SonicWall® SonicWave 200/400 Series

Deployment Guide

SONICWALL®

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Hardware Overview and Configuration

- Hardware Overview
- Product Specifications
- Deployment Requirements per Model
- Antenna Installation
- Connecting Cables
- Power Requirements
- Wireless Access Point Placement Considerations
- Mounting Wireless Access Points

1

Hardware Overview

This summarizes salient and visible differences among SonicWave 200 and 400 series access points.

Topics:

- SonicWave 231c Hardware Overview
- SonicWave 224w Hardware Overview
- SonicWave 231o Hardware Overview
- SonicWave 432e and 432i Hardware Overview
- SonicWave 432o Hardware Overview

SonicWave 231c Hardware Overview

SonicWave 231c Product Description

Salient features of the SonicWave 231c include:

- Ceiling mount design / mount on ceiling or wall
- Plenum-rated for safe ceiling use
- 2 x 2 MU-MIMO
- Ethernet: 1 x10/100/1000 auto-sensing RJ 45
- USB 2.0 interface
- 802.3AT PoE power supply with optional 12 V adapter

SonicWave 231c

SonicWave 231c Hardware Components

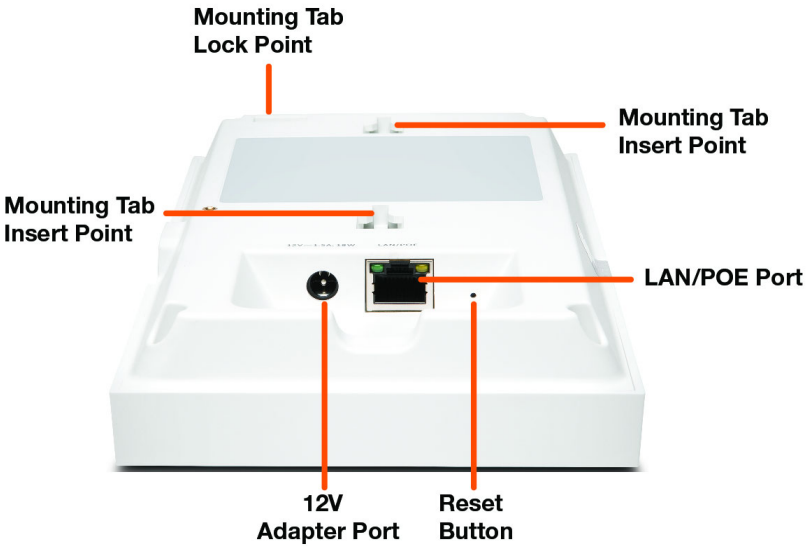
Component	Description
2.4GHz and 5GHz radios	Dual radios provide: • 802.11b/g/n/ac • DFS (Dynamic Frequency Selection) SonicWave 231c complies with FCC rules to detect and avoid interfering with radar signals in DFS bands. • 2x2 11n + 2x2 11ac Wave 2 MU-MIMO
1GbE LAN port	1 Ethernet 10/100/1000 LAN port for wired connection to a SonicWall network security appliance
USB port	1 USB 2.0 port
Flash memory	256 MB NAND Flash
DDR Memory	512 MB DDR3-1600MHz
Scanning radio	Dedicated third scanning radio
Antennas	5 internal (2.4Ghz x 2 / 5Ghz x 2 / Scan Radio x 1)
Power source	802.3at PoE (standard, PoE device sold separately) Optional DC 12V power adapter, sold separately
Chassis	Rectangle 119mm x 214mm x 34mm Plenum rated
Kensington security slot	For use with a Kensington locking cable to prevent theft
Operating temperature	0° to 40°C

SonicWave 231c Ports and LEDs

The back of SonicWave 231c provides a **LAN/POE** port where the PoE Ethernet cable connects the access point with the PoE injector or PoE-enabled switch, which connects to your SonicWall network security appliance.

A 12V power connection is also provided on the back of the unit, where you can plug in a 12V adapter (sold separately) to power the device.

SonicWave 231c Back



When the access point is installed, the back panel is attached to the ceiling or to a wall or other flat surface.

The side panel of the SonicWave 231c has the LED indicators and the USB port.

SonicWave 231c LEDs

You can insert a 3G/4G USB modem into the USB port to create a mobile wireless (MiFi) hotspot. See the *SonicOS 6.5 Connectivity* administration documentation for information about the MiFi Extender feature. You can also use the USB port with a USB security clamp.

SonicWave 231c LED Activity

The SonicWave 231c LEDs provide essential status information about the access point.

Power LED

LED Color	Description
Off	No power
Blue	Power is on

LAN LED

LED Color	Description
Off	No link
Solid Yellow	Link established at 1 Gbps
Blinking Yellow	Active traffic at 1 Gbps

LAN LED

LED Color	Description
Solid Green	Link established at 100 Mbps or 10 Mbps
Blinking Green	Active traffic at 100 Mbps or 10 Mbps

5 GHz Radio LED

LED Color	Description
Off	5 GHz radio is off
Solid Green	5 GHz radio is on
Blinking Green	Active traffic on 5 GHz radio

2.4 GHz Radio LED

LED Color	Description
Off	2.4 GHz radio is off
Solid Green	2.4 GHz radio is on
Blinking Green	Active traffic on 2.4 GHz radio

LED Pattern During Firmware or SafeMode Bootup

LEDs	LED Color	Description
LAN	Green - Heartbeat	The three LEDs blink simultaneously in a heartbeat pattern while booting is in progress: On - On - Off
5 GHz Radio	Green - Heartbeat	
2.4 GHz Radio	Green - Heartbeat	

LED Pattern for Reset Button Hold Durations

LEDs	LED Color	Description
LAN	Blinking Green	The three LEDs blink simultaneously at a slow or medium rate: • Slow blink – Press Reset button 3 sec • Med blink – Press Reset button 8 sec
5 GHz Radio	Blinking Green	
2.4 GHz Radio	Blinking Green	

LED Pattern in SafeMode

LEDs	LED Color	Description
LAN	Green - Flow	The three LEDs turn on serially (one by one) and then turn off serially in a flow pattern while the <Short Product Name> is in SafeMode.
5 GHz Radio	Green - Flow	
2.4 GHz Radio	Green - Flow	

NOTE: The LEDs are disabled by default. You can enable them in the SonicWave provisioning profile or individual SonicWave entry in SonicOS on the firewall.

SonicWave 224w Hardware Overview

SonicWave 224w Product Description

Distinguishing features of the SonicWave 224w include:

- Wall-mount design / mount on ceiling or wall
- 2 x 2 MU-MIMO
- Ethernet: 3 x 10/100/1000, 2x 10/100/1000 pass-through ports supporting PoE
- 802.3at PoE power supply with optional 12 V adapter
- PoE output: 802.3af
- Accessible (after mounting) reset button

SonicWave 224w

SonicWave 224w Hardware Components

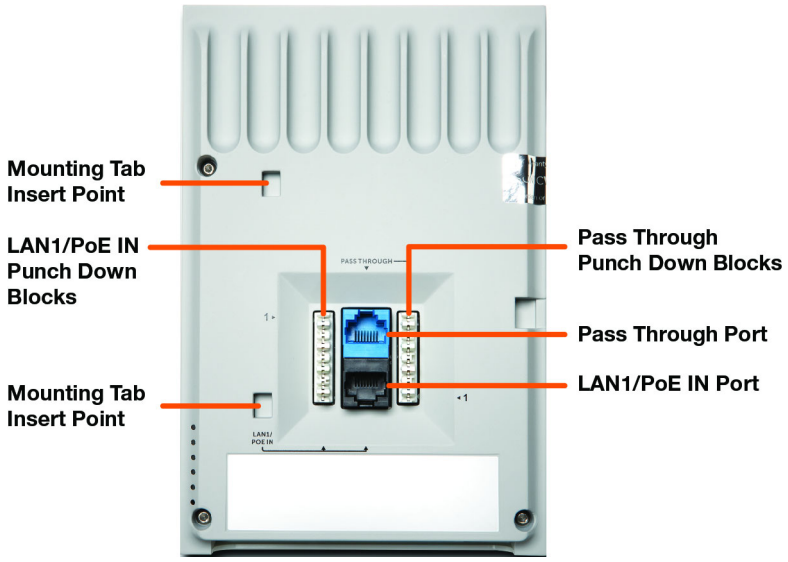
Component	Description
2.4GHz and 5GHz radios	Dual radios provide: • 802.11b/g/n/ac • DFS (Dynamic Frequency Selection) SonicWave 224w complies with FCC rules to detect and avoid interfering with radar signals in DFS bands. • 2x2 11n + 2x2 11ac MU-MIMO
1GbE LAN ports	3 Ethernet 10/100/1000 LAN ports for wired connections to a SonicWall network security appliance
Pass through LAN port	1 Ethernet 10/100/1000 pass through LAN port pair for a separate network connection from the same wall jack
LAN PoE Out port	1 LAN PoE Out port for 802.3af device
Flash memory	256 MB NAND Flash
DDR Memory	512 MB DDR3-1600MHz
Antennas	4 internal (2.4Ghz x 2 / 5Ghz x 2)
Power source	802.3at PoE (standard, PoE device sold separately) Optional DC 12V power adapter, sold separately
Chassis	Rectangle 122mm x 188mm x 18mm
Kensington security slot	For use with a Kensington locking cable to prevent theft
Operating temperature	0° to 40°C

SonicWave 224w Ports and LEDs

The SonicWave 224w is a “wall jack” access point. The back of the device provides two LAN ports, a **LAN1/PoE IN** port where the PoE Ethernet cable connects the access point with the PoE injector or PoE-enabled switch, and one port of the LAN **Pass Through** port pair.

