Web Controlled

DIN Relay III

USER'S GUIDE V3.1

DIGITAL LOGGERS, INC.

Standard Features

Congratulations on your purchase. The DIN relay is an industrial Ethernet controlled relay with these features:

Web Interface, Keypad and LCD
The internal web server is accessible from any standard web browser. Just enter an IP to configure and control via the web,
or use the keypad and LCD for local control.

8 SPDT Relay Outputs
Eight sets of single-pole double-throw contacts are provided. Screw terminals are rated at 6-10 amps over commercial temperature range. T-90 relays have 15-30A 277V ratings.

Universal Power Input
An internal bridge rectifier and switching power supply accept 9-24 volts AC or 10-48 volts DC. Input polarity doesn't matter.

New: **RS-232 Port, UVLO**
An RS-232 web terminal and undervoltage lockout have been added to version 3.1

Security: Password, HTTP Port and Subnet Restriction

Password security and a changeable HTTP port help control access. Subnet restriction limits control to your LAN. Multiple users are supported with individual relay masking.

Sequenced "On Timer"
A programmable delay timer allows relays to be switched on in sequence, rather than simultaneously. Many loads draw more power when they are initially switched on. Sequencing prevents circuit overloads when loads devices are attached to a single circuit.

Scripting, AutoPing, and FLASH Firmware Upgrades
A BASIC style scripting language provides simple PLC function-ality. AutoPing monitors and reboots routers, servers and IP gear automatically. FLASH firmware is upgradable via local hardwired TCP/IP as new features become available.

Mounting Rails

The DIN relay mounts on standard 35mm rail. Call us at (408) 330-5599 if you need a piece cut to length. To mount directly use #8 screws on 5.308"x1.968" centers.

Maximum Terminal Torque

Use stranded wire only. Torque terminals to 20in-lbs max.

Important Factory Defaults

DEFAULT IP ADDRESS AND LOGIN
The factory default IP address is 192.168.0.100
User name: admin (lower case)
Password: 1234

RESET PROCEDURE
To reset the IP address and login to defaults:

• Gently depress the reset switch with a stylus.

• The LCD displays "Reset to Defaults". Wait 30 seconds. You may need to restart your router or when the IP changes.

Note: A hardware reset affects the admin login credentials and IP address, but it won't change relay names, links, or scripts.

Quick Setup

Use these shortcuts for a quick installation:

1. Connect using an RJ-45 cable. Make sure the 192.168.0.100 IP is compatible with your LAN.

2. Apply power to the relay. The LCD will illuminate.

3. Enter 192.168.0.100 in your web browser address bar. If the login page doesn't appear, follow the IP Setup instructions.

4. Login using the default user name, **admin** (lower case). Enter the default password, **1234**

5. Use the setup page to add relay names or change the IP.

6. Important⊳ Set the recovery mode for safety after a power failure. The recovery mode controls default relay settings after power is restored.

7. Change the password to improve security.

Tip: An ohmmeter is handy for testing the relay before attaching equipment.

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 IP such as 192.168.0.50 Before adding an IP, close programs and browsers. After the link is established, you can revert to DHCP or use a combination of DHCP and static IPs.

Windows Step 1

In Windows, the first step to changing IPs is locating the network adapter TCP/IP properties. The procedure differs for each version of Windows:

Windows XP, 2000, 2003: Open **Start / Control Panel / Network Connections**. If you're using "classic view", it's **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: Use the default **Category View**. Open the **Start orb**, click on **Control Panel**. Click **View Network Status and Tasks**, then **Change Adapter Settings**. Proceed to step 2

Windows 8: Mouse or swipe to the bottom right corner and select **Settings**. Select **Control Panel**. Select **Network and Sharing Center**. Change **Adapter Settings**. 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. If you are using DHCP, it's easiest to temporarily disable it while configuring the relay.

Select **Internet Protocall TCP/IP V4 Properties** and click **Properties**. Enter a compatible static IP. Click **Apply** and close windows. Ping the relay to confirm. Point your browser to 192.168.0.100 Log in.

Max OS X IP Setup

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 192.168.0.50

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Basic Operation

After initial power-up, the relay performs a sequence of self-tests to ensure reliability. After self-test, an internal web browser starts at the fixed (static) IP address set on the setup page. If enabled, script execution starts on line 1.

The relay may then be operated via the web. To access the relay, simply enter the IP address (ie. 192.168.0.100) in the URL field of your web browser.

Home Relay (Relay) Control Page

To access the home page, first enter the IP address in web browser URL field, then log in. The home page contains links to other pages. The first four are static internal links:

Relay Control
Clicking "Relay Control" links to the home page used for manually switching relays on and off. Access masking to specific relays is determined by your login.

Settings
Clicking "Settings" links the administrator to a configuration page. This page is used to set relay names, power on features, network settings, user information and passwords.

Help
The Help link displays the latest online manual. Since features are subject to change without notice, online manuals are usually more current than printed manuals.

Logout
Logout ends the authenticated web session. Login to reconnect.

