection to the Inverter
- Use an appropriately rated over-current protection device in line with the ac input connection to the Inverter (if transfer relay option is installed)
- Use an appropriately rated disconnect switch or circuit breaker in line with the Inverter dc and ac inputs to enable installation and service with the battery and ac power source disconnected
- Shut off or disconnect the dc and ac power sources before connecting or disconnecting wiring
- Use wire and connectors rated for the maximum load current and size of fuse or circuit breaker, and keep cable lengths as short as practical
- Ensure battery voltage matches the rating of the model of inverter in use
- Carefully observe wiring polarity when making input connections
- Securely tighten all connections
- Install the wiring box and cover and use appropriate wiring strain relief devices on all wires
- The ac NEUTRAL line may be internally bonded to the chassis (if ground bonding screw is installed). Ensure chassis is connected to earth ground before use
- Batteries can explode or arc! Wear suitable face and hand protection and use insulated tools when working with batteries
- Do not attempt to service any internal parts. Refer all product service to an authorized ICT Ltd. service facility

**CAUTION**

Risk of personal injury or damage to equipment! Always observe the following:

- Install in a protected environment, keep sources of moisture away from unit
- Ensure the total power consumption of the load does not exceed the rated load capacity of the inverter
- Do not block air inlet or outlet openings in the inverter
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>4</td>
</tr>
<tr>
<td>INSTALLATION</td>
<td>4</td>
</tr>
<tr>
<td>OPERATION</td>
<td>8</td>
</tr>
<tr>
<td>Status Indicators and Alarms</td>
<td>9</td>
</tr>
<tr>
<td>AC Transfer Switch (Option “T”)</td>
<td>10</td>
</tr>
<tr>
<td>TCP/IP WEB BASED UTILITY OPTION</td>
<td>11</td>
</tr>
<tr>
<td>Status and Control</td>
<td>12</td>
</tr>
<tr>
<td>Device Setup</td>
<td>13</td>
</tr>
<tr>
<td>Network setup</td>
<td>14</td>
</tr>
<tr>
<td>E-mail Setup</td>
<td>17</td>
</tr>
<tr>
<td>User Setup</td>
<td>18</td>
</tr>
<tr>
<td>Maintenance</td>
<td>20</td>
</tr>
<tr>
<td>MOBILE WEB APP</td>
<td>21</td>
</tr>
<tr>
<td>PASSWORD and IP ADDRESS RESET</td>
<td>21</td>
</tr>
<tr>
<td>ROUTER CONFIGURATION</td>
<td>22</td>
</tr>
<tr>
<td>TEXT MESSAGE ALARM NOTIFICATIONS</td>
<td>24</td>
</tr>
<tr>
<td>TROUBLESHOOTING</td>
<td>24</td>
</tr>
<tr>
<td>PRODUCT SPECIFICATIONS</td>
<td>26</td>
</tr>
<tr>
<td>LIMITED WARRANTY</td>
<td>28</td>
</tr>
</tbody>
</table>
INTRODUCTION

The ICT1500 Sine Wave Series is a compact high efficiency true sine wave output DC to AC inverter with features optimized for commercial applications:

- Unparalleled power density at 1500W, with 3000W surge capability
- 115Vac 60Hz and 230Vac 50Hz models, with 93% peak efficiency
- Optional TCP/IP Ethernet port with built in web-server, and support for SNMP v1/v2 management systems for remote control and monitoring
- Optional DC wiring box for code compliant standalone installations
- 19" dual inverter rack mounting with optional kit for installing 2 units side by side in 1.5U of rack space
- Low idle current draw
- Form C alarm contacts for remote notification of alarms
- Optional automatic transfer switch with user definable trip levels
- Low EMI, FCC Class A compliance
- AC front convenience outlets or rear hardwire AC connections standard
- Temperature controlled variable speed fan for low noise and long life

Model Numbers and Options (factory installed):

