



Product Manual

October 2001

Part Number 15.00.029

Revision C

Lightwave Communications, Inc.
100 Washington Street Milford, CT 06460 USA
(800) 871-9838 • (203) 878-9838 • Fax: (203) 874-0157
Email: info@lightwavecom.com • Internet: www.lightwavecom.com

LCI Asia/Pacific
Postal address: P.O. Box 19 Glen Iris VIC 3146 Australia
Delivery address: 16 Network Drive Port Melbourne VIC 3207 Australia
+61 3 9646 1144 • Fax: +61 3 9645 3377
Email: sales@lightwavecom.com.au • Internet: www.lightwavecom.com.au

LCI Europe
Zaubzerstraße 11 Munich D-81677 Germany
+49-89-306-3810 • Fax: +49-89-306-3812
Email: office@lightwave.de • Internet: www.lightwave.de

PCU8 Product Manual, Copyright © 2001 by Lightwave Communications.

All rights reserved.

Printed in U.S.A.

Part Number 15.00.029, Revision History: Rev. C, October 11, 2001

Rev. A	Initial Release
Rev. B	Updated Help File, updated Power Ratings of Outlets, reorganized programming steps, added TOC, updated product images.
Rev. C	Revised Help file, command list.

Table of Contents

PCU8 Overview	5
Features	5
Front Panel	6
Rear Panel	6
AC Power Connections	7
Redundant Logic Power Supplies	7
Connection to Switched Outlets	7
Power Failure Recovery	7
Front Panel Controls.....	8
Rear Panel Controls.....	8
Console I/O Port Connections:.....	8
Settings for I/O Communication for CONTROL IN port.....	8
Cascading PCU8 Boxes	10
Box IDs	10
Program Storage.....	10
Connection to Lightwave Power Manager ports.....	10
Port Setting for your Terminal Device.....	10
Programming the System	11
Communicating with the PCU8	11
Programming Access.....	11
Log In	11
HELP file.....	12
Command Help	12
Log Off.....	12
PCU8 Commands.....	13
Ports and Port Groups	13
Global Commands.....	13
B - Front Panel Button Enable/Disable	14
C - Change Password	14
E - Case Sensitive Port Names.....	15
G - Display Port Status.....	15
H - Help Menu.....	15
L - Log Off.....	16
M - Set Reboot Time.....	16
N - Define Port Names.....	16
P - Display General Parameters	17
R - Reboot Output	18
S - Set Output On / Off.....	19
W - Width of Rows	19
O - Download New Application Code to Flash Memory.....	20
Materials:.....	20
Specifications	22
Regulatory Compliance.....	22

For Your Notes

PCU8 Overview

Lightwave's **Power Control Unit (PCU8)** is an AC Power Switch that provides the ability to remotely control the power to eight devices. It gives system administrators the capability to restart a “locked up” network device from anywhere on their network. The **PCU8** provides eight individually-controlled AC power outlets that are switched off and back on as desired. The **PCU8** communicates with its control terminal using a serial user interface.

The easy to use, easy to configure **PCU8** provides the means to control all devices with simple commands to turn Power Off / On to reboot any one port, multiple ports, port groups or all devices. Power restarts can be sequenced using programmed time delays to minimize surge or allow drive spin-up time. Front panel controls and indicators are also provided to show the status of each port.

Your configuration can be easily expanded by adding **PCU8** boxes and a serial cable for each. A single serial interface integrates the control of all **PCU8**s in your application. Up to nine **PCU8**s can be cascaded together to control multiple systems from one common user interface.

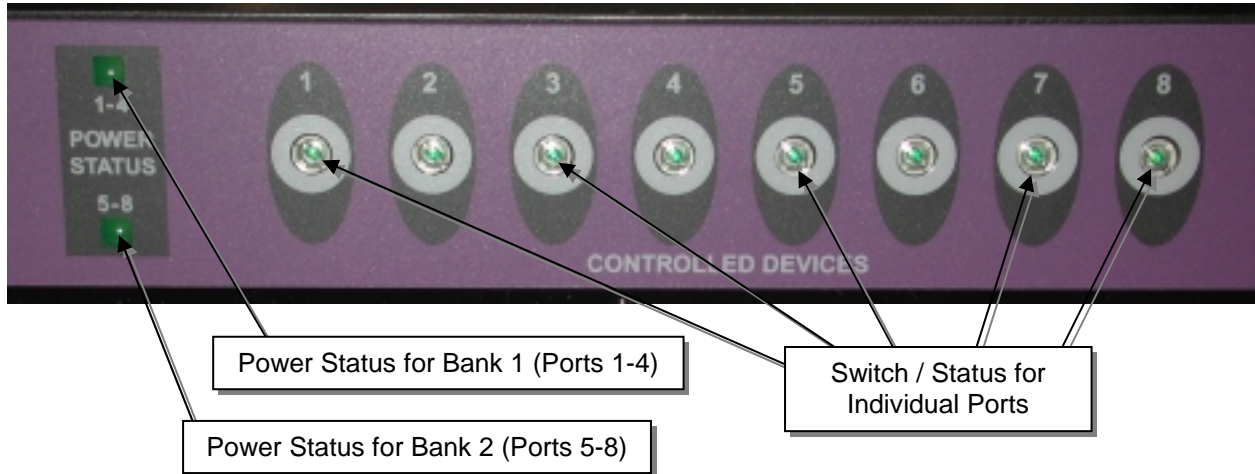
Each **PCU8** utilizes two banks of four outlets, each outlet individually switched and rated at 10 Amperes maximum with each bank rated at 12 Amperes total. The **PCU8** is designed for rack mounting (1U) or is placed on a shelf. The unit is convection cooled with ventilation louvers on either side.

