Ethernet Power Controller 7

USER'S GUIDE

DIGITAL LOGGERS, INC.

Features

Congratulations on selecting the DLI Ethernet Power Controller 7, a smart rack-mount 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 power cycle to automatically reboot it without user intervention. Several devices can be monitored simultaneously.

8 Switched Duplex Circuits + 2 Unswitched Outlets

Eight individual switch control circuits are provided with duplex outlets. Outlets are spaced for plugs and adapters. Un-switched outlets are provided for “always on” devices. Switched outlets are metered in two banks. Unswitched outlets are unmetered.

Programmable LCD Display and Keypad

A 2x16 LCD displays status for each outlet. Custom messages can be displayed via Lua scripts. A front-panel keypad provides local control and can be disabled.

Multi-User Password Security

Multi-user authentication limits access to the power controller. The administrator selects which outlets each user controls.

Sequenced “On Timer”

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

MOV Surge Suppression

Dual 3600W metal oxide varistors clamp power surges and spikes, protecting attached devices.

Scripting Language, Syslog, and Utilities

Lua scripting can be used to create custom control and reboot sequences, schedule periodic reboots, etc. Internal and external event logs are provided.

UPDATED Features

New hardware features include powerline surge dection, a high current driver for external relays, and larger internal power relays. Recently added features include context sensitive help, REST-ful API, MQTT support, Amazon Alexa compatibility, environmental sensor port, option expansion port, E-mail, SNMP and Jabber notification, improved power metering, a light sensor, internal temperature sensor, RS-232 for future expansion, extended battery life, HTTPS, WiFi support, web power meters/charts and Lua scripting. Future firmware upgrades may be necessary to access newer hardware features. Firmware is constantly being improved and is field upgradeable via Ethernet.

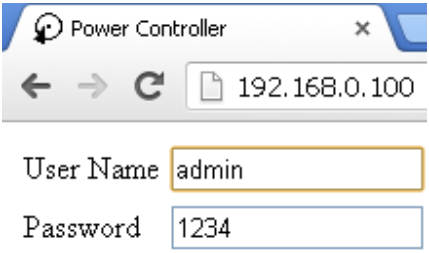
Package Contents

- Ethernet Power Controller 7 with NEMA 5-15 plugs and outlets.
- Reversable rack ears attached to front of unit.
- RP-SMA WiFi Antenna.
- Internal web server backup battery.
  (Battery is disconnected before shipment, located behind right front panel hatch)

Please 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.

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

Experienced? Use these shortcuts.
We recommend that first-time installers skim the entire manual.

- Unpack. Save the carton. Attach line cords to 15A circuits.
- Attach an Ethernet cable from the controller to your LAN. Switch power on. If you are attached through a switch, you may need to cycle switch power to 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.
- Log in to the power controller 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 on both inputs and battery depletion or disconnection.
- Configure the power switch 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 live loads.

IP Setup

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.

Windows Step 1

In Windows, 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 Newtork Connections**. A Network Connections window appears. Right click on the network connection to the switch, ie. **Local Area Network**. Proceed to step 2.

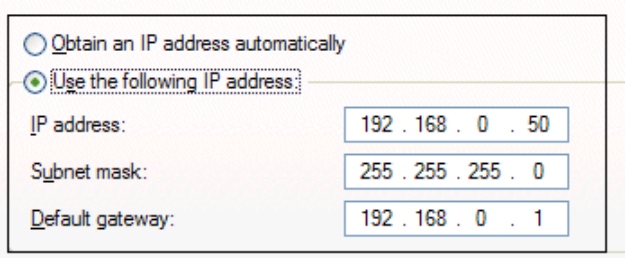
Windows 7: Open the **Start orb**, click on **Control Panel**. Click **View Network Status and Tasks**, then **Change Adapter Settings**. Proceed to step 2

Windows 8-10: Mouse or swipe to the bottom right corner and select **Settings**. 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 and 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 switch.

Select **Internet Protocall TCP/IP V4 Properties** and click **Properties**. Enter a compatible static IP such as: Click **Apply** and close windows. Ping the power switch to confirm the connection.