Punch down blocks are also provided for both **LAN1/PoE IN** and **Pass Through**. For the **LAN1/PoE IN** connection, pin 1 of the Ethernet connector connects to the top left punch down block (labeled as **1>**). For the **Pass Through** connection, pin 1 of the Ethernet connector connects to the bottom right punch-down block (labeled as **<1**). The rest of the pins are laid out in sequential order from 1-8.

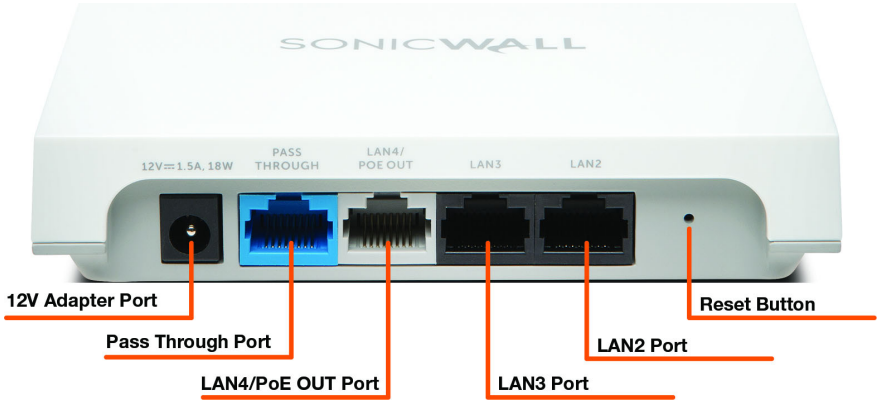
SonicWave 224w Back



When the access point is installed, the back panel is attached to the wall or to a junction box.

The blue **Pass Through** port is directly connected to the blue **Pass Through** port on the bottom edge of the unit. Neither of these ports access any functionality in the SonicWave 224w, but they provide a way for you to connect to a second network available in the same wall jack that provides your PoE-enabled network connection.

224w Ports on Bottom Edge

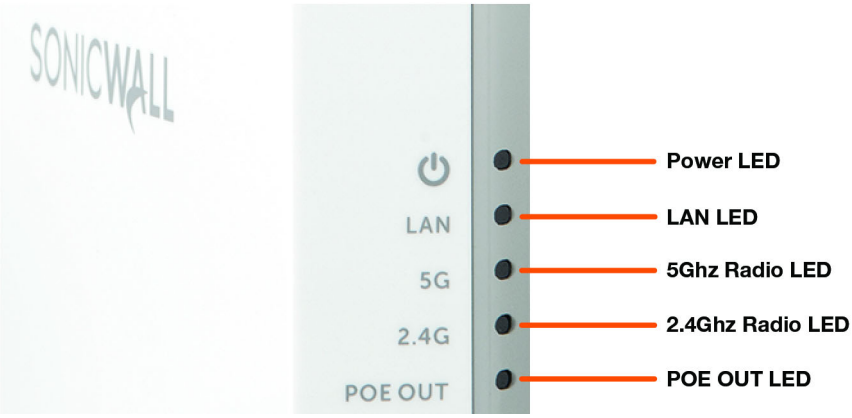


Other ports on the bottom edge of the SonicWave 224w include a power connection where you can plug in a 12V adapter (optional), and the **LAN4/PoE OUT** port which provides power over Ethernet for an 802.3af device, such as an IP camera.

The **LAN2** and **LAN3** ports provide a way for you to connect directly to the SonicWave 224w over Ethernet for access to the Internet or internal networks via the SonicWall firewall that is connected to the SonicWave 224w.

The side panel of the SonicWave 224w has the LED indicators.

SonicWave 224 LEDs



For information about the LEDs, see the SonicWave 224w LED Activity section.

SonicWave 224w LED Activity

The SonicWave 224w LEDs provide essential status information about the access point.

Power LED

LED Color	Description
Off	No power
Blue	Power source is AT (802.3at)
Yellow	Power source is not AT

LAN LED

LED Color	Description
Off	No link
Solid Yellow	Link established at 1 Gbps
Blinking Yellow	Active traffic at 1 Gbps
Solid Green	Link established at 100 Mbps or 10 Mbps
Blinking Green	Active traffic at 100 Mbps or 10 Mbps

5 GHz Radio LED

LED Color	Description
Off	5 GHz radio is off
Solid Green	5 GHz radio is on
Blinking Green	Active traffic on 5 GHz radio

2.4 GHz Radio LED

LED Color	Description
Off	2.4 GHz radio is off
Solid Green	2.4 GHz radio is on
Blinking Green	Active traffic on 2.4 GHz radio

PoE OUT LED

LED Color	Description
Off	PoE power output is disabled
Solid Green	PoE power output is enabled

LED Pattern During Firmware or SafeMode Bootup

LEDs	LED Color	Description
LAN	Green - Heartbeat	The three LEDs blink simultaneously in a heartbeat pattern while booting is in progress: On - On - Off
5 GHz Radio	Green - Heartbeat	
2.4 GHz Radio	Green - Heartbeat	

LED Pattern for Reset Button Hold Durations

LEDs	LED Color	Description
LAN	Blinking Green	The three LEDs blink simultaneously at a slow or medium rate: • Slow blink – Press Reset button 3 sec • Med blink – Press Reset button 8 sec
5 GHz Radio	Blinking Green	
2.4 GHz Radio	Blinking Green	

LED Pattern in SafeMode

LEDs	LED Color	Description
LAN	Green - Flow	The three LEDs turn on serially (one by one) and then turn off serially in a flow pattern while the SonicWave 224w is in SafeMode.
5 GHz Radio	Green - Flow	
2.4 GHz Radio	Green - Flow	

NOTE: The LEDs are disabled by default. You can enable them in the SonicWave provisioning profile or individual SonicWave entry in SonicOS on the firewall.

SonicWave 231o Hardware Overview

SonicWave 231o Product Description

Because this product has unique market and functionality, the SonicWave 231o requires specially trained professionals to configure and install it. Also, according to FCC rules (similar rules in other regulatory domains), you are required to consult with an experienced professional RF installer/dealer/technician to conduct the installation, conform to the regulation, and correct the interference from the standard industry measures. The FCC requires you to be notified that any changes or modifications made to the device, that are not expressly approved by SonicWall, could void your authority to operate the equipment. A professional installer is responsible for the proper installation and configuration of the outdoor SonicWave. The installer needs to understand and prepare for operating near any Terminal Doppler Weather Radar (TDWR) locations based on the FCC Memorandum and comply with all its requirements. The professional installer needs to choose the correct antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication to ensure the reduction of potential radio interference with other users. The professional installer must also properly select the current country of operation from the SonicWall configuration interface. Incorrectly entering the country of operation could result in illegal operation and might cause harmful interference to other systems.

Distinguishing features of the SonicWave 231o include:

- For outdoor application, licensed installer required.
- 2 x 2 MU-MIMO
- NEMA mounting kit / 4 external, omni-directional antennas.
- Ethernet: 1 x 10/100/1000 auto-sensing RJ-45
- PoE in: 802.11af

SonicWave 231o Top

SonicWave 231o Hardware Components

Component	Description
2.4GHz and 5GHz radios	Dual radios provide: • 802.11b/g/n/ac • DFS (Dynamic Frequency Selection) SonicWave 231o complies with FCC rules to detect and avoid interfering with radar signals in DFS bands. • 2x2 11n + 2x2 11ac wave 2 MU-MIMO
1GbE LAN port	1 Ethernet 10/100/1000 LAN port for wired connection to a SonicWall network security appliance
Flash memory	256 MB NAND Flash
DDR Memory	512 MB DDR3-1600MHz

SonicWave 231o Hardware Components

Component	Description
Scanning radio	Dedicated third scanning radio
Antennas	4 external Omni-Antenna (2.4Ghz x 2 / 5Ghz x 2) 1 internal antenna for scanning radio
Power source	802.3af PoE (standard, PoE device sold separately)
Chassis	Rectangle 122mm x 188mm x 18mm Plenum rated
Operating temperature	-30° to 60°C

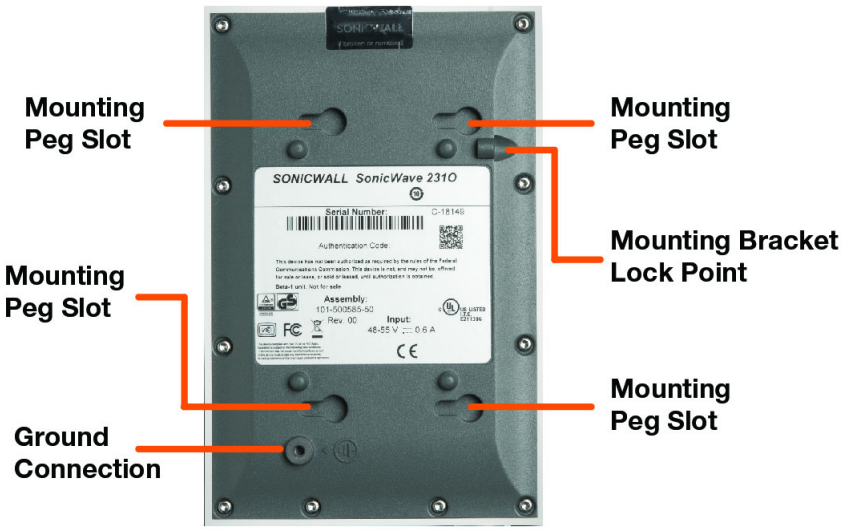
NOTE: The SonicWave 231o enclosure is IP67 compliant with components supplied with the product and when installed as instructed.