<table>
<thead>
<tr>
<th>115Vac 60Hz Models</th>
<th>230Vac 50Hz Models</th>
<th>Battery V</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT1500-12SW</td>
<td>ICT1500A-12SW</td>
<td>12</td>
<td>1500W True Sine Wave inverter</td>
</tr>
<tr>
<td>ICT1500-24SW</td>
<td>ICT1500A-24SW</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>ICT1500-48SW</td>
<td>ICT1500A-48SW</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>ICT1500-12SWT</td>
<td>ICT1500A-12SWT</td>
<td>12</td>
<td>1500W inverter with AC transfer switch option</td>
</tr>
<tr>
<td>ICT1500-24SWT</td>
<td>ICT1500A-24SWT</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>ICT1500-48SWT</td>
<td>ICT1500A-48SWT</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>ICT1500-12SWC</td>
<td>ICT1500A-12SWC</td>
<td>12</td>
<td>1500W inverter with Ethernet/SNMP communication option</td>
</tr>
<tr>
<td>ICT1500-24SWC</td>
<td>ICT1500A-24SWC</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>ICT1500-48SWC</td>
<td>ICT1500A-48SWC</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>ICT1500-12SWTC</td>
<td>ICT1500A-12SWTC</td>
<td>12</td>
<td>1500W inverter with AC transfer switch and Ethernet/SNMP option</td>
</tr>
<tr>
<td>ICT1500-24SWTC</td>
<td>ICT1500A-24SWTC</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>ICT1500-48SWTC</td>
<td>ICT1500A-48SWTC</td>
<td>48</td>
<td></td>
</tr>
</tbody>
</table>

Optional Accessories:
- 19 inch rack mounting kit (mount up to 2 inverters): ICT-RMK4
- Wiring Junction Box (attaches to back of inverter): ICT-DCWB

INSTALLATION

Perform a quick physical check of the unit as it is being taken out of the box to ensure it has not been damaged during shipping. Check for the included parts and accessories shipped with your unit:

1 Models with Australasian IEC type I front AC outlet shown

Innovative Circuit Technology Ltd.
Mount the optional wiring junction box base (part of the Wiring Junction Box kit ICT-DCWB) to the back of the inverter with 4 supplied screws, as shown in Figure 1. Knockout the plugs and install conduit fittings or wire strain relief clamps in the wiring box openings to be used for the installation, as required. The inverter must be installed in a restricted access environment such as an enclosed equipment rack if the back panel wiring junction box is not used.

![Figure 1: Wiring Junction Box Installation](image)

Mount the inverter using the wall mount bracket (included) or the optional 19 inch rack-mount tray (ICT-RMK4) using the 4 mounting screws on the bottom of the inverter, as illustrated in Figure 2. Keep the distance to the battery bank as short as practical to minimize power loss in the high current wiring. (see DC Wire Sizing Guide table)

![Figure 2: Inverter Wall Bracket Mounting](image)
The inverter may be mounted horizontally on a shelf, or the ICT rack tray, or in a vertical wall mounted orientation. Install the unit with either side located on top (as shown in Figure 3) when wall mounting to ensure proper cooling and long term safe operation of the inverter. (Mounting hardware not included)

Figure 3: Approved Mounting Orientations

Connect the chassis ground stud on the back panel to a reliable earth ground point.

Ensure the inverter switch is in the off position, then connect the dc input wiring from a suitable deep-cycle lead-acid battery to the inverter using appropriately rated wire size (see DC Wire Sizing Guide), and an in line over current protection device/disconnect switch or breaker (with disconnect switch in “off” position). Terminate wire with appropriate size of ring tongue to fit the 5/16” input bus bar mounting bolts.
**CAUTION**

Risk of personal injury or damage to equipment!
Ensure the nominal battery voltage is correct for the model of inverter, and that the battery positive is connected to the inverter input positive (+) terminal, battery negative is connected to the inverter negative (-) terminal.

<table>
<thead>
<tr>
<th>Distance from Inverter to Battery</th>
<th>12V input (100Ah min battery)</th>
<th>24V input (50Ah min battery)</th>
<th>48V input (25Ah min battery)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 5 feet</td>
<td>1 AWG</td>
<td>6 AWG</td>
<td>8 AWG</td>
</tr>
<tr>
<td>5 – 10 feet</td>
<td>2/0 AWG</td>
<td>4 AWG</td>
<td>6 AWG</td>
</tr>
<tr>
<td>10 – 20 feet</td>
<td>4/0 AWG</td>
<td>2 AWG</td>
<td>4 AWG</td>
</tr>
</tbody>
</table>

Table 1: DC Wiring Minimum Sizing Guide, Recommended Minimum Battery Size

Connect the AC loads to be powered by the inverter to the AC OUT wire clamp connector (Line, Neutral and Ground) located on the back panel, (see Figure 4) using wire rated for 15A (14 – 12AWG) Alternatively cord connected devices may be directly plugged in to the AC outlets located on the inverter front panel.