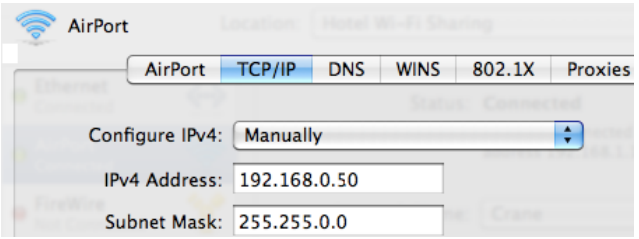


Point your browser to 192.168.0.100 Log in. Detailed instructions are at digital-loggers.com/ip_setup

Max OS X

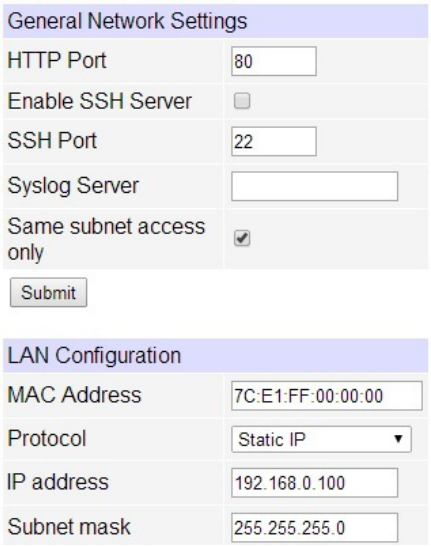
Turn **AirPort** off temporarily. Click the Apple logo, then **System Preferences**, then **Network**. Select **Built-In Ethernet** and then **Configure.** Under the **TCP/IP** tab, select **Manually** and enter an IP address such as 192.168.0.0 as shown:

Make the changes shown. Point a browser to 192.168.0.100 Log in. Find Mac setup details at digital-loggers.com/mac_ip_setup



Network Configuration

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 controls network configuration:



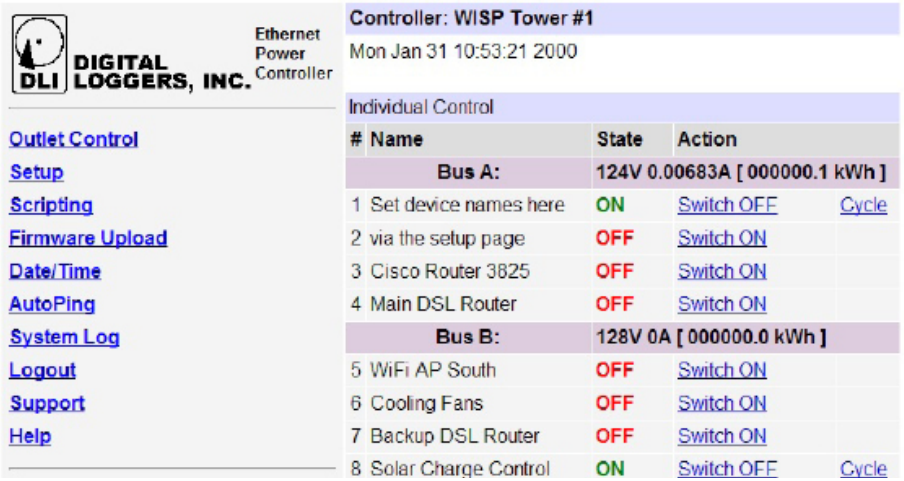
The IP address of the controller usually must match the “class C” of your system. In other words, the first three bytes (192.168.0) must match the IP on your computer to access the controller. Using a **Ping** utility is a good way to confirm a valid network configuration. An “unreachable” report from **Ping** indicates a misconfigured network.

Once you have a connection, the controller may be operated via a web browser. To access the controller, 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 that some browsers will deny connections to ports under 1024.**

Home (Outlet Control) Page



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 limited access to 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

An updated scripting language based on Lua lets you customize

the power controller. Scripts may be started manually, automatically on power-up, by external http commands, or by AutoPing events. Find a list of commands and examples 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 choose to automatically reboot both a router and a switch attached to two different circuits. See page 12.

System Log
The power controller 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 logout in advance.

