Web Power Switch *Pro*

USER'S GUIDE

DLI DIGITAL LOGGERS, INC.

Features

Congratulations on selecting the Pro, a smart web-controlled AC power switch. Features include:

Simple Web Interface
The internal web server is accessible from any browser. Simply enter an IP. Configuration and control are web-based.

AutoPing™ Reboot
AutoPing continuously monitors an IP address. If a server, router, or other peripheral goes down, AutoPing can automatically reboot it without user intervention. The Pro can monitor several devices and multiple IPs simultaneously.

8 Switched Duplex Outlets + 2 Unswitched Outlets
Eight individually switched control circuits are provided. Outlets are spaced for plugs and adapters. Un-switched outlets are provided for "always on" devices.

Programmable LCD Display & Keypad
A 2x16 LCD displays status for each outlet. Custom messages can be displayed via user scripts A keypad adds local control. Outlet states may be locked and the admin can disable the keypad. The keypad can also be used for initial configuration.

Multi-User Password Security
Multi-user authentication limits access to the Pro. The administrator selects which outlets each user can control.

Sequenced "On Timer"
A programmable delay timer allows outlets to be switched on in sequence, rather than simultaneously. Most devices draw a surge of power when initially switched on. Using this timer, more equipment can safely share a single circuit without overloads. Programmable scripts can be used to create customized power-up and shut-down sequences with variable timing.

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MOV Surge Suppression
A 3600W metal oxide varistor clamps power surges and spikes, protecting attached devices.

Scripting Language and APIs
Lua scripting can be used to create custom control and reboot sequences, schedule periodic reboots, etc. Internal and external event logs are provided. Sample program snippets are provided. A powerful RESTful API is now available.

New Features
Supported protocalls now include Email, MQTT, IFTTT,Alexa, cURL, SNMP, Jabber, HTTPS, SSH, SSL/TLS, NTP, MODBUS/TCP, UPnP, CoAP over web sockets, SYSLOG, AutoPing and Lua Scripting. The hardware features longer clock battery life, WiFi support, and a connection for an external enviromental (ie temperature) sensor.

Field Upgradeable Firmware
Firmware is field upgradeable via Ethernet.

Package Contents

- Web Power Switch Pro with NEMA 5-15 120V sockets
- RP-SMA WiFi Antenna
- Six foot C-19 to 5-15 power cord for 120V use.

Options

- Custom length cords & plugs: digital-loggers.com/cords.html
- L shaped bracket for vertical rack mounting
- External temperature sensor
- External AC voltage sensing relay with dry contact output
- Compatible 19" rack, DIN mount, and 240V models are available.

Freight Inspection

Please look things over and contact the freight carrier immediately if your package appears opened or damaged in transit. Call DLI at (408) 330-5599 for tech support, service, and hardware upgrades. The Pro performs a brief self-test when first powered up.

Important Factory Defaults

IP: 192.168.0.100
User name: admin
              (lower case)
Password: 1234
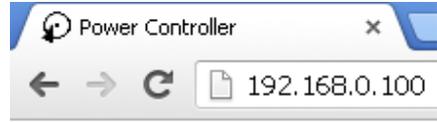
To reset to factory defaults, gently press the reset-to-defaults button below the LCD to enter the reset menu, then select a reset option.

Quick Setup

Use these shortcuts if you are an experienced installer. We recommend reading the entire manual for a first-time installation.

• Unpack. Save the carton. Attach the line cord. Power up.

• Attach an Ethernet cable from the controller to your LAN. If you are attached through a switch, you may need to power-cycle your switch to initially establish a connection.

• Ping the default address 192.168.0.100 to confirm that a network connection is established. If you don't receive a response, proceed to the **IP Setup** section below. You can either use the keypad or a browser connected to the LAN to edit the basic network settings.

• To set up via keypad, tap the up and down buttons simultaneously to enter the setup menu. See page 8 for keypad setup details.

• To set up the Pro via LAN, log in to the Pro using the default user name **admin** and the password **1234** Note: *"admin" must be entered in lower case.*

• Click the **Settings** link to reach the configuration page. Select the safest power-loss configuration for your installation: (all OFF, all sequential ON, or pre-powerloss sequential ON) Note that pre-powerloss means the last previously configured state, and it does not take cycling into account. "Power loss" is defined as loss of AC power for more than 100ms.

• Configure the Pro as described below. After each change, click **Submit** and wait for the page to refresh before continuing.

    Tip: A three-bulb electrical safety-tester is handy for checking configuration before attaching loads.

Setup via LAN

If your network settings won't access the default IP, use a direct cable connection (temporarily bypass any switch or router) and follow these steps to add a compatible static IP, such as 192.168.0.50   Before adding an IP, close all programs and browsers. After the link is established, you can enable DHCP if desired;

If you prefer, you can also adjust network settings using the keypad and LCD. See **Setup and Control via Keypad** on page 8.

Windows Step 1

The following instructions assume Windows is set to "Classic View". The first step is locating the network adapter TCP/IP properties. The procedure differs for each Windows version:

Windows XP, 2000, 2003: Open **Start / Control Panel / Network Connections**. In "classic view", select **Start / Settings / Control Panel / Network Connections**. Right-click on **Local Area Network Connection** and select **Properties**. Proceed to step 2.

