-48V DC Circuit Breaker Distribution with Remote Control

Installation/Operation Manual
Model: DST-8-RB

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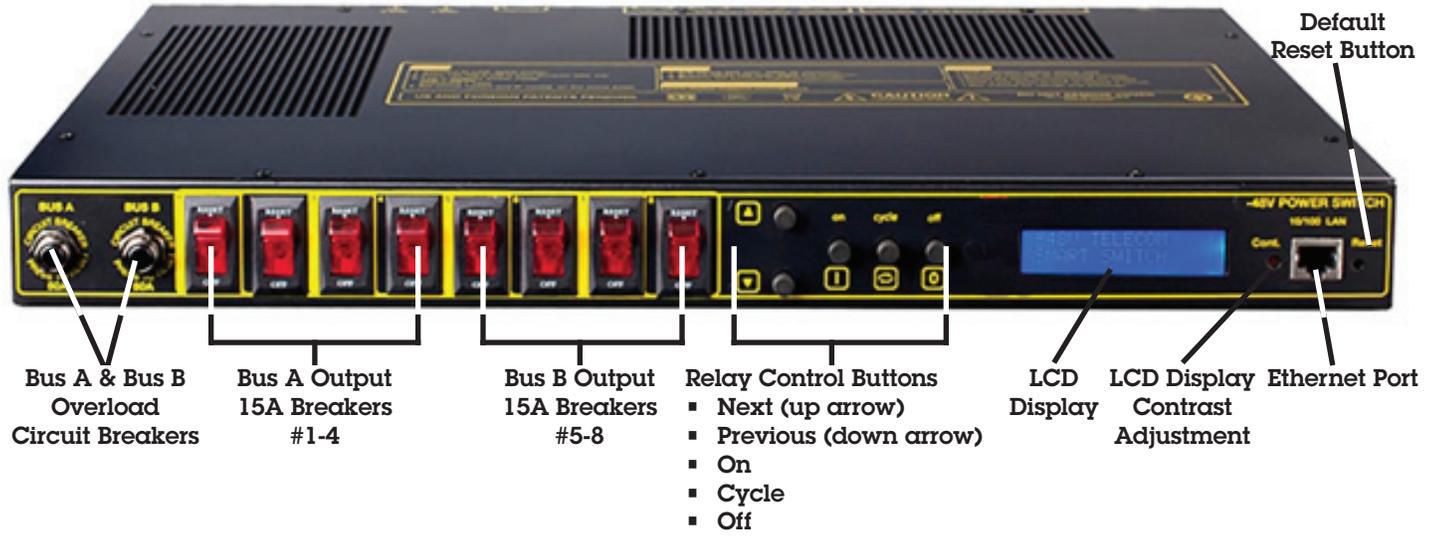
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Quick Product Overview

Fig. 1 - Front Panel

Bus A & Bus B Overload Circuit Breakers

Bus A Output 15A Breakers #1-4

Bus B Output 15A Breakers #5-8

Relay Control Buttons
- Next (up arrow)
- Previous (down arrow)
- On
- Cycle
- Off

LCD Display

LCD Display Contrast Adjustment

Ethernet Port

Default Reset Button

Fig. 2 - Rear Panel

Bus A Return (+) Terminals

Bus B Return (+) Terminals

48V Input Terminals Bus B

RTN (+)   (-)

Chassis Ground

-48V Switched Output, Terminals 1-4 Bus A

-48V Switched Output, Terminals 5-8 Bus B

RTN (+)   (-)

48V Input Terminals Bus A

Forced Air Ventilation, Do Not Block

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1. Product Overview and Features

The PDU Re-Boot, model DST-8-RB, is a DC Circuit Breaker Distribution Panel used for remote control and re-boot of -48V circuits (contact factory for special order +24 VDC).

The DST-8-RB comes equipped with the following standard features:

- **Web Interface**
  The internal web server is accessible from any standard web browser. Enter an IP address, and the switch may be configured and controlled via the web.

- **48V Dual Inputs**

- **8 DC Output Connections – 100A Total Load**
  Eight breaker protected circuits are divided in two busses, A and B of four circuits each. Each bus is protected by a 50A master breaker, and each switched circuit is protected by a 15A breaker.