SonicWave 231o Antenna Connectors and LAN(PoE) Port

Four antenna ports on the ends of the SonicWave 231o provide connection points for the two 5GHz antennas and two 2.4GHz antennas.

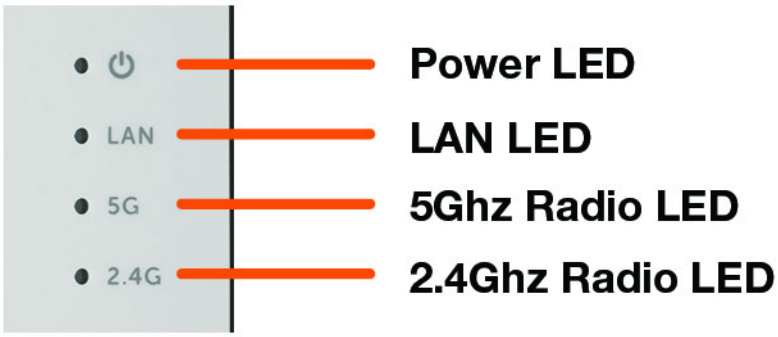
The SonicWave 231o provides one **LAN(PoE)** port for connecting to the PoE injector or PoE-enabled switch and to your SonicWall network security appliance. You can also use a SonicWall PoE-enabled security appliance to provide PoE from the appliance itself.

SonicWave 231o Bottom



The bottom of the SonicWave 231o has four slots for inserting the pegs on the mounting bracket, and a threaded hole for the mounting bracket locking screw. The ground connection point is also on the bottom of the device.

SonicWave 231o LEDs



The side panel of the SonicWave 231o has the LED indicators.

For information about the LEDs, see the SonicWave 224w LED Activity section.

SonicWave 231o LED Activity

The SonicWave 231o LEDs provide essential status information about the access point.

Power LED

LED Color	Description
Off	No power
Blue	Power is on

LAN LED

LED Color	Description
Off	No link
Solid Yellow	Link established at 1 Gbps
Blinking Yellow	Active traffic at 1 Gbps
Solid Green	Link established at 100 Mbps or 10 Mbps
Blinking Green	Active traffic at 100 Mbps or 10 Mbps

5 GHz Radio LED

LED Color	Description
Off	5 GHz radio is off
Solid Green	5 GHz radio is on
Blinking Green	Active traffic on 5 GHz radio

2.4 GHz Radio LED

LED Color	Description
Off	2.4 GHz radio is off
Solid Green	2.4 GHz radio is on
Blinking Green	Active traffic on 2.4 GHz radio

LED Pattern During Firmware Bootup

LEDs	LED Color	Description
LAN	Green - Heartbeat	The three LEDs blink simultaneously in a heartbeat pattern while booting is in progress: On - On - Off
5 GHz Radio	Green - Heartbeat	
2.4 GHz Radio	Green - Heartbeat	

NOTE: The LEDs are disabled by default. You can enable them in the SonicWave provisioning profile or individual SonicWave entry in SonicOS on the firewall.

SonicWave 432e and 432i Hardware Overview

SonicWave 432e and 432i Product Description

The SonicWave 432e provides physical layer enhancements over earlier SonicWall access points for higher throughput with a maximum data rate of 1.3 Gbps. To achieve this, the SonicWave 432e uses:

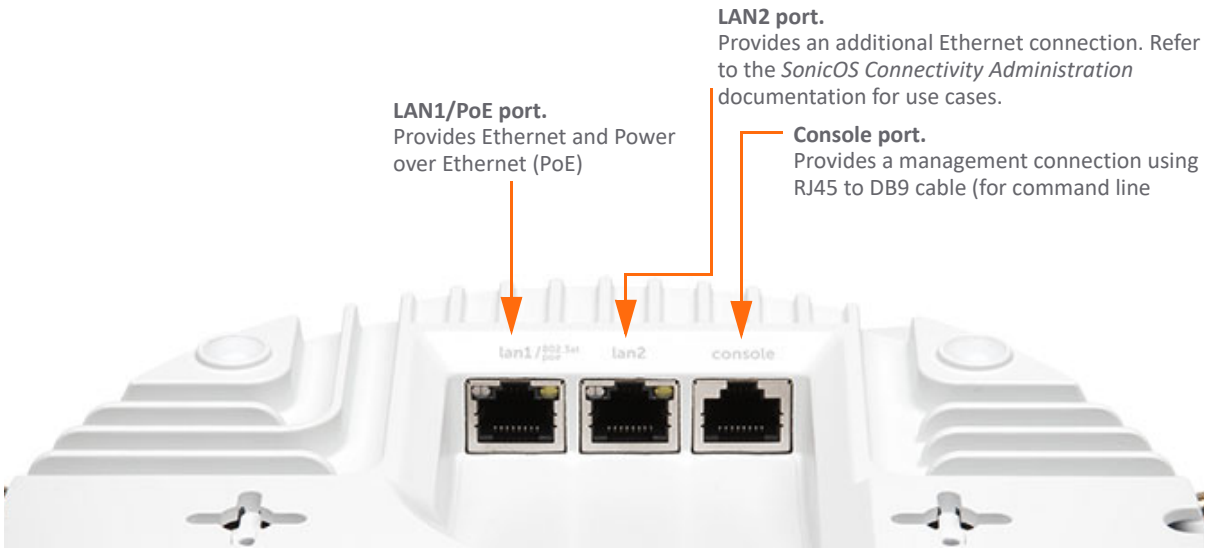
- More antennas—three antennas for the 5 GHz radio, and three more for the 2.4 GHz radio
- Wider channels—80 MHz-wide channels for the 802.11ac radio module, while continuing to support 20/40 MHz channels. This allows for dynamic per packet negotiation of channel widths so that when there is interference, the SonicWave can temporarily fall back to 40 or 20MHz channels.
- More spatial streams—4 x 4 multiple-input and multiple-output, (MIMO) for the 802.11ac radio module, where the capacity of a radio link is multiplied using multipath propagation.

Salient features of the SonicWave 432e and 432i include:

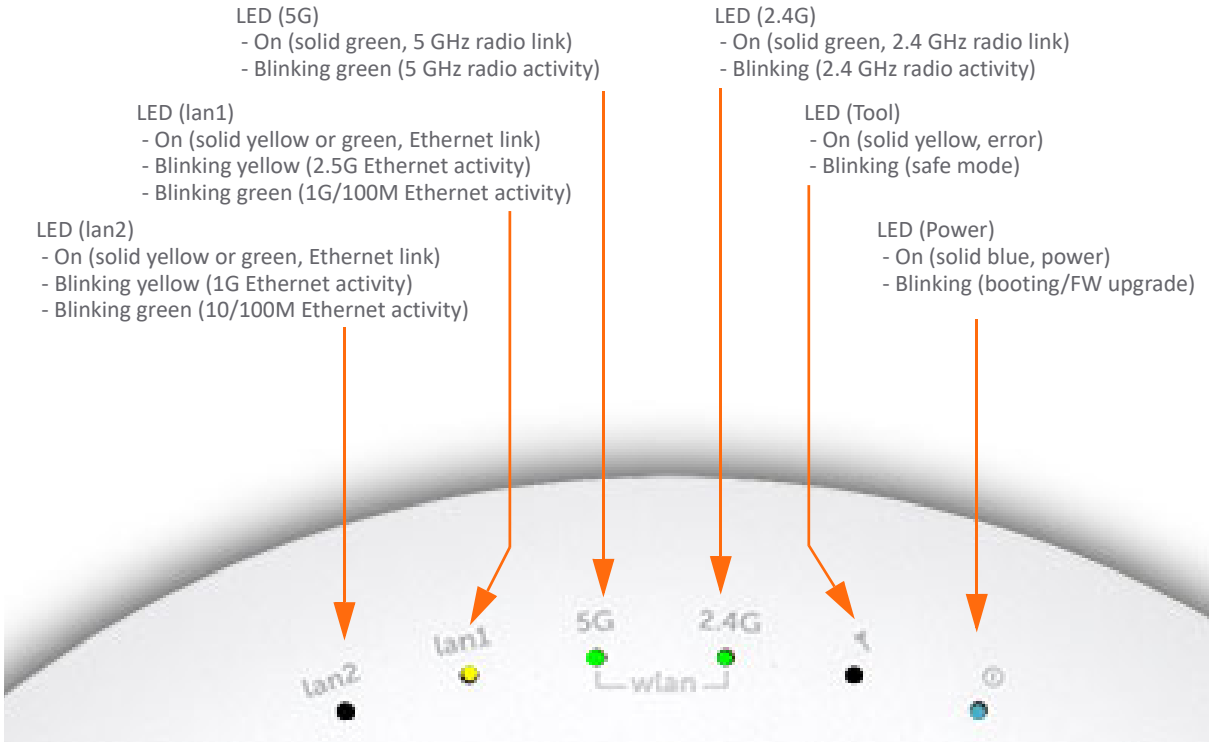
- For indoor use with wall / ceiling mount
- 4 x 4 MU-MIMO
- 432e with external high-gain antennas (4 x 4) and 432i with 8 internal antennas
- LAN1 supports up to 2.5 GbE and 802.3at PoE
- LAN2 supports 10/100/1000 MbE
- USB 2.0
- Ethernet console port (RJ 45)

