Innovative Circuit Technology Ltd.
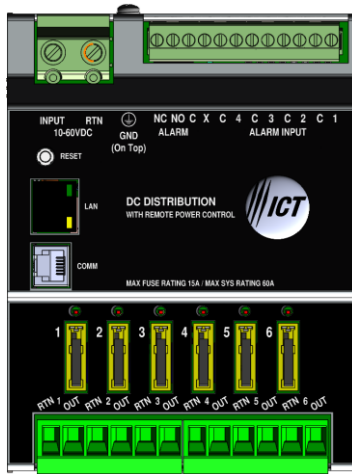

ICT DIN SERIES
POWER DISTRIBUTION UNIT
INSTRUCTION MANUAL

855-353-000

Model: ICT-DIN-PDU6

⚠ 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 connections to the power distribution unit
- Use an appropriately rated disconnect switch or circuit breaker in line with the dc inputs to enable installation and service of the power distribution unit with the dc source disconnected
- Shut off or disconnect all dc 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
- Carefully observe wiring polarity when making input and output connections
- Securely tighten all connections
- 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:

- Fuses may be HOT to touch. Disconnect power and allow to cool before removing or replacing
- Wiring terminals may be HOT to touch. Disconnect power and allow to cool before disconnecting load wires
- Install unit in a restricted access location (such as an equipment rack) to limit unintentional contact with terminals and wiring. Keep sources of moisture away from unit
- Do not block air inlet or outlet openings in the power distribution unit sides

NOTE:

Due to the fuse detection circuitry internal to the power distribution unit, it may be possible to measure a voltage on the output terminal(s) even if that output's fuse is open (with no load connected). This is normal operation. The detection circuitry is a high-impedance circuit, and while a voltage may be present on the output terminal, it is purely a signal voltage and does not support loading. Any load device connected to the output will immediately pull this voltage to zero volts.

Rev 0 (2023)

Contents

PRODUCT DESCRIPTION

The ICT Intelligent DIN Power Distribution Unit (PDU) is designed to provide DC power distribution to 6 individual outputs protected by GMT type fuses that are rated up to 15A each. DC outputs can be turned on and off remotely, allowing connected loads to be power-cycled through the Ethernet connection. Fuses are located on the front of the PDU for monitoring and replacement. Combined with the ICT DIN 360 watt Power Supply, remote monitoring of battery current, voltage and temperature, low voltage disconnect set points and battery charge current Alarm settings are available through the Ethernet controller and user interface.

There are 4 digital alarm inputs on the top of the unit for connecting external sensors. System voltage, system current, output currents, fuse status, and alarm input status can be monitored through Ethernet communication. Fuse status is also displayed by an LED indicator located over each fuse. Form "C" alarm contacts (C/NO/NC) are provided on the top of the unit which can be connected to an external alarm circuit for monitoring alarms. Remote monitoring is available through an Ethernet port on the front of the unit. The unit has a secure built-in web server with an embedded web-based GUI that can be accessed using any standard commercial web browser. The web server not only displays PDU information, it can also be set up to send an alarm to user-defined email accounts in the event a fault occurs. The web server can also be used for data logging of up to 30 days of time stamped event information.

FRONT PANEL
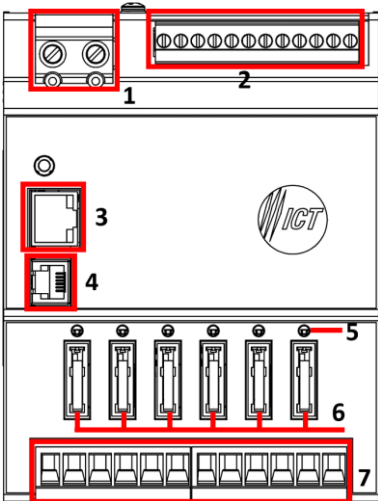
1. 2-pin input connector

2. Form C / digital alarm connector

3. RJ45 Ethernet port

4. RJ11 serial port for communication with ICT DIN Power Supply

5. FUSE STATUS LEDs
   Turns on when a fuse is blown.

6. Location of the GMT fuses rated up to 15A.

Figure 1. Front View of ICT-DIN-PDU6

INSTALLATION

1. Inspect the PDU and accessories to make sure everything is complete and in good condition.

Make the following connections and installation using wire and connectors appropriately rated for the maximum input and output current rating of the unit:

