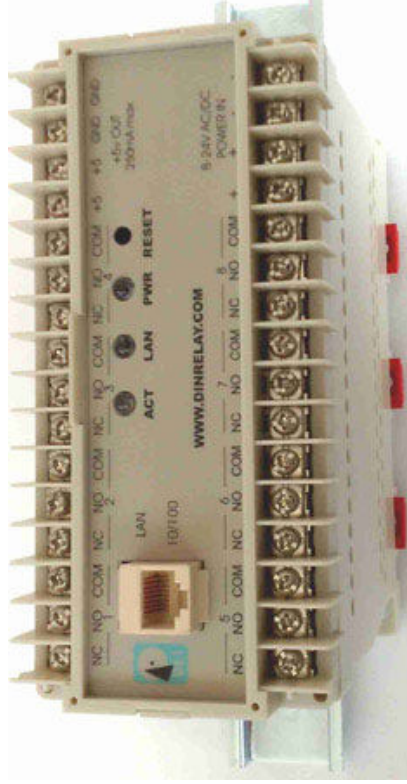


Web Controlled DIN Relay



User's Guide

Standard Features

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

Web Interface

The internal web server is accessible from any standard web browser. Just enter an IP to configure and control via the web.

8 SPDT Relay Outputs

Eight single pole double throw contact outputs are provided. Rugged T-90 relays are used with 15-30A 277V ratings.

Universal Power Input

An internal bridge and isolated switching power supply let you power the relay from 8 to 24 volts, AC or DC. Input polarity and grounding don't matter. An accessory 5VDC output is provided to power small external logic circuits.

Security: Password, HTTP Port and Subnet Restriction

Password security limits access to the relay. A changeable HTTP port makes the relay virtually impossible to access without knowing your custom URL. Subnet restriction restricts control to your LAN.

Sequenced "On Timer"

A programmable delay timer allows relays to be switched on in sequence, rather than simultaneously. Many circuits draw more power when they are initially switched on. This timer is useful in machinery applications where several devices may be attached to a single circuit without overload.

Flash Firmware Upgrades via Ethernet

Upgrade FLASH via Ethernet as new features become available.

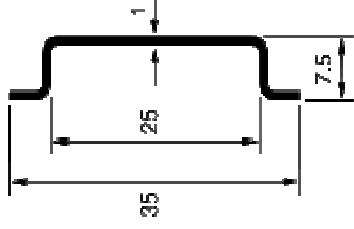
At DLI, we listen to customers. Please send suggestions to engineering@digital-loggers.com. Since we're constantly working to improve, product specifications are subject to change without notice.

Optional DIN Mounting Rails

Call DLI at (408) 330-5599 for competitive pricing on extruded aluminum 35mm DIN rail. We'll cut to your desired length.

Use these dimensions when fabricating your own rails.

To mount without a rail, use the four corner mounting holes on 5.672x2.522" centers.



Important Factory Defaults

DEFAULT IP ADDRESS

The factory default IP address is 192.168.0.100

DEFAULT LOGIN

User name: admin (lower case)

Password: 1234

RESET PROCEDURE

To reset the IP address and login to defaults:

- Switch the unit on
- Gently depress the reset switch with a pen for 2 seconds.
- The ACT and PWR lights will flash.

Note: This resets the admin login and IP address, but it won't affect relay names and links.

Quick Setup

Use these shortcuts if you are an experienced installer. Please read the manual if you haven't connected a web accessible product before.

1. Connect to your LAN Using a straight RJ-45 cable. Make sure the 192.168.0.100 address is compatible with your LAN, otherwise use a crossover cable directly to your PC.
2. Apply power to the relay. The PWR light will illuminate.
3. Enter 192.168.0.100 in your web browser address bar. If the login page doesn't appear, follow the network 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 for improved security.

Tip: An ohmmeter is handy for testing the relay. This ensures that it has been configured properly before attaching your equipment.

Windows IP Setup (2000, 2003, XP, Vista)

If your default Windows settings won't access the relay, use a crossover cable and follow these steps to reach the relay.

1. Before adding an IP, close network programs and browsers. Go to the Network Settings – Local Area Network.

2. Use the keyboard shortcut <Windows-R> - type "ncpa.cpl" and click OK.
3. Right click on your LAN connection and choose "Properties". Highlight "Internet Protocol" and click the "Properties" button.
4. Click the "Advanced" button. Under the IP Address settings, click the "Add" button.
5. Enter a new IP, such as 192.168.0.10, and a subnet mask of 255.255.255.0. Press the "Add" button. This new IP is added the list.
6. Close all windows for the configuration to take effect.