On units with the Transfer Relay (option “T”) connect the external AC power source (grid power, or AC generator) to the AC IN wire clamp connector on the back panel of the inverter, using wire rated for at least 15A (14 – 12AWG), with the AC power source switched off.
CAUTION

Risk of personal injury or damage to equipment!
AC input wiring from the grid or other power source to the inverter must be protected using a branch rated circuit breaker of 15A or lower value.

Connect the external alarm monitoring wiring to the Form-C alarm contact output if desired. (See Alarm Output Contacts table, below) Plug the Ethernet network (CAT-5) cable in to the optional Network port on the back panel (option “C” equipped units only), routing the alarm and network cable through the plastic bushing immediately adjacent to the connector on the side of the optional wiring box tray.

<table>
<thead>
<tr>
<th>Alarm Pin</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>Alarm output common</td>
</tr>
<tr>
<td>2</td>
<td>NC</td>
<td>Alarm output Normally Closed contact</td>
</tr>
<tr>
<td>3</td>
<td>NO</td>
<td>Alarm output Normally Open contact</td>
</tr>
</tbody>
</table>

Table 2: Alarm Output Contacts

Check that all connections to the inverter are correct and tight, then tighten the wire strain relief clamps in the wiring junction box (if used), and install the wiring box cover.

Set the external battery disconnect switch or breaker to “on”.

OPERATION
With the unit mounted, wired, and powered as described in the INSTALLATION section, turn the front panel power switch to the ON position and check that the green AC indicator on the front panel is flashing slowly, indicating the inverter battery powered AC output is on.

Switch the external ac source disconnect device to ON (if an external AC source is being used, Transfer Switch option “T” only), and observe that the green AC indicator on the front panel is now on continuously, indicating the external AC source is present and powering the load. The inverter output will now be powered directly from the external AC source.

The connected AC loads should now be operating normally, powered with up to 1500W (3000W momentary peak) of battery backed AC power.
### Status Indicators and Alarms

The 3 LEDs on the front panel and the Form-C alarm contacts on the back indicate the status of the inverter:

<table>
<thead>
<tr>
<th>Alarm or Notification</th>
<th>Trigger Condition</th>
<th>Inverter Output</th>
<th>Red FAULT LED</th>
<th>Yellow WARN LED</th>
<th>Green AC LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverter AC Output OK (Battery Backup Mode)</td>
<td>Normal operation, output above <strong>90VAC</strong> (or <strong>180Vac</strong>, 230V models)</td>
<td>Enabled</td>
<td>-</td>
<td>-</td>
<td>BLINK</td>
</tr>
<tr>
<td>External AC Voltage OK</td>
<td>AC input (Transfer Relay option only) is above set limit, and is powering the output</td>
<td>Enabled</td>
<td>-</td>
<td>-</td>
<td>ON</td>
</tr>
<tr>
<td>DC Undervoltage Warning</td>
<td>Triggers when Input Voltage drops below <strong>11.0/22.0/44.0VDC</strong> for 1 s. Clears when input is above <strong>11.2/22.4/44.8V</strong> for 1 s.</td>
<td>Enabled</td>
<td>-</td>
<td>ON</td>
<td>-</td>
</tr>
<tr>
<td>Remote Shutdown</td>
<td>Triggers when Remote Shutdown is activated over optional Ethernet, or remote panel switch</td>
<td>OFF</td>
<td>BLINK</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>System Fault</td>
<td>Indicates internal circuit fault - Clears when all fault conditions are cleared.</td>
<td>OFF</td>
<td>ON</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>DC Undervoltage</td>
<td>Triggers when Input</td>
<td>OFF</td>
<td>ON</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>Shutdown</td>
<td>Voltage drops below 10.5/21.0/42.0VDC for 1 s. Clears when Input Voltage rises above warning level for 1 s.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>DC Overvoltage Shutdown</td>
<td>Triggers when Input Voltage rises above 16.5/33/66VDC for 1 s. Clears when Input Voltage drops below 16.0/32/64VDC for 1 s.</td>
<td>OFF</td>
<td>ON</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>Over-temperature Shutdown</td>
<td>Triggers when internal temperature is too high. Clears when back to normal range.</td>
<td>OFF</td>
<td>ON</td>
<td>-</td>
<td>OFF</td>
</tr>
<tr>
<td>AC Output Failure</td>
<td>Triggers when Inverter output problem detected. Must be cleared manually by toggling the Power Switch.</td>
<td>OFF</td>
<td>ON</td>
<td>-</td>
<td>OFF</td>
</tr>
</tbody>
</table>

The form-C alarm contact will be triggered for any condition that lights the red FAULT LED, or shuts down the output of the inverter.

