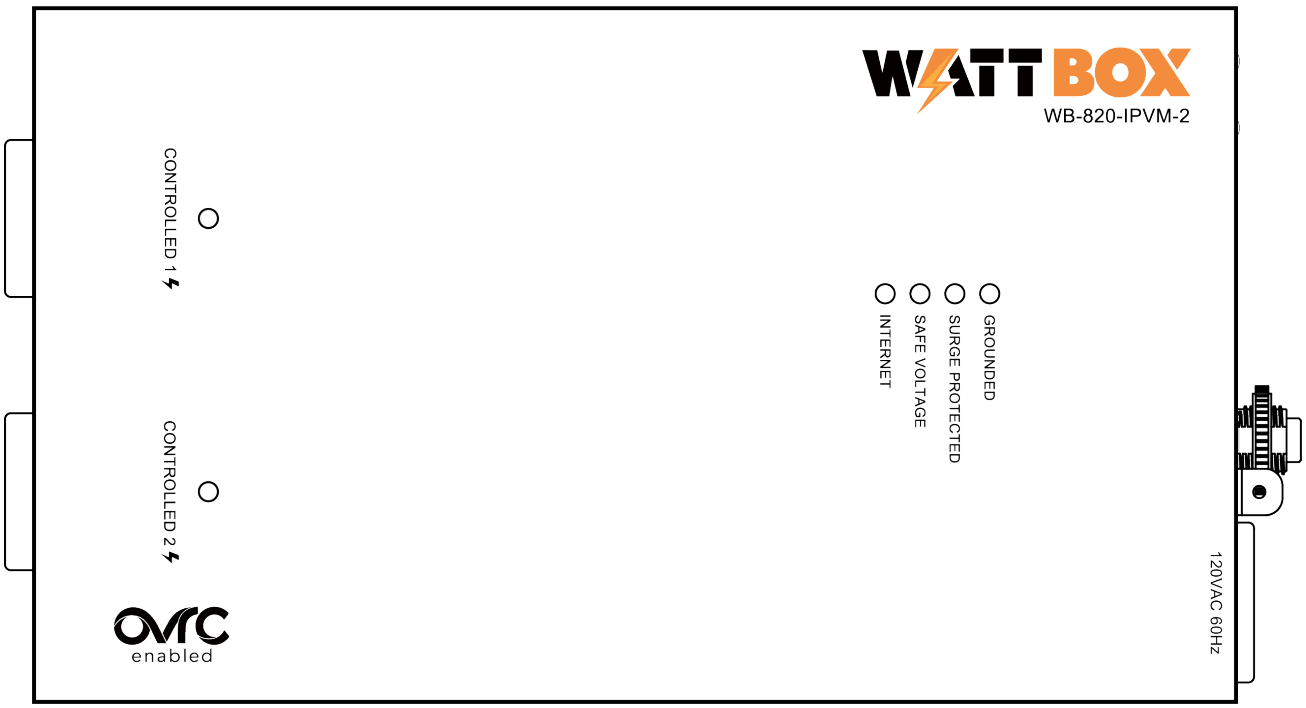
WattBox® 820 Series 20A IP Power Conditioner | 2 Individually Controlled and Metered Outlets Installation Guide

WB-820-IPVM-2



Package contents

- (1)WB-820-IPVM-2
- (1) Removable 2m (6') IEC 21 power cord
- (1) Documentation QR insert card
- (2) Mounting brackets

- (4) M3*16mm screws

  (4) washers
- (4) 3.5*19.1mm wall anchors
- (4) Press-in mounting pins for attaching to a structured wiring can or versabox.
- (1) Locking clip for IEC cord

Important Safety Instructions

Read and observe the following safety points at all times.

Notice

For indoor use only. Internal components are not sealed from the environment. The device can only be used in a fixed location such as a telecommunication centre, or a dedicated computer room. When you install the device, ensure that the protective earthing connection of the socket-outlet is verified by a skilled person. Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

Only use brackets/attachments/accessories specified by the manufacturer.

Do not place the device in an unstable position where it might fall and cause injuries. This equipment is not suitable for use in locations where children are likely to be present.

Do not cover this device with a cloth. Do not install it on a carpet or rug.

Caution — Potential injury

Do not use this product with extension cords, multioutlet power strips, multioutlet extenders, or UPS devices (other than a WattBox UPS). The power capacity of these accessories can be overloaded by this product and may result in a risk of fire, or property damage.

Warning — Lithium battery

A lithium battery is molded into this device's real-time clock. The lithium battery is not intended to be replaced; a lithium battery can explode if it is incorrectly replaced. Do not recharge, disassemble, or incinerate a lithium battery. Discard used lithium batteries according to local regulations.

Warning — Power sources, grounding, polarization

This plug is designed to be inserted into a NEMA 5-15 (three-prong grounded) outlet only. Do not force the plug into an outlet that is not designed to accept it. Never dismantle the plug or to alter the power cord, and do not attempt to defeat the grounding feature by using a three-to-two prong adapter. If you have questions about grounding, consult your local power company or a qualified electrician.

This WattBox requires a properly grounded outlet for safety. If you're not sure if your home's electrical wiring is properly grounded, have it checked by a qualified electrician.

If a rooftop devices such as a satellite dish connects to the WattBox, ensure that the device's wires are also properly grounded.

The Bonding Point can be used to provide a common ground to other equipment. This bonding point can accommodate minimum 12 AWG wire and should be connected using the required hardware specified by the other bonding point. Please use termination for your equipment in accordance with applicable local agency requirements.

Warning — Liquid: Avoiding electrical shocks

Do not operate the WattBox if liquid of any kind is spilled onto or inside the unit. Do not operate it near rain or water, even water that is contained (e.g., bathtub or sink).

Warning — Power cord safety

Do not place the power cord near areas with heavy foot traffic (e.g., hallways). Do not create a trip hazard with the power cord.

If the power cord's protective jacket rips or frays, exposing the internal wiring or shielding, disconnect it from the power source and replace the power cord immediately. See the warranty section of the owner's manual for details.

Warning — No user-serviceable parts inside

If the WattBox is not operating properly, do not remove any part of the unit (cover, etc.) for repair. Unplug the unit and consult the warranty section of **snapone.com/legal**.

Caution — Exposure to heat

Do not expose the WattBox to direct sunlight or place it near wall heaters, space heaters, or in an enclosed space prone to temperature increase.

Do not use the device in a confined, poorly-ventilated location; this can overheat the unit, possibly even causing a fire. If used in a small space other than an EIA-standard rack, ensure that there is adequate space around the device.

Caution — Proper cleaning

In general, the only cleaning necessary for is a light dusting. Unplug the WattBox from the wall outlet before cleaning it. Do not use liquid or aerosol cleaners.

FCC Warning

WARNING!! Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice: (1) An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord by used. (2) Use only shielded cables to connect I/O devices to this equipment.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

The Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulation.

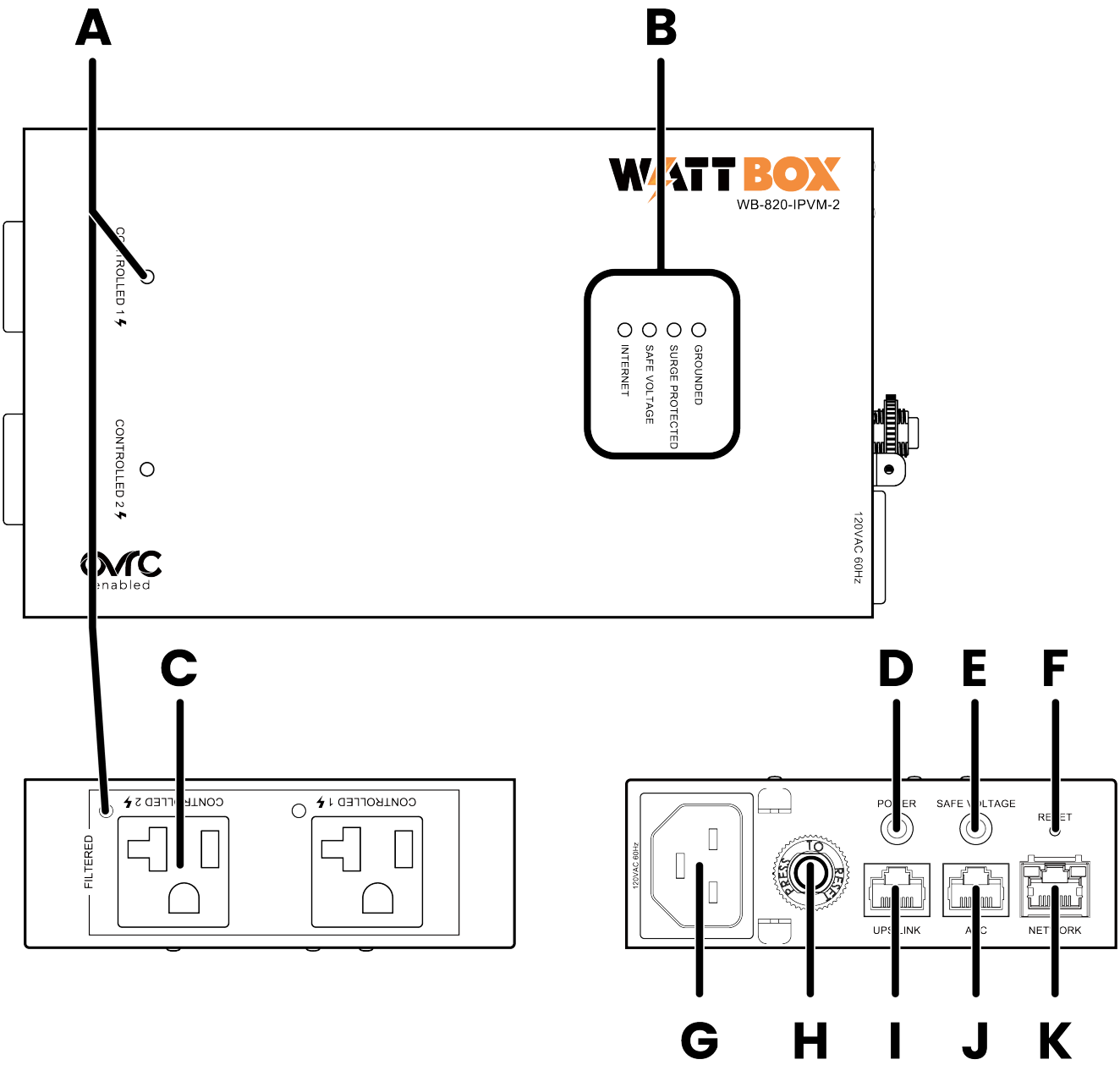
Cet appareil numerique de la class B respecte toutes les exigencies du Reglement sur le materiel brouilleur du Canada.

Warning

This product can expose you to chemicals including carbon black, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

To reduce the risk of electric shock, use only indoors and in dry locations.