Windows Vista: Open **Start**, right click on **Network**, then on **Properties**. Double click **Network and Sharing Center**, click **Manage Network Connections**. A Network Connections window appears. Right click on the network connection to the switch, ie. **Local Area Network**. Proceed to step 2.

Windows 7: Open the **Start orb**, click on **Control Panel**. Click **View Network Status and Tasks**, then **Change Adapter Settings**. Proceed to step 2.

Windows 8-11: Right-click on the Windows Start button. Select **Control Panel**. Select **Network and Sharing Center** or **Network->Network Settings**. Click **Change Adapter Settings** or **Adapter Options**. Right click on your connected network. Select **Properties**. Proceed to step 2.
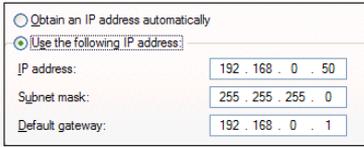
Windows Step 2

The second step is adding an IP such as 192.168.0.50
Temporarily disable DHCP while configuring the Pro.

Select:
Internet Protocall TCP/IP V4 Properties
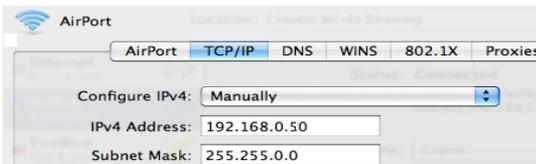and click **Properties**.

Enter a compatible static IP such as: 192.168.0.50
Click **Apply** and close windows. Ping the Pro to confirm the connection.
Point your browser to 192.168.0.100 Log in. Detailed instructions are at
digital-loggers.com/ip_setup

○ Obtain an IP address automatically	
⊙ Use the following IP address:	
IP address:	192 . 168 . 0 . 50
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	192 . 168 . 0 . 1

Mac OS X

Turn **AirPort** off temporarily. Click the Apple logo, then **System Preferences**, then **Network**. Select **Built-In Ethernet** and then **Configure.** Under the **TCP/IP** tab, select **Manually** and enter an IP address such as 192.168.0.0 as shown. Point a browser to 192.168.0.100 Log in. Find Mac setup details at digital-loggers.com/mac_ip_setup

AirPort	TCP/IP	DNS	WINS	802.1X	Proxies
Configure IPv4:	Manually				
IPv4 Address:	192.168.0.50				
Subnet Mask:	255.255.0.0				

Network Configuration

HTTP Port	80
Enable SSH Server	☐
SSH Port	22
Syslog Server	
Same subnet access only	☑
Submit	

HTTPS is disabled by default.
WiFi is enabled with a random key.

Start by establishing a hard-wired network connection to 192.168.0.100, or use the LCD and keypad to display the default WiFi SSID and password. The **Settings** page contains network configuration:

LAN Configuration	
MAC Address	7C:E1:FF:00:00:00
Protocol	Static IP ▼
IP address	192.168.0.100
Subnet mask	255.255.255.0
Gateway	

The IP address of the controller needs to initially match the "class C" of your system. In other words, the first three bytes (192.168.0) must match the IP on your computer to access the Pro. A ping utility is helpful. An "unreachable" report from Ping indicates a misconfigured network.

Once you have a connection, the Pro may be operated via a web browser. To access the Pro, enter the IP address in the URL field of your web browser. The default is http://192.168.0.100 SSH is disabled by default.

After setup, the HTTP and SSH ports (if enabled) may be moved to improve security. For example, changing the HTTP port to 2015 requires a browser URL of 192.168.0.100:2015 to reach the power controller.

Note: Some browsers deny connections to ports under 1024 by default.

Setup and Control via Keypad

In addition to setup via LAN, you may use the keypad and display to get started and to manually control the basic functions of the switch. This section describes basic keypad usage.

Press any key to activate the keypad. If you don't receive a response, the keypad is locked out (see below).

Outlet (port or relay) status shows on the first line. The outlet name or time/date of last modification shows on the second line. Three symbols are used for relay status + (ON), - (OFF), and * (LOCKED). In this example, relay 1 is locked ON, the even numbered relays are ON, and relays 3.5.7 are OFF. The flashing cursor indicates outlet 8 is selected:

Select an outlet by pressing 'UP' (next) or 'DOWN' (previous). Hold 'UP' or 'DOWN' to advance automatically. Select an outlet, then:

- Turn the selected outlet ON by pressing '1'.
- Turn the selected outlet OFF by pressing '0'.
- Cycle selected outlet OFF-then back-ON by pressing 'CYCLE'. The OFF time for a power cycle (ie. 10s OFF before switching power back ON) is adjusted here on the web UI setup page:

Holding ON or OFF down for a few seconds has a locking effect. For example, if an outlet is currently in the ON state, it can be locked in this state by long-pressing '1'. A star appears, ie:

Press '0' and hold for a few seconds to unlock. Similarly, if the outlet is currently in the OFF state it can be locked by holding '0' and unlocked by holding '1'.

Although the web interface is more commonly used, the keypad can be helpful for initial setup and for minor changes. To enter network setup, press 'UP' and 'DOWN' keys simultaneously for a second and release.

Network setup consists of several pages. Use 'CYCLE' to browse.

