

# DC Circuit Breaker Distribution with Remote Control



## Installation/Operation Manual Model: DST-8-RB

M-DSTRB-WIFI  
AS of 020318

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## Product Features

Congratulations on selecting this smart, web enabled DC 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. A REST API is provided in addition to traditional HTTP controls.

### AutoPing™ Reboot

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

### Dual 50A inputs, 8 Switched DC Outputs

Two input busses A&B are provided with separate 50A input breakers. Outputs 1-4 are powered from bus A. Outputs 5-8 are powered from bus B. On each output, a thermal circuit breaker (nominally 15A) protects against overcurrent.

### 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.

### Multi-User Password Security

Multi-user authentication limits access. The administrator selects which relays each user can control.

### Sequenced "On Timer"

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

### MOV Surge Suppression

Eight 3600W metal oxide varistors clamp surges across the switching contacts.

### 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.

### New Features

New features include Email, SNMP and Jabber notification, longer clock battery life, HTTPS, WiFi support, SSH and Lua scripting.

### Field Upgradeable Firmware

Firmware is field upgradeable via Ethernet.

## Package Contents

- DC Smart Switch with input compression lugs, and output screw terminals.
- RP-SMA 2.4GHz WiFi Antenna
- 4 x Black plastic snap on input terminal covers [snap on over input terminal(s) after completing wiring]
- Rack mounting brackets (front, center or rear mount)

## Options

- Custom output breaker ratings.
- External contactors.

## Inspection

Please contact the freight carrier immediately if your package appears opened or damaged in transit. Call Newmar at (714) 751-0488 for tech support, service, and hardware upgrades. The product performs a brief self-test when first powered up.

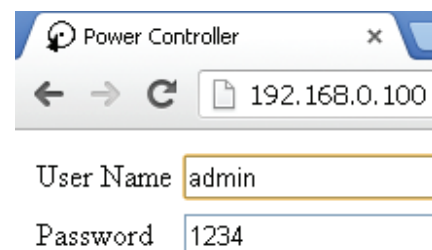
## Important Factory Defaults

**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.



Power Controller

← → ↻ 192.168.0.100

User Name

Password

## Quick Setup

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

- Unpack. Save the carton. Attach the line cord. Connect power and loads. The switch can be installed "high side" or "low side". Input can be positive or negative. Returns are bonded together.
- Attach an Ethernet cable from the controller to your LAN. Switch power on. 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.
- Log in to the switch 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" means <10.5V DC power for more than 100ms on both the A & B bus simultaneously
- Configure the switch as described below. After each change, click Submit and wait for the page to refresh before continuing.

**Tip:** A digital meter is handy for checking configuration and actual current drains.

## 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 Network Connections**. A Network Connections window appears. Right click on the network connection to the switch, ie. . 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.

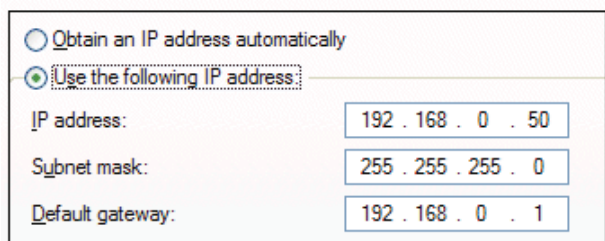
**Windows 8-10:** Right-click on the Windows Start button. Select Control Panel. Select Network and Sharing Center or Network->Network Settings. Click Change Adapter Settings or Adapter Options. Right click on your connected network and select Properties. Proceed to step 2.

### 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 Protocol TCP/IP V4 Properties and click Properties. Enter a compatible static IP such as:

Click Apply and close windows. Ping to confirm the connection.



The image shows a screenshot of the Windows TCP/IP Properties dialog box. The 'Use the following IP address' radio button is selected. The IP address is set to 192.168.0.50, the Subnet mask is 255.255.255.0, and the Default gateway is 192.168.0.1.