Anatomy



A. **Power indicators for outlets 1-2** —Illuminates when power is on (*2 – 1 for each outlet).

B. **LED indicators** — See the status of the internet, Safe Voltage, surge protection, and whether the unit is properly grounded. Refer to "LED indicators" on the facing page.

C. **Controllable outlets 1-2** — All outlets are individually switchable (IP controlled) and filtered against EMI/RF.

D. **Power button** — Press to manually toggle the unit's power outlets on or off. Outlets set to Reset Only are not affected.

E. **Safe Voltage button** — Toggles Safe Voltage on and off. When enabled, Safe Voltage turns off outlets to protect connected equipment from out-of-range input voltage.

F. **Reset button** — Press and release to restart the network card, press and hold five seconds to reset network settings, and press and hold 10 seconds to restore to factory defaults.

G. **Power input** — Input for 3-prong IEC 21 power cord, with detachable locking clip.

H. **Circuit breaker** — 20A resettable breaker that trips when overamperage conditions occur.

I. **UPS Link** — For connection to a WB-OVRC-UPS-2000-1.

J. **ACC port** — For use with WattBox 800 Series Accessories (WB-ACC-TRIGGER-800 & WB-800-FP).

K. **Network connection** — Connect to the Local Area Nertwork (LAN) for IP control and monitoring.

LED indicators

The below chart describes each LED status.

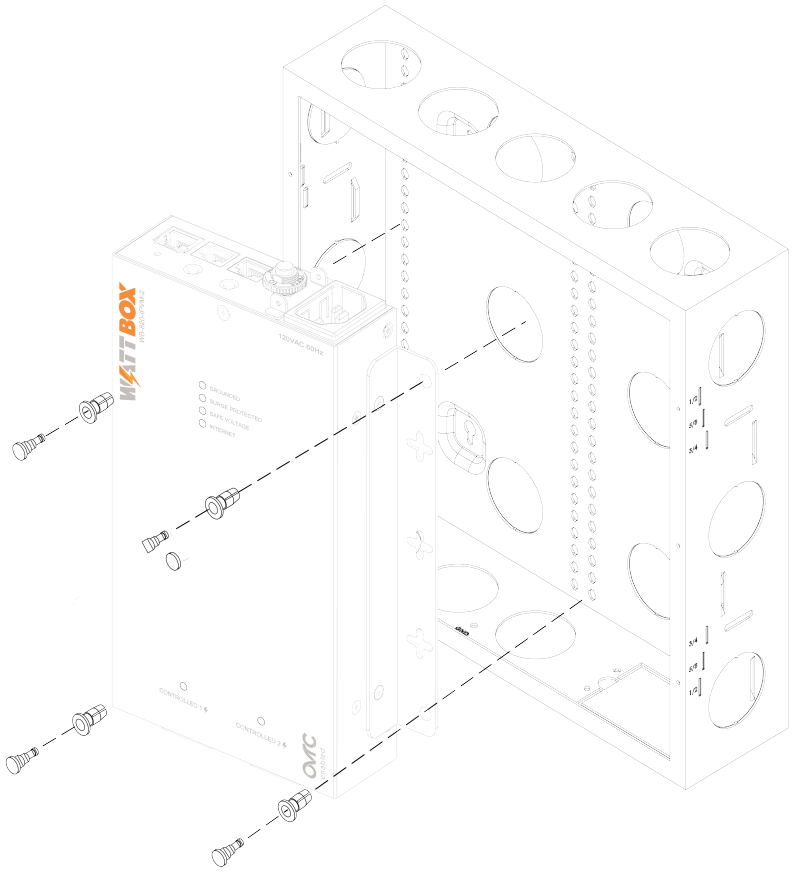
Internet	Blue(Solid)	All hosts are communicating with the WattBox.
	Blue(Flashing)	At least one (not all) sites / IP addresses are communicating with the WattBox.
	Red (Solid)	None of the hosts are communicating with the WattBox.
Safe Voltage	Blue (Solid)	Safe voltage is enabled. The current incoming AC voltage is safe for operation.
	Blue (Slow blink)	Safe voltage is enabled, but the incoming AC voltage is not safe.
	Off	Safe voltage is disabled.
Surge Protected	Blue (Solid)	WattBox is powered on and outlets are protected.
	Off	The WattBox is not powered on, or the MOVs have opened removing power from the outlets.
Grounded	Blue (Solid)	Incoming AC outlet is grounded.
	Off	Incoming AC outlet is not grounded and requires inspection by an electrician.

Mounting

The WB-820-IPVM-2 can be mounted on a wall or in a structured wiring cabinet.

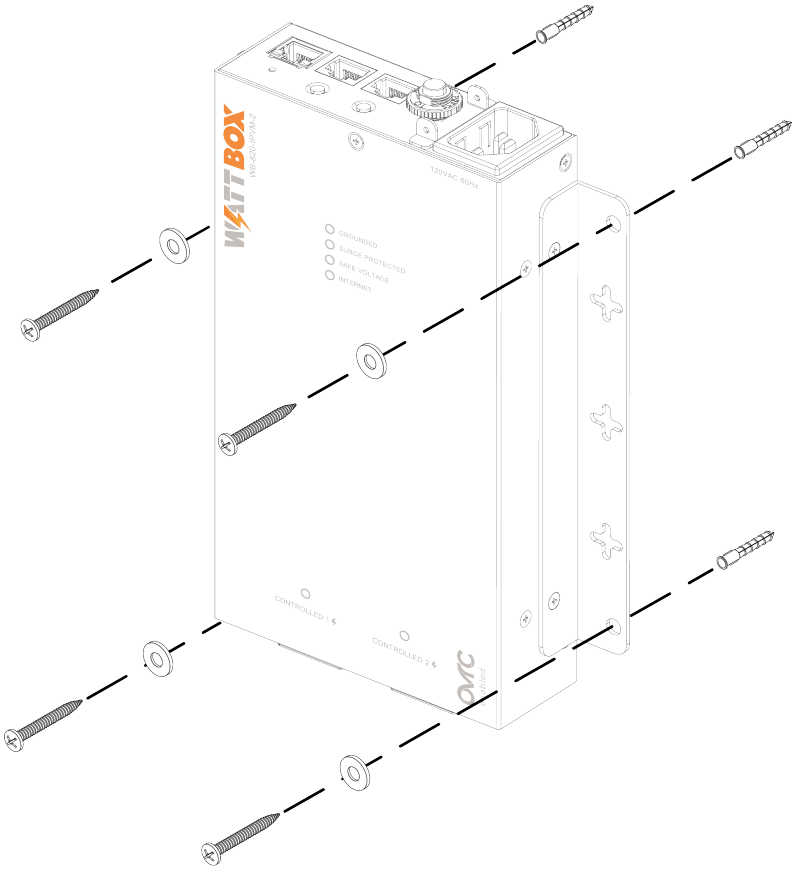
Structured wiring cabinet mounting

Use the supplied press-in mounting pins to mount the WattBox to the enclosure.

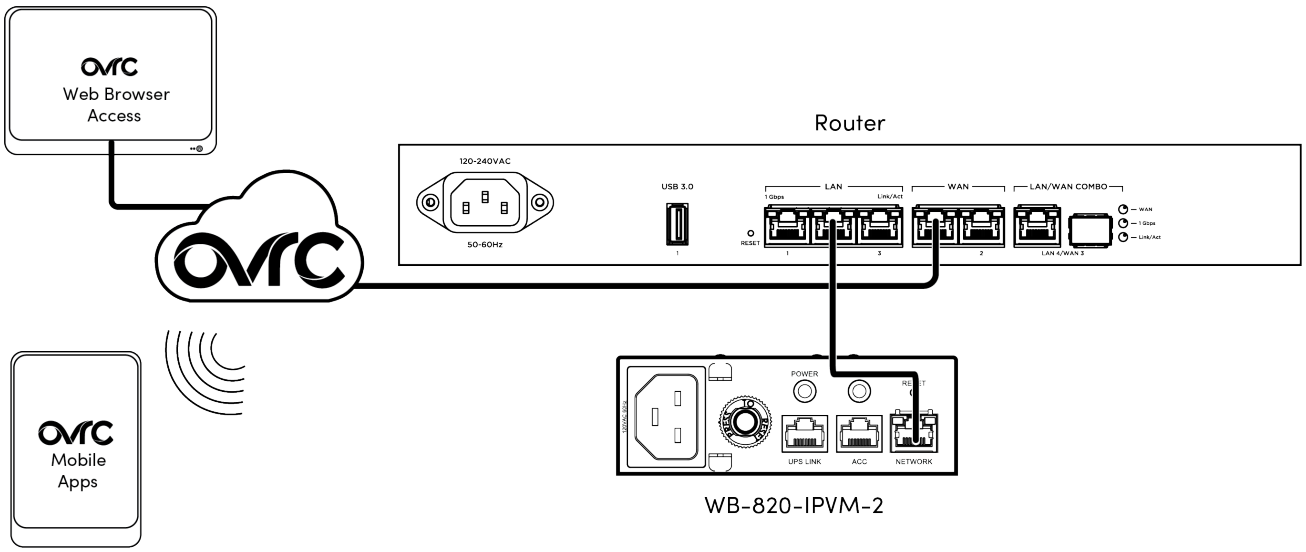


Wall mounting

Use the supplied M3*16mm screws and 3.5*19.1mm anchors to mount the WattBox to the wall.



Connections



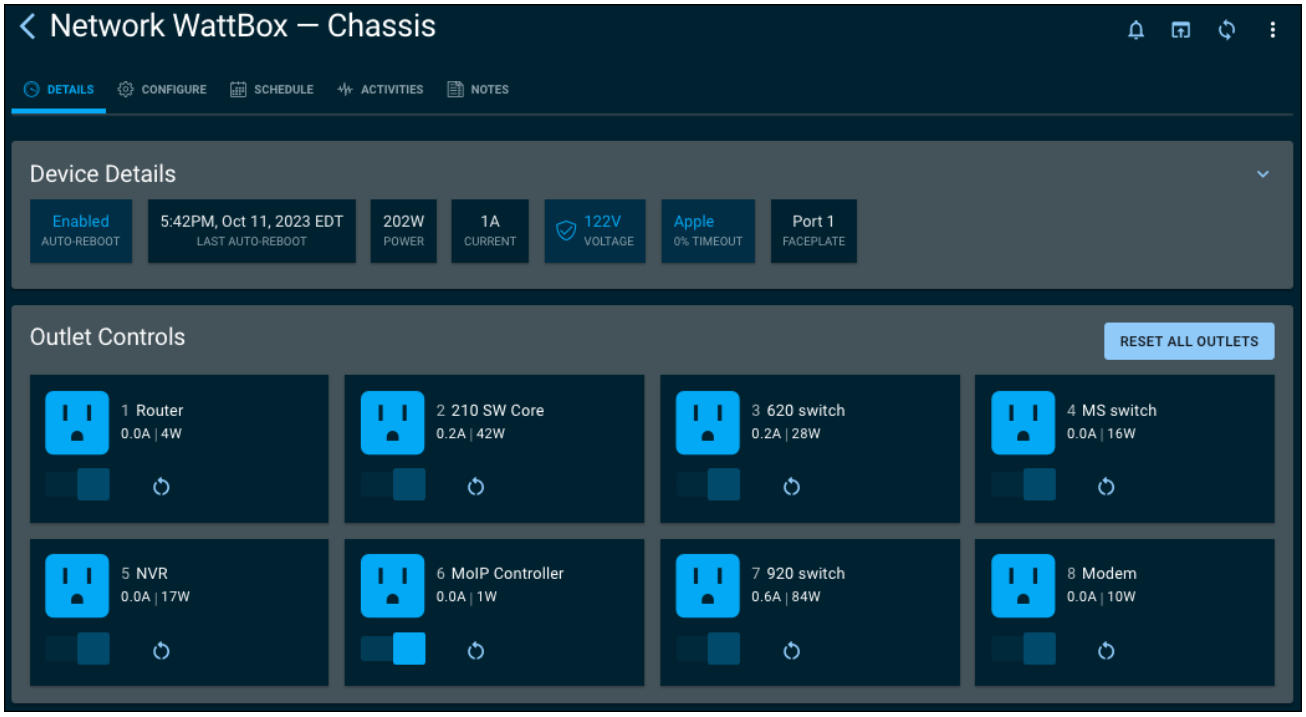
1. If attaching a WattBox UPS battery pack to the power conditioner, connect an Ethernet cable between the UPS Link ports on the power conditioner and the UPS.