Features

- Eight individually-controlled AC power outlets
- Dual 12 Amp (max) circuits, four 10A (max) outlets per circuit
- Redundant DC power supplies for built-in I/O and control circuits
- Individually programmable Reboot Time Delay on each outlet
- Solid state zero-crossing relays to minimize power spikes
- Easily expandable configuration, up to 72 controlled outlets
- Password Security
- User-definable Port Names and Port Groups
- Software-enabled front panel pushbutton switches for manual access
- Front panel indicators show the state of each outlet
- Application program updates available on ftp.lightwavecom.com

Front Panel

The front panel of the **PCU8** has two main **Power Status** indicator LEDs plus eight pushbuttons with indicators. The power circuits are divided into two Banks, with Ports 1-4 in Bank 1 and Ports 5-8 in Bank 2. All eight circuits can be controlled individually, in groups, or at the same time.



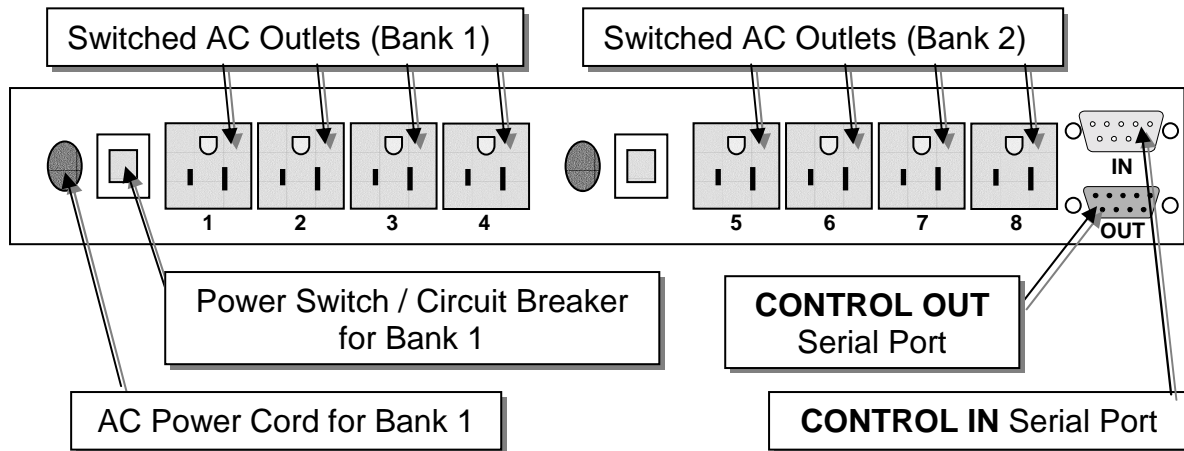
The front buttons can be disabled to prevent local control of switched devices; the indicator lamps will always operate. Each indicator is a green LED for an 'on' condition.

Rear Panel

The Rear Panel of the **PCU8** has two Power Cords, two Power Switch/Circuit Breakers, eight AC Power Outlets, and two Serial Interface connectors.



The following illustration shows detail of the connectors on the *PCU8*.



AC Power Connections

The *PCU8* has two AC Input Line Cords, equipped with an NEMA 5-15P plug, one for each Bank. Each Bank has a resettable 15 Amp Circuit Breaker/Main Power Switch that provides AC Power to that bank of four switched outlets and one internal AC/DC Power Supply:

- Bank A provides AC power for Output Ports 1-4 and AC/DC Power Supply #1
- Bank B provides AC power for Output Ports 5-8 and AC/DC Power Supply #2

The main power switches and power outlets are located on the back for limited access to the main power source, but easily accessible for authorized service events.

Redundant Logic Power Supplies

Two power supplies are used for the logic and switching power of the *PCU8*. The redundant power supplies are Diode OR'ed to provide DC power to the system and will maintain V_{CC} in the unlikely event of a DC Power Supply component failure.

Connection to Switched Outlets

Eight NEMA 5-15R nominal-115VAC power outlets are provided, labeled 1 through 8. Outlets 1 through 4 are in Bank 1, and Outlets 5 through 8 are in Bank 2; however, each outlet is independently controllable.

Note: Each outlet can switch up to **10 Amperes**.

The total power draw for each Bank of outlets must not exceed **12 Amperes**.