<input type="radio"/> Obtain an IP address automatically	
<input checked="" type="radio"/> Use the following IP address:	
IP address:	192 . 168 . 0 . 50
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	192 . 168 . 0 . 1

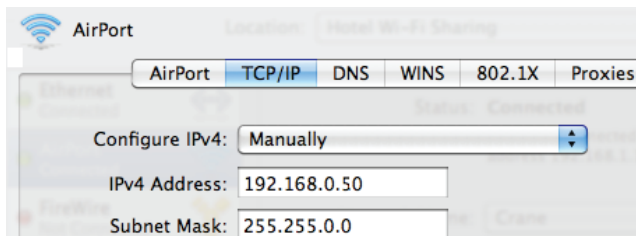
Point your browser to 192.168.0.100. Log in. Detailed instructions are at [digital-loggers.com/ip\\_setup](http://digital-loggers.com/ip_setup)

## 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:

## 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:

General Network Settings		LAN Configuration	
HTTP Port	<input type="text" value="80"/>	MAC Address	<input type="text" value="7C:E1:FF:00:00:00"/>
Enable SSH Server	<input type="checkbox"/>	Protocol	<input type="text" value="Static IP"/>
SSH Port	<input type="text" value="22"/>	IP address	<input type="text" value="192.168.0.100"/>
Syslog Server	<input type="text"/>	Subnet mask	<input type="text" value="255.255.255.0"/>
Same subnet access only	<input checked="" type="checkbox"/>		
<input type="button" value="Submit"/>			

The IP address of the controller needs to 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. Using a ping utility is a good way to confirm a valid network configuration. An "unreachable" report from Ping indicates misconfigured network settings.

Once you have a connection, the switch 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](http://192.168.0.100:2015) to reach the switch.

**Note that some browsers will deny connections to ports under 1024.**

# 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	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
2	Cable Router	OFF	<a href="#">Switch ON</a>
3	Nanostation E	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
4	Nanostation W	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
5	Backhaul Link	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
6	Beer Fridge	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
7	Firewall	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
8	Congressional O2 Supply	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>

Master Control  
[All Outlets OFF](#)  
[All Outlets ON](#)  
[Cycle all Outlets](#)

Sequence delay: 3 sec.

Version 1.8.1 (Dec 15 2014 / 02:00:17)

[Outlet Control](#)  
[Setup](#)  
[Scripting](#)  
[Date/Time](#)  
[AutoPing](#)  
[System Log](#)  
[Logout](#)  
[Support](#)  
[Help](#)

[Create custom links here](#)  
[To start scripts, control devices, or link to other HTTP](#)

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 circuits as assigned by the administrator.

## Relay Control

Clicking "Relay Control" links to the home page used for manually switching circuits on and off. Access to specific circuits is determined by user-name. 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 switch. Scripts may be started manually, automatically on power-up, by external http commands, or by AutoPing events.

## 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. Learn more on page 9.

## System Log

The switch keeps internal event logs including logins, outlet switching, errors, and AutoPing events. Recent events are stored in the log and accessible from the System Log page. SYSLOG export is supported.

## Logout

Browser logout is automatic when a session is closed or after a time-out period. Use this link to log-out in advance.



## 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 Circuits On and Off

The relay control page lets you control any circuit. The master control lets permitted users switch all circuits on or off.

To switch a circuit, simply click to the right of the relay 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 also want to Cycle an attached device. This feature is useful for rebooting Ethernet devices which may interrupt the web link to the switch. Clicking **Cycle** switches power off, waits for the **Cycle time**, and then switches power back on while conforming to the ON Sequence Delay. This can be used to restore connectivity).

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

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 switch.

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 **Wireless Link** to aid identification. Check the Confirm box to the right of the outlet name if you prefer a pop-up window confirmation before switching critical circuits.

### Power-On Sequence Delay

When a time value is entered in the **All ON Sequence Delay** field, the switch 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.



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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 may be set to ignore login attempts for a 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:

- |                                  |   |
|----------------------------------|---|
| When recovering after power loss | <input type="radio"/> Turn all Outlets off                      |
|                                  | <input type="radio"/> Turn all Outlets on (in delayed sequence) |
|                                  | <input checked="" type="radio"/> Return to pre-powerloss state  |

1. Turn all circuits off (all systems will be switched off until manually turned on later, possibly by a script).
2. You can automatically turn all circuits on using the sequence delay timer described above.
3. You can return to the same power 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 circuits. To set permissions, login as admin first, then create a permissions matrix by entering user names on the left and checking allowed circuits 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 near the Ethernet jack.**

## 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, or one that may be damaged by excessive power cycling, you can limit the number of times it will be rebooted here. For example, entering 5 to 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.