Programmable Web Links
Four additional user-defined web links are provided on the relay control page. Factory defaults are "Manual", "FAQs", etc. You may change the name and destination URL for these links on the "Setup" page. These links are convenient for connecting to other power switches or to remote sites.

Switching Relays on and Off
The relay control page lets you control any relay. The sequence delay in which relays will be switched on is determined by settings on the setup page.

To switch a relay on or off, simply click to the right of the relay name or number. Switching is immediate. You may also "Cycle" an attached device.. This is useful for rebooting devices which may interrupt the network link to the relay. Clicking "Cycle" switches power off, waits a few seconds (as specified by the sequence delay), and then switches power back on. You may also "cycle" all relays via the "Cycle all relays" button.

Most browsers have an internal setting for maximum refresh rate. Depending on your web browser settings, you may need to click the "refresh" button to update the on-screen status display after changes.

Setup Page

These settings configure the relay. Only admin has access.

Switch and Relay Names
Use the switch name field to assign a Switch Name to the power relay itself. Examples are "Machine Tool Controls" or "Lighting Relay". The Switch Name field appears on the top of the home page. Assign an identifying name to each load, such as "Sump Pump" or "Email Server".

Power-On Sequence Delay
When a time value is entered in the "All ON sequence delay" field, the power relay will pause for a period of time before energizing each relay on in sequence. This delay can prevent the power surges and blown circuit breakers which can occur when multiple loads are switched on simultaneously. A delay of 60-120 seconds is typical.

You may also enter a screen refresh delay. If "Enable screen refresh" is checked, and a delay value is entered, your browser should periodically update the status screen. The maximum update rate is limited by browser settings.

Power Loss Recovery Modes

The power loss recovery mode setting has three setting options which take effect after every power failure:

1. You can turn all relays off (all relays stay switched off until manually turned on later) by checking the first box.

2. You can automatically turn all relays on using the "All ON sequence delay" described above. Check the second option to do this.

3. You can return to the same relay settings that were used prior to the power loss. The "All ON sequence delay" will also be used in this instance. Check this option for ALL ON.

A script starting at line 1 will override these settings.

User Defined Links

You may link to other power relays, your own web pages, or remote web sites by entering up to four URLs and descriptions in the Setup page. For example, enter "Site Two Power Switch" in the description field with a URL of "192.168.0.102" These links appear in a left column.

Confirm Option Checkbox

Checking "Confirm" causes the web server to issue a confirmation dialog box before accepting any on/off change.

Adding Users

Only the admin may add users and passwords. Each user may control certain relays using the masking matrix. It is possible (but not recommended) to add a user without a password. This will allow unauthenticated access to selected relays. Only non-admin user web pages are scaled for mobile devices.

Network Settings

A fixed IP address, network mask, gateway, and subnet mask must be entered in this field. To lock these settings, click the "protect" button. This prevents change until the hardware reset button is pressed.

When changing IP addresses, 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.

Internal Scripting Language

The scripting language can be used to customize operation. It uses BASIC-like commands. Learn more and find sample scripts at: Digital-Loggers.com/Scripting.html

Auto Ping Automatic Reboot

The internal AutoPing™ feature is a handy system for rebooting IP equipment without human intervention. AutoPing works by cycling power when a device becomes unresponsive to IP pings. To learn more about AutoPing and how to use it, visit: Digital-Loggers.com/AutoPing.html

Security

Your relay employs secure challenge-response authentication, with a new encryption token for each transaction. This gives it fairly good out-of-the box security. Making it more secure takes just a moment:

Changing the Password

It's a good idea to change your password. You will be prompted to change it from the default. Use the Setup page to change it. Write it down in a safe place.

Restricting Subnet Access
To restrict access to only the 255 IP addresses on your LAN, or "Class C", enable the subnet restriction on the setup page.

Changing the HTTP Port
Changing the HTTP port to a non-standard value makes it very difficult for a hacker, even one with your password, to find the relay. The default port is 80. For example, if you change the port to 5372, use http://192.168.0.100:5372 to access the relay.

Installing Inside a Firewall
Install your relay inside a firewall (using port forwarding), rather than directly on the internet for an additional layer of security

Power Input and Consumption

Your relay can be powered from an external AC supply as low as 9VDC and as high as 24V. Do not exceed 24V AC input. A DC supply of 10 to 48V may be applied. Connect one side of the supply to the + terminal, and the other to the – terminal. Polarity is unimportant. The relay contacts are fully isolated (1KV hipot tested) from the power supply.

Maximum relay power dissipation occurs at 10V DC. Undervoltage lockout occurs at approximately 10V with 1.5V hysteresis. The switching supply can survive input voltages up to 63VDC, but 48VDC is the maximum recommended. Current drain decreases with input voltage due to the use of a bucking regulator. The lowest power consumption occurs at idle, approximately 2W. With all relays energized, power consumption increases to approximately 4W. Although the case is well ventilated, ambient air temperature should not exceed 150F for maximum reliability. Surges over 63V P-P may damage the internal regulator. Add an external MOV or other protection device across the power input terminals in noisy environments.