SonicWave 432e and SonicWave 432i Available Ports/Status LEDs

Available Ports



Status LEDs


LED (5G)
- On (solid green, 5 GHz radio link)
- Blinking green (5 GHz radio activity)
LED (2.4G)
- On (solid green, 2.4 GHz radio link)
- Blinking (2.4 GHz radio activity)
LED (lan1)
- On (solid yellow or green, Ethernet link)
- Blinking yellow (2.5G Ethernet activity)
- Blinking green (1G/100M Ethernet activity)
LED (Tool)
- On (solid yellow, error)
- Blinking (safe mode)
LED (lan2)
- On (solid yellow or green, Ethernet link)
- Blinking yellow (1G Ethernet activity)
- Blinking green (10/100M Ethernet activity)
LED (Power)
- On (solid blue, power)
- Blinking (booting/FW upgrade)
lan2
lan1
5G
2.4G
wlan

SonicWave 432o Hardware Overview

SonicWave 432o Product Description

The SonicWave 432o extends your wireless LAN past the traditional boundaries of indoor locations. With state of the art design and construction, it is resistant to harsh outdoor environments and extreme temperature changes. The unit is designed specifically for outdoor use and can be attached to either a pole or wall. Waterproof connectors are supplied to ensure watertight seals for connecting the Ethernet cables to the device. The SonicWave 432o also provides physical layer enhancements for higher throughput with a maximum data rate of 1.3 Gbps. To achieve this, the SonicWave 432o uses:

- More antennas—four antennas for the 5 GHz radio, and four more for the 2.4 GHz radio
- Wider channels—80 MHz-wide channels for the 802.11ac radio module, while continuing to support 20/40 MHz channels. This allows for dynamic per packet negotiation of channel widths so that when there is interference, the SonicWave can temporarily fall back to 40 or 20MHz channels.
- More spatial streams—4 x 4 multiple-input and multiple-output, (MIMO) for the 802.11ac radio module, where the capacity of a radio link is multiplied using multipath propagation.

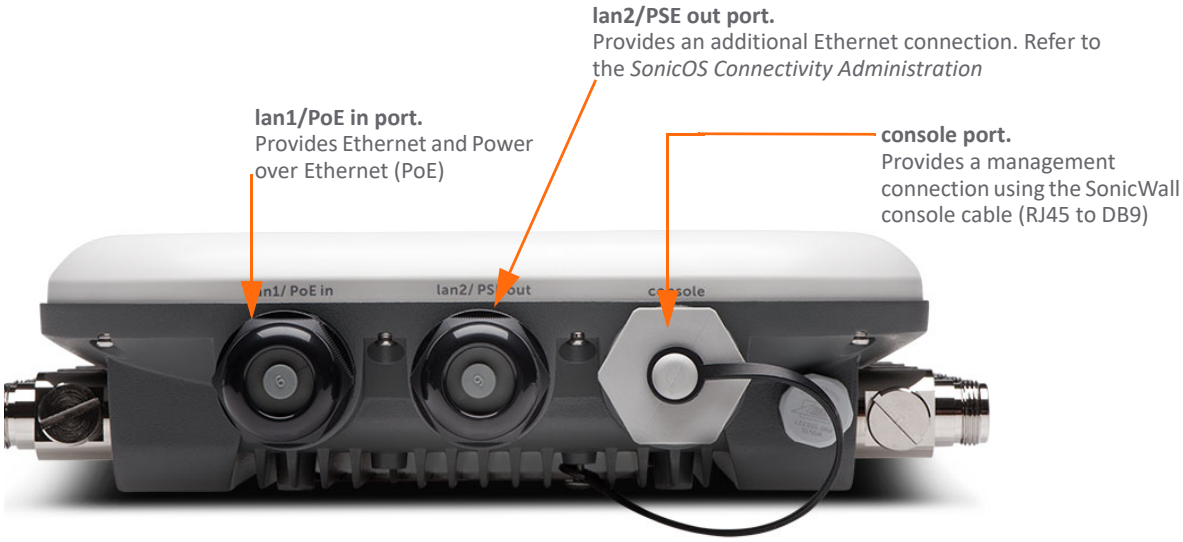
Because of potential EMI issues, professional installation by a properly licsened specialist is required for the SonicWave 432o.

Distinguishing features of the SonicWave 432o include:

- Antennas: 8 N-type dipole
- 4 x 4 MU-MIMO
- Ethernet: 1 x 10/100/1000 and 1 x 10/100/1000/2.5 GbE
- PoE: 802.3at in; 802.3af out
- Ethernet console port (RJ5)

SonicWave 432o Available Ports/Status LEDs

Available Ports



Status LEDs

LED (5G)
- On (solid green, 5 GHz radio link)
- Blinking green (5 GHz radio activity)

LED (2.4G)
- On (solid green, 2.4 GHz radio link)
- Blinking (2.4 GHz radio activity)

LED (lan2)
- On (solid yellow or green, Ethernet link)
- Blinking yellow (1G Ethernet activity)
- Blinking green (10/100M Ethernet activity)

LED (lan1)
- On (solid yellow or green, Ethernet link)
- Blinking yellow (2.5G Ethernet activity)
- Blinking green (1G/100M Ethernet activity)

LED (Power)
- On (solid blue, power)
- Blinking (booting/FW upgrade)

LED (safe mode)
- On (solid blue, power) with 4
- Blinking (green)

2

Product Specifications

SonicWave access point specifications are presented here:

- SonicWave 200 Series Specifications
- SonicWave 400 Series Specifications

SonicWave 200 Series Specifications

Hardware Specifications

Specification	*SonicWave 231c*	*SonicWave 224w*	*SonicWave 231o*
Location	Ceiling	Wall	Outdoor
Radio		2x2 802.11ac Wave 2	
Dedicated 3rd scanning radio	Yes	No	Yes
USB 2.0	Yes	No	No
Bluetooth Low Energy (BLE) radio	Yes	Yes	Yes
AntennaType	Internal	Internal	Omni-Antenna
Dimensions	118mmx214mmx34mm	122mmx188mmx18mm	190mmx120mmx42mm
Shipping dimension	150mmx240mmx73mm	150mmx240mmx73mm	265mmx450mmx78mm
Unit weight	0.4 kg	0.4 kg	0.7 kg
WEEE weight	0.7 kg	0.7 kg	2.0 kg
Shipping weight	0.7 kg	0.7 kg	2.0 kg
PoE	802.3af PoE (standard)	802.3at PoE (standard, sold separately)	802.3af POE
	DC 12V adapter (optional)	DC 12V adapter (optional)	(PoE sold separately)
Maximum power consumption (W)	12W	12W	12W
Status Indicator	4	5	4
Wired network ports	1 x 10/100/1000 auto-sensing RJ-45	3 x 10/100/1000, 2x 10/100/1000, PoE Pass through, 1 LAN PoE Out	1 x 10/100/1000 auto-sensing RJ-45
Accessories included	Ceiling/wall mounting kit		NEMA 4x Mounting kit and external antennas
Virtual access points	Up to 8 per access point.		
Chassis	Rectangle		

Standards and Compliance

Standard	*SonicWave 231c*	*SonicWave 224w*	*SonicWave 231o*
IEEE Standard	802.11a/b/g/n/ac		
Compliance	IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11ac, IEEE 802.11e, IEEE 802.11i, IEEE 802.3at, IEEE 802.3bz, WPA, TKIP, AES, IEEE 802.11r, IEEE 802.11k, IEEE 802.11v, IEEE 802.11w		
Plenum rated	Yes	No	No
Regulatory	FCC, IC/ISED, CE, RCM, NCC, TELEC, KCC		
Safety	UL, cUL, TUV-GS, CB, UL Mexico CoC		
MIMO	MU-MIMO		
Max/Recommended connected clients per radio	128/30		

Environmental

Specification	*SonicWave 231c*	*SonicWave 224w*	*SonicWave 231o*
Temperature Range	0^{o} to 40^{o}C	0^{o} to 40^{o}C	-30^{o} to 60^{o}C
Humidity	0% - 95%, typical	0% - 95%, typical	5% - 90%, typical

Radio Specifications

Specification	*SonicWave 231c*	*SonicWave 224w*	*SonicWave 231o*
Radios	3 radios: 5GHz, 2.4GHz and security radio	2 radios: 5GHz and 2.4GHz	3 radios: 5GHz, 2.4GHz and security radio
Frequency bands	IEEE 802.11 b/g/n: 2.412-2.484 GHz; IEEE 802.11a/n/ac: 5.150-5.250 GHz (UNII-1), 5.250-5.350 GHz (UNII-2), 5.470-5.600, 5.660-5.725 GHz (UNII-2e), 5.725-5.825 GHz (UNII-3)		
Operating channels*	2.4GHz channels: 1-13; 5 GHz channels: 36-64, 100-140, 149-165		
Transmit output power*	Based on the regulatory domain product is installed in and specified by the sytem administrator.		
Transmit power control*	Supported.		
Data rates supported	867 Mbps for 5 GHz radio 400 Mbps for 2.4 GHz radio		
Modulation technology spectrum	802.11ac: Orthogonal Frequency Division Multiplexing (OFDM)		

* Subject to country regulations.