- **Security Features: Password Security, HTTP Port and Subnet Restriction**
  Password security limits access to the switch. A changeable HTTP port makes the switch virtually impossible to access without knowing your custom URL. Subnet restriction restricts control to your LAN.

- **Sequenced "On Timer"**
  A programmable delay timer allows outlets to be switched on in sequence, rather than simultaneously.

- **Redundant Internal Power Supply**
  A redundant power circuit ensures that the failure of any switched circuit, or even the complete failure of a branch circuit will not affect the web server (exception: +24 VDC).

- **Flash Upgrade**
  Internal FLASH firmware is upgradable via the Ethernet port as new features become available. (Check www.adobe.com/support/flashplayer/downloads.html for current version).

- **LCD Display**
  A LCD screen displays status for each outlet. Custom messages can be displayed using a simple scripting language

- **Field Upgradeable Firmware**
  Firmware is field upgradeable via Ethernet using the web or a comman line utility.

2. Materials Provided

1 x Installation/Operation Manual
1 x Cross-over cable, 48", P/N 873-0048-0 - For direct PC set-up
2 x Mounting ear for 19" Rack Mount
8 x Flat Head Phillips screw, M4 x 4 mm - mount ears to panel
4 x Insulating shrink tubing for input terminals' protection

3. Mounting & Wiring

A) Mounting
Attach the 19" rack mounting ears to the panel. Two mounting ear locations are provided for flush or center mounting. Secure panel in relay rack.

Wiring information
- Common returns are tied together internally
- Output breakers are rated at 15 amps
- Bus master breakers are rated at 50 amps
- -48V DC applied to either A or B bus will power the web server

Caution: To prevent accidental shorts, install insulating tubing (provided) over input terminals.

Caution: If you are not familiar with -48V DC power systems please take a minute to review and identify correct terminal polarity & chassis ground.

Terminal I.D.	Polarity
'RTN' & 'RETURNS'	**+**
'1, 2, 3, 4, 5, 6, 7, 8'	**-**
'-48V IN A' & '-48V IN B'	**-**
'GND'	Chassis ground

Note: Chassis is floating from DC

B) Wiring
1) Attach Input Wiring
Each of the two input busses is rated at 50 amps. For full power applications 8 AWG wire size minimum is recommended per bus.

Note: If only one power source is used, you must jumper A and B input -48V terminals. The return input terminals are internally connected and do not have to be jumpered.

a) Disconnect -48V input wires from power source
b) Strip back the insulation ½"
c) Slide the provided shrink tubing over the input wires
d) Insert wire end in to input terminal and tighten the terminal screw
e) Slide insulation over terminal so entire terminal is covered and apply heat to shrink tubing.

2) Paralleling Inputs
8 AWG min. is recommended to feed bus A and B individually.

To parallel input requires #2 wire which will not fit the input terminals on the DST-8-RB. Run two #8 wires directly to the 48V source or to an external bus bar and feed this bus bar with a single #2 wire.

3) Attach Output Wiring
Each output circuit is protected by a 15 amp rocker handle circuit breaker. We recommend 14 AWG minimum wire size.

a) Strip back the insulation 3/8"
b) Slide wire end underneath terminal clamping plate, tighten terminal screw. Alternatively, the wires can be fitted with crimp fork terminals.
c) Turn on -48V power source. After power up, the unit performs a sequence of self tests.

4) Chassis Ground
The DST-8-RB is floating, however, a ground stud on the rear panel is provided. Use a #8 ring lug and connect to the site ground.

4. Initial Programming Quick Start

Use these shortcuts if you are experienced. If this is your first time, please review the entire manual first.

1. Connect input wiring - see Section 3. - B1. Do not energize power until Step 2.

2. Attach Ethernet cable from the DST-8-RB to a port on your LAN. Switch power on. If you are connected to a switch, you may need to cycle power to the switch to establish a connection.

3. Ping the default address: 192.168.0.100 to confirm a network connection is established. If you don't receive a response, see the **IP Setup** section below.

4. Log in to the power DST-8-RB using the default user name **admin** and the password **1234** "admin" must be entered in lower case.