Relay State	DC Volts	I (A)	Power (W)
All OFF	10	UVLO	Cutout
All OFF	11.5	UVLO	Startup
All OFF	10	0.19	1.91
All ON	10	0.41	4.10
All OFF	12	0.15	1.80
All ON	12	0.34	4.10
All OFF	24	0.073	1.75
All ON	24	0.162	3.89
All OFF	48	0.036	1.75
All ON	48	0.081	3.88

At 60Hz, AC power consumption is approximately 15% higher.

Status LEDs

The LCD now provides Ethernet cable connection status. LEDs on the connector are not used.

Manual Controls

Use the keypad to manually select and switch relays. Hold a button down for 5 seconds to lock or unlock a relay, Local keypad control may be disabled in software by the admin.

Contact Ratings and Protection

The internal T-90 Relays have the following ratings:

240VAC	NO 25A	NC 20A
277VAC	NO 20A	NC 15A
30VDC	NO 20A	NC 10A
250VAC	NO 1HP	NC 1/2HP

Relays are RU and CE approved, rated at 1 million mechanical, 250,000 electrical operations at 50% load and 800,000 operations at 10% load. The relays are sealed.

Because the DIN case terminals are rated at 10A peak, 6A continuous, we suggest limiting sustained current to 6A. Only stranded wire of appropriate gauge should be used. Terminals must be well torqued to 20 in-lbs max. It is wise to recheck torque after completing the installation.

Heavy traces and gold plating are used to minimize internal resistance between the terminals and relay contacts, typically 25m Ohms, so contact power dissipation is not normally a concern.

For maximum flexibility, relay contacts are unprotected. For high current inductive switching, consider adding an external snubber circuit to extend contact life. Download contact protection information from: DINRelay.com/RelayCare.pdf

RS-232 Console

Clicking the "Console" button on the Scripting page spawns a web terminal for remote management of RS-232 devices. Console 1 is the external serial port. Port 2 is reserved for internal TTL expansion options. Learn more about serial port operation at Digital-Loggers.com/SP.html

Base Screw Hole Mounting Dimensions
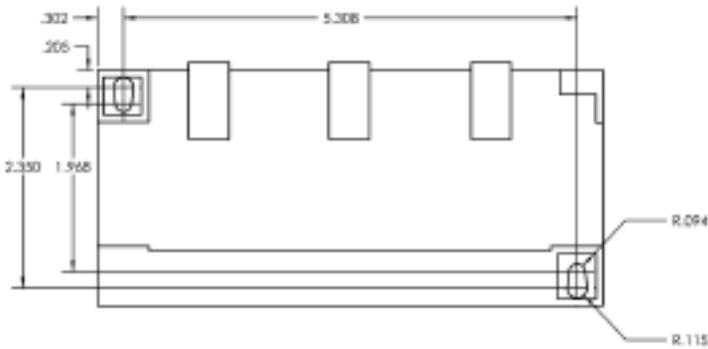
Download a drawing from:
Digital-Loggers.com/DINDrawing.pdf

System Log Feature – Email Reporting

A system activity log is accessible from the Setup page. The system log contains reports of all major activity including login attempts, setting changes, relay state changes, etc. Multiple relays and other DLI power controllers can report to a centralized syslog server. More information on setting up a syslog server is available at:
Digital-Loggers.com/Syslog.html Email reports can be triggered by certain events. DLI provides a free Windows utility to log status and generate automatic emails: Digital-Loggers.com/pcl.html

Frequently Asked Questions

Check the DIN FAQ page for answers to frequently asked questions: Digital-Loggers.com/DINFAQS.html

Specifications for DIN Relay III can be found at:
Digital-Loggers.com/DIN3SPEC.pdf

Remote Control from your Application

The relay can be easily controlled from your application in Windows or Linux. Find sample applications and more information at: Digital-Loggers.com/DINFAQS.html

Learning the BASIC Scripting Language

The relay can be easily customized using built-in control language. A good place to start is with the sample scripts:
Digital-Loggers.com/Scripting.html

Scheduling Feature

With a script, the internal clock can execute commands on a schedule. For example, the DIN relay could be used as an HVAC or lighting controller. Learn more at:

Digital-Loggers.com/Scheduling.html

At DLI, We Listen…

Your feedback is appreciated. Please send suggestions: Engineering@Digital-Loggers.com We're constantly working to improve, so product specifications are subject to change.

Limited One-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 relay 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 they are necessary. 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. WARRANTY SERVICE DOES NOT COVER DAMAGE TO SCREW TERMINALS FROM EXCESSIVE TORQUE OR DAMAGE DUE TO EXPOSURE TO WATER, MOISTURE OR VIBRATION. DLI will not service relays which show evidence of overloading or misuse. No warranty service will be provided without 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 modified, subjected to rough handling, or used in applications for which they were not originally intended. 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 ave 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 may not apply. This relay is not designed, qualified or intended for mobile, marine, airborne, medical or aerospace use.

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