Security

Specification	*SonicWave 231c*	*SonicWave 224w*	*SonicWave 231o*
Data encryption	WPA2; IPSec. 802.11i, WPA; 64/128/152-bit WEP, TKIP, AES, SSL VPN**		

**When used with SonicWall Secure Remote Series appliance.

Authentication

Specification	*SonicWave 231c*	*SonicWave 224w*	*SonicWave 231o*
Authentication	RADIUS, Active Directory, Single Sign-On (SSO)		

SonicWave 400 Series Specifications

Hardware Specifications

Specification	*SonicWave 432e*	*SonicWave 432i*	*SonicWave 432o*
Location	Indoor	Indoor	Outdoor
Dimensions	8.5(D) x 2.0(H) in 21.6(D) x 5.1(H) cm	8.5 (D) x 2.0 (H) in 21.6(D)x 5.1(H) cm	9.5(W)x9.3(D)x2.4(H)in 24.1(W)x23.6(D)x6.1(H) cm
Weight	1.1 kg / 2.5 lbs	1.0 kg / 2.2 lbs	2.2 kg /4.9 lbs
WEEE weight	1.4 kg / 3.1 lbs	1.2 kg / 2.6 lbs	4.1 kg / 9.1 lbs
Shipping weight	1.7 kg / 3.8 lbs	1.5kg / 3.3 lb	4.7 kg / 10.4 lbs
PoE	802.3at		
Maximum power consumption (W)	18.8W	18.8W	21.2W
Status Indicators	Six (6) LED (WLAN/Link)(LAN/Link) Power, Test		
Wired network ports	(1) 10/100/1000 auto-sensing RJ-45 for Ethernet (PoE): (1) 100/1000/2.5 GBE auto-sensing, RJ-45 for Ethernet; (1) RJ-45 console; USB 2.0 (except 432o)		
Accessories included	Wall / ceiling mount kit		
Virtual access points	Up to 8 per access point.		
Chassis	UL 1024 plenum rated		

Standards and Compliance

Standard	*SonicWave 432e*	*SonicWave 432i*	*SonicWave 432o*
IEEE Standard	802.11a/b/g/n/ac Wave 2		
Compliance	IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11ac, IEEE 802.11e, IEEE 802.11i, IEEE802.3at, IEEE 802.3bz, WPA, TKIP, AES, IEEE 802.11r, IEEE 802.11k, IEEE 802.11v, IEEE 802.11w		
Regulatory	FCC/ICES Class B, CE, RCM/ACMA, VCCI Class B, TELEC, BSMI, NCC, MSIP, ANATEL, Customs Union RoHs (Europe/China), WEEE		
Safety	UL, cUL, TUV/GS, CB, CE, BSMI, Mexico CoC, Custom Union		
MIMO	MU-MIMO 4x4 (4 streams)		
Max/Recommended connected clients per radio	128/30		

Enviromental

Specification	*SonicWave 432e*	*SonicWave 432i*	*SonicWave 432o*
Temperature Range	32° to 104°F, 0° to 40°C		-40° to 140°F -40° to 60°C
Humidity	10 — 95%, non-condensing		

Radio Specifications

Specification	*SonicWave 432e*	*SonicWave 432i*	*SonicWave 432o*
Radios	Dual: 4x4 11n + 4x4 11ac MU-MIMO; Dedicated third scaning radio; Bluetooth Low Energy Radio		
Frequency bands	802.11a: 5.180 – 5.825 GHz 802.11b/g: 2.412 – 2.472 GHz 802.11n: 2.412 – 2.472 GHz, 5.180 – 5.825 GHz 802.11ac: 2.412 – 2.472 GHz, 5.180 – 5.825 GHz		
Operating channels*	802.11a: US and Canada 12. Europe 11. Japan 4. Singapore 4. Taiwan 4. 802.11b/g: US and Canada 1-11. Europe 1-13. Japan 1-14 (14-802.11b only) 802.11n (2.4 GHz): US and Canada 1-11. Europe 1-13. Japan 1-13. 802.11n (5 GHz): US and Canada 36-48/149-165. Europe 36-48. Japan 36-48. Spain 36-48/52-64 802.11ac: US and Canada 36-48/149-165. Europe 36-48. Japan 36-48. Spain 36-48/52-64.		
Transmit output power*	Based on the regulatory domain product is installed in and specified by the sytem administrator.		
Transmit power control*	Supported.		
Data rates supported	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps per channel 802.11b: 1, 2, 5.5, 11 Mbps per channel 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps per channel 802.11n: 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2, 86.7, 96.3, 15, 30, 45, 60 90, 120, 135, 150, 180, 200, 65, 97.5, 130, 195, 260, 292.5, 325, 390, 433.3, 65, 130, 495, 260, 390, 520, 585, 650, 780, 866.7, 1040, 1170, 1300, 1560, 1733.4 Mbps		
Modulation technology spectrum	802.11a: Orthogonal Frequency Division Multiplexing (OFDM) 802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g: Orthogonal Frequency Division Multiplexing (OFDM)/Direct Sequence Spread Spectrum (DSS) 802.11n: Orthogonal Frequency Division Multiplexing (OFDM) 802.11ac: Orthogonal Frequency Division Multiplexing (OFDM)		

* Subject to country regulations

Security

Specification	*SonicWave 432e*	*SonicWave 432i*	*SonicWave 432o*
Data encryption	WPA2; IPSec**. 802.11i, WPA, 64/128/152-bit WEP, TKIP, AES, SSL VPN***		

** When used with a SonicWall firewall
***When used with SonicWall Secure Mobile Access Series appliance

Authentication

Specification	*SonicWave 432e*	*SonicWave 432i*	*SonicWave 432o*
Authentication	RADIUS, Active Directory, single sign-on (SSO)		

3

Deployment Requirements per Model

SoinicWall wireless access point deployment requirements are presented in the following sections.

Topics:

- SonicWave 231c Deployment Requirements
- SonicWave 224w Deployment Requirements
- SonicWave 231o Deployment Requirements
- SonicWave 432e and 432i Deployment Requirements
- SonicWave 432o Deployment Requirements

SonicWave 231c Deployment Requirements

SonicOS Firmware

SonicWave 231c access points are centrally managed by SonicWall network security appliances running SonicOS 6.5.3.1 or higher

Power Source

Use a 802.3at compliant PoE injector or a PoE-enabled switch to provide power to each SonicWave 231c. A 12 VDC adapter may also be used.

Internet Connectivity

An active Internet connection is required for your SonicWall network security appliance to download the latest SonicWave 231c firmware.

Gigabit Ethernet Connectivity

The SonicWave 231c requires a 1 Gigabit connection to the SonicWall network security appliance to take full advantage of the SonicWave 231c data throughput capability.

SonicWave 224w Deployment Requirements

SonicOS Firmware

SonicWave 224w access points are centrally managed by SonicWall network security appliances running SonicOS 6.5.3.1 or higher.

Power Source

Use a 802.3at compliant PoE injector or a PoE-enabled switch to provide power to each SonicWave 224w. A 12 VDC power adapter may also be used.

Internet Connectivity

An active Internet connection is required for your SonicWall network security appliance to download the latest SonicWave 224w firmware.

Gigabit Ethernet Connectivity

The SonicWave 224w requires a 1 Gigabit connection to the SonicWall network security appliance to take full advantage of the SonicWave 224w data throughput capability.

SonicWave 231o Deployment Requirements

Professional Installation

The installation of the SonicWave 231o should be performed by a professional installer to ensure proper operation and compliance with local safety guidelines.

SonicOS Firmware

SonicWave 231o access points are centrally managed by SonicWall network security appliances running SonicOS 6.5.3.1 or higher.

Power Source

Use an 802.3af compliant PoE injector, PoE-enabled switch, or SonicWall PoE enabled security appliance to provide power to each SonicWave 231o.

Internet Connectivity

An active Internet connection is required for your SonicWall network security appliance to download the latest SonicWave 231o firmware.

Gigabit Ethernet Connectivity

The SonicWave 231o requires a 1 Gigabit connection to the SonicWall network security appliance to maximize the SonicWave 231o data throughput capability.

SonicWave 432e and 432i Deployment Requirements

SonicOS Firmware

- SonicWave 432e and 432i access points are centrally managed by SonicWall network security appliances running SonicOS 6.5 or higher.

Power Source

- Use a multi-gigabit 802.3at compliant PoE injector or switch to provide power to each SonicWave 432e or 432i.

Internet Connectivity

- An active Internet connection is required for your firewall to download the latest SonicWave firmware.

Gigabit Ethernet Connectivity

- The SonicWave 432e or SonicWave 432i hardware requires more bandwidth than a 1 Gigabit Ethernet connection can handle. SonicWall recommends connecting your SonicWave (through a PoE device) to a 2.5 Gb interface to take full advantage of the SonicWave 432e or SonicWave 432i data throughput capability.

See Product Safety and Regulatory Information.

SonicWave 432o Deployment Requirements

Professional Installation

The installation of the SonicWave 432o should be performed by a professional installer to ensure proper operation and compliance with local safety guidelines.

SonicOS Firmware

- SonicWave 432o access points are centrally managed by SonicWall network security appliances running SonicOS 6.5 or higher.

Power Source

- Use a multi-gigabit 802.3at compliant PoE injector or switch to provide power to each SonicWave 432o.

Internet Connectivity

- An active Internet connection is required for your firewall to download the latest SonicWave firmware.

Gigabit Ethernet Connectivity

- The SonicWave 432o hardware requires more bandwidth than a 1 Gigabit Ethernet connection can handle. SonicWall recommends connecting your SonicWave (through a PoE device) to a 2.5 Gbps interface to take full advantage of the SonicWave 432o data throughput capability.

See Product Safety and Regulatory Information.

4

Antenna Installation

This chapter presents details on the installation of antenna.