**AC Transfer Switch (Option “T”)**

The automatic AC transfer switch ensures that your load is primarily powered from the AC grid or generator when available, and is quickly transferred to the battery powered inverter output should the AC power source fail. Transfer time is typically less than 1 ac cycle, and the voltage transfer thresholds may be adjusted using the back panel DIP switch settings shown in Table 1. (The output will be supplied by the inverter when the external line voltage is less than the Vac-Low setting, and will be transferred back the external AC source when the voltage rises above the Vac-High setting) The factory default setting is shown in bold type. Threshold values for 115Vac (230Vac) models shown.

<table>
<thead>
<tr>
<th>Vac-Low Transfer</th>
<th>Vac-High Transfer</th>
<th>Switch settings (1 = “on”, or down)</th>
<th>SW-1</th>
<th>SW-2</th>
<th>SW-3</th>
<th>SW-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>88 (190)</td>
<td>100 (206)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>92 (197)</td>
<td>105 (215)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>96 (205)</td>
<td>110 (224)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>100 (214)</strong></td>
<td><strong>115 (233)</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>86 (188)</td>
<td>104 (212)</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>91 (197)</td>
<td>109 (222)</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
The 15A (7A on 230V models) circuit breaker located on the back panel is a supplementary overcurrent protection device, to limit potential fault currents when operating from an external AC source. If this breaker trips it is indicating that your connected load is drawing excessive current from the unit, or that there is a fault with the AC wiring.

Note that disabling the inverter output on units with the transfer relay option will not cut power to the load if AC is being supplied by an external source via the internal transfer relay.

TCP/IP WEB BASED UTILITY OPTION

Connecting the inverter to the Internet using the optional TCP/IP communication port (Option “C”) enables full remote monitoring and control of the inverter via the on-board graphical web interface using any standard web browser, such as Microsoft Explorer, Google Chrome, or Mozilla Firefox.

To connect with your networked inverter, do the following:

- Start your browser
- Enter the IP address of the inverter in the address field of your browser as shown:

If the inverter is connected to a network with a DHCP server it will be assigned an IP address automatically. To find the current IP address of the inverter you will need to run the IP Address Discovery Utility (available on the Tools download section of the ICT Web page http://www.ictcorporate.com/resources/tools/) to locate the connected inverter and see the assigned IP address. Run the utility on a Windows computer connected to the same network as the inverter, and it will report the IP addresses of all ICT units connected to that network.

The inverter will otherwise use the factory default IP address of 192.168.0.180, as shown above.

- Enter your username and password once you are connected to the unit. The default Administrator user name is admin, with no password.
Your browser will then be logged in to the inverter and the Status and Control page for the unit will be displayed as shown below. See the following section for descriptions on how to use the various monitoring and control features available through the inverter’s graphical web interface.

**Status and Control**

This page provides information on the input battery voltage, the inverter output voltage and power, whether the AC output is provided by the inverter or an external AC source (units with the optional AC transfer relay only), and alarm status for the inverter. The inverter output may be enabled or disabled by clicking the on screen **On** or **Off** push button. Note that disabling the inverter output on units with the transfer relay option will not cut power to the load if AC is being supplied by an external source via the internal transfer relay.
Select any one of the other Inverter web interface pages (such as Device Setup, or Network Setup etc.) by clicking on one of the blue menu bar items at the left side of the screen.

**Device Setup**

Use this page to configure the inverter settings. Click on the **Save Settings** button when finished to save and implement all new changes.

![Device Setup Page](image)

**Figure 8: Device Setup Page**

**Device Info:**

- **Device Name:** Enter a custom descriptive name for the inverter, if desired.
- **Model:** Displays the ICT model number for the inverter.
- **Hardware:** Displays the hardware version of the inverter.

**Network Watchdog:**

- **Watchdog Enabled:** Checking this box will enable the watchdog feature, which will cause the unit to periodically ping up to two remote IP addresses to verify the network connection status. If there is no response from either address the unit will cycle the inverter output power. This feature is useful for re-booting a modem or other network device that is powered by the inverter, to help recover the network IP connection when one of these devices has crashed. The inverter output will be held in the off state for the duration set by the Reset Delay time, and then will be turned back on.