> **Caution:** The UPS link must be connected before applying power to the PDU. For OvrC connectivity, plug a network cable from your router or switch into the network port.

2. For IP control and OvrC connectivity, connect a network cable from your router or switch into the WB-820 Network port. To learn more about OvrC, visit the **Tech Community** and read the **OvrC User Guide**.
3. Connect the IEC power cord to the power conditioner and to the WattBox UPS (if applicable) or a grounded outlet.

OvrC setup

The **Details** page shows the outlet name, power draw, and provides outlet control to power an outlet on/off or reset it, as well as the Device Details window preset on all OvrC-enabled devices.



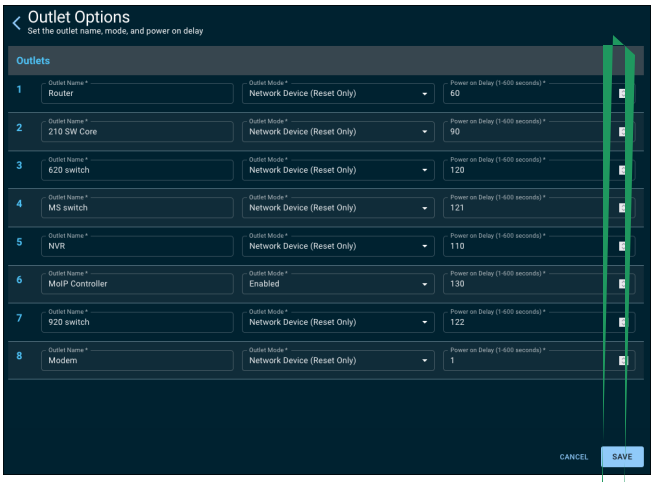
Note: If an outlet is set to **Disabled** you cannot control it. If an outlet is set to **Reset Only** it can only be reset.

Outlet Options

Enter the Outlet Name, Mode, and Power on Delay.

When configuring **Power on Delay**, make sure the first device in the network topology powers on first. Make sure the first device has enough time to power on before the next device in the topology powers on.

For example, the Modem's Power on Delay is 1 second, the router's Power On Delay is 60 seconds, and the Core switch's Power on Delay is 90 seconds.



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o Tip: Configure the **Outlet Mode** to **Network Device (Reset Only)** for all network devices to avoid outages caused by devices accidentally being powered off.

IP Settings

Select DHCP (default) or Static. Static allows you to designate an IP address, Subnet Mask, Device Gateway, and DNS Server for the WattBox.

Pro Tip: Use DHCP and give the WattBox a MAC (DHCP) Reservation to avoid IP conflicts or connection loss in case the IP scheme changes.

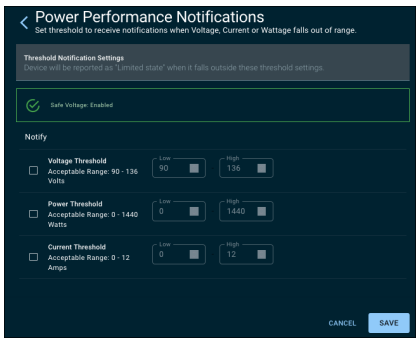
Time Settings

Use the dropdown to select the Time Zone the WattBox is installed in.

Power Performance Notifications

Enable or disable notifications when the Safe Voltage, Current, or Wattage falls out of the specified range.

Each notification type allows you to set a specified range. When a threshold falls out of range the WattBox reports that it is in a Limited state.



Note: These settings affect each user on the OvrC account. Manage which notifications you receive in the User settings.

UPS Settings

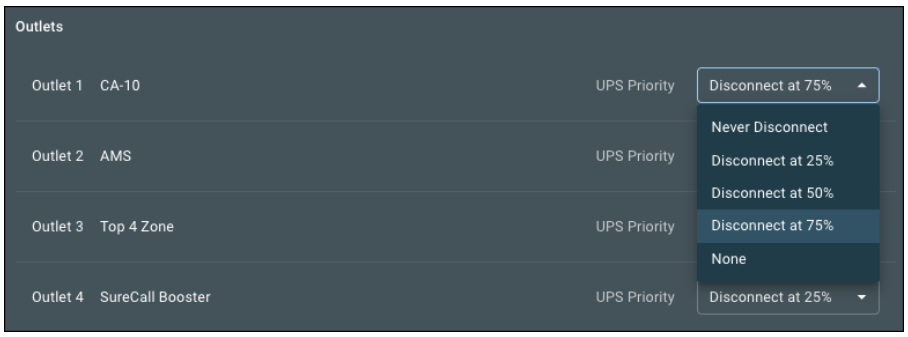
These settings appear if you have an OvrC-enabled UPS connected to the UPS Link of an IP-enabled WattBox.

UPS Alarm on Power Loss

Toggle on for the UPS to emit an alarm when you lose power.

Load shedding configuration

Use the drop-down next to each outlet to set the battery percentage that the UPS turns the outlet off.



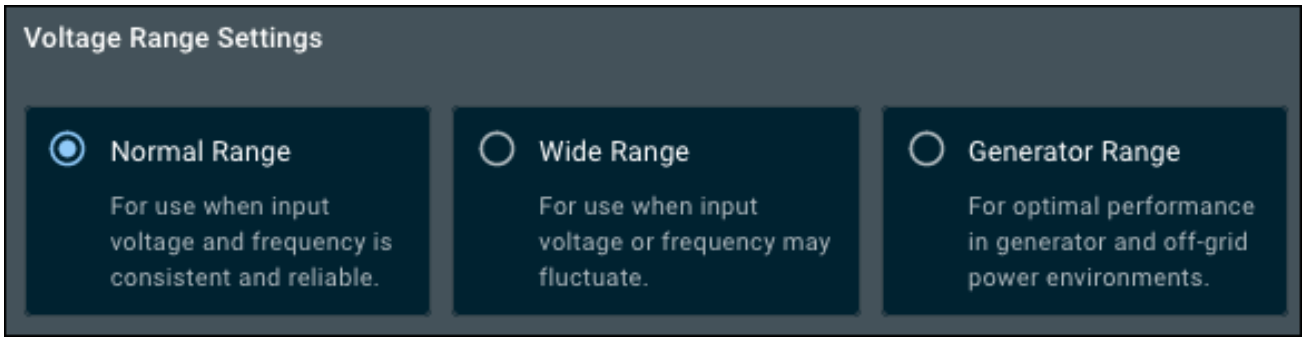
Note: Load shedding does not work for outlets configured to **Reset Only**.

Click **Save** to apply changes.

Voltage Range Settings (800 series OvrC-enabled UPS only)

Select the type of Voltage Range you expect at the installed location. Options include:

- **Normal Range** — For locations with consistent and reliable input voltage and frequency.
- **Wide Range** — For locations where the input voltage or frequency may fluctuate.
- **Generator Range** — For optimal performance in generator and off-grid power environments.



Note: This feature is not available for International WattBox PDUs. Compatible with the WB-OVRC-UPS-2000-1.

UPS Settings

Delete this text and replace it with your own content.

Safe Voltage

Safe Voltage disables all the outlets when the input voltage falls outside of a safe range. Toggle this feature on or off.

Note: This feature is only compatible with the WB-800CH1U-IPVM-8 and 820 series in North America. All 800I devices are compatible.

LED Brightness

(chassis and faceplate devices only)

If the WattBox is a chassis model or has a connected faceplate Use the slider to set the brightness of the faceplate's LEDs

Telnet Control

(150/250/800/820 series only)

Toggle to enable/disable control API communication.

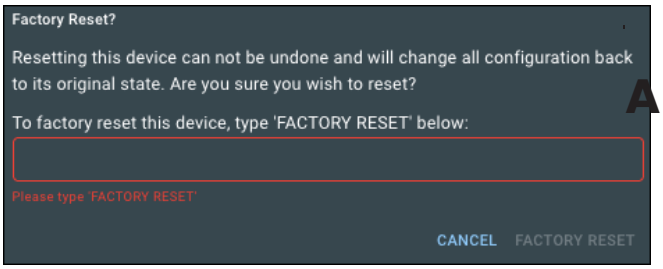
Note: Changes require the WattBox to restart. Outlets are not affected.

Reset to Factory Default Settings

(150/250/800/820 series only)

Click the **Reset** button to return the WattBox to factory default settings. Read the warning statement, then click **Yes, Continue**. Type "FACTORY RESET" in to the new text field, then click **Factory Reset** to

complete the process.



A

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to-Reboot Settings

Use these settings to take advantage of the WattBox's self-healing features.

Auto-Reboot

Enable to reset specific outlets when the WattBox fails to connect to the hosts configured in Host Settings.