5. Click on the **Settings** link to reach the configuration page.

6. Select the safest power-loss configuration for your installation: (all OFF, all ON, or sequential ON)

7. Configure the DST-8-RB as described below. After each change, click Submit and wait for the page to refresh before continuing.

Tips:
▪ A digital meter is handy for configuring the DST-8-RB before attaching your DC loads.
▪ Returns (positive leads) are bonded together internally.

5. Initial Programming & Settings - Full Description

If your network settings won't access the default IP, use the provided cross-over cable (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 programs and browsers. After the link is established, you can revert to DHCP if desired or use a combination of DHCP and static IPs.

A) IP Set-Up

1) Window 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**. 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 DST-8-RB, 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.

2) Windows Step 2
The second step is adding an IP address such as 192.168.0.50. If you are using DHCP, it's easiest to temporarily disable it while configuring the DST-8-RB. Select **Internet Protocall TCP/IP V4 Properties** and click **Properties**. Enter a compatible static IP such as this:
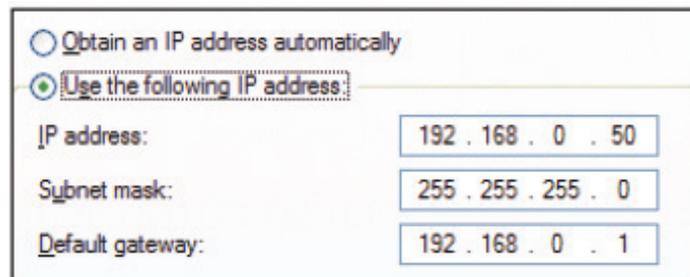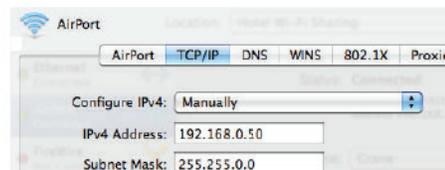

Click **Apply** and close windows. Ping the DST-8-RB to confirm the connection. Point your browser at 192.168.0.100 and log in.

3) 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 192.168.0.50 as shown:

Make changes shown. Point your browser at 192.168.0.100 and log in.

Find detailed instructions at www.newmartelecom.com/ DST-8-RB/Newmar_DST-8-RB_Mac_IP_Setup.pdf

4) Basic Operation
After power-up, the DST-8-RB performs a sequence of self-tests to ensure reliability. Network settings on the **Settings** page are used:

The IP address of the DST-8-RB needs to match the "class C" of your system. In other words, the first three bytes (192.168.0) must be the same as the IP address on your computer in order to access the DST-8-RB. Using a Ping utility is a good way to confirm you have a valid network configuration.

Once you have a connection, the DST-8-RB may be operated via a web browser. To access the DST-8-RB, enter the IP address in the URL field of your web browser. The default is http://192.168.0.100.

B) Home (-48 Control) Page
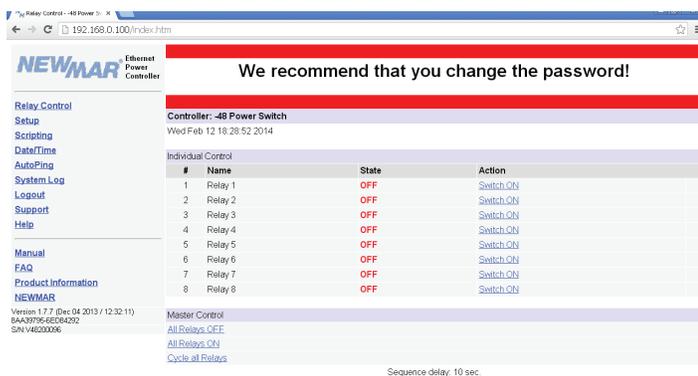
To access the home page, first enter the IP address in web browser URL field, then log in. User admin has access to all features. Other users have limited access to relays as assigned by the administrator. When configuring the DST-8-RB for the first time, use the default **admin** username and **1234** password.

The home page contains 13 external hyperlinks. The first nine are fixed internal links: The four links in the lower left corner of the screen are user-programmable.

1) Relay Control - Switching Relays On and Off
The relay control page lets you control any relay (except the always-on pair). A master setting also allows users (with security access) to switch all relays on or off.