Note that disabling the inverter output on units with the transfer relay option will not cut power to the load if AC is being supplied by an external source via the internal transfer relay.

- **Primary IP Address:** Enter the remote IP address you would like the inverter to monitor. If left blank the unit will monitor the Gateway IP address listed in the Network Setup page.
**Secondary IP Address**: Enter an optional second IP address that the unit can monitor to verify network status. The Network Watchdog will only trigger if both the Primary and Secondary IP addresses fail to respond.

**Watchdog Timeout**: Enter the time (1 to 80 minutes) that the remote IP address must stop responding to ping requests from the inverter, before the Network Watchdog will trigger an inverter output power cycle. Ensure this time is greater than the normal start-up time for the network hardware to prevent nuisance power cycle events at system start up.

**Reset Delay**: Enter the time (10 to 240 seconds) that the inverter will wait before re-enabling its output after a watchdog timeout. This delay must be long enough for any external networking equipment powered by the inverter to fully shut off, to force the equipment to re-boot when AC power is restored.

**Network setup**
Use this page to configure the network settings for the inverter. Click on the Save Settings button at the bottom of the page to save any changes and re-boot the unit.

![Network Setup Page](image-url)
NOTE:
Saving any changes to the network settings will cause the inverter to re-boot, cycling power to the output.

Network:
MAC Address: Displays the MAC address assigned to the inverter.

Enable DHCP: Turn on this setting if your network uses a DHCP server to automatically assign IP addresses. (Enabled as default setting). To manually assign a static IP address to the unit uncheck this box, then set the following parameters.

IP Address: Specify a unique IP address for the unit.

Subnet Mask: Specify the mask for the subnet the inverter 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:
CAUTION:
Changing the web server port numbers may cause loss of communication with the inverter.

The following ports may be changed within a range of 1 to 65565, if required.

HTTP Port: This port is used for HTTP traffic between the inverter and your browser. The default HTTP port is 80, and if you change this the new HTTP Port number must be appended to the URL used to access the inverter. (e.g. use URL http://192.168.0.180:8000 for IP address 192.168.0.180, port 8000)

HTTPS Port: The HTTPS (HTTP Secure) protocol uses encrypted data transfer between web browsers and servers for higher security. The default HTTPS port is 443. Append any changed HTTPS port to the end of the URL for the unit.
To access the inverter through a secure HTTPS connection, use https:// at the start of the units URL. (e.g. https://192.168.0.180:8888 for IP address 192.168.0.180, HTTPS port 8888)

**UDP Port:** This port is used when applying firmware upgrades to the inverter. The default UDP port is 9393.

**SNMP:**
Configure these settings if you would like to use SNMP based monitoring. SNMP (Simple Network Management Protocol) is an industry standard protocol for network management software. Enabling the SNMP function on the inverter will allow standard SNMP management software to connect to the SNMP agent running on the inverter and read real time system information such as battery voltage, and output power. The inverter can 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 inverter’s Help page. The unique inverter MIB file must then be imported into your external SNMP management software.

- **Enable SNMP:** Check this box to enable the SNMP agent
- **Read Community:** Enter the community string/password for read-only SNMP access. The default read community string is “public”.
- **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. The default trap community string is “public”.
- **Trap IP Addresses:** Assign the IP address for up to two devices that will receive SNMP traps from the inverter.
- **Enable SNMP Write Access:** Check this box to allow remote SNMP control of the inverter output. If this box is unchecked information from the unit will be read-only.
- **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.
**SNMP Contact Information**: Assign contact information, such as an operator name and phone number for the inverter, which can be read via SNMP queries. (This information is optional)

Click on the Save Settings button at the bottom of the page to save any changes and re-boot the unit.

**E-mail Setup**

Configure these settings to enable automatic e-mail notifications directly from the inverter. The information required for this is available from your Network Administrator, or Internet Service Provider (ISP).