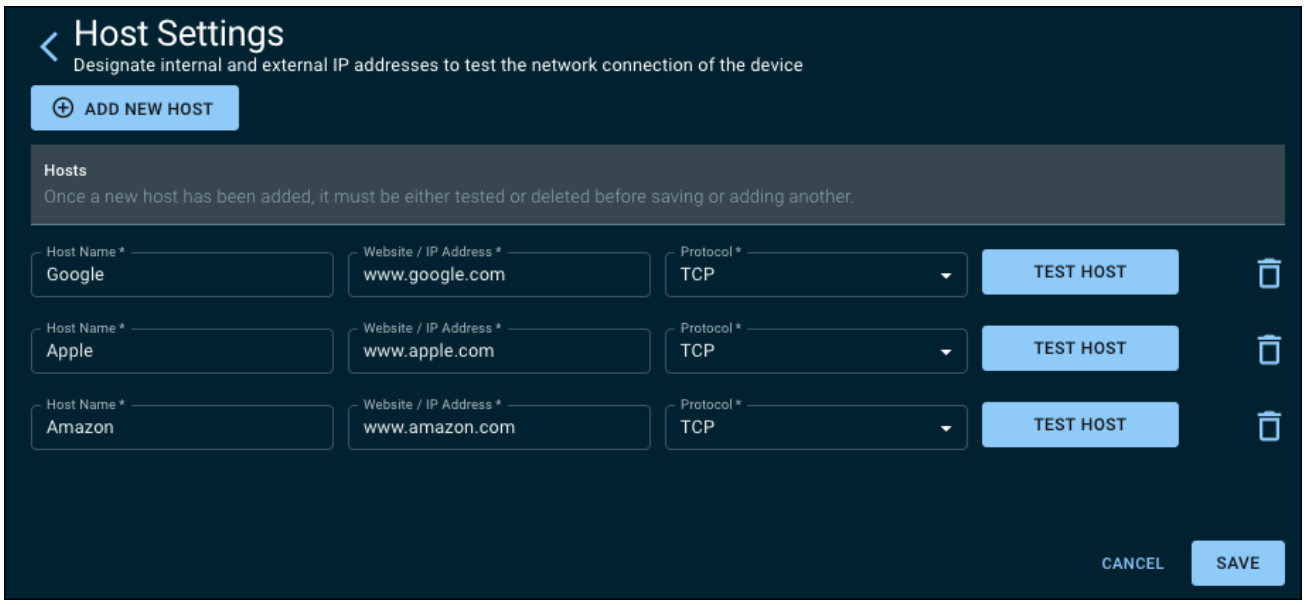
> **Note:** Auto-Reboot does not need to be enabled to configure the rest of the Auto-Reboot Settings.

Host Settings

Add, delete or test hosts for the WattBox to ping. The default hosts are Google, Apple, and Amazon.

Click **ADD NEW HOST** at the top of the page to add an internal or external IP address to the list. Enter a **Host Name**, **Website or IP Address**, and the **Protocol** to use, then click **TEST HOST**.

> **Note:** You must click the **TEST HOST** button before you can add another Host or save your changes.



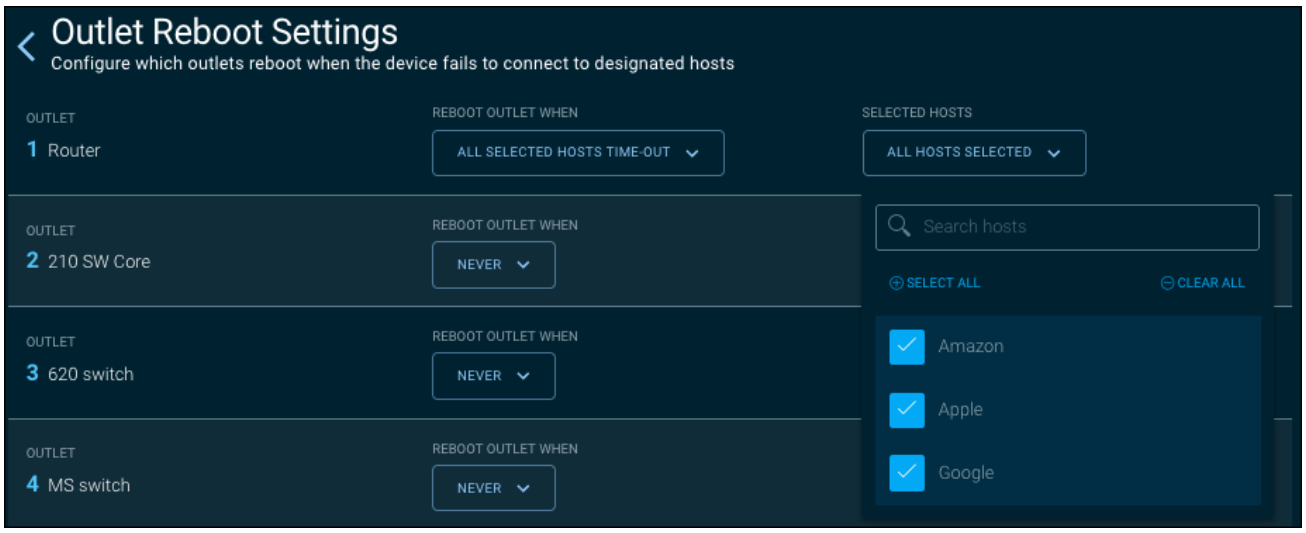
Outlet Reboot Settings

Configure which outlets restart when they cannot connect to the selected hosts.

Use the **Reboot Outlet When** dropdown to specify whether the outlet restarts when All selected hosts time-out, Any selected host time-out, or Never.

Use the **Selected Hosts** dropdown to select all the Hosts configured in the Host Settings or specific hosts.

Pro Tip: Only use Hosts with external IP addresses for outlets with routers or modems connected. If you use internal IP addresses the device will most likely not restart when you'd like it to.



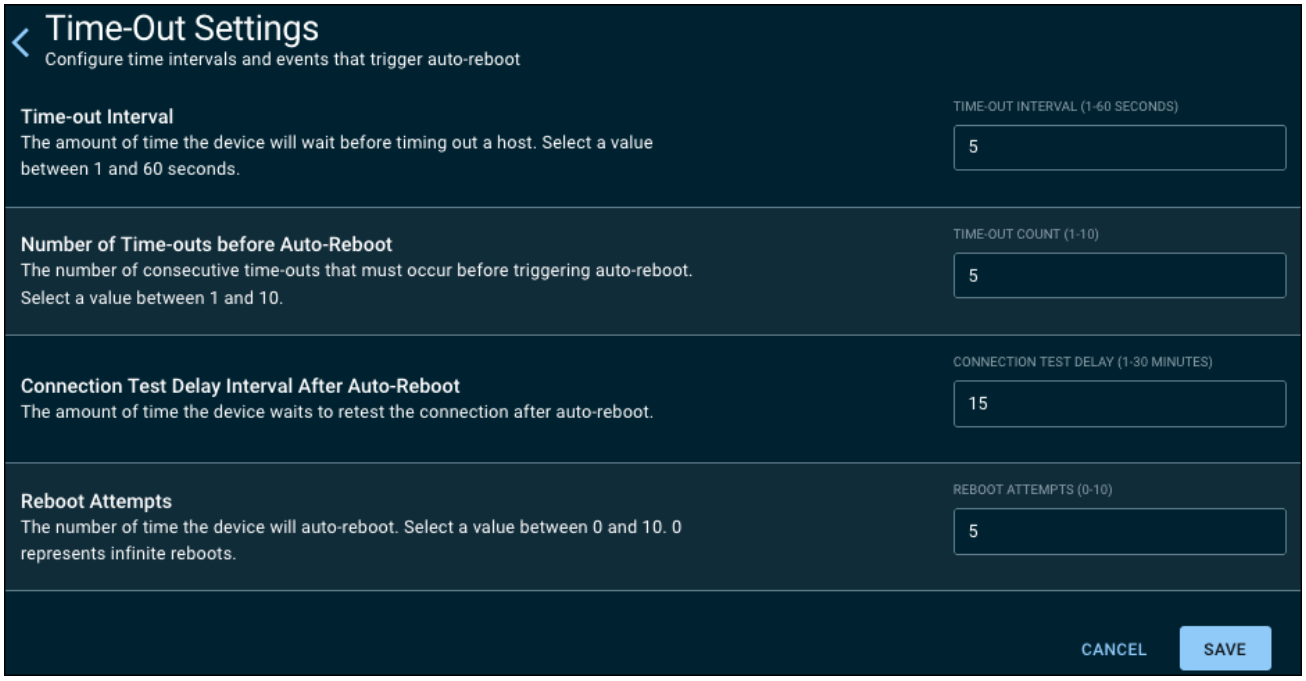
Time-Out Settings

Configure the amount of time and the events that trigger an auto-reboot. Options include:

- **Time-out Interval** is the amount of time (between 1 and 60 seconds) the device waits before it considers a host to time out. For example, if the Time-out Interval is set to 30 seconds the host(s) must be unreachable for 30 seconds before it is considered a time-out.
- **Number of Time-outs before Auto-Reboot** is the number of consecutive time-outs (between 1 and 10) that must occur before an outlet reboots.
- **Connection Test Delay Interval After Auto-Reboot** is the amount of time the WattBox waits between time-out tests.

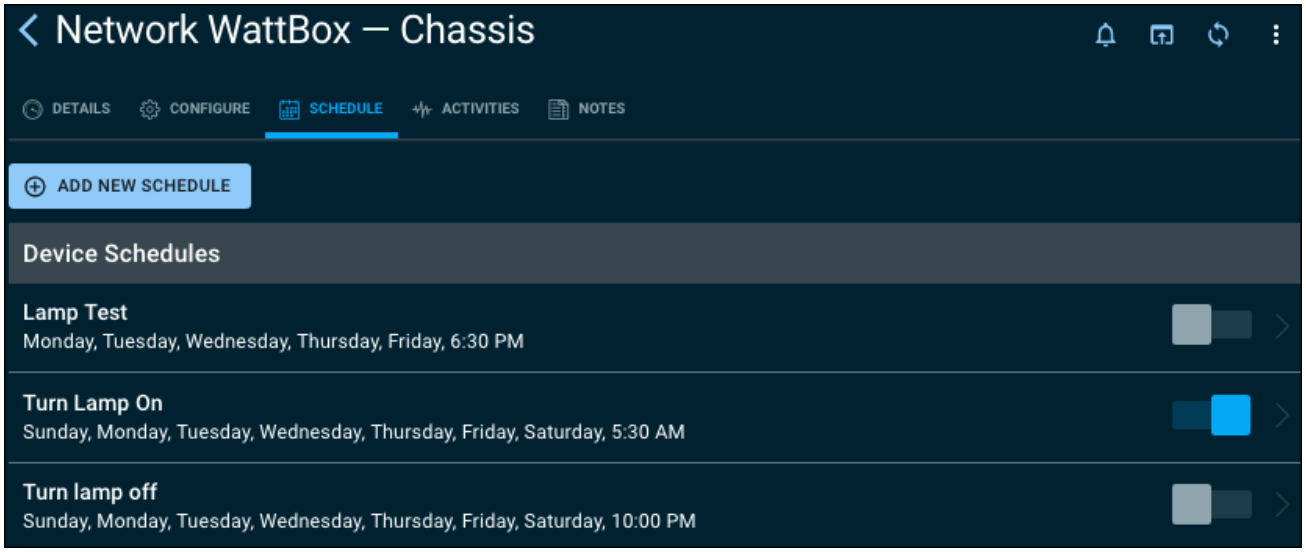
Pro Tip: Make sure there is enough time for the networking equipment to power on and start their services before the WattBox tries to connect to the configured Hosts.

- **Reboot Attempts** is the number of times the WattBox will auto-reboot the outlets. Zero means the WattBox will continue restarting outlets until the hosts stop timing out.