Power Failure Recovery

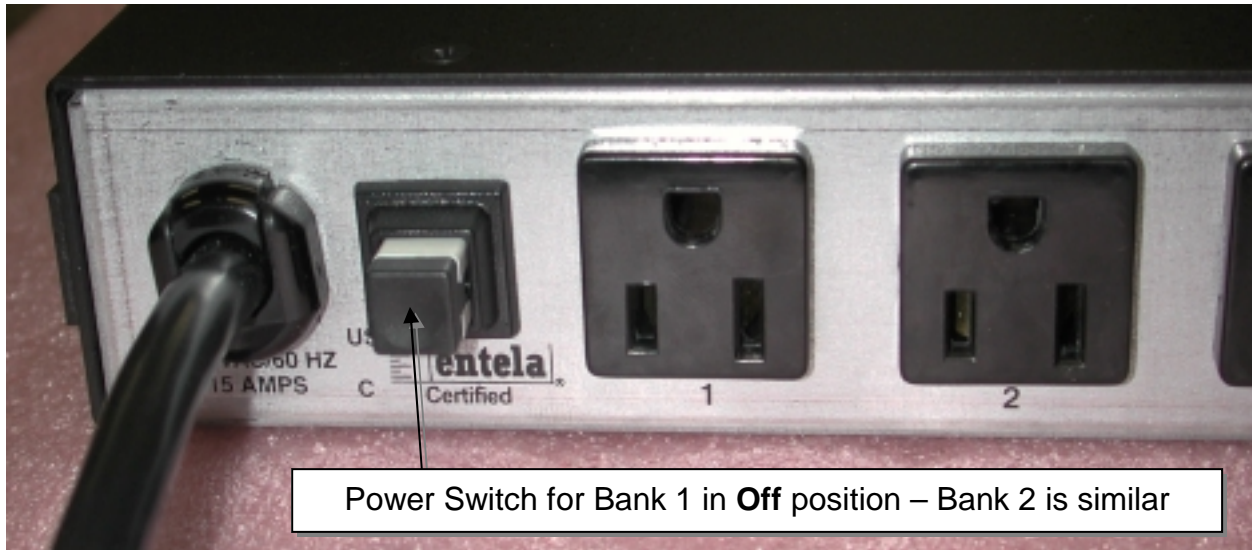
Upon recovery from a power failure to the *PCU8*, it will switch the Outlets to the same state they were in prior to the *PCU8* losing power. The outlets are sequentially activated with a 1-second delay to minimize potential surge effects.

Front Panel Controls

The **PCU8** has eight lighted front panel push button switches. The LEDs provide a visual indication of the Port status (green LED = on), and if enabled, the switches provide a manual toggle for each of the outlets.

Rear Panel Controls

Two Power Switch / Circuit Breakers are provided (one for Bank 1, one for Bank 2). If either is turned on, an internal power supply will provide logic power to operate the **PCU8**. If both are off, the **PCU8** will not function and all outputs will be off.



Console I/O Port Connections:

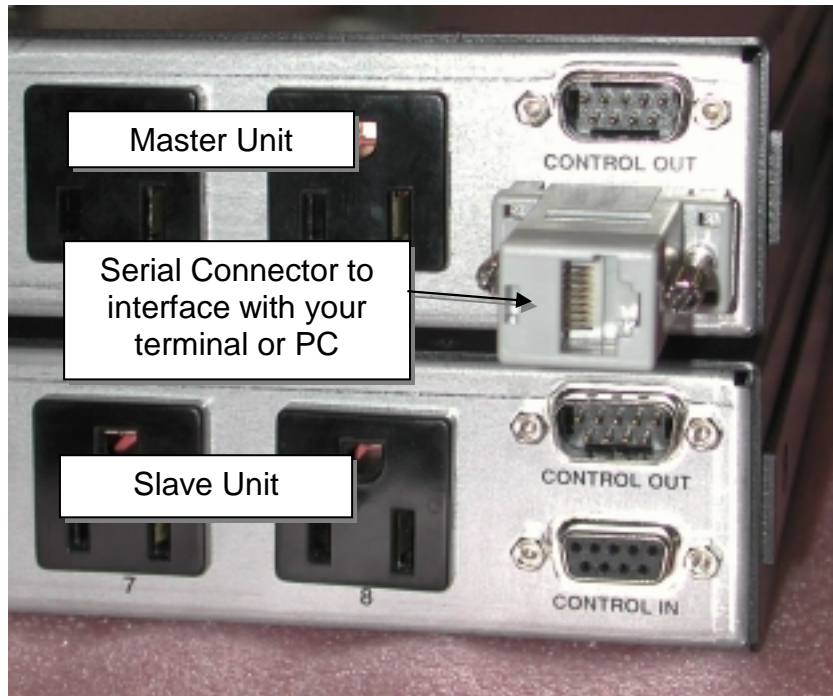
The **PCU8** has two RS-232 serial connectors: **CONTROL IN** and **CONTROL OUT**.