![E-mail Setup Page](image)

**E-mail**:  
**SMTP Server**: Enter the name or the IP address of your SMTP server used for sending outgoing e-mail. (e.g. “smtp.gmail.com”)  
**SMTP Port**: Enter the port used by your SMTP server. (Normally 25)  
**SMTP Server requires SSL**: Check this box if your SMTP server requires an encrypted SSL connection.  
**Sender E-mail Address**: Enter an e-mail address that will appear as the sender for all e-mail notifications sent from the inverter.
Recipient E-mail Addresses: Enter one or more e-mail addresses that are to receive all e-mail notifications from the inverter. Use commas to separate multiple addresses. This field can also be used to send a text message notification to a phone; see the Text Message Alarm Notifications section for further information.

SMTP User Name: Enter a SMTP user name here, if required by your SMTP server. Leave this field blank if the server does not require authentication.

SMTP Password: Enter a SMTP password here, if required by your SMTP server. Leave this field blank if the server does not require authentication.

Minimum E-mail Interval: Specify a minimum interval required between e-mail notifications. (Default 0 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.

E-mail Notifications:
Select these options to receive an e-mail when one or more of these events occurs.

An inverter failure occurs: Check this box to receive an e-mail notification when the inverter has an internal fault.

Inverter Communications reset: Check this box to receive an e-mail notification when the inverter communications processor resets, normally due to either unit start-up or remote reset.

The Network Watchdog triggers: Check this box to receive an e-mail notification after the Network Watchdog triggers due to a loss of the network connection and the network has then come back online.

The Output switches between Inverter and Grid power: Check this box to receive an e-mail notification if there is a transition in the internal AC transfer relay (on units with the Transfer Relay option installed) due to the loss of the external AC source, or when it returns within the acceptable AC voltage range.

User Setup
Use this page to configure passwords for limiting access to the inverter settings. Click on the Save Settings button at the bottom of the page to save any password changes.
The unit has no password assigned by default, so an Administrator password should be assigned to your inverter for improved security.

**NOTE:**
Record your new password for future access! If the Administrator password is lost the unit must be reset to return the password to the blank default setting, causing loss of all other user settings. See the **Password Reset** section for more details.

**Select a User to Edit:** Choose which of the two user accounts to edit.

- **Administrator** (user name: **admin**) This account has full access to the inverter settings.

- **Standard User** (user name: **user**) This account has read-only access to the inverter, and cannot enable or disable the outputs, or change any of the inverter settings.

**New Password:** Use these fields to change the password of the selected user.

- **New Password:** Enter the new password for the chosen user.

- **Confirm New Password:** Re-enter the new password to confirm the entry.

**Confirm Changes:** Enter the current **Administrator Password** to confirm the new password changes, prior to saving the settings.
**Maintenance**

Use this page to reset the inverter communications port (soft reset), restore its factory default settings, or send a test e-mail to verify e-mail functionality.

![Maintenance Page](image)

**Figure 12: Maintenance Page**

**Reset Communications**: Clicking the Reset button will restart the communication processor, resetting the Ethernet communication port without interrupting the AC output. All other settings are maintained.

**Restore Factory Default Settings**: Clicking the Restore button will restore ALL settings to the original factory default values, including the user passwords. To only restore the network settings and passwords see the Password Reset section.

**Send Test E-mail**: Click the Send Test E-mail button to send a test e-mail to the listed e-mail recipients using the e-mail settings on the E-mail Setup 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 Ping button.
MOBILE WEB APP
Use the mobile version of the Status and Control page to monitor and control the inverter with a smartphone web browser.

Access the Mobile Web App by entering the address of the inverter in the address field of your browser, followed by “/m”. (e.g. https://192.168.0.180/m) You will then be prompted for your user name and password, and logged into the following Status and Control screen:

For improved security you should normally use a HTTPS (secures) connection when accessing the inverter over the Internet with the Mobile Web App, or use a Virtual Private Network (VPN) connection.

A shown above the Mobile Web App provides information on Battery Voltage, Inverter Output Voltage, Inverter Output Power, Output Power Source (from battery, or external AC source), and any alarms. Tap on the Inverter Enabled button to toggle the inverter output power on or off.

PASSWORD and IP ADDRESS RESET
Reset the Administrator password, the IP address, and network settings to the original factory default values by doing the following: (the standard User password is not affected)

1. With unit powered on press and hold the recessed Comm Reset button on the back panel for approximately 20 seconds, using a paper clip wire or similar item to press the button.

2. Release the button
ROUTER CONFIGURATION
Use this section to set up an inverter with remote Internet access when located behind a router.

A router allows multiple PC’s to share a single Internet connection, and must be configured correctly to forward incoming remote data to the local IP address of your inverter.