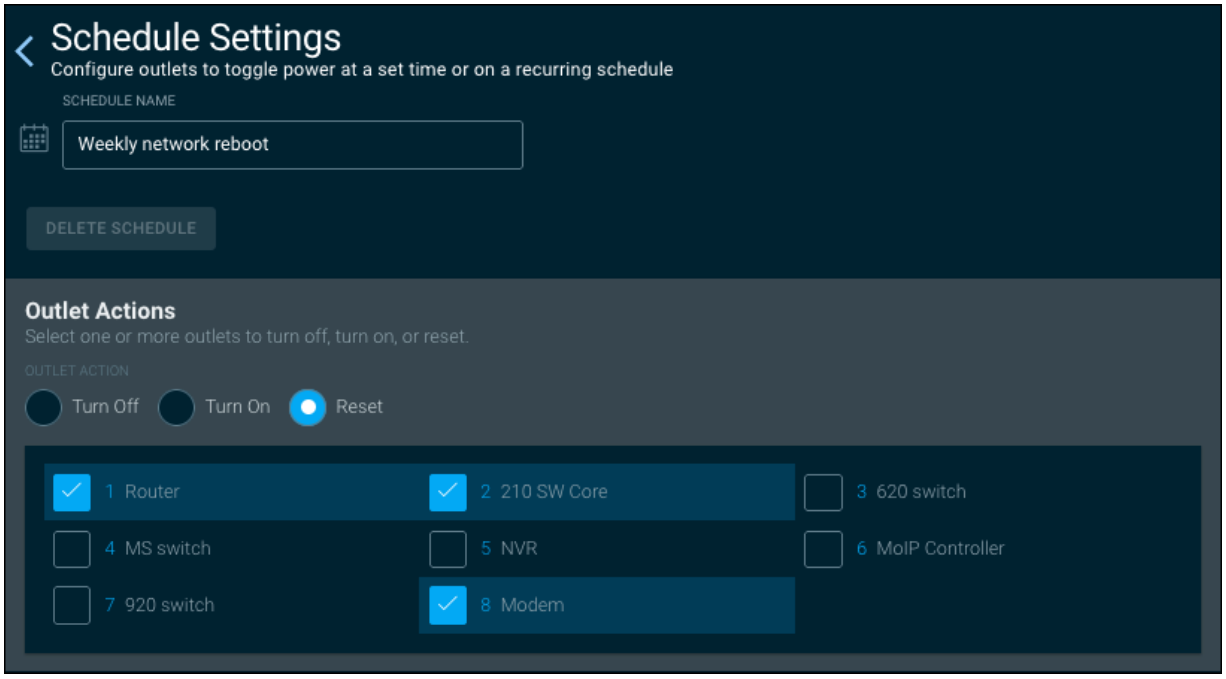
Outlet Schedules

The **Schedule** tab allows you to create schedules to turn off, turn on, or reset outlets at specific times. Device Schedules can be toggled on or off. Click a schedule to delete or edit it.

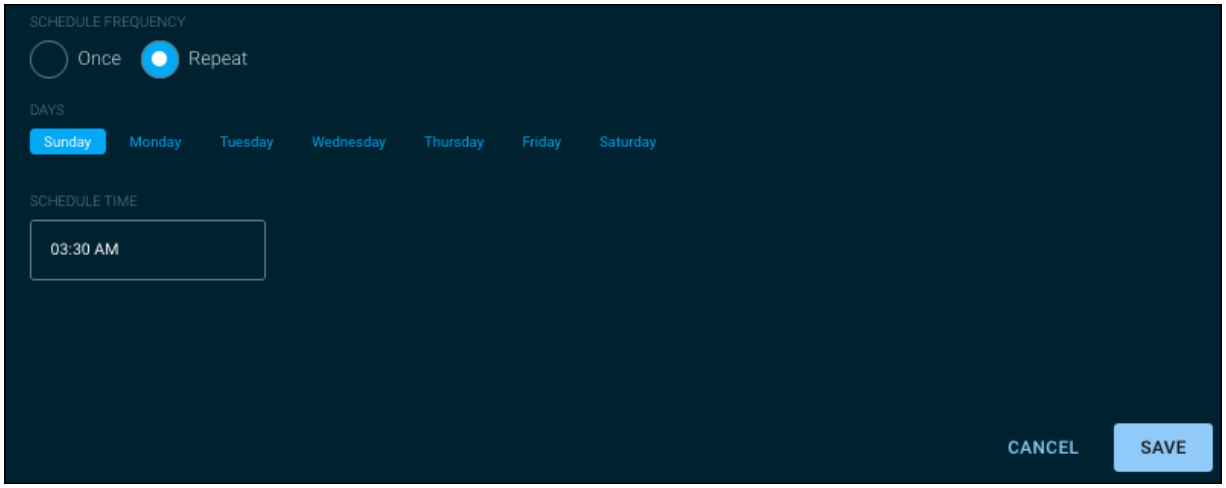


How to create a Device Schedule

1. Click **Add New Schedule** to open the Schedule Settings page.
2. Enter a meaningful **Schedule Name**. Something with the device or device type, the outlet action, and how often the action happens. Like "Weekly network reboot."
3. Select an **Outlet Action**. Turn Off, Turn On, or Reset. You can only select one type of action per Device Schedule. Then select the outlets to take the action.



4. Set a **Schedule Frequency**. **Once** allows you to set a Schedule Date and Time. **Repeat** allows you to select which days and at what time the Outlet Action is taken. Click **Save** when finished.



Local web interface

You can access the interface by typing the IP address into a web browser or by using OvrC's WebConnect feature.

Username and password

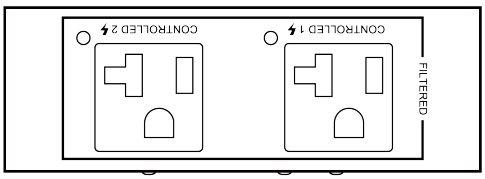
The default username and password are both wattbox. You must change them after the initial login.

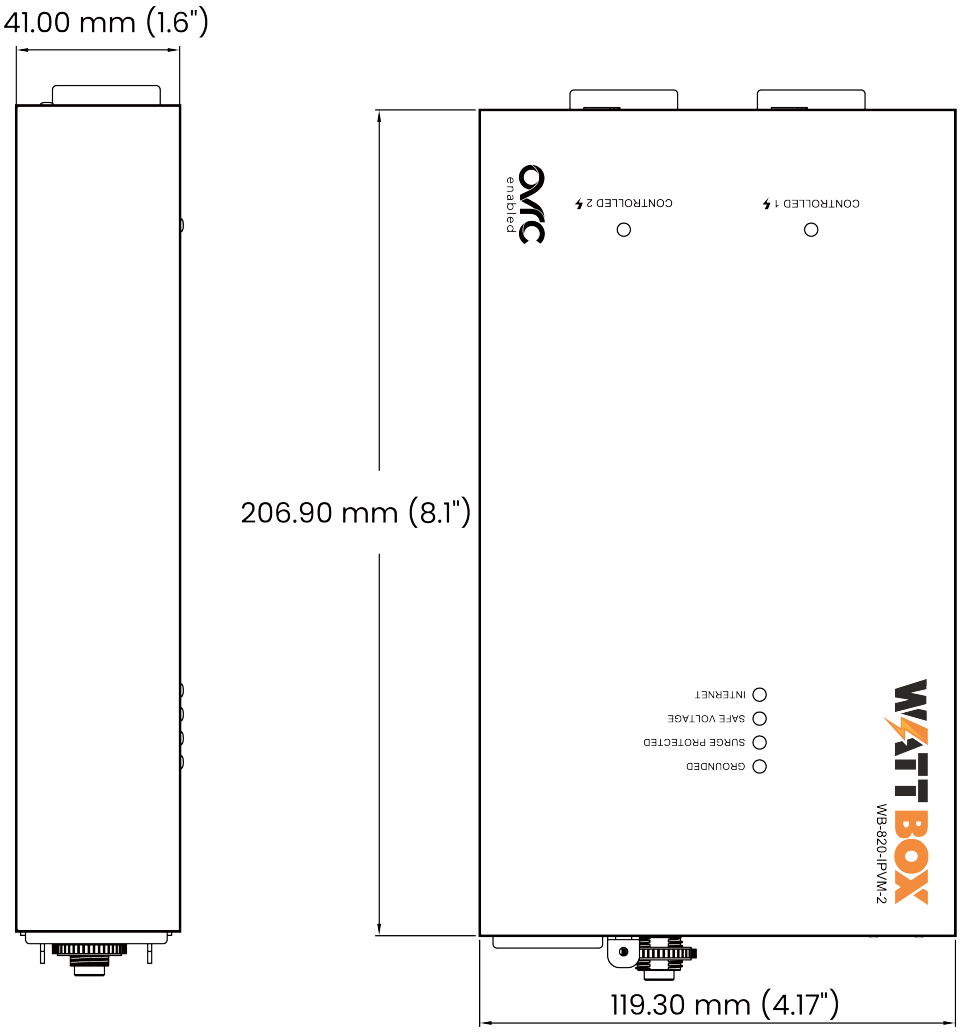
Troubleshooting

Symptom	Possible cause	Remedy
WattBox is not receiving power (the System Status LED is not illuminated).	No power is being supplied.	Make sure the AC power plug is plugged into a properly grounded 120V (nominal) wall outlet. Some wall outlets are controlled by a wall switch. Try flipping the switches in the room, especially those near the wall outlet. Also check the location's circuit breakers.
	Too many devices are connected, causing an overload, tripping the WattBox's internal circuit breaker.	Press the circuit breaker's reset button. Allow 10 minutes before attempting to reset; otherwise, the reset will fail. If the circuit breaker continues to trip, move one or more components to another WattBox.
The attached component is not receiving power from the WattBox.	Component is plugged into a controlled outlet and the outlet is off.	To turn the outlet on, log in to the WattBox interface or press the power button.

Symptom	Possible cause	Remedy
	In some instances, a component plugged into a switched outlet won't automatically power itself up when the WattBox is turned on.	Turn the component power on.
Speakers emit a humming or buzzing noise.	WattBox is sharing AC power with equipment that is not properly grounded.	Connect WattBox to a dedicated outlet. Unplug different components from WattBox one at a time to see if the noise stops.

Dimensions





Specifications

EMI/RFI Filtration	# of Filters = 1 for 2 outlets

Outlets	(2) NEMA 5-20 Outlets
Peak Impluse Current	45,000A
Safe Voltage	Yes, (90V ~ 136V)
Certifications	UL 62368-1, UL 1449, UL 1283, FCC 47 CFR Part 15 Subpart B-Class B
Dimensions	Device: 119.30 mm (4.7") W x 206.90 mm (8.1") L x 41.00 mm(1.6") H With Brackets attached: 162.56 mm (6.4") W x 206.90 mm (8.1") L x 41.00 mm(1.6") H
Features	Protection Modes: L-N, L-G, N-G Locking and Detachable Power Cord
Inputs	AC Input Connection: IEC C-22
Operating Temperature	14 °F - 104 °F
Power Cord Length	6 ft. with IEC C-21 Connection
Line Voltage	120V, 50/60 Hz
Circuit Breaker Rating	20A
UL Current Rating	16A
UL Power Rating	1920W
Voltage Protection Rating	L-N 500V, L-G 600V, N-G 700V
Joule Rating	1080J
Rack Spacing	N/A
Fuse Type	Thermal Fuse
IP Controllable Outlets	2
API	Yes
Power Metering	Individual Outlets: Yes Whole Device: Yes
Surge Protection	Yes, MOV Type with AC Disconnect Thermal Fuse

Best practices

"Use the checklist" on the facing page

"Plan a proper power load" on the facing page

"Physical installation" on page 33

This guide is neither comprehensive nor exhaustive, nor is it a replacement for employing (or becoming) a licensed electrician. Nonetheless, these simple tips make your installs better.