- If using a single **PCU8**, you will only require a connection to the **CONTROL IN** port
- If cascading multiple **PCU8** units, the first or “Master” **PCU8** will be connected to the programming terminal using the **CONTROL IN** port, and the **CONTROL OUT** port will be connected to the **CONTROL IN** port of the next unit using a straight-through serial cable, and so on

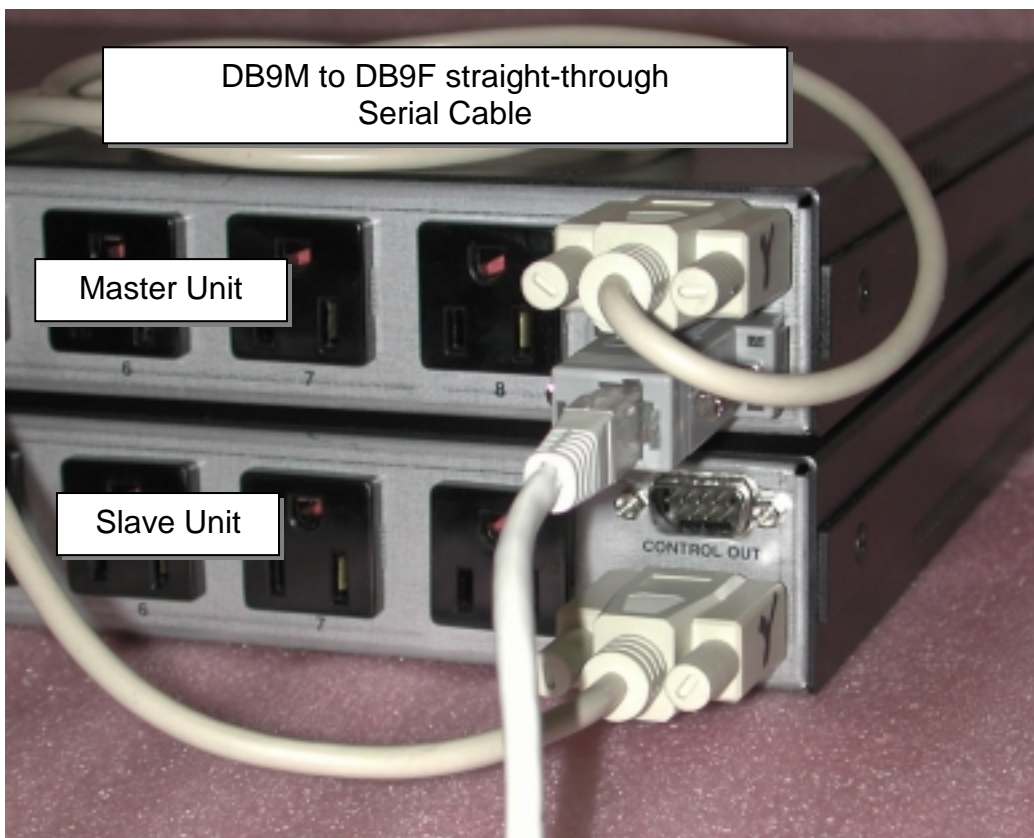
Settings for I/O Communication for CONTROL IN port

- RS-232 interface (DB9 connector)
- Your terminal must be set as **DTE**
- 9600 baud
- 8 data bits
- 1 Stop bit
- No Parity

The **CONTROL IN** port (DB9F) is used to connect to a Lightwave Console Server 800, 3200 or SCS1620, or a serial terminal. Adapters are sometimes used for these connections.



The **CONTROL OUT** Port is a DB9M Connector used to cascade **PCU8** boxes. A DB9M to DB9F Straight through cable is required.



Cascading PCU8 Boxes

If more than eight switched AC Power ports are required, the **PCU8** configuration can be expanded by daisy-chaining up to nine (9) **PCU8** systems. The first **PCU8** assumes the "Master" role, with the Master **PCU8**'s CONTROL OUT Port connected to the next box's **CONTROL IN** Port. A DB9M-to-DB9F straight-through serial cable must be used.

Box IDs

The first box assumes the Master box ID of 1, and additional **PCU8** boxes are designated a "Slave" status and are automatically designated with the next sequential box ID (numbered 2 through 9). All commands issued to the master unit referencing a slave unit will be passed on to the designated box. The program parameters for each **PCU8** are stored in that unit; the Master unit only verifies the existence of slave units and passes commands to the slave units.

Note: If an intermediate unit in such a chain of **PCU8**'s loses power, the control and operation of the **PCU8** configuration stops at the unit without power.

Program Storage

All programmed data in the **PCU8** is stored in non-volatile memory in the event of a power failure. The **PCU8** will return each port to its previous state (on or off) when power returns to the unit.

Note: Many PC-based communications packages offer the ability to buffer the serial data that has been entered and displayed, so that it may be copied and saved to a file. In this case, you can keep a copy of the programmed data for your reference, if required.

Connection to Lightwave Power Manager ports

The **PCU8** is designed to connect to **Lightwave's Console Server** products that offer a "Power Manager" interface port. The Power Manager port is a compatible RS-232 Port designed to connect the **PCU8**'s **CONTROL IN** port to the Lightwave ConsoleServer 800 and other Lightwave systems. Some early Lightwave products may require a software update (available from Lightwave's FTP site) to use the Power Manager port with the **PCU8**.