Start your Browser and type 192.168.0.100 in the URL field. The login page should now be displayed. The default user name and password are "admin" (lower case) and "1234".

Basic Operation

After power-up, the relay performs a sequence of self-tests to ensure reliability. After self-test, an internal web browser starts using the fixed (static) IP address selected on the setup page.

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

Home Relay (Outlet) 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:

Outlet Control

Clicking “Outlet Control” links to the home page used for manually switching relays on and off. Access 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, this manual may not be a perfect match for your relay, but the later manuals will include all legacy features.

Logout

Logout ends the web session. A login is required to reconnect.

Programmable Web Links

Four additional user-defined web links are provided on the outlet 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 outlet control page lets you control any relay (outlet). 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” a device which is connected to the relay. This feature is useful for rebooting Ethernet devices which may interrupt the web 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. This resets the attached device. You may also “cycle” all relays using the “Cycle all outlets” button on the bottom of the page.

Depending on your web browser settings, you may need to click the “refresh” button to update the on-screen status display after changing settings. Most browsers update automatically after one minute.

Setup Page

The settings page allows the administrator to configure the power relay. These settings are supported:

Relay and Outlet Names

The terms “relay” and “outlet” are used synonymously in this product. 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 a separate name to each relay, such as “Missile Launcher” or “Email Server” to make identification of each circuit simple.

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 switching each relay on in sequence. This delay helps prevent the 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. If “Enable screen refresh” is checked, and a delay value is entered, your browser should periodically update the status screen.

Power Loss Recovery Modes

The power loss recovery mode setting has three settings which take effect after a power failure:

1. You can turn all relays off (all systems will be 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 the third option for ALL ON.

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 on the home page.

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 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.*

Status LEDs

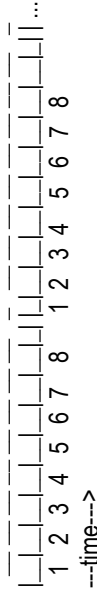
Three LEDs provide status indications:

PWR - RED

The red power illuminates whenever the relay is powered and the CPU is running.

ACT LED - GREEN

The green ACT LED is off when all relays are switched off and none of them is going to be switched on during delayed sequence. The green LED blinks once for each relay switched on according to the following graph:



LAN LED - YELLOW

The yellow LAN LED is an indicator of remote access via the LAN, not solely of LAN activity or packet reception. The LAN LED lights when a non-expired login session exists. The yellow light goes out after all users log out, security expires, or after 30 minutes of inactivity. This LED also blinks to display any network activity.

Security

Your switch employs JavaScript encryption and secure MD5 challenge-response authentication. This gives it good out-of-the-box security. Adding additional security takes just a moment.

Changing the Password

It's a good idea to change your password for better security. You will be prompted to change it from the default. Change it on the setup page, and write it down in a safe place.

Restricting Subnet Access

To restrict access to your local LAN, or "Class C", check the subnet access setting on the setup page.

Changing the HTTP Port

Changing the HTTP port makes it almost impossible for a hacker, even one with your password, to find your relay.

Installing Inside a Firewall

Install your relay inside a firewall, rather than directly on the internet for an additional layer of security.

Electrical Power Input Connection

Your relay can be powered from an external AC or DC supply as low as 8V and as high as 24V. Do not exceed 24V input. 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, but **the auxiliary +5 output is not isolated**. A potential difference of approximately 1V will exist between the – supply output and the – input terminal due to the bridge rectifier used on the input.

AC Power Requirement

The relay dissipates a maximum of 10.48W at 8VAC input with all relays on. Power dissipation decreases with input voltage due to the use of an efficient switching power supply. Typical dissipation with relays off is 3.1W. Although the case is well ventilated, ambient air temperature should not exceed 130°F for maximum reliability. Surges over 40V P-P may damage the internal regulator. Add an external MOV or other protection device across the power input terminals in noisy environments. Power consumption below does not include any load on the +5V accessory output.

AC Power Consumption

RMS Input	Current	Power (W)
8	1.31	10.48
9	1.11	9.99
10	0.97	9.70
12	0.76	9.12
14	0.64	8.96
16	0.55	8.80
18	0.49	8.82
20	0.44	8.80
22	0.40	8.80
24	0.36	8.64
26	0.33	8.58

DC Power Requirement

Maximum relay power dissipation occurs at 9V input with a DC power input. Care should be taken to ensure that DC voltages below 8V are not used, as relays will drop out below this voltage. The switching supply will survive input voltages up to 40VDC, but 24V is the maximum recommended. Power consumption below does not include any load on the +5V accessory output.