Use the checklist

We have created a checklist to help ensure you don't miss any important steps when setting up your WattBox devices.

Download it here.

Plan a proper power load

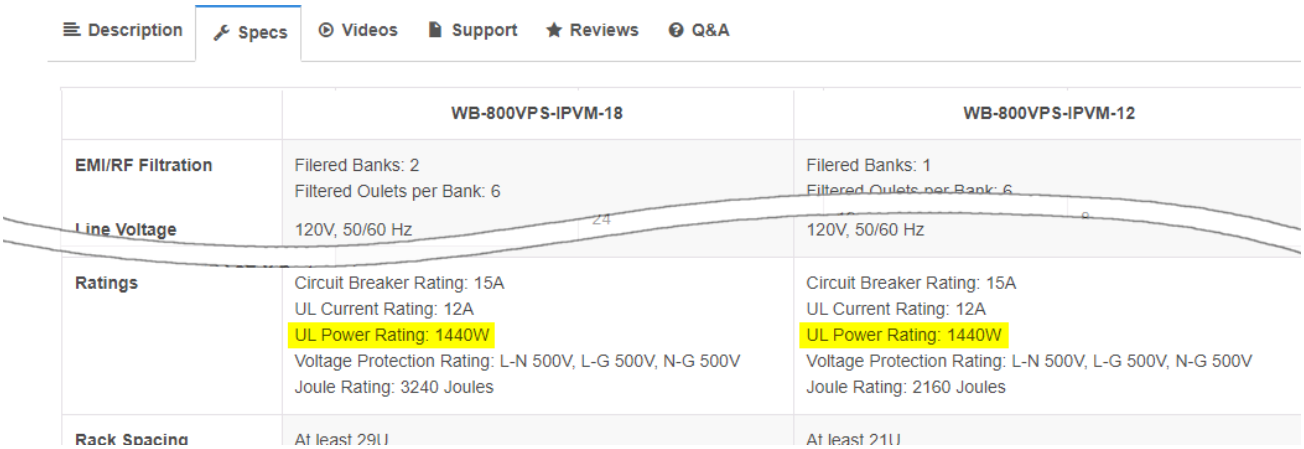
Power load is the total amount of power that attached equipment draws from the WattBox PDU (power distribution unit). Each PDU is designed to handle a specific maximum electrical load. If the load is higher than the PDU's rating, then the attached equipment cannot get enough power. This degrades performance and may damage or ruin the equipment.

Do not calculate load using average power consumption; certain devices draw more power at specific times. For example, when amplifiers start up, they can draw up to four times more power than normal. Security cameras draw more power at night when they activate their infrared emitters. This means that a home system with sound and surveillance may run fine in the daytime, but if it's nighttime (cameras running infrared) and someone powers up the sound system (heavy amplifier draw), the extra power load can cause issues if you didn't plan for it.

How to determine the potential load

All images here display details for North American markets.

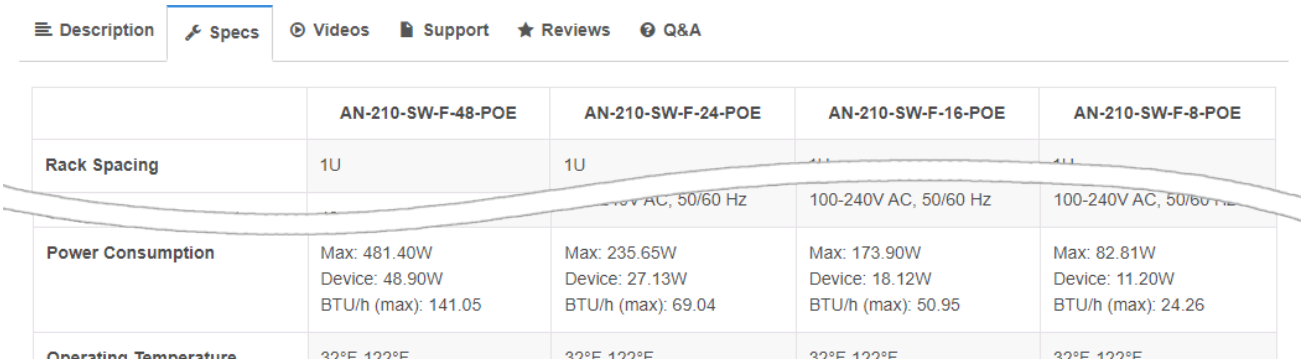
Find the power rating of each PDU; this is 1440W for many North American models. You can find this listed under “UL Power Rating” on the model’s product page.



Description | Specs | Videos | Support | Reviews | Q&A

	WB-800VPS-IPVM-18	WB-800VPS-IPVM-12
EMI/RF Filtration	Filered Banks: 2 Filtered Oulets per Bank: 6	Filered Banks: 1 Filtered Oulets per Bank: 6
Line Voltage	120V, 50/60 Hz	120V, 50/60 Hz
Ratings	Circuit Breaker Rating: 15A UL Current Rating: 12A UL Power Rating: 1440W Voltage Protection Rating: L-N 500V, L-G 500V, N-G 500V Joule Rating: 3240 Joules	Circuit Breaker Rating: 15A UL Current Rating: 12A UL Power Rating: 1440W Voltage Protection Rating: L-N 500V, L-G 500V, N-G 500V Joule Rating: 2160 Joules
Rack Spacing	At least 29U	At least 21U

Find the **maximum** power rating (in watts) for each device attached to the PDU. You can find this listed under “Power Consumption” on the device’s product page. For PoE devices, include their maximum PoE budget.



Description | Specs | Videos | Support | Reviews | Q&A

	AN-210-SW-F-48-POE	AN-210-SW-F-24-POE	AN-210-SW-F-16-POE	AN-210-SW-F-8-POE
Rack Spacing	1U	1U		
			100-240V AC, 50/60 Hz	100-240V AC, 50/60 Hz
Power Consumption	Max: 481.40W Device: 48.90W BTU/h (max): 141.05	Max: 235.65W Device: 27.13W BTU/h (max): 69.04	Max: 173.90W Device: 18.12W BTU/h (max): 50.95	Max: 82.81W Device: 11.20W BTU/h (max): 24.26
Operating Temperature	32°F 122°F	32°F 122°F	32°F 122°F	32°F 122°F

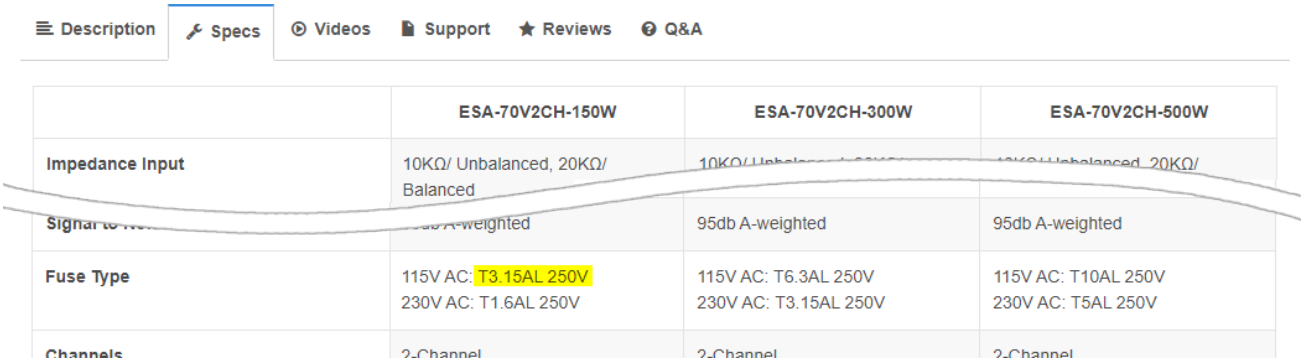
Add the various power consumptions together to find the maximum potential load. This load must be lower than the power rating for the PDU's power rating.

If the total load is greater than the PDU can handle, remove devices from the PDU until the maximum load is within parameters. This may require swapping devices between PDUs or purchasing additional PDUs to distribute the load.

If a device doesn't list a maximum power rating (for North America and other 120V systems)

If you can't find an official maximum power rating listed for your device, you can generate a good estimate with a quick calculation.

Find the fuse rating for your specific device on its product spec page. For an example, let's use the **Episode® 70V 150W IP-Enabled Amplifier**. On the product page, it lists a fuse rating of T 3.15A L 250V. The part we are interested in is the 3.15A section of that fuse rating.



Description | Specs | Videos | Support | Reviews | Q&A

	ESA-70V2CH-150W	ESA-70V2CH-300W	ESA-70V2CH-500W
Impedance Input	10KΩ/ Unbalanced, 20KΩ/ Balanced		
		95db A-weighted	95db A-weighted
Fuse Type	115V AC: T3.15AL 250V 230V AC: T1.6AL 250V	115V AC: T6.3AL 250V 230V AC: T3.15AL 250V	115V AC: T10AL 250V 230V AC: T5AL 250V
Channels	2-Channel	2-Channel	2-Channel

Take that 3.15 amps and multiply it by the standard North American power grid rating of 120 volts. 3.15A × 120V = 378W.

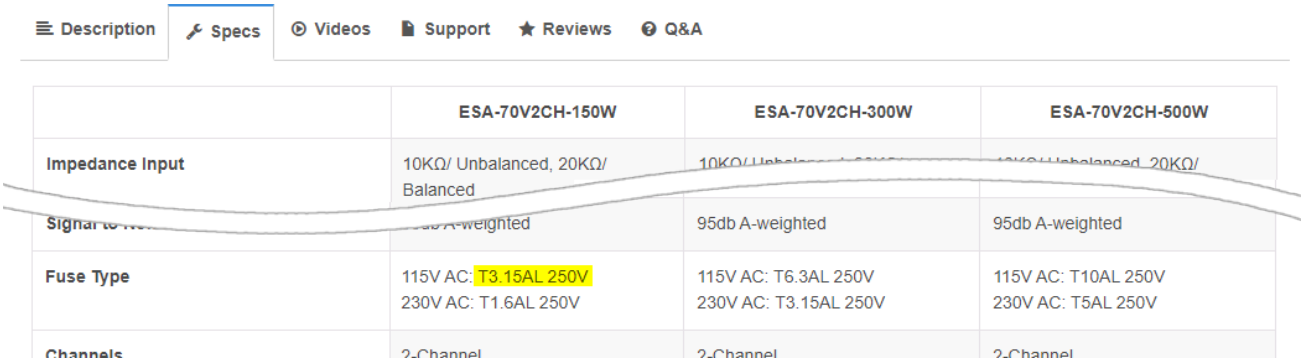
Is this accurate? In this case, we can cross-check that with the power consumption rating shown on the product page. We see that the amp is rated for 400W, so the 378W calculation is on point.