Topics:

- Installing SonicWave 231o Antennas
- Installing SonicWave 432e Antennas
- Installing SonicWave 432o Antennas

Installing SonicWave 231o Antennas

Prepare the SonicWave 231o for installation by connecting the antennas.

NOTE: This device must be professionally installed using either the supplied antennas or with approved alternate antennas available from SonicWall.

To connect the antennas to your SonicWave 231o:

1 Remove all four antennas from their bags and place one on each of the antenna connectors, ***matching the radio signals (5GHz or 2.4GHz) marked on the antennas to those marked below the connectors.***

2 Insert the antenna base firmly into the antenna connector.

3 Making sure there is no cross threading, fully tighten the silver knurled fitting using your fingers to the point that it cannot turn with moderate force. Do not use or twist the white antenna housing enclosure while securing the antenna.

4 Repeat Step 2 and Step 3 for each antenna.

CAUTION: To prevent damage to the SonicWave 231o, all RF output ports must be attached to an approved antenna before the radios are enabled.

SonicWave 231o Approved Alternative Antenna

Alternate antennas used with the SonicWave 231o must be approved and certified before use. To comply with the local laws and regulations, an approval might be required by the local regulatory authorities. The included antennas have been tested and approved for use with the SonicWave 231o model. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p) is not more than that required for successful communication. Contact SonicWall for a list of antennas approved for use with the SonicWave 231o.

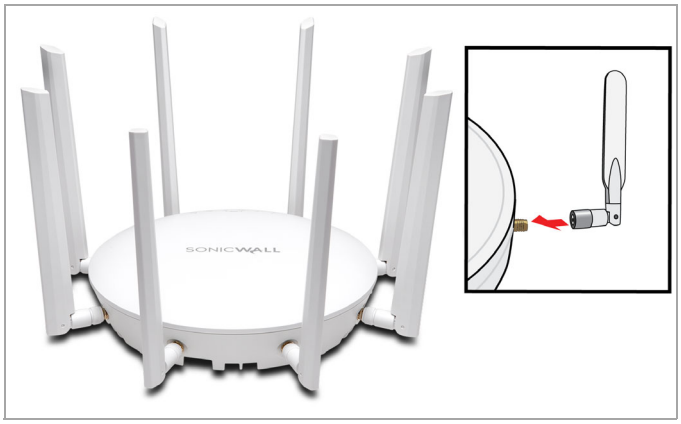
Installing SonicWave 432e Antennas

To install the antennas on your SonicWave 432e:

1. Remove all eight antennas from their bags and place one on each connector.
2. Carefully finger-tighten the fittings.
3. Adjust the antennas upright for optimal reception.

For optimal wireless coverage, the SonicWave 432e antennas should be oriented vertically. The circular design of the SonicWave aides in creating a strong multi-directional wireless signal pattern. In most cases, leaving the antennas straight up (as shown in the illustration) provides the best overall coverage.

TIP: There might be a “dead” zone directly underneath the SonicWave 432e when it is mounted on a ceiling with the antennas oriented vertically. You can mitigate this by slightly angling the antennas.



CAUTION: Only antennas provided by SonicWall are authorized for use with the SonicWave 432e. Be aware of the regulations in your region before using other antennas. Please refer to the SonicWave 432e Safety and Regulatory Reference Guide.

Installing SonicWave 432o Antennas

IMPORTANT: This device must be professionally installed using either the supplied antennas or with approved alternate antennas available from SonicWall.

Install the external antennas (or approved alternates) intended for area coverage. The SonicWave 432o features dual concurrent radio signals. Use the 2.4 GHz antennas to access Radio 1 (802.11 b/g/n at 600 Mbps) signals, and the 5 GHz antennas to access Radio 2 (802.11 a/n/ac at 1733 Mbps) signals. You should use all eight WiFi antennas to utilize both radio frequencies concurrently.

CAUTION: To prevent damage to the SonicWave 432o, all RF output ports must be attached to an approved antenna before the radios are enabled.

To install the antennas on your SonicWave 432o:

1. Remove all eight antennas from their bags and place one on each of the appropriate connectors, matching the radio signals marked on the antennas to those marked above the connectors.
2. Insert the antenna base firmly into the antenna mount.
3. Carefully finger-tighten the fittings being cautious not to over-tighten them.
4. Repeat with the remaining antennas.

Available Antennas for the SonicWave 432o

The following antennas are approved for use with the outdoor SonicWave 432o.

NOTE: For NEMA Type 4X compliance, use the optional NEMA Type 4X mounting kit (purchased separately) and default antennas D121-05/D151-07.

Antenna Mode	Band (GHz)	Antenna Gain (dBi)	Antenna Type	Deflection (Beamwidth)
Default: D121-05*/D151-07*	2.4/5G	5dBi/7dBi	Omni/Dipole	360°
S124-12†	2.4G	12dBi	Sector	120°
S154-15†	5G	15dBi	Sector	120°
P124-10‡	2.4G	10dBi	Panel	70°
P154-12‡	5G	12dBi	Panel	70°
P254-07	2.4/5G	5dBi/7dBi	Panel	90°
P254-09	2.4/5G	8dBi/9dBi	Panel	60°

Antenna Mode	Band (GHz)	Antenna Gain (dBi)	Antenna Type	Deflection (Beamwidth)
P254-13	2.4/5G	12dBi/13dBi	Panel	40°

* Default antennas provided with appliance.
† S124-12 and S154-15 must be used together.
‡ P124-10 and P154-12 must be used together.

CAUTION: To prevent damage to the SonicWave 432o, all RF output ports must be attached to an approved antenna before the radios are enabled.

For details regarding these alternately approved antennas (including important safety information) refer to the respective antenna guides. Some antennas might not be offered for sale in all countries. Contact SonicWall for purchasing information.

The SonicWave default antenna configuration only supports Omni/Dipole antennas as shipped from the factory. When any other antenna or antenna pair is installed, the professional installer must correctly configure the SonicWave for the new antennas before enabling the radios. Configuration instructions are included in this guide and with each antenna.

5

Connecting Cables

This section collects cabling instructions for the SonicWave 200/400 series products.

Topics:

- Connecting Cables for SonicWave 231c
- Connecting Cables for SonicWave 224w
- Connecting Cables for SonicWave 231o
- Connecting Cables for the SonicWave 432e and SonicWave 432i
- Connecting Cables for the SonicWave 432o

TIP: Translations of these instructions are available in the Safety and Regulatory Reference Guides in Japanese, Traditional Chinese, Simplified Chinese, Korean, and Brazilian Portuguese. Installation summaries are also available in German and Canadian French. See Product Safety and Regulatory Information.

Connecting Cables for SonicWave 231c

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

This section describes how to connect the PoE and network cables and then attach them to the SonicWave 231c mounting bracket.

The SonicWave 231c connects to a WLAN zone interface on your SonicWall network security appliance. The access point is powered through Power over Ethernet (PoE), with the PoE device positioned between the SonicWave 231c and the firewall. SonicWall recommends using CAT5e Ethernet cables to connect the devices.

CAUTION: An 802.3at compliant PoE injector or PoE enabled switch is required to provide power to each SonicWave 231c.
To maintain power to the SonicWave 231c, the maximum length of CAT5e cable from the PoE device to the SonicWave 231c is 100 meters (333 feet).

To connect the SonicWave 231c to PoE and the network:

1 Using an Ethernet cable, connect the **Data in** port on the PoE Injector to an existing WLAN zone interface on the firewall or to an unused interface to be configured later in SonicOS.

2 Using a second Ethernet cable, connect the **Data and Power Out** port on the PoE injector to the **LAN/POE** port on your SonicWave 231c.

Refer to your *PoE Installation Guide* for more information.

3 Plug the power cord of the PoE Injector into an appropriate power outlet.

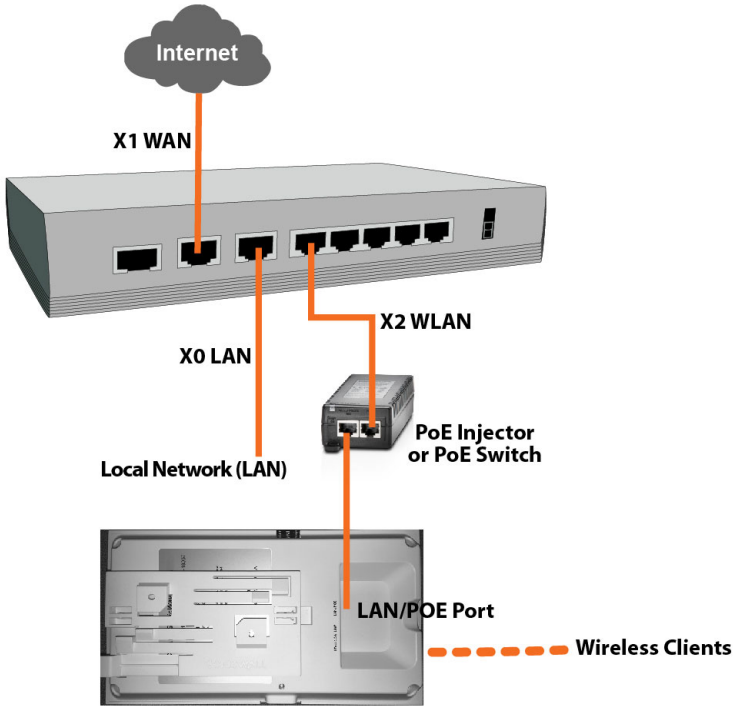
4 Wait up to two minutes for the **LAN LED** on the SonicWave 231c to illuminate. This indicates an active connection.