- 'UP' and 'DOWN' are used to select a field within the page.
- Pressing '1' means "yes" or "add 1"
- Pressing '0' means "no" or "subtract 1"

Available keypad network settings include:

- **IP address** (default 192.168.0.100)

- **Netmask** (default 255.255.255.0)

- **Gateway** (default 192.168.0.1)

- **Syslog server** (default 0.0.0.0 = disabled)

- **LAN protocals** (either static or DHCP, default = static)

- **SSH** (disabled by default)

- **WiFi and DNS** settings

IP addresses are comprised of four octets per page. Select an octet with 'UP' (next) or 'DOWN' (previous). Press '1' to increment the octet, or '0' to decrement.

HTTP Port
Press '1' to increment the port, or '0' - to decrement.

Same Net Only - Subnet Restriction
Press '1' to activate restriction, '0' - to deactivate. By default, only devices in the same class-C can access the switch. Note: whitelists can only be edited from the web UI.

Web configuration protection (configuration locking)
Network settings are locked on the web setup page when protection is enabled. Press '1' to activate protection, '0' - to deactivate. If you are installing the switch in a remote location, bear in mind: you will need physical access to the switch to unlock it.

Password for admin user
Press '0' to leave the password unchanged. Press '1' to assign a new random case-sensitive password.
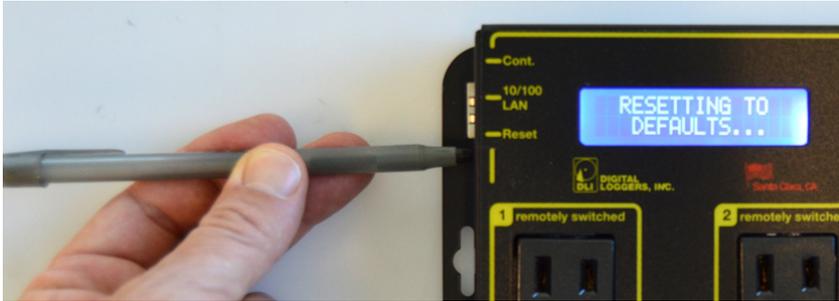

The physical keypad can be enabled or disabled by the admin from the Web interface located on the SETUP page:

Reset-to-Defaults

Press the reset button gently with a pen to enter the reset menu:

Please be gentle. Mashing it with a screwdriver could damage it. Consider exporting a backup of your settings first.

The LCD displays an overview of reset options on the second line. Use the UP and DOWN buttons to select a reset option:

Clear Lock Bits
Clears protection bits only. Other settings are preserved.

Reset network and scripting
Clears protection bits, reset network settings and admin login, disable autoping and scripts. Other settings are preserved.

Reset Network and Scripting + Enable WiFi
Clears protection bits, resets network settings and admin login, disables autoping and scripts, and enables open WiFi access. Other settings are preserved.

Complete Wipe
Resets all settings to factory defaults and remove any user files. All settings will be lost!

Complete Wipe + enable WiFi
Resets all settings to factory defaults and removes any user files, then enables open WiFi access. *All settings are lost and WiFi is open!*

To trigger the reset, press and hold the reset or CYCLE button. NB: If all settings are reset (the two last 'wipe' modes), the Subnet Restriction will be enabled to prevent remote access using the default password. ONLY MACHINES IN THE SAME SUBNET WILL BE ABLE TO CONNECT AFTER RESETTING TO DEFAULTS. If connectivity is lost, try a local connection such as a laptop to restore network settings, or use the keypad to reconfigure.

Home (Outlet Control) Page

Controller: WISP Outpost 2			
Thu Mar 31 11:36:19 2016			
Individual Control			
# **Name**		**State**	**Action**
1 DSL Router 1		ON	Switch OFF Cycle
2 Cable Router		OFF	Switch ON
3 Nanostation E		ON	Switch OFF Cycle
4 Nanostation W		ON	Switch OFF Cycle
5 Backhaul Link		ON	Switch OFF Cycle
6 Beer Fridge		ON	Switch OFF Cycle
7 Firewall		ON	Switch OFF Cycle
8 Congressional O2 Supply		ON	Switch OFF Cycle
Master Control			
All Outlets OFF			
All Outlets ON			
Cycle all Outlets			
Sequence delay: 3 sec.			

To access the home page, first enter the controller's IP address in the browser URL field, then log in. User **admin** has access to all features. Other users have access limited to certain outlets as assigned by the administrator.

Outlet Control
Clicking "Outlet Control" links to the home page used for manually switching outlets on and off. Access to specific outlets is determined by username. Admin controls all circuits.

Setup
The setup page lets you set outlet names, create web links, adjust startup delays, and set a power loss recovery mode. You can also add user accounts and change login credentials on this page.

Scripting
The Lua language lets you easily customize the Pro. Scripts may be started manually, automatically on power-up, by external http commands, or by AutoPing events. Find example snippets by following the internal **Scripting** and **Help** links and at: digital-loggers.com/scripts.html

AutoPing
The AutoPing page lets you set parameters to automatically reboot attached equipment. First, specify an IP address to ping. Next, adjust the timing settings and use the checkboxes to link the IP to power circuits. For example, if a router is unreachable, you may set AutoPing to reboot both a router and a switch attached to two different circuits. Learn more on page 14 and at digital-loggers.com/autoping2.html

System Log
The Pro keeps an internal event log including logins, outlet switching, power interruptions, and AutoPing events. Recent events are stored in the log and accessible from the **System Log** page. SYSLOG export is supported. For more information: digital-loggers.com/syslog.html

Logout
Browser logout is automatic when a session is closed or after a time-out period. Use this link to log-out in advance. Timeouts can't be disabled but can be set to large values ie. a year.