Install DIN PDU on DIN Rail TS-35 (EN50022) standard DIN rail.
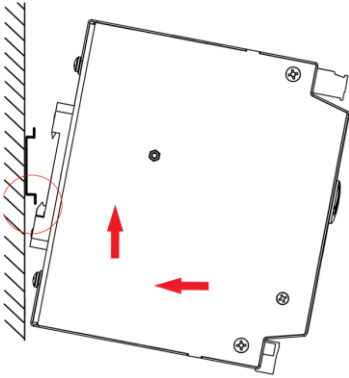
Step 1. Push device from bottom while also pushing towards mounting rail to engage spring loaded clip
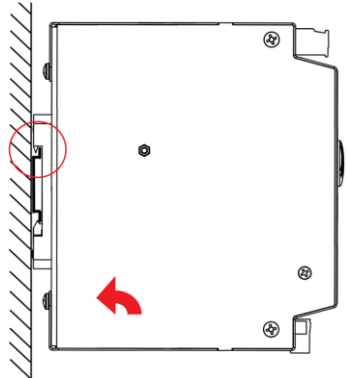
Step 2. Pivot the device towards the wall so that the top hook clips into the mounting rail as illustrated

Figure 2. Installation of ICT DIN Power supply and Distribution unit

2. For positive-ground system, connect the (+) output terminal to the "RTN" terminal on PDU and connect the (-) output terminal to the "INPUT" terminal on PDU. Note that ICT DIN PDU6 can be either negative or positive-ground system connection.

3. Install fuse on the front of the PDU for each output terminal block. The fuse number on the front of the PDU matches the output terminal block number. Consult your local electrical codes for wire ampacity and fuse sizing. Typically, fuses and wiring are derated to 80% of their rating (e.g. 12 Amps maximum for a 15 Amp fuse).

4. For remote monitoring and power control, connect your network interface to the Ethernet port on the front of the Unit. The recommended cable for Ethernet connection is Cat5e UTP network cable.

5. If the PDU is used in combination with an ICT DIN Power Supply, the serial data cable can be installed to allow the PDU to monitor the status of the power

supply. Install the PDU and power supply units side by side, then connect the two RJ-11 COMM ports together using the data cable, as shown in Figure 3.
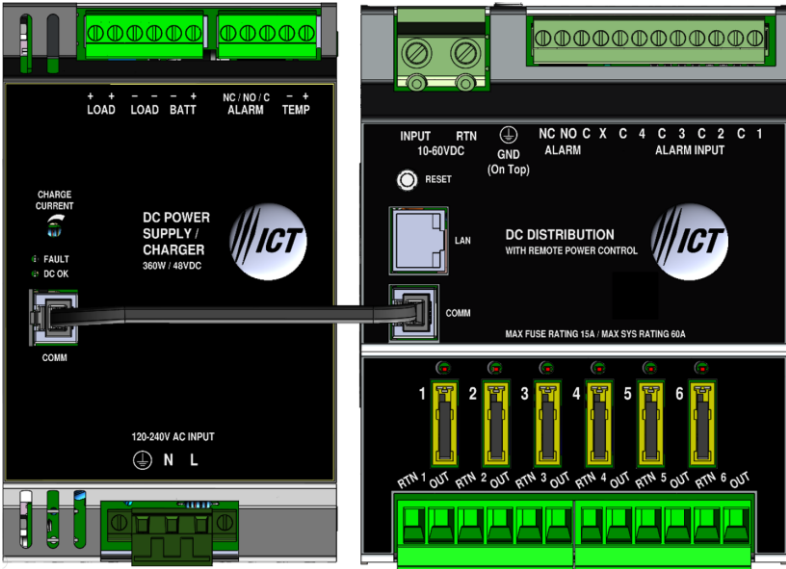
Figure 3. Connection between ICT DIN Power supply and ICT-DIN-PDU6

6. The Alarm Form "C" contacts on the back of the PDU can be connected to an external alarm circuit to monitor alarms generated by the PDU. Depending on the alarm circuit (refer to table 2), connect it between normally open (NO) and common (C), between normally closed (NC) and common (C), or both. The built-in web server controls this alarm. The alarm connector can be unplugged from the PDU for easy installation.

7. For monitoring external Dry Contact sensors, connect each sensor between an Alarm Input (1 - 4) and common (C) on the alarm input connector. The alarm input connector can be unplugged from the PDU for easy installation. Refer to table 3 for the alarm input connector pin-out.