To attach the SonicWave 231c to the mounting bracket:

1 Line up the two mounting tab insert points on the back of the SonicWave 231c with the mounting tabs on the mounting bracket.

2 Insert the mounting tabs into the SonicWave 231c and slide the access point down until the locking tab on the bracket clicks into place on the SonicWave.

Connecting the SonicWave 231c



Connecting Cables for SonicWave 224w

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

This section describes how to connect the PoE and network cables and then attach the SonicWave 224w to the mounting plate.

The SonicWave 224w connects to a WLAN zone interface on your SonicWall network security appliance. The access point is powered through Power over Ethernet (PoE), with the PoE device positioned between the SonicWave 224w and the firewall. SonicWall recommends using CAT5e Ethernet cables to connect the devices.

CAUTION: An 802.3at compliant PoE injector or PoE enabled switch is required to provide power to each SonicWave 224w.
To maintain power to the SonicWave 224w, the maximum length of CAT5e cable from the PoE device to the SonicWave 224w is 100 meters (333 feet).

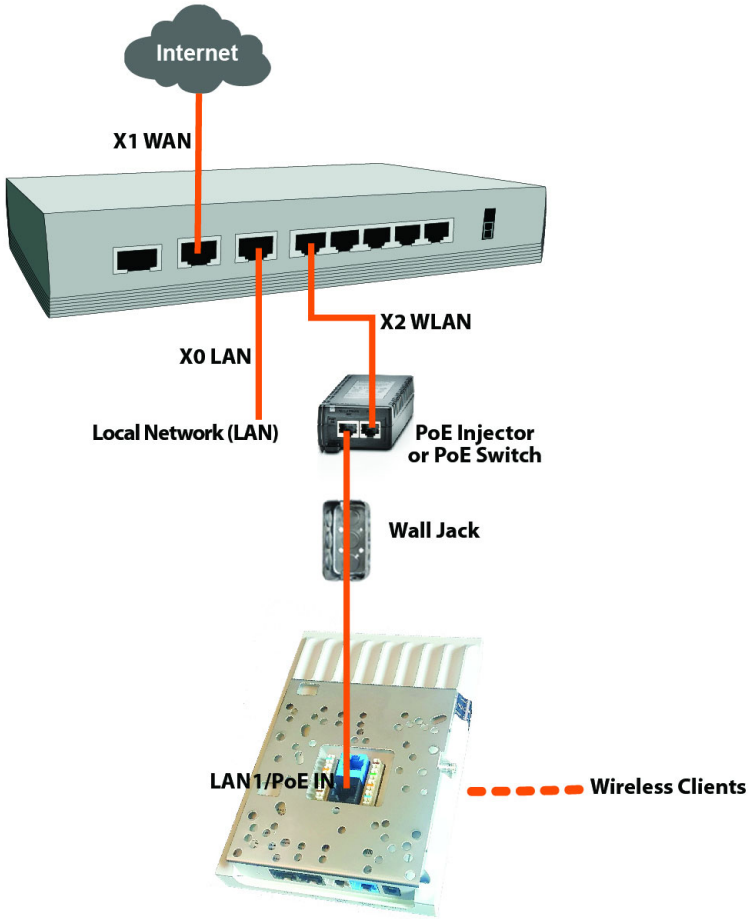
To connect the SonicWave 224w to PoE and the network:

1 Using an Ethernet cable, connect the **Data in** port on the PoE Injector to an existing WLAN zone interface on the firewall or to an unused interface to be configured later in SonicOS.
2 Using a second Ethernet cable, connect the **Data and Power Out** port on the PoE injector to the **LAN1/PoE IN** port on your SonicWave 224w.
   Refer to your *PoE Installation Guide* for more information.
   Alternatively, insert the Ethernet cable wires into the corresponding punch down blocks and use a 110 punch down tool to secure the wires.
3 Plug the power cord of the PoE Injector into an appropriate power outlet.
4 Wait up to two minutes for the LAN LED on the SonicWave 224w to illuminate. This indicates an active connection.
5 Optionally connect a second Ethernet cable or wires to the **Pass Through** port or punch down blocks.

To attach the SonicWave 224w to the mounting plate:

1 Line up the two mounting tab insert points on the back of the SonicWave 224w with the mounting tabs on the mounting plate.
2 Insert the mounting tabs into the SonicWave 224w and slide the access point slightly to the left to engage the tabs in the insert points.
3 Using a Phillips screwdriver, tighten the mounting screw to securely attach the SonicWave 224w to the mounting plate.

Connecting the SonicWave 224w



Connecting Cables for SonicWave 231o

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

This section describes how to attach the SonicWave 231o to the mounting bracket and then connect the ground wire and a CAT 5e PoE/network cable.

CAUTION: An 802.3af compliant PoE injector, PoE enabled switch, or SonicWall PoE enabled appliance is required to provide power to each SonicWave 231o.
To maintain power to the SonicWave 231o, the maximum length of CAT 5e cable from the PoE device to the SonicWave 231o is 100 meters (333 feet).

To attach the SonicWave 231o to the mounting bracket:

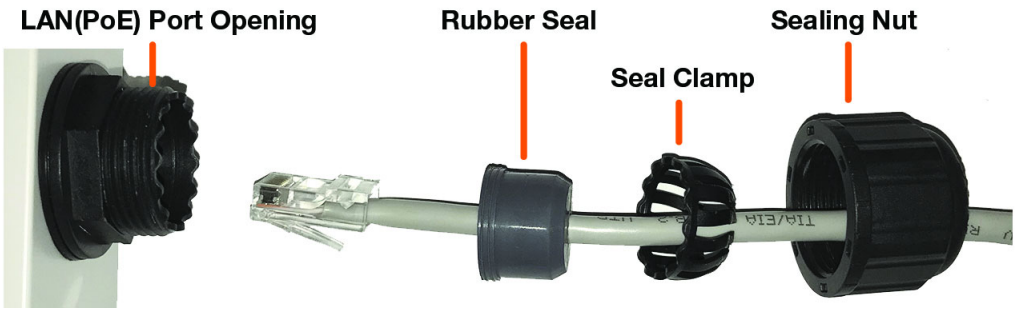
1 Line up the four mounting peg slots on the back of the SonicWave 231o with the mounting pegs on the mounting bracket.
2 Insert the mounting pegs into the SonicWave 231o and slide the access point sideways to slide the pegs into the narrow ends of the slots.
3 Using a screwdriver, tighten the locking screw on the bracket to secure the SonicWave to the bracket.

To connect the ground wire to the SonicWave 231o:

1 Insert the provided ground connector screw into the star washer and then into the ring connector of the provided grounding wire.
2 Insert the ground connector screw into the SonicWave 231o and tighten with a screwdriver to securely attach the grounding wire to the unit.
3 Securely attach the other end of the grounding wire to ground.

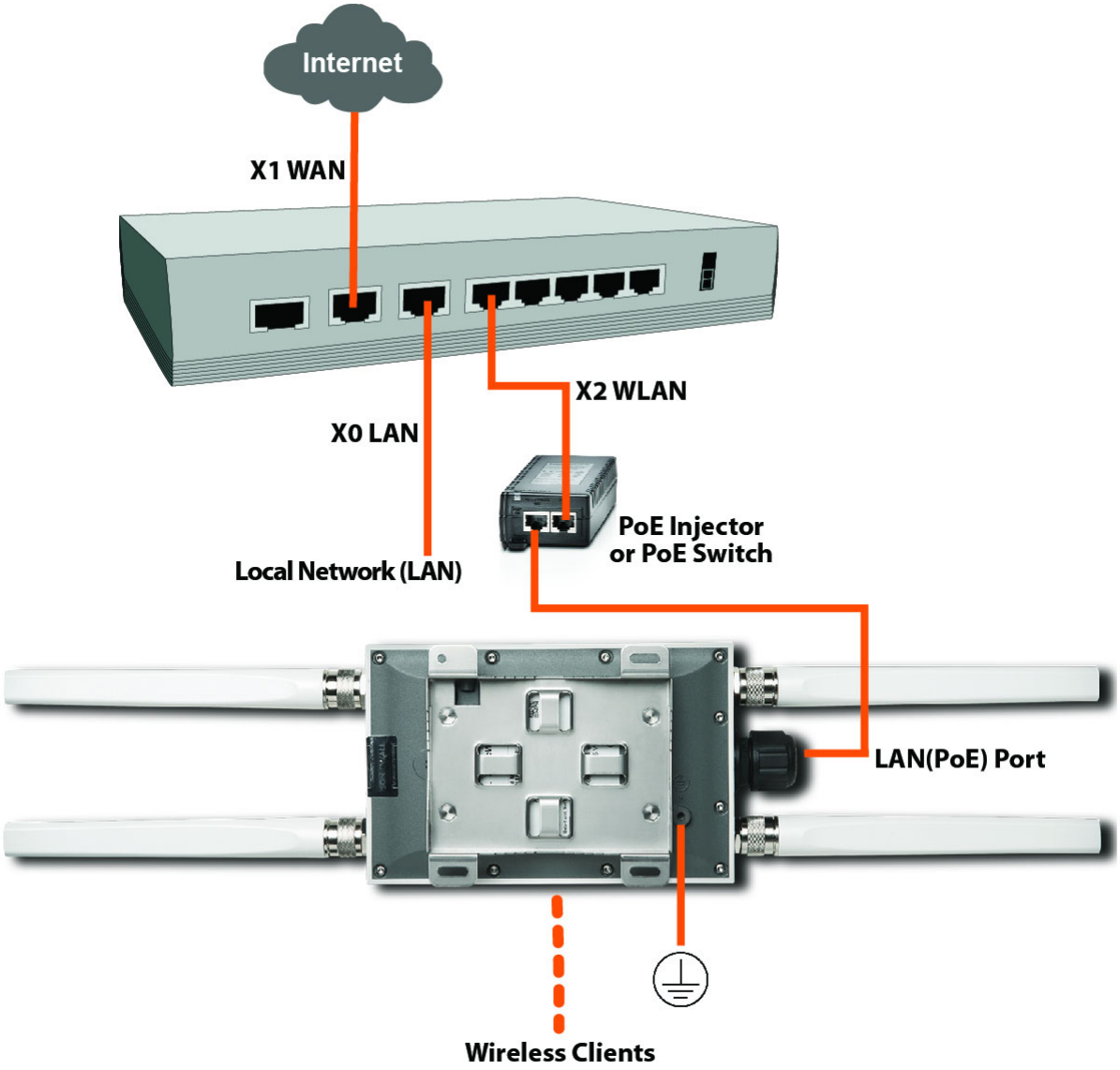
To connect the SonicWave 231o to PoE and the network:

1 Unscrew the cable gland sealing nut from the SonicWave and remove it along with the rubber seal and seal clamp, noting the orientation and positions of these parts.
2 Insert the CAT 5e Ethernet cable end (with RJ45 connector attached) through the sealing nut, then through the seal clamp.