Example configuration using a Linksys WRT54G router: (others will be similar)

1. Log into your router and go to the port forwarding screen. In the example Linksys WRT54G router this is located in the Applications and Gaming tab. The location of the port forwarding fields may be different on your particular router. (consult the router manual for instructions)

2. Configure HTTP forwarding:
   a. Enter a unique name in the Application field
   b. Enter the HTTP port number that the inverter is using in the Start and End fields. The default HTTP port for the inverter is 80.
   c. Select Both under Protocol (TCP and UDP)
   d. Enter the local IP address of the inverter (e.g. 192.168.0.180) in the IP address field. (see step 2 of the TCP/IP Web Based Utility section to verify the inverter IP address)
   e. Check the Enable box, and then click on Save Settings

NOTE:
Many ISP’s block access to port 80, so if your ISP does block this port you must change the HTTP port the inverter uses from 80 to something else, such as 8000. (Valid port numbers are in the range of 1 to 65535) See the Network Setup section for information on assigning new network ports.

You must also change the inverter’s HTTP port from 80 if your local network has another device (such as a web server) already using port 80.

3. Configure HTTPS forwarding by repeating steps 2a to 2e with the HTTPS port number that the inverter is using. The default HTTPS port number is 443.
4. Set up your router to allow remote firmware upgrades to the inverter by repeating steps 2a to 2e with the UDP port number the inverter is using. (default UDP port is 9393) This step is optional if firmware upgrades are to be done locally.

5. Determine the WAN IP address of your router assigned by the ISP. With the example router this information is on the Status tab, listed as IP Address.

NOTE:
When using a dynamic IP address the router’s WAN IP address may change from time to time without warning, depending on your ISP. In this case you should obtain a Static IP address from your ISP (it will not change) which will ensure more predictable access to the inverter from a remote location. If a static IP address is not available you can use a Dynamic DNS service such as Dyn (www.dyn.com) to provide a stable address for the router.

6. To access the inverter 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 the inverter is using. (e.g. http://209.123.10.33:8000 for a router address 209.123.10.33, port 8000)
TEXT MESSAGE ALARM NOTIFICATIONS

The inverter can send alarm notifications as text messages to a cell phone by configuring the alarm e-mails to be sent to your mobile phone service provider. On the E-mail Setup page of the web based utility enter the text address of your phone in the Recipient E-mail Address field.

Example with an AT&T phone: enter the recipient address cellnumber@txt.att.net, replacing cellnumber with your 10 digit cell phone number.

Cell address formats for some common North American mobile phone providers:

- AT&T  cellnumber@txt.att.net
- Verizon  cellnumber@vtext.com
- Sprint  cellnumber@messaging.sprintpcs.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

TROUBLESHOOTING

I am unable to access the web-based configuration utility:

- Check that you are using the correct IP address for the inverter by running the IP Address Discovery Utility (available on the Tools download section of the ICT Web page http://www.ictcorporate.com/resources/tools/ ) to locate the connected inverter and see the assigned IP address. Run the utility on a Windows computer connected to the same network as the inverter, and it will report the IP addresses of all ICT units connected to that network. The IP address may have been changed if DHCP is enabled.

- Ensure you are using an industry standard “crossover” type of network cable if directly connecting a computer to the inverter, and a “straight-through” type of cable to connect the inverter to a network.

- Ensure the network card settings on your computer are configured for accessing the IP address of the inverter. To access a unit with the default
IP address of 192.168.0.180 the typical network settings for your computer are:
  o IP Address: 192.168.0.180
  o Subnet Mask: 255.255.255.0
  o Gateway: 192.168.0.1

- If the HTTP port of the inverter has been changed, you must append the new port number to the URL used to access the unit. (See the Network Setup section) See the Password Reset section for details on how to reset the port number to the factory default value.

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

**I forgot my password:**

- See the Password Reset section of the manual

**I am not receiving e-mails from the inverter:**

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

- Verify your e-mail settings by going to the Maintenance page on the inverter’s web utility and clicking on the Send Test E-mail button, to send a test message to your designated recipient addresses. The Send Test E-mail page will show an error message if the unit is unable to send the e-mail.

- Check on the E-mail Setup page and 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 the SMTP Server requires SSL checkbox is ticked. Otherwise leave blank.