LED	FUSE STATUS
ON	Blown
OFF	Good

Table 1: Fuse Status LED

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NC/C PINS	NO/C PINS	CONDITION
Open	Closed	Fuse Alarm • **Activate Alarm Form C Contact** is checked • One or more blown or missing fuse
		System Under - Voltage Alarm • **Activate Alarm Form C Contact** is checked • System Voltage is below the set value
		System Over - Voltage Alarm • **Activate Alarm Form C Contact** is checked • System voltage is above the set value
		System Over - Current Alarm • **Activate Alarm Form C Contact** is checked • System current is above the set value
		Alarm Input #1 - #4 • **Activate Alarm Form C Contact** is checked • Digital Alarm is triggered
		Output Over - Current Alarm #1 - #6 • **Activate Alarm Form C Contact** is checked • Output Current is above the set value
		Output Under - Current Alarm #1 - #6 • **Activate Alarm Form C Contact** is checked • Output Current is below the set value
		No power to unit
Closed	Open	**Activate Alarm Form C Contact** is checked and no fault occurred
		All **Activate Alarm Form C Contact** is not checked

Table 2: Form "C" Alarm

PIN	DESCRIPTION
1	Alarm Input # 1
2	Common
3	Alarm Input # 2
4	Common
5	Alarm Input # 3
6	Common
7	Alarm Input # 4
8	Common

Table 3: Alarm Input Connector Pin-out

WIRING

When connecting the unit to external devices such as a power supply or electrical load device, use an appropriate wire gauge (AWG), as shown in table 4.

Location	Socket / Plug	Wire (AWG)
Input	2pin Terminal block (DG136HT-12.70-02P-14-00A)	20 ~ 6
Form C Digital Input	Pluggable 12pin terminal block (2ESDP-12P)	30 ~ 12
Output	Pluggable 6pin terminal block (EC762V-06P)	30 ~ 10

Table 4: Specification of Connectors and Plugs

TCP/IP WEB BASED INTERFACE

The PDU is equipped with a built-in web server and Graphical User Interface (GUI) to enable full remote monitoring and control using any standard web browser, such as Microsoft Edge, Google Chrome, or Mozilla Firefox. To connect with your networked PDU, do the following:

1. Start Your Browser.
2. Enter the IP address of the PDU in the address field of your browser as shown.
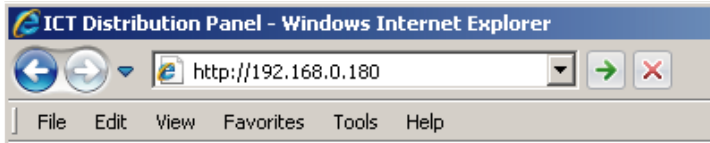
   If the PDU is connected to a network with a DHCP server, the PDU will be assigned an IP address automatically. To find the current address of your PDU, run the ICT **IP Address Discovery tool**, after installing it on your Windows computer (tool available for download from ICT http://www.ictcorporate.com/resources/tools/). Otherwise the PDU will use the factory default IP address of **192.168.0.180**, as shown above.

3. Enter your user name and password. The default Administrator user name is **admin**, with no password

Once your browser is connected to the unit, the Status & Control page for the PDU will be displayed, as shown in figure 4. See the following section for descriptions on how to use the various monitoring, configuration, and control features available through the PDU's graphical web interface.

To log out, click on the Logout link on the top right of your browser window. The system will also automatically log off the user after 20 minutes of inactivity.

Figure 4. Status & Control page

Click on any one of the blue buttons in the menu bar on the left side of the screen to select the desired page.

Status & Control

This page provides information on system voltage, system current, alarm status, output status, and current level by output contact (1 through 6). It also allows you to manually enable or disable DC power to the each of the output terminals.

The status of any of the four Input Alarms for alarms that have been enabled (see **Alarm Setup** page) will be shown on this page. A grey Alarm Input indicator box shows that the sensor input is ready; a red box indicates that that external sensor is in an alarm condition.

Enable All Outputs: Pressing this button will enable DC power to all outputs. If power-on sequencing is enabled on the Device Setup page, the outputs will be enabled in sequence, instead of enabling them simultaneously.

Disable All Outputs: Pressing this button will disable DC power to all outputs.

Output On/Off Buttons: Pressing these buttons will enable or disable DC power to individual outputs.

If the COMM port on the PDU is connected to an ICT DIN Power Supply, this page will also display Power Supply status information including output voltage, output current, alarm status, battery voltage, battery current, battery temperature, and LVD status.

Alarm Status

This page displays the status of currently active alarms as well as the alarm history.

Power Supply

The Power Supply page is only accessible if the COMM port on the PDU is connected to an ICT DIN Power Supply. This page displays the connection status of ICT DIN Power supply and allows you to configure the power supply settings.

Power Supply Info
> **Model**: Displays the model number of the ICT DIN Power Supply
> **Battery Charge Current Limit:** Displays the maximum battery charge current that can be provided through the battery terminals of the power supply. This threshold is set using the selector dial on the ICT DIN Power supply.
> **Connection Status:** Displays the status of the data connection between the PDU and power supply. "OK" will be shown if the connection is good, "NOT CONNECTED" will be shown if the data cable is not installed correctly.