Note that this is peak power consumption, but with power conditioning and surge protection, this is the number we want to use. We don't care what the average consumption is.

If a device doesn't list a maximum power rating (for Europe and other 240V markets)

If you can't find an official maximum power rating listed for your device, you can generate a good estimate with a quick calculation.

Find the fuse rating for your specific device on its product spec page. For an example, let's use the **Episode® 70V 150W IP-Enabled Amplifier**. On the product page, it lists a fuse rating of T 3.15A L 250V. The part we are interested in is the 3.15A section of that fuse rating.



Description | Specs | Videos | Support | Reviews | Q&A

	ESA-70V2CH-150W	ESA-70V2CH-300W	ESA-70V2CH-500W
Impedance Input	10KΩ/ Unbalanced, 20KΩ/ Balanced		
Signal to N...	...A-weighted	95db A-weighted	95db A-weighted
Fuse Type	115V AC: T3.15AL 250V 230V AC: T1.6AL 250V	115V AC: T6.3AL 250V 230V AC: T3.15AL 250V	115V AC: T10AL 250V 230V AC: T5AL 250V
Channels	2-Channel	2-Channel	2-Channel

Take that 3.15 amps and multiply it by the standard European power grid rating of 240 volts. 3.15A × 120V = 756W.

Note that this is peak power consumption, but with power conditioning and surge protection, this is the number we want to use. We don't care what the average consumption is.

Example load calculation

This example uses a six-outlet, 800-series PDU. As you can see, the power consumption is well within parameters.

Outlet #	Attached Device	Max Load
1	Araknis 110 router	9
2	Araknis 210 switch	83
3	Araknis 510 access point	10

4	SunBrite Veranda outdoor television	266
5	Episode EVO10 subwoofer	480
6	Episode 150W amplifier	400
PDU maximum allowed power load: 1440W		1248W

Physical installation

Grounding

Plug the PDU ***directly*** into a grounded outlet. Do not use extension cords, non-grounded two-prong adapters, or other gear between the PDU and the outlet.Do not use external ground wires or ground connections other than those installed by an electrician.

Having a ground is required for the surge protection to work. Always confirm that the Ground LED (available on most models) is green; this indicates that the device is properly grounded.

Don’t use daisy chains

⚠ **Warning:** Daisy chaining can overheat a multi-outlet power strip, which can cause a fire.

Never plug a multi-outlet power strip or another PDU into an outlet of a WattBox PDU. If you do, power usage becomes much harder to track, and it increases the chance that the chained devices may draw more power than the PDU’s rating. When this happens, the PDU flips to Overcurrent Protection Mode, shutting off to prevent permanent damage to itself and the devices it powers. (Most electrical devices are designed to operate only at optimal power input levels, so low power can permanently affect their performance.)

to restore a unit from Overcurrent Protection Mode.

Physical positioning

UPSs and their battery packs are very heavy pieces of equipment. As such, install them as low in the rack as you can, so the rack won't tip when it's bumped or being moved.

To ensure stability, ensure that 70% of the gear weight in a rack is placed in the lowest 30% of the rack height.

Connections

Which device(s) to use

- If the job requires multiple amplifiers, consider dedicated electrical outlets for the equipment. Check that the circuit that powers the equipment can support the total potential load. When in doubt, consult an electrician.
- If a device needs to be remotely restarted or put on a schedule, use an 800-series, IP-controllable WattBox PDU.
- If a device has high peak-power requirements, consider a 200-series WattBox PDU with a dedicated outlet for proper surge protection.
- If a device has an inrush current that is high enough to trip a WB-800, but also needs to be power cycled or controlled via schedule, a WB-250 or WB-300 provides surge protection and individual outlet control, though without overcurrent protection.
- If the device doesn’t need to be on a controlled outlet, use a surge-only PDU.

Take full advantage of OvrC

OvrC ("oversee") is a **free** remote management platform that lets you manage and monitor each of your clients from the comfort of your office and with the convenience of your cell phone. With OvrC, your WattBox PDUs can:

- **Automatically restart devices** when they become unresponsive
- **Restart your router** when the internet goes down
- **Schedule off times** for specific equipment
- **Configure power-on delays** so multi-device systems come online smoothly
- **Allow the homeowner to restart** select equipment safely, without calling you or going behind the rack

Explore OvrC's complete capabilities at **OvrC.com**.

Update the firmware

Always keep your firmware up to date. Firmware updates fix known security and performance issues. Firmware updates are most easily checked and applied through OvrC. Find out more at **OvrC.com** or on **Tech Community**. Otherwise, follow the update instructions on your device's manual.

Caution: When updating a WB-800 device to firmware version 2.1.2.0, you must first ensure that each of the PDU's outlets are set to Enabled. Then either (a) power cycle the entire WattBox PDU with its power button, or (b) or use the "Reset All" command in OvrC. If any outlets are Disabled before reboot, the firmware features related to **OCP (over-current protection)** will not take effect.

Test the system thoroughly

Test the system while you are still on site, including using any standby states, to ensure that a connected device (like an amplifier) doesn't trip overcurrent protection with a strong inrush while charging its capacitors.

> **Pro Tip:** Amplifiers rarely need to be restarted. If there is not a specific reason to connect an amp to an IP-enabled WattBox, consider plugging it in to a surge-only WattBox instead.

Planning for power

Incorporating WattBox power equipment is not difficult, but poor planning puts an entire install at risk. Insufficient power can degrade equipment performance and reduce its lifespan, and a lightning strike can use one unprotected wire to cause massive damage.

Calculate outlet needs at each location

Once you have an install plan, sort each device by its location. Devices at each location should be physically close enough to be plugged into the same WattBox PDU. If they are not, split them into two locations (e.g., Home Theater Front and Home Theater Rear).

At each location, the quantity of electric devices tells you how many outlets each location needs.

To allow for the inevitable expansion, multiply the outlets at each location by 1.25. This gives you 20% headroom, just in case.

Calculate power draw

Find the maximum power consumption in watts for each device. Find this either on a label on the bottom of the device, or on the specs tab of the product page.

Total the power consumption of all devices each location.

As with the outlets, multiply the watts by 1.25 to give yourself 20% headroom for future expansion or equipment upgrades.

Determine the needed functionality

Different devices have different needs, and this should inform your choices.

- **Surge Protection:** Any device that is connected by a wire to another device in the system needs to be surge protected. Devices that are not directly connected to any other device cannot spread a surge, so they do not necessarily need surge protection.
- **Power Conditioning:** Precision devices like audio gear need constant, reliable, noise-free power. Simpler devices like fans and touchscreens can do without.
- **Voltage Regulation:** If you have voltage drops in power supply, your high-performance gear needs a small UPS that can boost when needed.
- **Battery Backup:** If your gear needs to operate (even if only for a safe shutdown) when the power goes out, you need a UPS.
- **Outlet Control and Monitoring:** The project needs this so you can monitor power use by a device, and/or reboot a device that has a tendency to hang.
- **Wi-Fi:** This allows IP control (above) in a location you cannot reach with an ethernet cable.
- **Installation specifications:** The features, size, and mounting options must be considered.

Compare project needs to WattBox PDU and UPS specs

For each location, start with the most demanding device. Select the WattBox PDU and UPS that meets its needs.

Group additional devices to use (most of) the remaining outlets or power, whichever comes first.

If there are devices remaining at that location, either select a PDU with more outlets, or select a second PDU to cover the rest of the needs.

Here are some special cases to consider:

- If the job requires multiple amplifiers, consider dedicated electrical outlets for the equipment. Check that the circuit that powers the equipment can support the total potential load. When in doubt, consult an electrician.
- If a device needs to be remotely restarted or put on a schedule, use an 800-series, IP-controllable WattBox PDU.
- If a device has high peak-power requirements, consider a 200-series WattBox PDU with a dedicated outlet for proper surge protection.
- If a device has an inrush current that is high enough to trip a WB-800, but also needs to be power cycled or controlled via schedule, a WB-250 or WB-300 provides surge protection and individual outlet control, though without overcurrent protection.
- If the device doesn't need to be on a controlled outlet, use a surge-only PDU.

Configuring backup power

When the power goes out, a battery backup, called an uninterruptible power supply or UPS, can supply emergency power.

What a UPS does

The UPS provides battery power for a short time to ensure that equipment can be powered down in a proper manner. This helps eliminate equipment damage, loss of computer files, etc.

Like PDUs, each UPS has a maximum power output that it can support. You can find this on the product spec sheets under Power Rating. A UPS is designed to supply power to a PDU to support the PDU's equipment. Depending on your gear, this maximum UPS power may be below the level that a PDU can support.

Since the UPS is responsible for powering all gear attached to the PDU, once you attach it to your PDU, the UPS becomes the ruling device for power throughput to that PDU. As such, total power throughput of the PDU is limited to the capacity of the UPS even if AC power is present. Example: If your 1440W PDU is plugged into the wall, it can pass 1440W of power. If it is plugged into a UPS (that is in turn plugged into the wall) with a maximum power rating of 1000W, then your 1440W PDU can only pass 1000W of power, as set by the UPS, even though AC power is available.

Load shedding

Battery backup is not intended to provide full power for a long time. Typically, a UPS providing power to a full load only lasts for a few minutes. However, if the UPS is only powering, say, a network modem, router and switch, it might be able to provide power for hours.

When your 700- or 800-series PDU is plugged into a UPS and is also a linked by a category cable, you can extend the time that battery backup can power mission-critical components by configuring the PDU for load shedding. This extends the duration of battery backup by disconnecting non-critical components.

When switching to battery backup, the PDU powers off equipment in a predictable order that you specify, to provide maximum safety for both gear and data.

To customize your load shedding schedule, log in to OvrC, click on the PDU, and navigate to the Configure tab. Under the General Setting group, click on UPS Settings.

The UPS has five levels of battery-powered equipment support. These stages are based on remaining battery life. While every install is different, best practices generally adhere to the following schedule:

Calculating battery life

Calculating how long your UPS will last is not precise, because the amount of power each device uses is not a fixed, reliable amount. In addition, battery duration is not strictly arithmetic based on power consumption. That is, if you use a battery at 1/10 of its capacity, it will last over twenty times as long as a battery that runs at full capacity. However, it is possible to estimate the duration based on loads.

Example duration calculation

This example uses a 12-outlet, 800-series WattBox attached to a 2000VA UPS.

Here is the duration in minutes for the UPS, based on load (this data is available on the website). Note that times are given in decimal minutes, not minutes and seconds):

Load	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
Time	3.42	4.37	5.44	6.88	8.85	11.63	15.76	22.59	36.69	73.82

This particular client wants no interruption to his outdoor media when power goes out. This way he can shut down his audio nicely, then finish viewing whatever scene is happening on TV before he shuts that down (maybe not the best of priorities, we know). After that, he wants to maintain his surveillance until the total power gets down to 25%.