DC Power Consumption		
RMS Input	Current	Power (W)
8	1.10	8.80
9	1.30	11.70
10	1.14	11.40
12	0.88	10.56
14	0.72	10.08
16	0.61	9.76
18	0.54	9.72
20	0.48	9.60
22	0.44	9.68
24	0.40	9.60
26	0.37	9.62

The +5 output is protected by an auto-resetting polyfuse. Overloading this output will thermally shut down the polyfuse. Remove the load and allow 60 seconds for the fuse to reset if this occurs.

Contact Ratings and Protection

All eight internal T-90 Relays have the following ratings:

Relay Contact Ratings		
Voltage	NO	NC
240VAC	30A	20A
277VAC	20A	15A
30VDC	20A	10A
250VAC	1HP	1/2HP

Relays are RU and CE approved, and rated at 250,000 operations MTBF at 50% load.

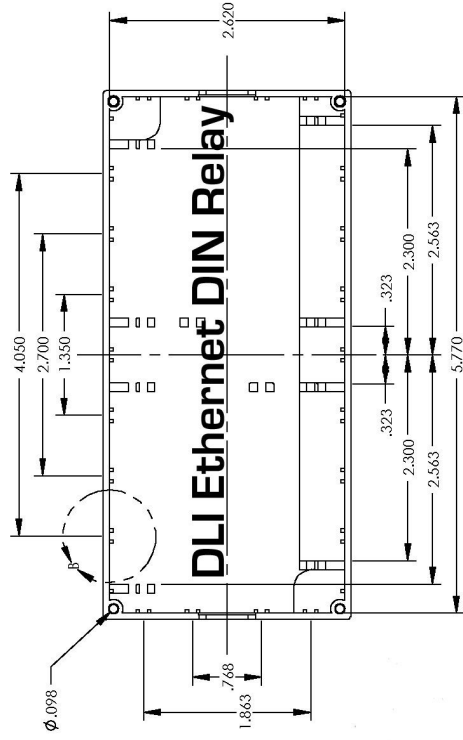
Case terminals are rated at 12A peak, 6A continuous, so limit sustained current to 6A. Only stranded wire of appropriate gauge should be used. Terminals must be well torqued. It is wise to recheck torque after completing the installation.

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

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 www.dinrelay.com/relaycare.pdf

Mounting Dimensions

Mounting holes are located on 5.672x2.522" centers per this diagram:



Remote Control from your Application

The relay can be easily controlled from your application or a command line using the PERL script below. Download it from www.digital-loggers.com/lpcperl.txt.

```
#!/usr/bin/perl -w
#-----
use LWP::UserAgent;
#-----
$ua = LWP::UserAgent->new ();
#-----
if ($#ARGV <= 1)
{
```

```

print STDERR 'Usage: UserUtil <Host> [:port] <login:password>
<n|on|off|pulse|status> ...'\n\n";
exit -1;
}
($pc, $auth)=splice (@ARGV, 0, 2);
$base='http://'. $auth. '%'. $pc. '/';
foreach (@ARGV)
{
    $_=lc;
    s/^[^1-8]//a$1/;
    if (/^[1-8a]on$/)
    {
        ReLink('outlet?'. $1. '=ON');
    }
    elsif (/^[1-8a]off$/)
    {
        ReLink('outlet?'. $1. '=OFF');
    }
    elsif (/^[1-8a]pulse$/)
    {
        ReLink('outlet?'. $1. '=CCL');
    }
    elsif (/^[1-8a]status$/)
    {
        $_n=$_;
        defined($response) && ($response->content =~/<a href=outleto/ ||
        ReLink('');
        $content=$response->content;
        while ($content =~ /<a href=outlet\?([1-8])=(on|off)/>/ig)
        {
            if (($1 eq $n) || ($n eq 'a'))
            {
                if ($2 eq "ON")
                {
                    {print $1, " OFF\n";}
                }
                else
                {
                    {print $1, " ON\n";}
                }
            }
            else
            {
                die "Unknown command $_\n";
            }
        }
    }
}
sub ReLink
{
    local ($) = @_;
    #print STDERR $base.$_. "\n";
    $response = $ua->get($base.$_);
    $response->is_error() && die $response->status_line;
}

```

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 INCLUDE SOFTWARE OR HARDWARE UPGRADES.** 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 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.



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