To switch an relay on or off, simply click to the right of the relay name or number. Switching is immediate.

Use the keypad for local control: Select a relay using the arrow keys, then press on, off, or cycle. Press ON or OFF for 5 seconds to lock or unlock a relay. Locking prevents web access.

You may also Cycle a device which is connected to the DST-8-RB. 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 **ON Delay time**, and then switches power back on. This reboots the attached device.

You can also cycle all relays using the Master Control on the bottom of the page. An adjustable ON sequence delay takes effect when cycling, when using All Relays ON and on power-up.
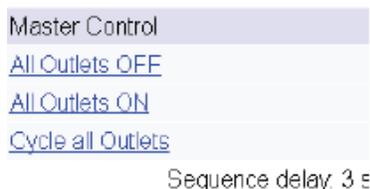
Depending on your web browser settings, you may need to click the Refresh button or F5 key to update the on-screen status display after changing settings. Screen refresh rate is adjusted in two places: on the Setup page and in your browser settings.

2) Setup Page
The **Setup** page allows the administrator to configure the power DST-8-RB. These settings are supported:

a) Controller and Relay Names
Use the controller name field to assign a Controller Name to the unit itself. Examples are **Server Rack 4 PDU** or **Phone Room Power Switch**. The Controller Name appears on top of all pages. Assign a separate name to each relay, such as **DSL Router 1** or **Backup Email Server** to aid identification. Check the **Confirm** button to the right of the relay name if you would like a pop-up window to appear before switching critical relays.
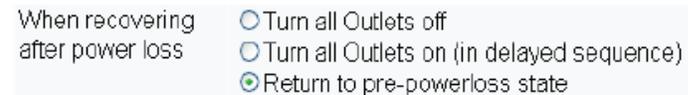
b) Power-On Sequence Delay
When a time value is entered in the **All ON Sequence Delay** field, the DST-8-RB will pause for a period of time before switching each relay on in sequence. This delay helps prevent power surges and blown circuit breakers which can occur when multiple devices are switched on simultaneously. A delay of 60 seconds is suggested for server applications. This delay value is also used in the Cycle function.

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.

c) 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).
2. You can automatically turn all relays on using the **All ON sequence delay** timer described above.
3. You can return to the same relay settings that were used prior to the power loss. ie. 1 On, 2 Off, etc. The ON Sequence delay timer is used.

Note: If you have written a script and enabled scripting, the script will start automatically on power up at LINE 1.

d) User Defined Links
You may link to other DST-8-RBs, 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 DST-8-RB" in the description field with a URL of "192.168.0.250" These links appear on the home page.

e) 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.*

f) Access Control
The administrator can restrict user permissions to certain relays. To set permissions, login as admin, then create a permissions matrix by entering user names on the left and checking permitted relays to the right of each user name.

3) Scripting
The unit can be used as-is in most applcations, or customized using a BASIC scripting language. A full description is beyond the scope of this manual, so please visit our website for other examples and a full command list. Here's a simple example: a lighting economizer.

This simple program shuts the lights off at 9:30PM daily. Users can turn them on using a web browser. Should they forget to turn them off, the power switch takes care of it.

User strings

1	30 21 * * *
2	

Script listing

1	WAIT 1	("30 21 * * *")
2	OFF 12345678	
3	GOTO 1	

Find more scripting examples, and a full list of commands at www.newmartelecom.com/DST-8-RB/Newmar_DT-8-RB_Scripting.pdf

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

To use Auto-Ping, first add an IP address. Next, link that IP address to one or more relays. Timing settings must be considered.

b) Add IP Address to Auto-Ping
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 relays associated with this address. Use the checkboxes in the Auto-Ping section to correlate the IP address to one or more relays. If communications to the target IP is lost, these relays will be rebooted. Four parameters control Auto-ping operation:

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

d) 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.

e) 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.

f) Device Reboot Delay
After power cycling to reboot a device, a waiting period will occur before the IP address is re-checked by Auto-ping. 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 DST-8-RB to start checking the server for normal IP operation 10 minutes after reboot.

Find a detailed explanation, visit www.newmartelecom.com/DST-8-RB/Newmar_DST-8-RB_Auto-Ping.pdf

g) Auto-Ping Example
In this example, we use Auto-Ping 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 multidude of Google name servers. We can safely assume that if none of them respond, we have lost network connectivity.