Output Voltage Control

   Output Voltage: Set the DC output voltage of the ICT DIN Power supply. Set this to match the float voltage requirement for your external battery.

   Temperature Coefficient/cell: Automatically adjust the output voltage of the power supply according to the battery temperature. Configure this setting to match the battery manufacturers recommended compensation value in –mV/°C per cell. Compensation will be disabled if this setting is set to 0mV. Note that the power supply must have the battery temperature sensor (ICT-TMP) installed on the battery for this setting to have an effect.

Alarm Reporting

   Send E-mail: Check this box to receive an e-mail notification when a power supply alarm is triggered.

LVD Settings

   Disconnect Voltage: Set the battery disconnect voltage threshold to a level that will protect the battery from excessive discharge. The LVD contactor will open when the battery discharges to this level for at least 3s.

   Reconnect Voltage: Set the battery reconnect voltage to a level at least 2.0V more than the disconnect voltage to prevent the LVD contactor repeatedly cycling on and off. This setting will be used when charging the battery from an external dc source (such as a solar system), otherwise once AC power returns the LVD contactor will automatically close so that the power supply can charge the battery directly.

LVD Setting	24V	48V
Disconnect Voltage (Default)	22.0V	44.0V
Reconnect Voltage (Default)	25.0V	50.0V

Table 5: Disconnect and Reconnect Voltage default settings

Battery Over-Current Alarm

   Over-Current Threshold: Set the maximum current to be drawn from the battery. The Battery Over Current alarm will be triggered if this level is exceeded. Set the threshold to 0A to disable this alarm.

Device Setup

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

Device Info

   Site Name: Enter a custom descriptive name for the PDU
   Model: Displays the ICT model number for the PDU
   Hardware: Displays the hardware version of the PDU

Date and Time Settings

Current System Time: Displays the date and time used in the PDU's internal clock for time stamping data entries in the data logs. This clock may be set manually, or synchronized with a remote NTP Time Server over the Internet (recommended).

Synchronize with NTP Server: Check this box to select automatic synchronization with the external server. (recommended)

NTP Server: Enter the name or IP address of the NTP Server used for date and time synchronization, such as "*pool.ntp.org*".

Time Zone: Select the appropriate time zone relative to GMT for your unit so that the NTP server time can be converted to your local time zone.

Set Time Manually: Checking this box will allow the unit's clock and calendar to be set manually by entering date and time in MM/DD/YY and HH:MM:SS format.

Power-On Sequencing/Cycling

Sequence/Cycle Delay: Entering a time delay in this field (0-60s) will cause all outputs to be enabled in sequence when the **Enable All Outputs** button is pressed on the **Status & Control** page, rather than enabling all outputs simultaneously. This delay helps prevent power surges that can occur when too many devices are turned on at the same time. Setting this time to 0 or leaving the box blank will cause all outputs to always be enabled simultaneously. (Factory default).

Note the **Sequence Delay** time will also be used as the **Power Cycling** time delay for each output that has the **Power Cycling** feature enabled on the **Output Setup** page.

Reverse Sequence Order: Checking this box will cause the power on sequence to run in reverse order with output channel 6 on first, ending with output 1, when the **Enable All Outputs** button is pressed on the **Status & Control** page.

Network Watchdog:

Select a Watchdog to edit: Select one of the six independent Watchdogs to configure. Each Watchdog, if enabled, 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 power on all outputs that are configured in the **Cycle Outputs** setting below. This feature

is useful for re-booting a modem or other network device that is powered by one of the PDU outputs, to help recover the network IP connection when one of these devices has crashed. A delay time must be entered in the **Sequence/Cycle Delay** field for this function to work. Power for a cycled channel will be held in the off state for the duration set by the Sequence/Cycle delay time, then will be turned back on.

Watchdog Enabled: Check this box to enable the selected Watchdog.

Primary IP Address: Enter the remote IP address you would like the selected Watchdog 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.

Cycle Outputs: This sets which output(s) to power cycle when the Network Watchdog triggers.

Watchdog Timeout: Enter the time (1 to 80 minutes) that the remote IP address must stop responding to ping requests from the PDU, before the Network Watchdog will trigger an 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.

Maximum Cycle Attempts: This setting will limit the maximum number of times the PDU can attempt to cycle power to the output(s) before giving up, if the remote IP address continues to be unresponsive. Set Maximum Cycle Attempts to zero for no limit.