Programmable Web Links
User-defined web links are provided. Set names and destination URLs for these links on the **Settings** page. These are convenient for connecting to other power controllers, linking to page hosted elsewhere, and for starting scripts.

Switching and Cycling Outlets

The outlet control page lets you control any outlet (except the always-on pair). A master control lets permitted users switch all outlets on or off.

To switch an outlet, simply click to the right of the outlet name or number. On->Off switching is immediate Off->On switching speed is limited by the adjustable On Sequence Delay setting.

Use the keypad for local control: Select an outlet using the arrow keys, then press on, off, or cycle. Press ON or OFF for 5 seconds to lock or unlock an outlet. Locking prevents web access. To change the display mode, press the up and down arrows simultaneously. The keypad may be disabled on the Setup page.

You may want to Cycle a device which is connected to the Pro. This feature is useful for rebooting Ethernet devices which may interrupt the web link to the controller. Clicking **Cycle** switches power off, waits for the **Cycle time**, and then switches power back on while conforming to the ON Sequence Delay. This reboots the attached device.

You can also cycle all outlets using the Master Control on the bottom of the page. An adjustable ON sequence delay takes effect when outlets are turned on one after another, either when using the **All**

Outlets On button, at power-up, or when switching manually using the front panel. This delay prevents power surges. A *separate* Cycle delay setting is provided on the setup page.
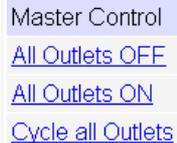
Master Control
All Outlets OFF
All Outlets ON
Cycle all Outlets

Depending on your web browser settings, you may need to click the Refresh button or F5 key to update the on-screen status

display after changing settings. Screen refresh rate is adjusted in two places: on the Setup page and in your browser settings.

Setup Page

The **Setup** page allows the admin to configure:

Controller and Outlet Names
Use the controller name field to assign a name to the Pro.
An example is **Rack 4 PDU.** The Controller Name will appear on top of all pages. Assign a separate name to each outlet, such as **DSL Router 1** or **Email Server** to aid identification. Check the **Confirm** box to the right of the outlet name if you would like a pop-up window to appear before switching critical outlets.

Power-On Sequence Delay
When a time value is entered in the **All ON Sequence Delay** field, the Pro will pause for a period of time before switching each outlet on in sequence. This delay helps prevent power surges and blown circuit breakers which can occur when multiple devices are switched on simultaneously. A delay of 60 seconds is suggested for server applications.

You may also enter a screen refresh delay in this section. If **Enable screen refresh** is checked, and a delay value is entered, your browser should periodically update the status screen.

Wrong Password Lockout
After five failed login attempts, the Pro can disable access for a selected period of time.

Power Loss Recovery Modes
The power loss recovery mode setting is a very important setting that determines operation when power is restored after a power failure:
1. Turn all outlets off (all systems will be switched off until manually turned on later, possibly by a script).

2. You can automatically turn all outlets on using the sequence delay timer described above.
3. You can return to the same outlet settings that were used prior to the power loss. ie. 1 On, 2 Off, etc. The ON Sequence delay timer is used here as well.

Note: If you have written a power-on script, the recovery mode takes effect before script execution begins. Scripts start after self-test, approximately 30 seconds after power-up.

User Defined Links
Add hyperlinks to other power controllers, your own web pages, or remote web sites by entering URLs in the **Setup** page. For example, enter "Site Two Power Controller" in the description field and a URL of "192.168.0.250" These links appear on the left side of the web pages.

Access Control
The administrator can grant users access to only certain outlets. To set permissions, login as admin first, then create a permissions matrix by entering user names on the left and checking allowed outlets on the right.

Network Settings
A valid fixed IP address, network mask, and gateway must be entered in this section.

When changing IPs, you may need to restart your network switch to validate the new IP on an "auto-configuring" switch port. *Be sure to record the new IP address.*

Use the **Protect** button to lock the network settings. *Once protected, the network settings cannot be changed without pressing the physical reset button on the side of the Pro.*

AutoPing™
Operation and Settings
AutoPing is an automatic system for rebooting IP equipment without human intervention. AutoPing will monitor a device. If it stops responding, AutoPing can cycle power to reboot it. For example, you might use AutoPing to monitor an external multi-cast IP to automatically reboot a DSL router or WiFi AP.

To use AutoPing, first add an IP address. Next, link that IP address to one or more outlets. Timing settings must be considered.

Add IP Address to AutoPing
Use this option to specify the address of an IP device you wish to monitor. After entering the IP address, the settings page will refresh and you can select the outlets associated with this address. Use the checkboxes in the AutoPing section to correlate the IP address to one or more outlets. If communications to the target IP is lost, these outlets will be rebooted.

AutoPing Parameters

AutoPing can monitor a network device and perform a task if the device stops responding. It can also monitor a group of devices, the task will be executed if none of the group members respond. The task is either a list of outlets to reboot or a script to execute. Be sure to enable AutoPing operation by checking the "Enable AutoPing" checkbox to the left of the target IP. Certain reset procedures may turn AutoPing off automatically.