Programmable Web Links
User-defined web links are provided. Set names and destination URLs for these links on the **Settings** page.

Switching Outlets

The outlet control page lets you control any duplex outlet (except the always-on pair). A master control allows those users with access to switch all outlets on or off.

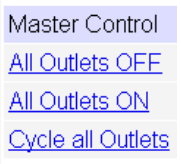
Individual Control				
#	**Name**	**State**	**Action**	
1	DSL Router	ON	Switch OFF	Cycle

To switch an outlet, simply click to the right of the outlet name or number. On->Off switching is immediate Off->On switching is subject to the configurable On Sequence Delay..

Use the front panel 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 controller. 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, on power-up, or when switching manually using the front panel. This prevents power surges. A *separate* Cycle delay setting is provided on the setup page.



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 Controller Name to the power controller itself. An example is **Server 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** button to the right of the outlet name if you would like a pop-up window to

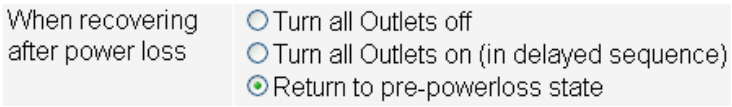
appear before switching critical outlets.

Power-On Sequence Delay
When a time value is entered in the **All ON Sequence Delay** field, the power controller 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 three failed login attempts, the switch can disable access for a selected period of time (0-60 minutes).

Power Loss Recovery Modes
The power loss recovery mode setting has a very important setting that determines operation 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 Sequency 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 except by pressing the physical reset button below the LCD.*

AutoPing™

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. Four main parameters control AutoPing:

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

Ping failures before reboot
This sets the number of failed communications attempts that must be sequentially detected before a power cycle. For example, when set to 5, the target system must fail to respond 5 times in a row before it is rebooted. Since occasional network timeouts and packet loss can occur during normal Ethernet operation, between 5 and 10 pings is suggested.

Times to Attempt Reboot
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 reboot your server up to 5 times before giving up.

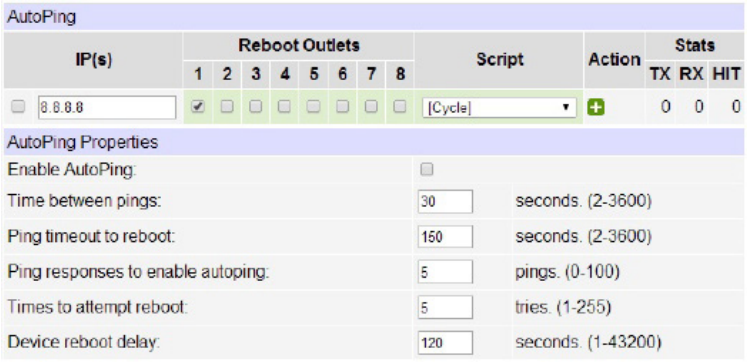
Device Reboot Delay
After power cycling to reboot a device, a waiting period will occur before the IP address is re-checked by AutoPing. This delay allows the device time to reboot. Most devices take some time to reboot. Windows and Linux servers can force automatic file system checks which may take several minutes to complete. To allow for startup delays, enter a time delay in the **Device Reboot Delay** period. For example, a reasonable value for a typical server might be 10 minutes (600 seconds). Entering 600 would cause the power controller to start checking the server for normal IP operation 10 minutes after reboot.

Find more details at: digital-loggers.com/AutoPing2.html

AutoPing Example

In this example, we use AutoPing to automatically reboot a DSL router. Since the switch 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, enter the external IP on the left, and leave all timing values at defaults.



Internet Access

Like to access your power controller over the Internet? Learn how to configure your router at port-forward.com A firewall is recommended.

Mobile Device Access

Non-admin accounts have simplified UIs suitable for smaller LCDs. Third-party apps are available to control various DLI products from Android and IOS. These 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. Set it manually using the **Date/Time** link. The time zone is selectable based on GMT. Clock batteries have an estimated 15-year lifetime.