Data Logging:
Data Logging rate: Enable this feature to keep a running record the system voltage, system current, channel output currents, fuse status, and alarm inputs at a rate of up to 1 sample per minute. View this Comma Separated Values (CSV) format log by clicking the **Download Log** button, and open in any Spreadsheet software, such as Microsoft Excel. The log will store up to 30days of data, with the oldest entries at the top of the file, newest at the bottom.

Log Start Date: Shows the date/time the most recent log began.

Output Setup
This page allows you to configure the output settings of the PDU. In the **Select an Output to edit** box, click on the output number of the output you wish to

configure. To save any changes to the output settings, click on **Save Settings** at the bottom of this page.

To copy the configuration settings from one output to all of the other outputs, click on **Copy Settings to All**, and then click on **Save Settings** to save the new settings.

Output Settings:

Output Label: Enter a descriptive label for the selected output channel if desired.

Output State after Panel Reset: Sets the state for the output after an input power failure, or soft reset of the PDU. Select one of the following:

- **Restore last State**: If this option is selected, the PDU will remember if this output was enabled or disabled prior to the power failure or reset. The output will be restored to the same state after the PDU starts up. (default)
- **Enable Output**: If this option is selected, this output will always be enabled after the PDU starts up after a power failure or reset.
- **Disable Output**: If this option is selected, this output will always be disabled after the PDU starts up after a power failure or reset.

Ignore Fuse Status: Will mask the fuse open circuit detection, to prevent false alarms on unused channels.

Enable Power Cycling: Check this box to enable output power cycling for the selected output, so that the output will automatically be re-enabled after the **Sequence/Cycle Delay** time whenever the output is disabled using the **Output Off** button on the **Status & Control** page. This feature is useful for remotely resetting power to hardware required for the network connectivity of the PDU.

The **Sequence/Cycle Delay** time must be set on the **Device Setup** page with duration long enough for the connected network hardware to fully reset for this function to be effective. Multiple outputs that are disabled using Power Cycling will be re-enabled in sequence.

Output Load Shedding:

Enable Load Shedding: Check this box to disable this output when the system voltage drops below the load-shedding threshold for at least 30s. This feature can be used to disconnect less critical loads to preserve back-up battery power as the battery voltage drops.

Load-Shedding Threshold: Enter the voltage level at which the selected output will be disconnected.

Load-Shedding Auto Recovery: Check this box to allow the output to be automatically reconnected when the system voltage is above the **Auto Recovery Threshold** for at least 60s. The output must be manually re-enabled using the **Output ON** button on the Status & Control page if the **Auto Recovery** function is not enabled.

Auto Recovery Threshold: Enter the voltage level at which the selected output will automatically be reconnected. This value must be at least 0.5V above the **Load-Shedding Threshold** voltage.

NOTE:

Outputs that have been disabled on the Status & Control Page will reconnect automatically if Load-Shedding Auto Recovery is enabled for that output. To prevent this, ensure that Load-Shedding Auto Recovery is not enabled.

Output Over-Current Alarm:

Over-Current Threshold: Enter the over-current level. Output current above this level for at least 5s will trigger the Over-Current Alarm. Disable this alarm by setting the threshold to 0A.

Activate Form-C Contact: Checking this box will cause the Alarm relay to trigger for an over-current condition.

Send E-mail: Checking this box will cause the unit to send an output Over-Current alarm e-mail to the assigned address entered on the **E-mail Setup** page.

Output Under-Current Alarm:

Under-Current Threshold: Enter the under-current level. Output current below this level for at least 5s will trigger the Under-Current Alarm. Disable this alarm by setting the threshold to 0A.

Activate Form-C Contact: Checking this box will cause the Alarm relay to trigger for an under-current condition.

Send E-mail: Checking this box will cause the unit to send an output Under-Current alarm e-mail to the assigned address entered on the **E-mail Setup** page.

Network Setup

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

Network:

MAC Address: Displays the MAC address assigned to the PDU.

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 PDU 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 PDU

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 PDU 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 PDU. (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 PDU.

To access the PDU 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**)

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 PDU will

allow standard SNMP management software to connect to the SNMP agent running on the PDU and read real time system information such as system voltage, and channel currents. The PDU 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 PDU's **Help** page. The unique 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 PDU 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: Turning on this setting will allow you enable or disable DC power to individual outputs through SNMP. If this box is unchecked, all information available from the SNMP agent will be read-only.

SNMP Control Access: Sets the level of device control that is allowed through SNMP. This setting is only available if Enable SNMP Write Access is enabled.

- **Output Control:** Allows DC power to individual outputs to be enabled or disabled through SNMP. No other settings can be configured through SNMP.
- **Full Device Control:** Allow SNMP clients to set all device settings through SNMP. MIB files for full SNMP device control can be downloaded from the ICT Website: https://www.ict-power.com/tools-utilities/

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

SNMPv1/v2c Settings:

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

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

It is recommended to change the community strings before enabling SNMP, as the defaults are well known.