The following parameters control Autoping operation.

AutoPing Properties			
Enable AutoPing:		☑	
Time between pings:	60	seconds. (2-3600)	
Ping timeout to reboot:	180	seconds. (2-3600)	
Ping responses to enable autoping:	2	pings. (0-100)	
Times to attempt reboot consecutively:	5	tries. (1-255)	
Total times to attempt reboot:	0	tries. (1-255)	
Device reboot delay:	240	seconds. (1-43200)	
Handle failures immediately instead of waiting for timeout: ☐			
Activate enabled entries without trial on service restoration: ☐			

Time between pings: This is the time between each ping check of an address. 60 seconds should be useful for most applications.

Ping timeout to reboot: This sets the maximum time that sequential communication attempts may fail. Any failure beyond this time limit will cause the task to be executed. For example, when set to 300 seconds and a time between pings is 30 seconds, if a target system fails to any pings for 330 seconds, the task will be executed. The ping that occurred after 300 seconds came at 330 seconds and still failed. Since occasional network overloads and missed packets can occur during normal network operation, be sure to choose a reasonable time. AutoPing may handle certain failures immediately instead of waiting for the timeout if configured to (see below).

Ping responses to enable AutoPing: To ensure a reliable connection, AutoPing will only be enabled after this many successful pings. We do not recommend changing this (10 is default) unless you must configure your controller before connecting it to the target devices.

Times to attempt reboot consecutively: If you have an unreliable target device, limit the number of times it will be rebooted by entering that value here. For example, entering 5 will execute the task up to 5 times before giving up. A successful ping will reset the counter.

Total times to attempt reboot: similar to above, but limit the total number of times the device will be rebooted, even with successful pings in between.

Device reboot delay: After rebooting a device with a cold-boot power-off, a waiting period should occur before the IP address is re-checked by AutoPing. This delay allows the device to reboot. Windows and Linux servers can force automatic file system checks which may take several

minutes to complete. Enter a safe value here, for example entering 600 would cause the power controller to start checking the server for normal operation 10 minutes after reboot. If a script is to be triggered, any delays contained in the code being executed should be considered in determining the delay setting here so that the thread completes before the delay elapses. This timer starts at the execution of the thread started.

Handle failures immediately instead of waiting for timeout: Enabling this feature may make sense for handling certain AutoPing target types which may return an explicit error (TCP RST, HTTP 500, etc.) by invoking the task immediately instead of waiting for the timeout to pass (during which the error condition could have disappeared and no action would have been taken). Consider the setup and AutoPing action when enabling this option (e.g. you shouldn't enable it if the AutoPing action is to power cycle a server, you need to shut one of its services down temporarily for maintenance and it's the only target of the AutoPing entry).

Activate enabled entries without trial on service restoration: By default enabled entries still need to wait for a certain number of successful ping responses on initial power-up before AutoPing actions are taken to make sure the targets have come online as well (in the assumption that they might have suffered a power failure as well and may need time to recover). This option can be used to disable this additional check.

Ping target configuration

To actually use AutoPing, start by adding one or more target IP addresses.

to the list. The ![X] button is used to remove a target from the list. Below is an example AutoPing configuration with four targets:

Individual AutoPing settings

IP(s)	Reboot Outlets								Script	Action	Stats		
	1	2	3	4	5	6	7	8			TX	RX	HIT
74.125.87.103											790	578	
☑ 67.122.199.250	☑	☐	☑	☐	☐	☑	☐	☐	switch_off ▼	☑ ☒	642	583	2
											0	0	
☐ 192.168.0.92	☐	☐	☑	☐	☑	☑	☐	☐	[Cycle] ▼	☑ ☒	215	41	5
											0	0	
☑ 192.168.0.93	☐	☐	☐	☐	☐	☐	☐	☐	toggle_stuff_and_log ▼	☑ ☒	823	822	0
											0	0	

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The checkbox to the left of the IP address is used to start/stop target monitoring. Confirm your action with button. This button is also used to link a list of outlets or a script line to the AutoPing target.

The current AutoPing item and target state are indicated as follows:

AutoPing target and item state indication

☐ 192.168.0.1	No checkmark indicates that the AutoPing item is not enabled.
☑ 192.168.0.2	Checkmark indicates that the AutoPing item is enabled and operating normally.
☑ 192.168.0.3	Red border around the AutoPing target indicates that it is awaiting a response (that a response has not been received for at least one ping within the "Ping timeout to reboot" period).
☑ 192.168.0.4	Yellow background indicates that the AutoPing item is undergoing testing before becoming initially enabled.
☑ 192.168.0.5	Orange background indicates that the AutoPing item has failed and the related action is being performed.
☑ 192.168.0.6	Green background indicates that the AutoPing item is undergoing testing before being enabled after a power-on or service restart.

You can select a scripting action to perform when the AutoPing item triggers (by default the selected outlets are cycled). The action must be a function defined in the scripting server, like

In the second form the argument selected_outlets (any other name will do) will receive a table of the 1-based indices of outlets selected (e.g. {1,3,6}). The order of outlets in the table is unspecified; use table.sort in the script function if you rely on a particular order.

The stats column shows useful statistics.

TX — the number of pings sent to the target IP address.

RX — the number of pongs received back so far;

HIT — the number of times the trigger action was executed.