Web Server Backup Power

A separate rechargable battery pack maintains web server operation for a few minutes during power failures. Batteries are located on right side of teh faceplate. To open the battery compartment door, press the latch to the left of the door.to access the battery and connect the cable. Allow 48 hours for full recharge. Web server batteries should be replaced after 5 years of use.

Lua Scripting

The controller can be customized using the Lua language. A full description is beyond the scope of this manual. Please visit digital-loggers.com/Lua.html

RESTful API

To easily develop your own control app, please read digital-loggers.com/restapi.pdf

Power Metering and Time Integration

Four web meters provide voltage and current readings on the A&B bus. Cumulative killowatt hours are displayed. For non-PFC loads, a power factor correction value may be manually enetered on the setup page. Current metering includes only the switched outlets. Co-location users may elect to use the unswitched outlets for “house power”. To avoid tripped breakers, take the current drain of the unmetered outlets into account when operating near the 15A per circuit maximum rating.

Meters & Charts

Histograms can be created with user-selectable time scales and metering sources: AC input currents, AC input voltages, battery voltage, and CPU / Relay voltages are metered. A thermistor monitors CPU and control board temperature, which should never exceed 185F. An external sensor port is provided for Dallas 1-wire and similar sensors. The 5V meter monitors the control board VCC, and the 12V meter indicates control relay power. Batteries are fully charged at 5.60V and 90% discharged at 4.60V.

Safety Shutdown "E Breaker"

Supplementary over-current, over-voltage, and low-voltage shutdown are provided on the safety shudown page. Take care when configuring the E-Breaker so as not to create an oscillation.

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 Atheros are highly recommended before attempting any custom development. DLI cannot provide warranty or tech support for modified units.

Tech Support

Please register. Painless online registration gets you free tech support, firmware updates, and information. Check the FAQs link below. Also note that internal help links are now context sensitive.

Suggestions

Looking for a new feature? Let us know:
engineering@digital-loggers.com We'll listen.

FAQs

Please check the FAQs at:
digital-loggers.com/epcr7faqs.html

Specifications

Alert Beeper	73dBa at 12" Programmable
Applications	Test equipment, industrial, datacenter power control and reboot. Indoor use only.
Circuit Breakers	Manual reset, 15A Thermal, UL Supplemental
Clock / RTC	15 year Li battery
Controls / Display	Reset -to-factory-default switch, 2x16 Backlit LCD w/ PowerSave, 5 button keypad, E-Stop
Enclosure	Steel, double grounded. Vented 4 sides Fanless
Environmental Port	RJ-12. Suitable for DHT/SHT series sensors
Ethernet Interface	10/100 autosensing, Static IP, TCP port selectable, 8 pin RJ-45 w/ internal FCC filtering
FCC Testing	Part 15 FCC ID 2ACIUEPCR5
Humidity	8-80% RH Operating
Input Power Cord	Fixed 14AWG with 5-15 plug standard 120VC only
Inlet and Outlet Rating	UL, CSA 15A, 120VAC only
Input Frequency	Power supply - DC-400Hz
Metering Accuracy	+/- 2V, +/- .5A when calibrated at 50-60Hz only
Operating Temperature	-30º to 170ºF, -34º to 77ºC
Options - Factory	Input cord length and 120V plug style
Power Supply Rating	90-240V, AC/DC Autosensing
Password Transmission	Encrypted, base 64 or HTTPS
Power Dissipation	5.3W Typ Max (all on, battery charging) <3 W idle
Power Fail Hold-Over	350ms minimum (all relays on)
Power-Up Modes	Last used settings, all power on or off, sequential on or run user-script ~30s after power-up
Relay Contact Spec	15-25A AC/DC, 1/2HP
Surge Protection	Dual 3600WMetal Oxide Varistors
Size	3.5x5.5x19" 8.9x14x48cm 2-U
Weight (packed)	Single unit 10.3lbs 4.7kg
WiFi	Atheros 9331 2.4G 802.11n RP-SMA - FCC Note: The EPCR5 may only be used with (1) the manufacturer 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 do not agree to the terms listed 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 warrants this power controller to be free from 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 your 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 to you. 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 is not intended for and should not be used in outdoor, mobile, airborne, or FDA Class III applications.

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DIN Power relay with WiFi

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