SNMPv3 Settings:

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 Version: Sets the SNMP version (v1 or v3) for SNMP traps sent from the PDU. The appropriate settings for the selected SNMP version will need to be configured.

Trap Community: Assign the community string/password that will be sent with all SNMPv1 traps. Some trap receivers are able to filter based on Trap Community.

Trap User Name: Assign the user name for SNMPv3 traps.

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

Authentication Password: If an authentication protocol is selected, enter the authentication password for SNMPv3 traps.

Privacy Protocol: Select the privacy protocol for SNMPv3 traps (None, or AES).

Privacy Password: If a privacy protocol is selected, enter the privacy password for SNMPv3 traps.

Trap IP Addresses: Enter the IP addresses for up to two devices that will receive SNMP traps from the PDU.

E-mail Setup

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

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.

This box should normally be checked 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 an e-mail address that will appear as the sender for all e-mail notifications sent from the PDU.

Recipient E-mail Addresses: Enter one or more e-mail addresses that are to receive all e-mail notifications from the PDU. 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 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.

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

The Distribution Panel restarts: Check this box to receive an e-mail notification when the PDU restarts after a power failure or a soft reset.

Load-Shedding is activated: Check this box to receive an e-mail notification when any of the outputs are disabled or enabled due the voltage crossing one of the load-shed settings configured on the **Output Setup** page.

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 comes back online.

Alarm Setup

Use this page to configure the set points of alarms to be monitored, and set the required actions when an alarm is triggered. Click on the **Save Settings** button at the bottom of the page to save any changes.

Fuse Alarm:

Activate Alarm Form-C Contact: Checking this box will cause the Alarm relay to trigger when an output fuse is blown.

Send E-mail: Check this box to cause an e-mail notification to be sent when an output fuse is blown. Note that the e-mail settings must be fully configured on the **E-mail Setup** page for this to occur.

System Under Voltage Alarm:

Under-Voltage Threshold: If the system voltage drops below the value in this field, the system under-voltage alarm will trigger.

Under-Voltage Recovery: If the system voltage rises above the value in this field, the system under-voltage alarm will clear. The value in this field must be at least 0.50V higher than the Under-Voltage Threshold.

Activate Form-C Contact: Checking this box will cause the Alarm relay to trigger for an under-voltage condition.

Send E-mail: Checking this box will cause the unit to send a System Under-Voltage alarm e-mail to the assigned address entered on the **E-mail Setup** page.

System Over Voltage Alarm:

Over-Voltage Threshold: If the system voltage rises above the value in this field, the system over-voltage alarm will trigger.

Activate Form-C Contact: Checking this box will cause the Alarm relay to trigger for an over voltage condition.

Send E-mail: Checking this box will cause the unit to send a System Over-Voltage alarm e-mail to the assigned address entered on the **E-mail Setup** page.

System Over-Current Alarm:
   Over-Current Threshold: Enter the maximum total current level for the system. Current exceeding this level will trigger the Over-Current alarm.

   Activate Form-C Contact: Checking this box will cause the Alarm relay to trigger for an over-current condition.

   Send E-mail: Checking this box will cause the unit to send a System Over-Current alarm e-mail to the assigned address entered on the **E-mail Setup** page.

Alarm Input #1 to #4: Configure the four Site Monitor inputs to enable the PDU to monitor external contact closure events on door and window sensors, smoke alarms, etc.
   Alarm Name: Enter a descriptive name for the external contact being monitored. This will be used in e-mail and front PDU alarm messages.

   Contact Type: Select if the external alarm contact input is to be used, and what contact type is connected to each input. Choose "Normally Open" contact, "Normally Closed" contact, or "Not Used".

   Activate Alarm Form-C Contact: Check this box to have the Alarm relay output indicate a fault for an alarm condition on that input.

   Send E-mail: Check this box to have an email notification sent when one of the enabled alarm inputs is triggered, stating which input was affected. Note that the e-mail settings must be fully configured on the **E-mail Setup** page for this to occur.

User Setup
Use this page to configure passwords for up to 10 users, with the ability to limit who has access to the PDU 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 PDU 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 user accounts to edit. Set the access level to be appropriate for the amount of control each user requires.

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

> **Control:** User has read-only access to the PDU, but can enable or disable the outputs, and change some of the basic settings.

> **View-Only:** User can only view status, cannot change any 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 PDU (soft reset), restore the PDU default settings, or send a test e-mail to verify e-mail functionality.