On the sample image, three targets are being monitored (74.125.87.103, 67.122.199.250, and 192.168.0.93). 192.168.0.93 seems to be a very reliable/well-connected device: 823 pings were sent to it and 822 pongs received back. Chaces are very good, the 823rd pong will arrive soon. The reboot task (script function toggle_stuff_and_log) was never executed.

Looks like 192.168.0.92 failed hard. The task (cycle outlets 3,5,6) was executed 5 times in a row but the target did not respond. Monitoring was automatically disabled.

74.125.87.103 and 67.122.199.250 form a group, the trigger task will be performed if they both lose 5 sequential packets simultaneously. This has happened 2 times so far. Monitoring a group of several external spatially separated reliable IP addresses (in this example they belong to Google and Digital Loggers respectively) may become very useful to detect a stuck ADSL or cable modem or some other no-Internet condition.

Limited Actions Taken on Local Targets

AutoPing is designed to control operation of remote hosts. You usually don't want to e.g. cycle power to all servers if you turn on same subnet restriction. So AutoPing tries not to trigger if there might be a problem local to the unit itself. For example, if you detach the Ethernet cable from the Pro, you'll see messages in the logs similar to the following:

kernel: eth0: link downconfig.net: Interface "eth0" is down

autoping: ping x.y.z.t: no usable route to host, ..., not considered a failure

and no actions will be performed. A similar situation will occur if you reconfigure the controller to use a new IP network from which old addresses are unreachable. Use the link:// scheme to check for local link loss.

Advanced AutoPing Targets

AutoPing targets don't have to be IP addresses. If you enter a hostname, it will be resolved before sending each request. If the name resolution fails, it is assumed to be a local error and, as described above, no action is taken. If a name is resolved to multiple IP addresses, a random one is chosen.

AutoPing defaults to checking targets using the ICMP protocol by default. A variety of other ping target kinds can be used if you specify a URL instead of simply an IP address or hostname. Supported URL schemes include:

icmp — this is explicit specification of the "regular" ping protocol, e.g. icmp://192.168.0.1 is equivalent to 192.168.0.1 (note that no trailing slash is used);

link — this allows to check if the physical link is present on the wired (link://eth0) or wireless (link://wlan0) interface (which is useful as higher-level targets will usually ignore link loss);

tcp — this causes AutoPing to try to establish a TCP connection to the given port, e.g. tcp://192.168.0.1:22 can be used to check that there's a service listening on TCP port 22 (usually SSH) of 192.168.0.1 (note that no trailing slash is used);

http and https — this causes AutoPing to perform a HTTP/HTTPS GET request for the given URL, e.g. http://www.digital-loggers.com/index.html can be used to check that the web server is responding and can serve its

Web Power Switch *Pro*   digital-loggers.com

main page.

AutoPing Events

The most frequently encountered AutoPing events are:

pinging ... (timeout)
ping ... succeeded (time)
ping ... failed (time)

The time is request round-trip time, in seconds. Note that it's purely informative and can't be used as an accurate measure of target response time unless it has order of hundreds of milliseconds and above.

Several failures in a row will trigger AutoPing actions which are reported with corresponding events:

item ... (addresses...) failed [failures/max]
item ... (addresses...) failed over (max) times in a row, disabling

As described above, local network failures don't count toward failure count, but generate these notifications instead:

no usable route to host, possibly due to local network outage, not considered a failure (when a request isn't being sent)

ping ... not received (time), possibly due to local network outage, not considered a failure (when an outage occurred after a request has been sent)

The events associated with item trial before enabling are self-explanatory:

item ... (addresses...) enable approved
item ... (addresses...) enable cancelled
item ... (addresses...) trial restarted due to address list changes

AutoPing Minimal Example

In this simple example, we use AutoPing to automatically reboot a DSL router attached to outlet 1. The Pro is connected inside the router. We select a target IP of 8.8.8.8 This is a multi-cast address which connects to a multitude of Google name servers. We can safely assume that if none of them respond, we have lost network connectivity.

We connect the router to outlet 1, select it, and enter the external IP on the left. All timing parmeters below that are left to defaults. Clicking the box the left of the IP enables AutoPing. The "same subnet" restriction is disabled.

AutoPing									
Target(s)	Reboot Outlets								Script
	1	2	3	4	5	6	7	8	
☑ 8.8.8.8	☑	☐	☐	☐	☐	☐	☐	☐	[Cycle] ▼

Internet Access

Like to access your power controller over the Internet? A firewall is recommended. Need router settings? Learn how to configure your home router at portforward.com Give us a call if you need help.

Alexa / UPnP Compatibility

Like to access your Pro via Alexa? First, be sure that your Echo or similar device is fully set up and has access to your network. Log in to the Pro to set outlet/device names and enable UPnP. Select the **External APIs** link from the left sidebar. Click on **Enable UPnP service.** Press Submit.

Allow JSON-RPC:	☐
Allow REST-style API:	☑
Enable UPnP service:	➡ ☑
Enable SNMP service:	☑
Relax non-HTML method CSRF checks:	☐
Relax non-HTML content type CSRF checks:	☐
Submit	

Under UPnP outlet binding configuration, check to enable the outlets that Echo to will control. Set "Profile" for each outlet to belkin_wemo. Click **Submit**.