- If your SMTP server requires authentication ensure that the SMTP User Name and SMTP Password fields are correctly entered.
## PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>12V model</th>
<th>24V model</th>
<th>48V model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuous Output Power:</strong></td>
<td>10.5 to 16.0Vdc</td>
<td>21.0 to 32.0Vdc</td>
<td>42.0 to 64.0Vdc</td>
</tr>
<tr>
<td><strong>Surge Power (2 seconds):</strong></td>
<td>1500W</td>
<td>3000W</td>
<td></td>
</tr>
<tr>
<td><strong>Peak Efficiency (typical):</strong></td>
<td>93%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input Voltage:</strong></td>
<td>10.5 to 16.0Vdc</td>
<td>21.0 to 32.0Vdc</td>
<td>42.0 to 64.0Vdc</td>
</tr>
<tr>
<td><strong>Battery Low Shutdown:</strong></td>
<td>10.5Vdc</td>
<td>21.0Vdc</td>
<td>42.0Vdc</td>
</tr>
<tr>
<td><strong>No Load Power draw:</strong></td>
<td>&lt; 18W (SW unit, no options)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Switched Off Power Draw:</strong></td>
<td>&lt; 15mW</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output Frequency (115Vac models):</strong></td>
<td>60Hz +/- 0.2Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output Frequency (230Vac models):</strong></td>
<td>50Hz +/- 0.2Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output Voltage (115Vac models):</strong></td>
<td>115Vac +/- 5Vac</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output Voltage (230Vac models):</strong></td>
<td>230Vac +/- 10Vac</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output Sinewave Distortion (typical):</strong></td>
<td>&lt; 3% THD</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transfer Time (Grid to Inverter) (Option “T”):</strong></td>
<td>&lt; 1 cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethernet Network Port (Option “C”):</strong></td>
<td>RJ45 connector, 10/100Base-T</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SNMP:</strong></td>
<td>SNMP v1/v2c supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alarm Output:</strong></td>
<td>Form-C contact, 0.5A 60Vdc max</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DC Input Connectors:</strong></td>
<td>Bus Bar, 5/16” hole</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AC Input/Output Connectors (rear):</strong></td>
<td>3 terminal cage clamp 20A max, 12 – 16 AWG, 0.5N-m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Front AC Outlet (115Vac models): 2 NEMA 5-15R, 120V 15A
Front AC Outlet (230Vac “A” models): 1 IEC Type I, 230V 10A
Alarm Connector: Removable plug, cage clamp type 16 – 28AWG
Operating Temperature Range: -20C to +40C
Humidity: 10 – 90% (non-condensing)
Cooling: Temperature controlled fans (2)
Dimensions (inches):

Weight: (lbs/kg) 8lbs / 3.6kg

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference in which case the user will be required to correct the interference at their own expense.
LIMITED WARRANTY
ICT Ltd. warrants to the original consumer purchaser that this product shall be in good working order, free from defects in materials and workmanship, for a period of two (2) years from the date of purchase. Should failure occur during the above stated time period, then ICT will, at its option, repair or replace this product at no additional charge except as set forth below. All parts, whether for repair or replacement, will be furnished on an exchange basis. All exchange pieces become the property of ICT. This limited warranty shall not apply if the ICT product has been damaged by unreasonable use, accident, negligence, disaster, service, or modification by anyone other than the ICT factory.

Limited warranty service is obtained by delivering the product during the above stated two (2) year warranty period to an authorized ICT dealer or ICT factory and providing proof of purchase date. If this product is delivered by mail, you will insure the product or assume risk of loss or damage in transit, and prepay shipping charges to the factory.

Every reasonable effort has been made to ensure that ICT product manuals and promotional materials accurately describe ICT product specifications and capabilities at the time of publication. However, because of ongoing improvements and updating of ICT products, ICT cannot guarantee the accuracy of printed materials after the date of publication and disclaims liability for changes, errors or omissions.

If this ICT product is not in good working order, as outlined in the above warranty, your sole remedy shall be repair or replacement as provided above. In no event will ICT be liable for any damages resulting from the use of or the inability to use the ICT product, even if an ICT employee or an authorized ICT dealer has been advised of the possibility of such damages, or for any claim by any other party.

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INNOVATIVE CIRCUIT TECHNOLOGY LTD.
26921 Gloucester Way
Langley, British Columbia, Canada  V4W 3Y3
T 604.856.6303  F 604.856.6365  www.ict-power.com