Reset Distribution Panel: Clicking the **Reset** button will restart the PDU. Channel output states will be restored according to the **Output State after Panel Reset** setting for each output on the **Output Setup** page. All other setting are maintained during the reset.

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.

Export and Import Settings: The **Manage Settings** 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 a **.cfg** file on a local computer. Use the **Import Settings** section on other distribution power units to locate this file and then import it to any other PDU you are logged in to, greatly simplifying the configuration of multiple identical units.

Update Firmware: Click this button to locate and install the latest version of the unit's operating firmware, while maintaining previous settings. Download the latest firmware file for your model unit from the ICT website (**ict-power.com**). De-compress this file then press the **Choose File** button, and link to this file. Begin the firmware update by clicking the **Update Now** button.

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 & Control** page to monitor and control the PDU with a smartphone web browser.

Access the Mobile Web App by entering the address of the PDU 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 & Control** screen:

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

Figure 5: Mobile Web App

The Mobile Web App (shown above) provides information on system voltage, system current, input alarm status, and the status and current level of each of the output channels.

Tapping on an output cell will enable or disable that output. (if logged in using an account with control access) The cell will be green when enabled, red when disabled.

Tap the **Enable All Outputs** button to enable DC power to all outputs. If power-on sequencing is enabled on the Device Setup page, the outputs will be enabled in sequence, instead of enabling them simultaneously.

Tap the **Disable All Outputs** button to disable DC power to all outputs.

PASSWORD RESET
Reset the Administrator password, the network, and web server settings to the original factory default values by doing the following: (the standard User password and other settings are not affected)

1. Press and hold the recessed reset button on the front panel for approximately 10 seconds.

2. Release the button

3. Log in to the unit as user name **admin**, no password required. Set a new password as desired

ROUTER CONFIGURATION
Use this section to set up a Distribution Power Unit 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 PDU.

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

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b. Enter the HTTP port number that the PDU is using in the **Start** and **End** fields. The default HTTP port for the PDU is **80**.
c. Select **Both** under **Protocol** (TCP and UDP)
d. Enter the local IP address of the PDU (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 PDU 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 PDU 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 PDU's HTTP port from 80 if your local network has another device (such as a PDU, or web server) already using port 80.

3. Configure HTTPS forwarding by repeating steps 2a to 2e with the HTTPS port number that the PDU is using. The default HTTPS port number is **443**.
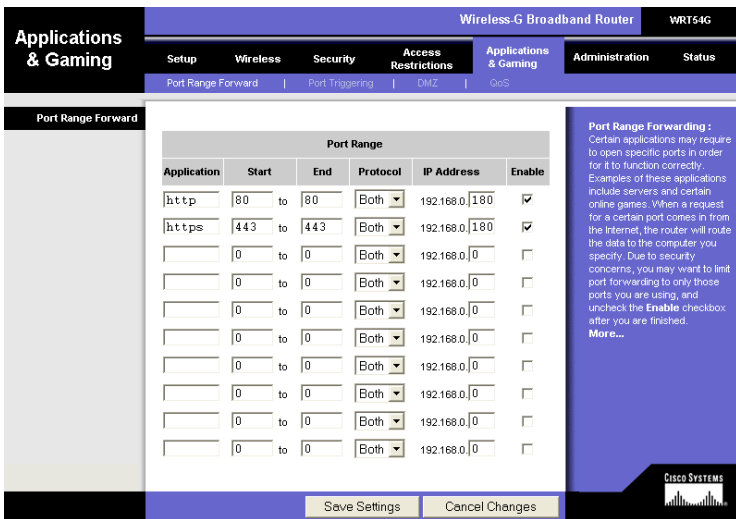

Figure 6: Router Port Forwarding Screen

4. 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 PDU 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.

5. To access the PDU 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 PDU is using. (e.g. **http://209.123.10.33:8000** for a router address **209.123.10.33**, port **8000**)
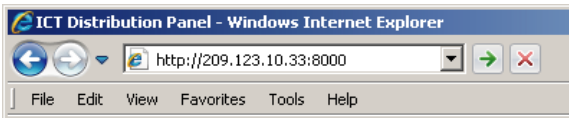

Figure 7: PDU Access With Router Address

TEXT MESSAGE ALARM NOTIFICATIONS

The PDU 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 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 PDU by downloading and running the **ICT IP Address Discovery tool** http://www.ictcorporate.com/resources/tools/

- Check the network cable connections to the PDU and the network

- Ensure the network card settings on your computer are configured for accessing the IP address of the PDU. To access a PDU with the default IP address of 192.168.0.180 the 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 PDU has been changed, you must append the new port number to the URL used to access the PDU. (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 PDU is connected to.