To fill out this load shedding worksheet:

- Enter each device attached to the PDU that it powered by the UPS.
- For each shedding column, enter the device's load in watts for active outlets, or leave it blank if that outlet is disabled at that level.
- For power rating, enter the UPS's power rating. You can find this on the product's web page.
- For capacity, divide the load by the power rating to determine how taxing the active equipment is. Since this is all based on averages, the actual duration can vary greatly.
- Finally, for duration, look at the duration for that approximate load, and divide by four (for the stages of load shedding). This tells you how many minutes that the UPS can provide energy for that quartile of power consumption.

Outlet	Device	100%	75%	50%	25%
1	Araknis 110 router	9	9	9	9
2	Araknis 210 switch	83	83	83	83
3	Araknis 510 AP	10	10	10	10
4	Luma NVR	180	180	180	
5	Front Dome Camera	8	8	8	
6	Back PTZ Camera	23	23	23	
7	SunBrite Veranda	266	266		
8	Episode EVO10 Sub	480			
9	Episode 150W Amp	400			
10–12	Empty				
Total Load	Add rows 1–12	1459	579	313	102
Power Rating	of your UPS	1710W	1710W	1710W	1710W
Capacity	Load / UPS rating	85%	34%	18%	6%
Duration	Load time / 4	1.25	4.8	9.2	18.4

- Looking at the loads, in the 100% column, we are running an 85% load. That's halfway between 80% (5.44 minutes) and 90% (4.37 minutes), so we'll split that time and call it 4.9 minutes. Divide that by 4 (for operating from 100% down to 75%), and we get a final duration of 1.25 minutes for that section. The customer therefore has 75 seconds to shut down his audio gear.

- For the next column, 34% splits the difference between 30% and 40%. Those durations average out to 19.2 minutes. One fourth of that means that devices in this section run for roughly 4.8 minutes.
- The 18% we'll just round up to 20%. Taking the 36.69 minute duration and dividing by four, we get 9.2 minutes for the battery to drain from 50% capacity down to 25%.
- Finally, the 6% we'll just call 10%, with a final calculated duration of 18.4 minutes.

This means that, if everything is running at full power consumption at the moment the power goes out, the UPS will provide power for roughly 33 minutes, 30 seconds. Of course, if the TV and outdoor audio are already off, and the system only has to run the surveillance and network, the battery will last a whole lot longer.

Troubleshooting

If a client is having problems, follow these basic troubleshooting steps. Each step is hotlinked to a detailed description. Note that each of these steps is made easier and faster if you are using OvrC.

Update the firmware

Always keep your firmware up to date. Firmware updates fix known security and performance issues. Firmware updates are most easily checked and applied through OvrC. Find out more at **OvrC.com** or on **Tech Community**. Otherwise, follow the update instructions on your device's manual.

Caution: When updating a WB-800 device to firmware version 2.1.2.0, you must first ensure that each of the PDU's outlets are set to Enabled. Then either (a) power cycle the entire WattBox PDU with its power button, or (b) or use the "Reset All" command in OvrC. If any outlets are Disabled before reboot, the firmware features related to **OCP (over-current protection)** will not take effect.

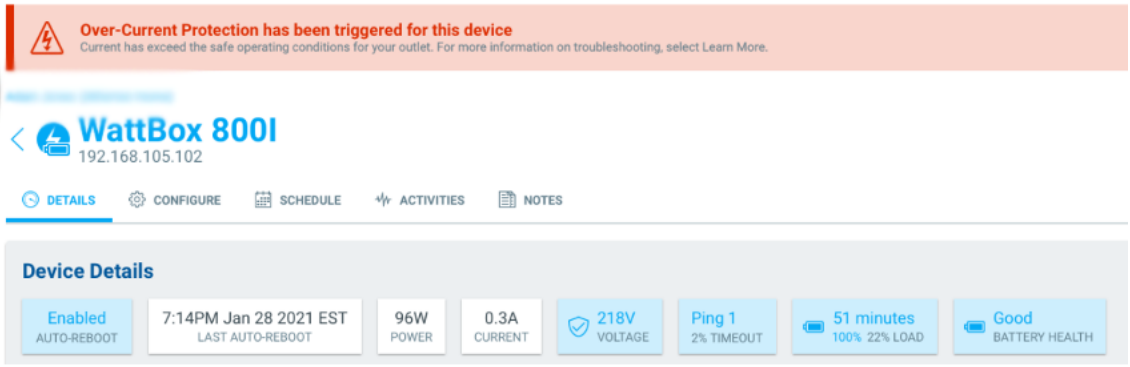
Reset over-current protection mode

Over-current Protection (OCP) is a feature of the WattBox 800 series that protects each outlet (and therefore the equipment connected to that outlet) from excessive current. OCP turns off an individual outlet in order to protect itself, appearing unresponsive.

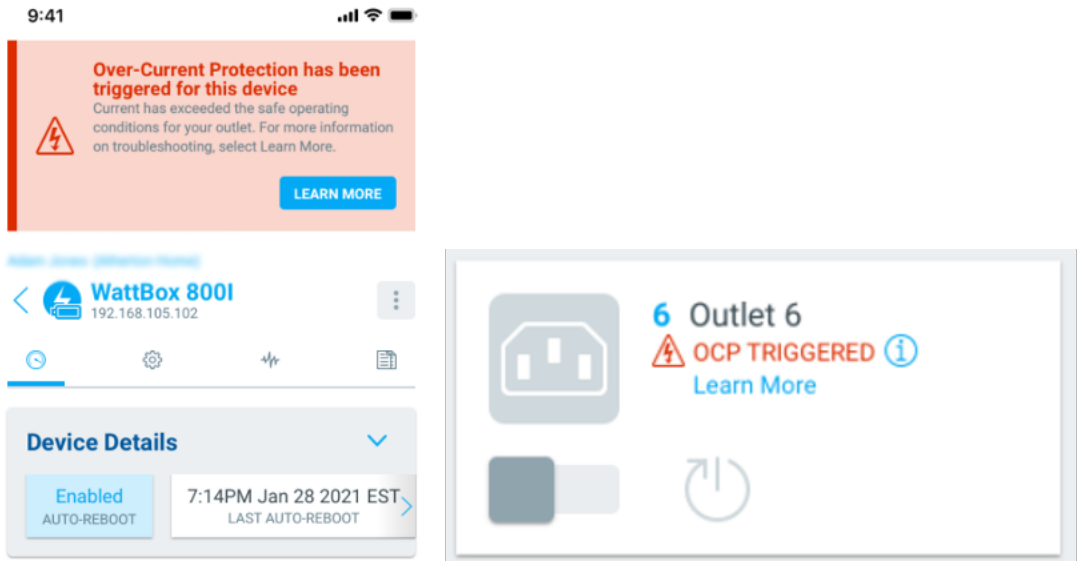
You know that OCP is tripping if:

- The total possible load of all devices connected to the PDU exceeds the power rating (for North America, this is 12A @ 120V, 1440 Watts), also called "constant OCP".
- An outlet with a high-inrush device such as an amplifier shuts off as the device powers up, also called "instantaneous OCP".

When operating with the latest firmware, the PDU provides a warning banner in OvrC that notifies you that an OCP event has occurred.



There is also a new “Learn More” link that explains OCP and ways to troubleshoot.



Ensure there are no daisy chains

Double-check to ensure that no one has plugged a multi-outlet power strip into the PDU.

Check that there are no new devices

If someone plugs a new device into your PDU, that’s a power draw that you hadn’t accounted for, and it might cause problems.

With 800-series PDUs, if you have labeled your outlets in OvrC, you can check power consumption with the metering data to see if it has changed (or to see if a formerly empty outlet is mysteriously drawing power).

You can also use OvrC to scan the network to see if there are any devices that you haven't accounted for. Some of these might just be the neighbor kid's cellphone that's using the client's Wi-Fi, but others might be that new sound system the client forgot to tell you about.

Check the outlet mode

Using OvrC, an outlet can be turned off or set to Disabled. To check the outlet mode, log in to OvrC, navigate to the location, and click the PDU.

Outlets that are off provide no power. In the Details tab, check that the outlet's slider is to the right and colored blue. If the slider is to the left and gray, the outlet has been turned off and transmits no power. Click the slider to turn the outlet back on.

Outlets that are set to Disabled are no longer affected by OvrC commands, OvrC Connect commands, or the PDU's power button. They cannot be adjusted from their current state unless you go to the Configure tab, click Outlet Options, and choose either the Enabled or Network Device (Reset Only) mode.

Check the schedule

OvrC can set your WattBox PDU to shut off or reboot selected outlets at specified times. A forgotten scheduled event looks just like a major failure.

To check the schedule, log in to OvrC and navigate to your WattBox PDU. In the PDU's Schedule tab, check that there are no unwanted events in the calendar. If there are, edit or delete them.

Also check that the proper Time Zone is set.

Check the power load

If an outlet with a high-inrush device (such as an amplifier) shuts off as the amplifier powers up, it may be an overcurrent issue. First verify that the WattBox firmware is up to date. If the problem persists, move the device to a different outlet. If the issue follows the device, there is most likely an overcurrent issue with that device.

If all else fails, calculate the total power load "How to determine the potential load" on page 29.

Once any power issues have been cleared, if any outlets remain unresponsive, it's possible that "Reset over-current protection mode" on page 43 has been tripped.

Check for needed replacement

Like the brakes on your car, surge protection wears out.

PDUs are rated for how much surge they can withstand. This amount is rated in joules. Typically, PDUs divert their excess energy to metal oxide varistors (MOVs), which get degraded as they dissipate this energy. Thus, if you have a MOV rated to 1000 joules, it can withstand one 1000-joule hit, ten 100-joule hits, or 1000 tiny 1-joule hits before it fails.

Replace your PDUs periodically, because even small surges eventually grind down your protection. If you're in a location that has frequent thunderstorms, replace your PDUs every 4–5 years. In locations with no thunderstorms and a stable power supply, you might be able to stretch this to 6–8 years.

How to tell if your MOVs are dead

If you have a surge and the AC power cuts out to all devices on a specific PDU, that shows that the PDU just shut down power transmission to save the gear. It must be replaced, even if the unit can be restarted (this happens in rare cases).

Also, most WattBox PDUs (300s, 700s, 800s) have an LED light labeled “Protected.” When this LED is green, that indicates that the MOVs are still operational. When this LED is off, that indicates that the MOVs have been used up; replace the PDU.

Technical Support

For chat and telephone, visit **snp1.co/techsupport** • Email: **TechSupport@SnapOne.com**. Visit **snp1.co/tc** for discussions, instructional videos, news, and more.

Warranty and Legal Notices

Find details of the product’s Limited Warranty and other resources such as regulatory notices and patent and safety information, at **snapone.com/legal** or request a paper copy from Customer Service at **866.424.4489**.

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