Connect the DB9F-to-DB9M cable from the **PCU8**'s **CONTROL IN** port to the Console Server's **Power Manager** port. The **PCU8** is administered by first connecting to the Power Manager port using commands in the Console Server, then using **PCU8** commands once connected. Refer to the Console Server manual for Console Server information.

On systems that do not have a special Power Manager port, the connection can be done if the port is configured as follows:

Port Setting for your Terminal Device

If your switch does not have a dedicated 'Power Manager' port, you can configure a serial port to be similar to the Console Server's Power Manager interface using the following settings:

1. Configure an RS-232 serial port as a **DTE** port.
2. Configure the port for **9600** baud, **8** data bits, **No** Parity, **1** Stop Bit.
3. Name the port for the **PCU8** (e.g., PCU_8).

Programming the System

Communicating with the PCU8

The **PCU8** uses a simple proprietary serial user interface. It accepts commands from a serial terminal or terminal emulation package, and it responds with acknowledgement statements. The command language also provides status information upon request.

In order to enter any command function, the user must gain access to the **PCU8 COMMAND MODE** by entering a password to log on. Most commands start with a single alpha character command and a unit or box number. Each command is completed by pressing the 'Enter' or 'Carriage Return' (<CR>).

NOTE: In this manual, pressing 'Enter', 'Return' or <CR> represent the same action.

Programming Access

Once connected to the **PCU8's** CONTROL IN serial port, the following access and programming commands may be used. Invalid commands or unauthorized access attempts will not affect the **PCU8**. The programming interface will automatically log out after 5 minutes of idle time.

1. Connect your programming terminal to the **CONTROL IN** port.
2. Press 'Enter' or <CR> on the keyboard to establish communication. Your display should show "**Enter Password:** "; it may also show '**INVALID**' if the 'Enter' or <CR> was pressed more than one time.

```
Copyright 1999 by Lightwave Communications, Inc.
All rights reserved.
  Software Version: V1.04
Enter Password:
```

If you do not get the **Enter Password** prompt (or any other activity), check your connections and your terminal's configuration.

Log In

The **PCU8** is password protected at Log In. The factory-set password is **PASS** (case-sensitive) which may be changed by the System Administrator.

To Log In to the **PCU8**, you type in the Login command (which is **LOGIN** or **LOGON**) and Press Enter or <CR>. You must know the password to Log In to the system.

As you enter the password, the display will show '*' for each character entered:

```
Enter Password: ****
Password OK

PCU8_loggedin>
```

- The **PCU8** is shipped with a default Case Sensitive Password of **PASS**.
- Entering an invalid password returns the response '**INVALID**'.
- Password entry is case sensitive.

When Logged In, the command prompt will show "**PCU8_loggedin>**".

HELP file

A HELP file provides a summary of the commands and syntax for the **PCU8**.

Type 'H', 'h' or '?' and press Enter or <CR> to access the HELP file at any time after you've logged in.

```
PCU8_loggedin> H -> OK
```

ID	Name	Description
B	Buttons	Enable or Disable Front Button Access
C	Change Password	Change Log In Password
E	Case Sensitivity	Enable or Disable Case Sensitive Port Names
G	Output Status	Display Status of Output Ports for all connected PCU8 boxes, starting with the Master
H	Help	Access the Help file (same as ? and h)
L	Log Off	Log off from the Logged In state
M	Set Reboot Time	Set the Reboot Time Delay before power-up for each Port (1-29 Seconds)
N	Set Output Name	Allow User Entry for Names or Groups, for each Port
O	Download Code	Download new Code to Flash memory
P	General Parameters	Display Status of General Parameters
R	Reboot Output	Reboot the Outputs (one, multiple, group, all)
S	Set Output	Turn Outputs On Off (one, multiple, group, all)
W	Row Width 25 50	Set the number of Rows displayed at a time

For command syntax type <ID> ?

Command Help

To check the syntax of a command, type the **command ID, space, and ?**.

For example, to view the Syntax for the Reboot Output command, type 'R ?' and press enter. The system will show:

```
PCU8_loggedin> R ? -> OK
```

```
R [BOX #] [PORT # | PORT NAME(S) | ALL] <ENTER>
```

```
PCU8_loggedin>
```

Log Off

The Logoff Command: **L <CR>** - Logs the user off and returns the 'OK' prompt followed by the Enter Password: prompt.

Note: Logging In starts a Timer that will automatically log the current user off if no activity is detected over a 5 minutes period. In this case, the user will see "Ti meout !!!".

PCU8 Commands

Commands are executed from the Serial terminal. You must log in in order to access any programming commands.

Reminder: In this manual, pressing 'Enter' or <CR> represent the same action.

Note: If your display is set for 25 rows (instead of 50 rows), your display may be split up and awaiting your action to show the remainder of the screen. [The 'W' command determines this Row Width setting.] Your display of the HELP file, for example, might be interrupted with the following line:

```
Press Any Key for Menu Continued or ESC
```

Ports and Port Groups

Commands can be entered for individual Ports, either by name or by number; for a range of port numbers separated by a dash (e.g., 5-8), any combination of port numbers, separated by a space or a comma (e.g., 1 4 5 8); or for a **Port Group**. A Port Group is defined when more than one Port is assigned an identical name (e.g., SUN) and the port name is used in a **PCU8** command.