I forgot my password:

- See the Password Reset section of the manual

I am not receiving e-mails from the PDU:

- 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 PDU'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 PDU 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

Operating Voltage: 10VDC to 60VDC

System Current Rating: 60A (Continuous)

Fuse Capacity: 15A GMT Fuse x 6

Continuous Load Rating: 12A per output

CAUTION: **Ensure that the load total connected to the fused outputs does not exceed the system current rating.**

NOTE: **Most fuses should be continuously operated at no more than 80% of their nominal current rating.**
Consult the fuse manufacturers specifications.

Power Consumption: 4 W (all outputs enabled)

Alarm Form-C Contacts: Form "C" Dry Contacts
1A/60VDC Max

Alarm Sensor Inputs: Four external dry contact alarm inputs, configurable for NC or NO contacts. Applied voltage 3.3V, 0.4mA for contact closure detection

Ethernet: 10Base-T/100Base-T, RJ45 Connector

SNMP: SNMP v1/v2c/v3 supported

Network Security: Password protection, SSL encryption for HTTPS , SMTP (TLS 1.2) and SNMPv3 protocols

Operating Temperature: -20°C to +60°C

Weight: 2.7lbs (1.22kg)

EMC: Designed to FCC Class B

Warranty: 2 years
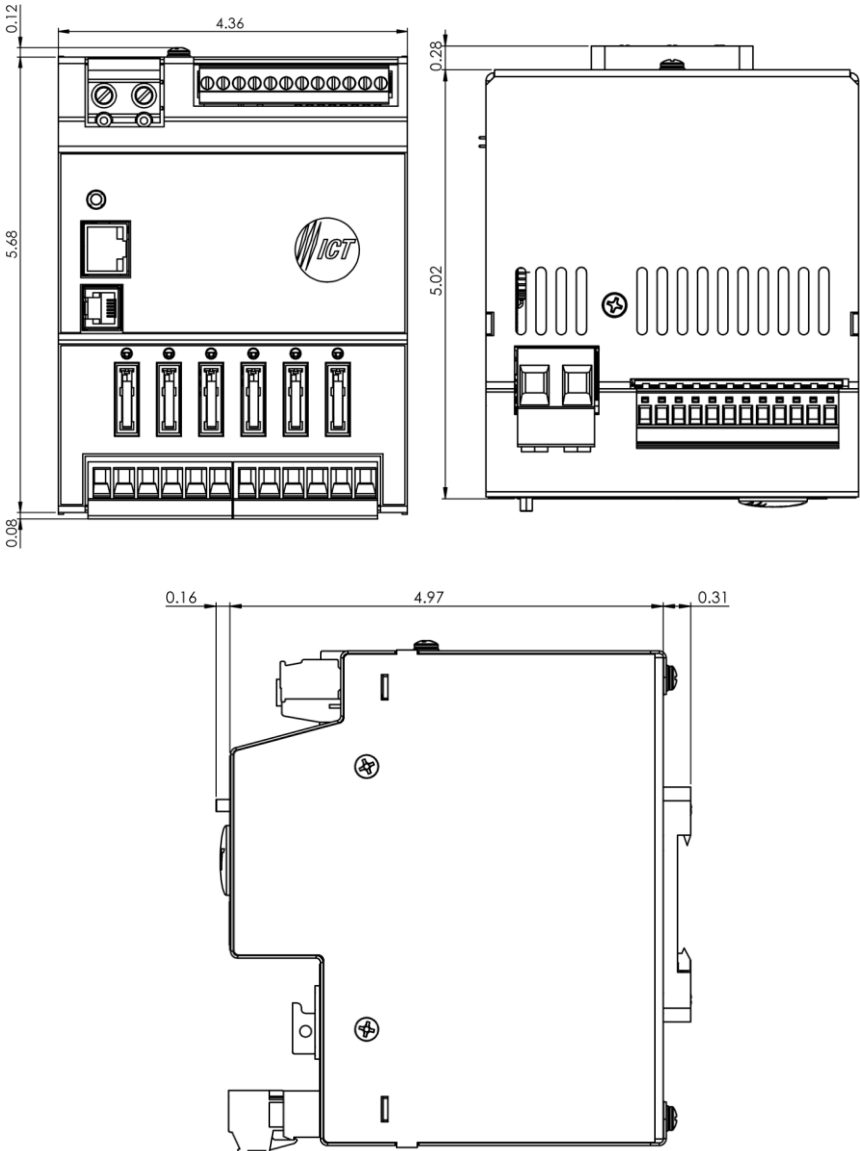
Dimensions (L x W x H):   4.4" x 5.3" x 5.7"
                             111mm x 134mm x 144mm

Figure 8: Mechanical Dimensions

ICT 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 procedure 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.

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