UPnP outlet binding configuration

#	Enable	Alternate name	Profile
1	☑ ⬅	Car Charger	➡ belkin_wen
2	☐	Outlet 2	belkin_wen
3	☑	Kitchen Light	belkin_wen
4	☑	My PC	belkin_wen

Finally, ask Echo to "discover devices". If the total count is short, repeat the discovery step. That's all there is to it! "Alexa, turn on the Car Charger!"

Mobile Device Access

Most mobile users find the Pro's web UI zooms well on phones and tablets, so in most cases, no app is required. Non-admin accounts have a simplified UI suitable for mobile devices with small screens. Third-party applications may be available to control various DLI products from Android and IOS. We welcome the contributions and encourage developers. Apps are sold and supported by independent developers, not by DLI. Learn

more: digital-loggers.com/mobile.html

Real-Time Clock
An internal Real-Time-Clock (RTC) is provided. This clock can be set manually using the **Date/Time** link. The time zone can be selected based on GMT. Internal batteries have an estimated 15-year lifetime.

Lua Scripting
The controller can be customized using the Lua language. The example script below reboots a modem weekly each Monday at 04:00.

```
-- Constants for convenience
local Jan,Feb,Mar,Apr,May,Jun,Jul,Aug,Sep,Oct,Nov,Dec= 1,2,3,4,5,6,7,8,9,10,11,12
local Sun,Mon,Tue,Wed,Thu,Fri,Sat=1,2,3,4,5,6,7
local Modem=1 -- Modem outlet

-- Start all of my scripts from here.
-- We can start several at once this way.
function start_my_scripts()
  thread.run(reboot_modem_weekly, "Reboot the modem every week")
end

-- Reboot the modem weekly
function reboot_modem_weekly()
  for i,t,data in event.stream(event.local_time({wday=Mon,hour=4,min=0})) do
    outlet[Modem].off()
    delay(45)
    outlet[Modem].on()
  end
end
```

A full description of Lua is beyond the scope of this manual, so please take advantage of the emedded example scripts and context sensitive help. There are several examples which you might modify to suit your needs. Click **Scripting** on the left sidebar, then click **Help** for more detailed help on Lua

scripting. You may also find lua.org helpful.

Remote Control via External APIs

The Pro can be accessed programmatically using a number of protocols and APIs, including: the REST-like API, in the following variants:

- **Regular HTTP**
- **CoAP over WebSockets over HTTP**
- **Command-line via SSH**
- **JSON-RPC (over HTTP)**
- **SNMP**
- **MQTT**
- **Modbus/TCP**
- **UPnP**

Find the latest documentation on each method in the online help by clicking on **External APIS** and **Help.**

Here are a few simple cURL commands to get you started using the REST API:

// Power ON outlet 1
curl -u admin:1234 http://192.168.0.100/outlet?1=ON

// Power OFF outlet 2
curl http://admin:1234@192.168.0.100/outlet?2=OFF

// Cycle an outlet outlet 8
curl http://admin:1234@192.168.0.100/outlet?8=CCL

// Get the encoded outlet status
curl -u admin:1234 http://192.168.0.100/status

Modbus / TCP

The Pro can act as a Modbus slave. Enable Modbus near the top of the **External APIs** page. Read/write priviledges are selected at the bottom of the page. Details are in the online help and at digital-loggers.com/modbus.html

SNMP Support

The PDU supports SNMPv1-3. Enable SNMP near the top of the **External APIs** page. Read/write priviledges are selected at the bottom of the page. Download the MIB at digital-loggers.com/ENERGY-OBJECT-MIB.txt You may need to use the importer tool from your management suite.

Please consult e.g. http://epcr.digital-loggers.com:5002/guide/html/apis.html (credentials: admin/4321) or the similar page in your controller for details. This documentation is context sensitive and remains in sync with your firmware release.

NB: bus objects with power metering exist in Ethernet Power Controllers and other products which include internal AC voltmeters and ammeters. The Pro does not contain ADCs, AC metering or GPIO.

SNMP Notes:

- The root of the OID tree is at 1.3.6.1.2.1.229 as per RFC.
- The objects are outlets, with indices starting at 1, and buses, with indices starting at 257.
- The power consumed is indicated in the eoPower table (1.3.6.1.2.1.229.1.2.1.1) for buses only.
- The current actual power states are indicated in the eoPowerOperState (1.3.6.1.2.1.229.1.2.1.9) table;
- The assigned (expected) power states can be manipulated in the eoPowerAdminState (1.3.6.1.2.1.229.1.2.1.8) table;
- Supported power states are IEEE1621Off (257) and IEEE1621On (259) only.
- Bus objects have unknown (255) power state as they are not directly controllable.

Using SNMP to Manipulate Relays:

To set relays via SNMP, be sure to manipulate eoPowerAdminState values, not eoPowerOperState, and be sure permissions are OK. Details are in the built-in help and at digital-loggers.com/snmp.html

Backup and Restore
Select specific function categories to backup and restore. Note that some restorations may require a reboot or physical access to the hardware reset switch.

Safety Shutdown
The Pro uses a UL rated thermal circuit breaker for safety. In the event of an overload, the breaker will trip. Correct the situation by removing excessive load, then allow a minute or two for the breaker to cool. Use the red rocker switch to cycle power off then on again to reset the breaker. The maximum rated current is 15A.