Global Commands

For multiple-**PCU8** configurations, many commands will accept a **box ID of zero (0)** to generate a **Global Command** that will execute that operation in **all** connected boxes. Global operational commands include an 'Are You Sure' prompt, as a safety measure, requiring an additional step in the response by the operator.

```
Are you sure you want to execute this command for all boxes?  
'Y'<CR> for Yes or 'N'<CR> for No:
```

```
PCU8_loggedin>
```

Global commands include **0** (the digit zero) to operate all connected **PCU8** box ID's, and **ALL** or **all** for all port IDs within a box or a number of cascaded boxes.

The following commands are presented in alphabetical order. Do not type the square brackets, [and], when entering data.

B - Front Panel Button Enable/Disable

The Front Panel Buttons can be disabled to prevent unauthorized control of the outputs of the **PCU8**. The LED indicators in each Front Panel Button will continue to operate, showing a solid green LED indicator for an 'on' indication and no indicator for 'off'. If enabled, pressing a front panel button will turn that outlet On or Off immediately.

```
PCU8_loggedin> B ? -> OK
B [BOX #] [ENABLE | DISABLE] <ENTER>
PCU8_loggedin>
```

Examples:

- Enable Front Panel Button control on Box 1 B 1 Enable
- Disable Front Panel Button control on all **PCU8s** B 0 Disable

C - Change Password

The factory password of "**PASS**" can be changed to any string of **1 to 16 characters** (including all printable characters), not including 'space' or 'comma', and the new password must not start with a number.

```
PCU8_loggedin> C ? -> OK
C <ENTER>
PCU8_loggedin> C -> OK
Enter Password : ****
Enter New Password : *****
Verify Password : *****
Password Accepted
PCU8_loggedin>
```

Pressing C + <CR> returns the prompt: "Enter Password"

1. To the prompt "Enter Password", Enter 'Current Password'
2. To the prompt "Enter New Password", Enter 'New Password'
3. To the prompt "Verify Password", Re-enter 'New Password'
4. Password will be accepted. If the new password was not accepted, "**INVALID**" will be returned and the original password is maintained.

The default password is **PASS** and it is case-sensitive.

Note: The password is used to access the programming interface of the Master **PCU8**. Any Slave units will not have their password changed using this programming option, but also do not employ the user interface if configured as Slave units.

E - Case Sensitive Port Names

The Port Names can be specified as case sensitive or not, on a per-unit basis. Default setting for Case Sensitivity is OFF.

```
PCU8_loggedin> E ? -> OK
E [BOX #] [ON | OFF] <ENTER>
PCU8_loggedin>
```

Examples:

- To enable Case Sensitive Names in all **PCU8** units: **E 0 ON**
- To disable Case Sensitive Names in **PCU8** box **2**: **E 2 OFF**

Note: Password entry is always case-sensitive, regardless of this parameter.

G - Display Port Status

Using the **G** command, the user can get a snapshot report of the status of each port.

```
G [BOX #] <ENTER>
PCU8_loggedin> G 1 -> OK
```

OUTPUT	NAME	STATUS	REBOOT DELAY
1	DEVICE1	ON	2
2	DEVICE2	ON	3
3	DEVICE3	ON	4
4	DEVICE4	ON	5
5	DEVICE5	ON	2
6	DEVICE6	ON	3
7	DEVICE7	ON	4
8	DEVICE8	ON	5

```
PCU8_loggedin>
```

The G Command displays:

- Output Number (port 1 through 8) and the assigned Port Name
- Outlet On/Off Status
- The programmed Reboot Delay Time

Note: A Box # of 0 reports for all boxes.

H - Help Menu

Typing '**H**', '**h**' or '**?**' from the command line will access the **HELP** menu, which reviews the programming parameters for the **PCU8** system.

See Page 12 for a review of the HELP file.

L - Log Off

Typing 'L' or 'l' from the command line will log the system off. You will be immediately logged off of the system. You are then prompted for the Password.

```
PCU8_loggedin> L ? -> OK

L <Enter>

PCU8_loggedin> L -> OK

Enter Password:
```

The System will automatically timeout and log off after 5 minutes of idle time (no terminal activity). If a timeout is experienced the display will show "Timeout !!!".

M - Set Reboot Time

The Reboot Time command sets the time duration that a Port will remain Off before turning back On, after issuing a **Reboot** Command to the **PCU8**. The Time duration is adjustable from 1 to 29 seconds; each Port may be individually programmed. Default values will stagger the start-up times of the Ports to minimize the effects of power surge on start-up.

```
PCU8_loggedin> M ? -> OK

M [BOX #] [TIME] [OUTPUT # | OUTPUT NAME | ALL] <ENTER>

PCU8_loggedin>
```

Note: The user should consider power surge to minimize any issues upon power-up.

N - Define Port Names

The N command allows the user to assign names to each of the ports to assist in the administration of the ports. Ports with identical names are grouped together since commands can be issued to control the boxes by name or by port number.