IP	1	2	3	4	5	6	7	8	Script	Action
☐ 8.8.8.8	☑	☐	☐	☐	☐	☐	☐	☐		☑ ☒
Add IP Address to AutoPing										
IP Address			8.8.8.8							

After clicking the green checkbox, Auto-Ping will check for several responses before enabling itself. After that, the router will be monitored and automatically rebooted.

Had we entered a number in the Script box, a program would be excuted (starting at that line number) when the target router required reboot. Find more examples at: www.newmartelecom.com/DST-8-RB/Newmar_DST-8-RB_Auto-Ping.pdf

5) System Log
The DST-8-RB keeps a log of system events including logins (successful and attempted), relay switching, power interruptions, and Auto-Ping events. Recent events are stored in the log and accessible from the System Log page. Multiple DST-8-RBs can export logs to a single external SYSLOG server.

6) Logout
The DST-8-RB will automatically log-out when your browser session is closed.

6. Windows Logging and Email Notifcation

A Windows utility can be used to record activity and notify you when specified trigger events occur.

7. LCD Switching Status Display

By default, the LCD displays the status of the internal switching logic, not the presence of power at the output terminals. A breaker tripped manually or by circuit overload will not affect the LCD display. The LCD display may be reprogrammed using the scripting feature to display other information.

8. Wrong Password Lockout

After three failed login attempts, the switch can disable access for a selected period of time (0-60 Minutes).
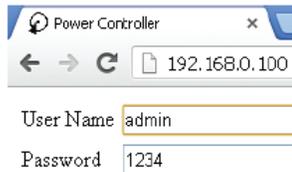
9. Factory Default Settings

DEFAULT IP ADDRESS
The factory default IP address is 192.168.0.100

DEFAULT LOGIN
User name: admin (lower case)
Password: 1234

To reset the IP address and admin login to defaults, gently press the reset-to-defaults button to the right of the RJ-45 plug.

Note: Reset-to-defaults sets the admin login and IP address

10. Warranty and Factory Contact Information

Newmar warrants that DST-8-RB PDU Re-Boot to be free from defects in material and workmanship for two years from date of purchase. If a problem with your DST-8-RB, or if you have any questions about the installation and proper operation of the unit, please contact NEWMAR's Technical Services Department:

Phone: 714-751-0488 - From the hours of 7:30 a.m. to 5:00 p.m. weekdays, P.S.T.; **Fax:** 714-957-1621
E-mail: techservice@newmarpower.com

Frequently Asked Questions

We have developed a FAQ's and Answer's section for your assistance. Please visit www.newmartelecom.com/DST8F for additional information.

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11. Specifications

Alert Beeper	73dBa at 12". Programmable.
Applications	Indoor commercial, industrial, and telecom use.
Branch Circuit Breaker	Manual reset, 50A Thermal, UL
Clock / RTC	15 year Li battery, NTP support
Control/Display w/PowerSave	Reset-to-factory-default switch, 2x16 Backlit LCD
Dimensions	Outside 1.6" x 5.8" x13"; 12.3" Between mtg. holes
EEPROM	512Kb I2C Standard
Enclosure	Aluminum chassis, double grounded.
Ethernet Interface	10/100 autosensing, Static IP, TCP port selectable, 8 pin RJ-45 w/ internal FCC filtering
FCC Testing	Part 15 S/D
Humidity	8-80% RH Operating
Inlet and Outlet Wiring	Stranded copper wire only.
Load Circuit Breakers	Manual reset, 15A Thermal, UL
Operating Temperature	-30° to 170°F, -34° to 77°C
Power Supply Rating	36-63V DC Redundant
Password Transmission	Encrypted, base 64 Movable HTTP port for security
Power Dissipation	3.9W Typ Max (all on) <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 BASIC program script
Relay Contact Spec	40A NO, 30A NC
Software Controls	Individual outlets on/off, all on/off/cycle. Net settings, Web UI
Surge Protection	3600W Metal Oxide Varistor
Dimension/Weight:	1.75" (1-U) x 19" x 13.74"/ Single unit 7.6 lbs (empty)