## **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 a router to outlet 1, enter the external IP on the left, and leave all timing values at defaults.

AutoPing													
IP(s)	Reboot Outlets								Script	Action	Stats		
	1	2	3	4	5	6	7	8			TX	RX	HIT
<input type="checkbox"/> 8.8.8.8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Cycle]	+	0	0	0
AutoPing Properties													
Enable AutoPing:	<input type="checkbox"/>												
Time between pings:	<input type="text" value="30"/>	seconds. (2-3600)											
Ping timeout to reboot:	<input type="text" value="150"/>	seconds. (2-3600)											
Ping responses to enable autoping:	<input type="text" value="5"/>	pings. (0-100)											
Times to attempt reboot:	<input type="text" value="5"/>	tries. (1-255)											
Device reboot delay:	<input type="text" value="120"/>	seconds. (1-43200)											

## Internet Access

Like to access your switch over the Internet? Learn how to configure your router at [portforward.com](http://portforward.com). A firewall is recommended.

## Mobile Device Access

Non-admin accounts have a simplified UI suitable for mobile devices with small screens. Third-party applications are available to control Newmar DST-8-RB from Android and IOS. These apps are sold and supported by independent developers, not by Newmar.

## 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 is set based on GMT. Batteries have an estimated 15-year lifetime.

## Lua Scripting

The controller can be customized using the Lua language. A full description is beyond the scope of this manual, so please visit [lua.org](http://lua.org).

## Safety Shutdown

The switch uses thermal circuit breakers for safety. In the event of an overload, a breaker will trip. Correct the situation by removing excessive load, then allow a minute or two for the breaker to cool. Cycling power on and off with the red rocker switch resets the breaker. The maximum rated current is 15A.

## Open Source Code

In compliance with the spirit of the GNU public license, source code is provided for reference. Purchasing a TLA and signing an NDA from Atheros / Qualcomm is highly recommended before attempting any custom development. Newmar can't provide warranty or offer tech support for modified units. We abide by the NDA.

## Specifications

<b>Alert Beeper</b>	73dBa at 12". Programmable.
Applications	Commercial, industrial power distribution and remote reboot. Indoor use only.
Circuit Breakers	Manual reset, 15A-50A Thermal Supplemental
Clock / RTC	15 year Li battery, under 2 grams
Controls / Display	Reset -to-factory-default switch, 2x16 Backlit LCD w/ PowerSave, 5 button keypad
Enclosure	Steel, double grounded. Vented 4 sides.
Ethernet Interface	10/100 autosensing, Static IP, TCP port selectable, 8 pin RJ-45 w/ internal FCC filtering, WiFi
FCC Testing	Part 15 FCC ID 2ACIUDC3
Humidity	8-80% RH Operating
Input Terminals	Two 50A copper compression lugs
Output Terminals	Eight 15A screw terminals
Power Input	2x50A, 12-72VDC, positive or negative ground
Operating Temperature	-30° to 170°F, -34° to 77°C
Options - Factory	Custom breakers. External contactors.
Power Input	DC only, 12-72V, positive or negative ground
Power Supply Rating	12-72VDC. Undervoltage lockout at 11.3V
Password Transmission	Encrypted, base 64 or HTTPS
Power Dissipation	5.9W Typ Max (all on) <3 W idle
Power Fail Hold-Over	100ms 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 Specs	40A AC NO, 1/2HP, 12V DC coil
Surge Protection	3600W Metal Oxide Varistor
Size	1.75 (1 RU) x 9.0 x 19.0"
Weight (packed)	Single unit 11lbs 4.8kg
WiFi	Atheros 9331 2.4G 802.11n RP-SMA - FCC Note: The switch may only be used with (1) the manufacturer supplied antenna (Gain: 2.0dBi), or (2) a 50 Ohm antenna of equal or lesser gain.

## Warranty

Newmar warrants that the DST-8-RB 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: 714-896-9679

E-mail: [techservice@newmarpower.com](mailto:techservice@newmarpower.com)