The Port Names can be changed to any string of **1 to 16 characters** (including all printable characters) not including 'space' or 'comma'. Port names cannot start with a number.

```
PCU8_loggedin> N ? -> OK

N [BOX #] [NEW NAME] [PORT #] <ENTER>

PCU8_loggedin>
```

The Define Port Names command allows the user to give each port an *Alias* that is a more meaningful name and allowing the grouping of outlets. The Port Number is not changed or affected by renaming the Port, and may always be used to control the port.

Examples:

- The Command line entry of: `N 1 sun 3` assigns the alias of **Sun** to Box 1, Port 3
- `N 1 Sun 1,3,5` assigns the alias of **Sun** to Box 1, Ports 1, 3, and 5
- `N 0 Sun 1-4` assigns the alias of **Sun** to all Boxes, ports 1 through 4
- `N 0 Sun ALL` assigns the alias of **Sun** to all Boxes, all ports

Notes:

1. Default names are 'Device1' through 'Device8' for Ports 1-8, respectively.
2. Port Names must be at least one character, and can be up to 16 characters long, and can include any printable characters except for 'space' or 'comma', and cannot start with a number.
3. Port Names are **Not Case Sensitive** by default.
4. '**ALL**' or '**all**' is a reserved keyword and is not valid as a Port Name.

Port Groups can be formed and operated by assigning identical names to two or more ports. All ports with identical names within one **PCU8** are grouped together, if the user enters an operational command for that name. All ports with identical names in ALL daisy-chained **PCU8** boxes will be operated if the user enters a valid GLOBAL (box ID = 0) command.

P - Display General Parameters

The General Parameters list several system settings, and show the current number of boxes that are cascaded.

```
PCU8_loggedin> P ? -> OK

P [BOX #] <ENTER>

PCU8_loggedin> P 1 -> OK

GENERAL PARAMETERS
Buttons Status:           : enable
Power Supply #1 Status   : GOOD
Power Supply #2 Status   : GOOD
# of Rows Displayed      : 25
Case Sensitive           : off

PCU8_loggedin>
```

- **Buttons Status** shows if front panel buttons are enabled or disabled
- **Power Supply Status** reports if V_{cc} power is being received from each supply
- **Number of rows** shows the display setting, either 25 or 50 rows
- **Case Sensitive** identifies if Case Sensitivity for Port Names is On or Off
- **Number of Cascaded Boxes** identifies how many boxes follow this Master; **Box #** identifies which box number this Slave box is

If two or more boxes are cascaded, use the Global command option (box ID = 0) to show the detail for all installed boxes. All boxes, except for the first box, will list the 'Box #' instead of informing how many boxes are cascaded in total.

```
PCU8_loggedin> P 0 -> OK

GENERAL PARAMETERS
Buttons Status:      : enable
Power Supply #1 Status : GOOD
Power Supply #2 Status : GOOD
# of Rows Displayed  : 25
Case Sensitive       : off

GENERAL PARAMETERS
Buttons Status:      : enable
Power Supply #1 Status : GOOD
Power Supply #2 Status : GOOD
# of Rows Displayed  : 25
Case Sensitive       : off
Box #                 : 2

PCU8_loggedin>
```

R - Reboot Output

The Reboot Output command is used to turn a port or ports off and then back on. The purpose is to 'reboot' a server or device by cycling the power off and on. Ports that are currently off will be turned on. Ports that are currently on will be turned off and then back on. The Reboot Time duration for each port is assigned in the "M" Reboot Delay Time program.

- Any Port may be referred to by either Port Numbers or Port Names. All ports with identical port names will be rebooted together (i.e., a Port Group)
- The keyword "ALL" or "all" is a valid argument

```
PCU8_loggedin> R ? -> OK

R [BOX #] [PORT # | PORT NAME(S) | ALL] <ENTER>

PCU8_loggedin>
```

Examples:

- Reboot Box 1, Port 8 R 1 8
- Reboot Box 1, Ports 1, 5, and 7 R 1 1,5,7
- Cycle all outputs OFF/ON in Box #1 R 1 ALL
- If Ports 1,2,3 in Box 2 are defined as "SUN2", then to Reboot ports 1,2,3 in box 2 R 2 SUN2
- Reboot all outputs in all boxes. R 0 ALL

Note: If any of the selected ports are already On, they will be power cycled off, then after a delay, back "ON" or if any of the selected ports are Off they will be power cycled "ON".

S - Set Output On / Off

'Set Output On' or 'Set Output Off' is used to turn a port on or off, respectively. Ports already in the desired state will not be changed or affected.

- Any port may be referred to by either Port Numbers or Port Names. All ports with identical port names will be turned on together (as a Port Group)
- The keyword "ALL" or "all" is a valid argument

```
PCU8_loggedin> S ? -> OK
S [BOX #] [ON | OFF] [PORT # | PORT NAME(S) | ALL] <ENTER>
PCU8_loggedin>
```

Examples:

- Set Box 1, Ports 5 & 7 ON S 1 ON 5,7
- Set all boxes, ports 1 through 5, OFF S 0 OFF 1-5
- If Ports 1, 4 and 8 are named "SUN" in Box #2, then: S 2 ON SUN
sets ports 1, 4 & 8 ON in Box #2.