External Environmental Sensor
A 3.5mm jack near the antenna connector provides power and ground for TTL environmental sensors. The tip is bidirectional TTL data, the ring provides 5V and sleve is grounded. The Dallas DS18B20 is recommended. DHT-11 sensors are also compatible but not as rugged. The sensor is detected automatically when attached. Sensors are sold separately.

Open Source Code
In compliance with the spirit of the GNU public license, most source code is provided for reference. Purchasing a TLA and signing an NDA from Qualcom/Atheros is highly recommended before attempting any custom development. DLI can't provide warranty or tech support for modified units.

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AutoPing

Rack Mount Model

Scripting

DLI Home

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Specifications

Applications	Test equipment. Commercial, industrial, and residential remote power control and reboot, Indoor use only
Audio Alert	73dBa at 12" programmable
Circuit Breakers	Manual reset, 15A Thermal Supplemental, UL
Clock / RTC	15 year Li battery, under 2 grams
Controls / Display	Reset -to-factory-default switch, 2x16 Backlit LCD with power Save, 5 button keypad, manual reset button
Enclosure	Steel, double grounded. Vented 4 sides. Fanless.
Ethernet Interface	10/100 autosensing, Auto-MDIX, Static or DHCP Ports selectable, 8 pin RJ-45 w/ internal filtering
FCC Testing	Part 15 FCC ID 2ACIUEPCR5 contains 2ACOE-SKW71
Humidity	8-80% RH Operating
Input Power Cord	Removable 16-14AWG 120VAC C-19
Inlet and Outlet Rating	UL, CSA 15A, 5-15,120VAC only
Input Frequency	Power supply - DC-400Hz
Operating Temperature	-30º to 170ºF, -34º to 77ºC
Options - Factory	Input cord and plug options, rack bracket, temp. probes
Power Supply Rating	90-240V, AC/DC Autosensing
Password Transmission	Encrypted, base 64 or HTTPS
Power Dissipation	3.9W Typ Max (all on) <3 W idle
Power Fail Hold-Over	200ms minimum (all relays on)
Power-Up Modes	Last used settings, all power on or off, sequential on or run user-script. Scripts start ~30s after power-up
Protocall Support	Alexa, HTTP, HTTPS, IFTTT, SSH, SSL, NTP, Json--RPC, MQTT, Lua, UPnP, SNMP, JABBER, SYSLOG, RESTful cURL API, MODBUS/TCP, EMAIL, XMPP, UPP, CoAP over web sockets
Relay Specs	40A AC NO, silver alloy contacts, 1/2HP, 12V DC coil
Surge Protection	3600W Metal Oxide Varistor
Size	5.5x13.7x1.6'"
Weight (packed)	Single unit 4.7lbs 2.2kg
WiFi	Atheros 9331 2.4G 802.11n RP-SMA - FCC Note: The Pro may only be used with (1) the manufac- turer supplied antenna (Gain: 2.0dBi),or (2) a 50 Ohm antenna of equal or lesser gain.

Limited Five Year Warranty

The terms of this warranty may be legally binding. If you disagree with the terms below, return the product immediately in original unopened condition for a full refund. The purchaser assumes the entire risk as to the results and performance of the unit. DLI makes reasonable efforts to ensure that this power controller is free of major defects. No agency, country, or local certifications are included with this unit. It is the responsibility of the user to obtain such certifications if necessary for the customer's application. Buyer acknowledges and agrees that he is solely responsible for proper use, certification and safety testing of components supplied by DLI. DLI's entire liability and exclusive remedy as to defective hardware shall be, at DLI's option, either (a) return of the purchase price or (b) replacement or repair of the hardware that does not meet DLI's quality control standards and has been returned through proper RMA procedures. DLI's liability for repair or replacement is to DLI's customer ONLY. NO SUPPORT IS PROVIDED FOR MODIFIED FIRMWARE. MODIFICATION OF FIRMWARE VOIDS ALL WARRANTY. Warranty service requires an original invoice from DLI and an RMA number provided by technical support. RMA material must be shipped prepaid to DLI. RMA numbers are valid for 15 days from date of issue. This warranty does not cover products which are modified (including firmware modifications), subjected to rough handling, or used in applications for which they were not originally intended. Batteries are not covered under warranty. Physical damage caused by customer or in transit to DLI is not covered under warranty. Please insure shipments. No oral advice or verbal warranties made by DLI's employees, dealers, or distributors shall in any way increase the scope of this warranty. DLI makes no warranty as to merchantability or fitness for any particular purpose. DLI assumes no liability for incidental or consequential damages arising from the use or inability to use this product. This warranty gives you specific legal rights. You may also have other rights that vary from state to state. Since some states do not allow the exclusion of liability for consequential damages, some of the above limitations may not apply. Auto-Ping™ is a registered trademark of Computer Performance, Inc. Since this is a FLASH based product, firmware should not be updated over the Internet or a busy LAN. Packet loss could result in FLASH corruption, requiring mail-in service. This product is designed for indoor use only. It should not be used for outdoor, mobile, airborne, or FDA Class III applications.

DIGITAL LOGGERS, INC.

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Compatible Products:

90-240VAC Smart PDU

DIN Relay

2x50A, 8x15A DC Smart Switch

Dual bus 120V PDU with metering and I/O

Smart PoE Injectors

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