Note: In order to limit current surges, each port is turned on or off at 1 second intervals when using the **S** command, starting with Port 1 up through Port 8. Therefore, Port 8 will take approximately 8 seconds to turn on or off if using a Set Output command. This time delay also occurs when the **PCU8** is first turned on or recovers from a power failure.

Examples

- S 3 ON ALL Sets ports 1-8 ON in box #3
- S 1 ON SUN All Ports labeled as "SUN" in Box 1 are turned On

W - Width of Rows

Sets the number of rows displayed on a single page of your display or printout. Parameter choices are '25 rows' or '50 rows'.

Syntax: **w [25|50] <Enter>**

```
PCU8_loggedin> W ? -> OK
W [25 | 50] <ENTER>
```

Example

- w 50 Sets number of rows displayed to '50'

O - Download New Application Code to Flash Memory

The flash memory update feature allows the user to install newer versions of operating software in the **PCU8** without removing the unit from its installation (the system must be removed from service, however). New software revisions will be released from time to time to add features or make changes for customer requests. The process usually takes less than 10 minutes.

The binary file for the flash update can be downloaded from
ftp://ftp.lightwavecom.com/pub/products/PCU8/software/

Materials:

1. Laptop or other computer with RS-232 serial I/O port
2. Serial cable with DB9 male end and mating connector for the above computer's serial port
3. Communications software capable of XMODEM or KERMIT uploads
4. **PCU8** software update file (from FTP site)

Note: This will take the **PCU8** out of service while the flash memory is being updated. You will need to use a terminal package (e.g. ProComm or PCTerm, etc.) of your choice that will store and then deliver the downloaded binary file to the **CONTROL IN** port.

Caution: Using this program improperly can make your **PCU8** inoperable. Be certain to follow the directions precisely, and to have a copy of the updated binary file (.bin) for the **PCU8** loaded in your computer, ready for transfer, before starting.

```
PCU8_loggedin> O ? -> OK  
  
O <ENTER>  
PCU8_loggedin> O
```

The System will prompt you:

```
Warning !!! This command will erase your application  
program. Be sure to have a .bin application file to download  
before continuing with this command. The latest .bin application  
file for the PCU can be found on www.lightwavecom.com.  
  
Are you sure you want to download new code to the flash Y/N  
'Y'<CR> for Yes or 'N'<CR> for No:
```

Press 'N' and enter to stop the process, or press 'Y' and enter to continue...

Note: Be sure to have a valid .bin file before continuing with this command because a response of `Y` will erase the application code prior to any DOWNLOAD.

```
Are you sure that you want to download new code to flash?
'Y'<CR> for Yes or 'N'<CR> for No: y
Copyright 1999 by Lightwave Communications, Inc.
  All rights reserved.
Software Version: V1.04
Start file xfer
PCU program...

Select download protocol - X for XMODEM, K for KERMIT:
```

The download program is designed to use either XMODEM or KERMIT. Depending on your PC and terminal package, you may choose either Kermit or XMODEM for transfer of this file.

In this example, **K** is selected for KERMIT.

The terminal emulation program will provide status information to you. Download will often take two or three minutes to complete.

```
k
Start Kermit transfer
```

When the file transfer is complete (your Terminal program will indicate it is completed), it should then return the display monitor to the screen for the **PCU8** program, and you will see the following display

```
Download Successful
```

You must now Turn the power off to the **PCU8**, wait approximately 30 seconds, and then turn the unit back on.

Note: If power or the data circuit is interrupted during download, the system will 'fail' the current download process, and return to the start of the download process after you reconnect the unit. Simply reconnect the **PCU8** to your computer and start the download again.

If multiple **PCU8** units are cascaded and all must be upgraded, you must disconnect them and upgrade each unit individually. There is no global Flash memory update function.

Specifications

Lightwave Power Control Unit - **PCU8**

Part Number **600.000.0001** (North American model)

AC Inputs Requirements per Box: Two dedicated lines, 15 Amps each

Voltage: 100 -132 VAC 50/60 HZ

AC Outlets: 8 Total

Ports 1-4 = Bank 1

Ports 5-8 = Bank 2

AC Output Connectors: NEMA 5-15R, 15 Amp outlets

Max Load Per Outlet: Any single outlet up to 10 Amps

Max Load Per Bank: Total for a bank (4 Outlets) must not exceed 12 Amps

Console I/O Interface:

RS232 CONTROL IN : DB9F

RS232 CONTROL OUT : DB9M

Coding: Serial ASCII, 8 Bit Data, 1 Stop bit, and No Parity

Baud Rate: 9600

Regulatory Compliance

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 a 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 is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The PCU8 has been tested and listed with Entela Inc., a Nationally Recognized Test Lab (NRTL) as compliant with UL1950 3rd edition and CSA 22.2 No. 950-95.

An 'International' model is available for nominal 230 VAC applications. Contact your Lightwave representative for more information.