3 Insert the RJ45 connector into the LAN(POE) port, clicking it securely in place.
4 Pry apart the two sides of the rubber seal and then press them together around the Ethernet cable between the seal clamp and the RJ45 connector.
5 Slide the seal clamp over the end of the rubber seal and push the rubber seal into the port opening on the SonicWave, making sure to match the wave pattern on the edge of the seal clamp with the pattern on the edge of the port opening.
6 Screw the sealing nut securely onto the port opening.
7 Connect the other end of the Ethernet cable to the **Data and Power Out** port on the PoE injector or PoE enabled switch.
8 Using a second Ethernet cable, connect the **Data in** port on the PoE Injector or switch to an existing WLAN zone interface on the firewall or to an unused interface to be configured later in SonicOS.
Refer to your *PoE Installation Guide* for more information.
9 Plug the power cord of the PoE Injector into an appropriate power outlet.
10 Wait up to two minutes for the **LAN LED** on the SonicWall 231o to illuminate. This indicates an active connection.

Connecting the SonicWall 231o



Connecting Cables for the SonicWave 432e and SonicWave 432i

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

The SonicWave 432e and 432i are powered through Power over Ethernet (PoE), and should be cabled with CAT5e Ethernet cabling.

When using PoE, a SonicWall 802.3at compliant midspan PoE line injector (sold separately), or an 802.3at compliant switch is required to power each SonicWave 432e or 432i.

To connect PoE to a SonicWave 432e or 432i

1 Using an Ethernet cable, connect the **Data in** port on the SonicWall PoE Injector to an existing WLAN zone interface on the firewall or to an unused interface to be configured later in SonicOS.

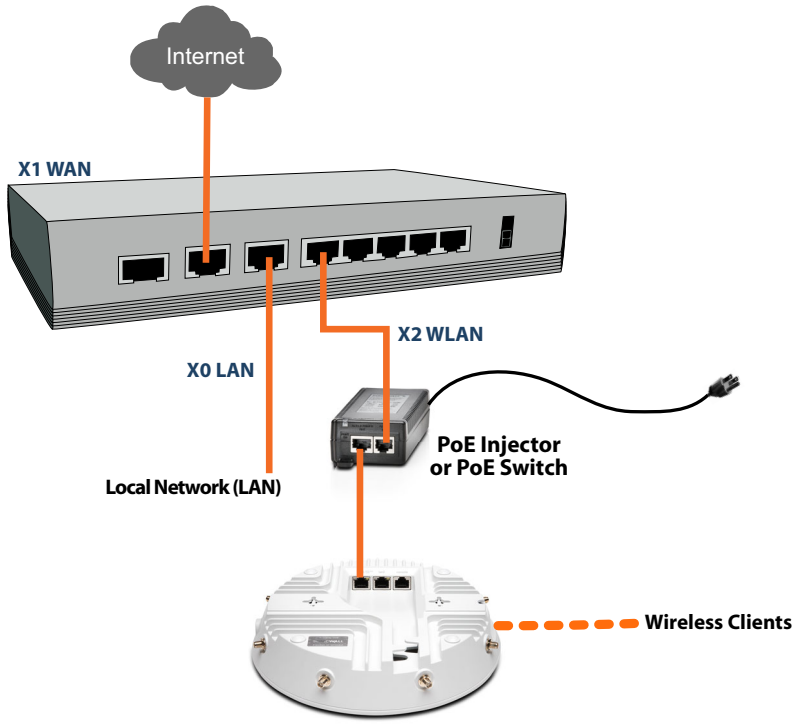
2 Using a second Ethernet cable, connect the **Data and Power out** port on the SonicWall PoE injector to the **LAN1/PoE** port on your SonicWave 432e or 432i.

IMPORTANT: Be sure cables are connected correctly.

3 Plug the power cord of the SonicWall PoE injector into an appropriate power outlet.

4 Wait for the **LAN1** LED on the SonicWave 432e or 432i to illuminate. This indicates an active connection.

Connecting the SonicWall 432i or 432e



CAUTION: A multi-gigabit 802.3at compliant PoE injector or PoE-capable switch is required to provide power to each SonicWave 432e or SonicWave 432i.

To maintain power to the SonicWave 432e or 432i, the maximum length of CAT5e cable from the 802.3at PoE injector to the SonicWave 432e or 432i is 100 meters (333 feet).

Connecting Cables for the SonicWave 432o

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

Provide adequate grounding to the SonicWave 432o and the PoE injector. Use the grounding screw and wire. Consult a certified electrician to ensure that all grounding and cabling is installed in compliance with local electrical codes. The SonicWave 432o is powered through Power over Ethernet (PoE), and should be cabled with CAT5e Ethernet cabling.

When using PoE, a SonicWall 802.3at compliant midspan PoE line injector (sold sComeparately), or an 802.3at compliant switch is required to power each SonicWave 432o.

NOTE: To maximize the SonicWave 432o's power capabilities, connect the PoE to a 2.5Gb port on the firewall.

To connect PoE to a SonicWave 432o:

1. Install the cable gland adapter assembly through the LAN/PoE sealing nut, slide claw, and seal onto the RJ45 Ethernet cable.
2. Slide the seal and claw into the SonicWave 432o port.
3. Secure the seal nut onto the main assembly body.
4. Tighten the assembly by hand (finger-tight).
5. Repeat using a second Ethernet cable, connecting to the **Data & Power out** port on the SonicWall PoE Midspan injector to the **LAN1/PoE** port on your SonicWave 432o.

   IMPORTANT: Be sure cables are connected correctly.

6. Plug the power cord of the SonicWall PoE injector into an appropriate power outlet.
7. Wait for the **LAN1** LED on the SonicWave 432o to illuminate green. This indicates an active connection.

CAUTION: A multi-gigabit 802.3at compliant PoE injector or PoE-capable switch is required to provide power to each SonicWave 432o.

To maintain power to the SonicWave 432o, the maximum length of CAT 5e cable from the 802.3at PoE injector to the SonicWave 432o is 100 meters (333 feet).

6

Power Requirements

SonicWave PoE Standards

SonicWave Model	PoE Input Standard	PoE Output Standard	Optional AC/DC Power Supply	PoE Injector Requirement	Cable Requirements
231c	802.3**af**[1]	N/A	12 VDC[2]	Gigabit[3]	CAT5e[4]
224w	802.3**at**[5]	802.3**af**[6]	12 VDC[7]	Gigabit[3]	CAT5e[4]
231o	802.3**af**[8]	N/A	N/A	Gigabit[3]	CAT5e
432e	802.3**at**[9]	N/A	N/A	Gigabit[3]	CAT5e[4]
432i	802.3**at**[9]	N/A	N/A	Gigabit[3]	CAT5e[4]
432o	802.3**at**[9]	802.3**af**[10]	N/A	Multi-Gigabit[3]	CAT5e

1 When this product's power is provided by the Ethernet cable plugged in to the “LAN/POE” port, this is called “Power over Ethernet” or “PoE”. The PoE source should only be UL listed marked “Class 2” or “LPS” with an output rated 48 VDC, minimum 0.3 A, Tma: minimum 40 degrees C.

2 Sold separately, available from SonicWall. When powering via external power adapter via barrel jack, use only UL listed power supply marked “Class 2” or “LPS” with output rated 12Vdc, min. 2.0A, Tma: minimum 40 degrees C.

3 Sold separately, available from SonicWall.

4 One cable included with access point.

5 When this product's power is provided by the Ethernet cable plugged in to the “LAN1” port, this is called “Power over Ethernet” or “PoE”. The PoE source should only be UL listed marked “Class 2” or “LPS” with an output rated 48 VDC, minimum 0.6 A, Tma: minimum 40 degrees C.

6 To use PoE output on LAN4, the PoE power source must be used. PoE output can supply power to single 802.3af compliant device, (output is 48 VDC, maximum 0.3 A).

7 When powering via external power adapter via barrel jack, use only UL listed power supply marked “Class 2” or “LPS” with output rated 12Vdc, min. 1.5A, Tma: minimum 40 degrees C.

8 When this product's power is provided by the Ethernet cable plugged in to the “LAN(PoE)” port, this is called “Power over Ethernet” or “PoE”. The PoE source should only be UL listed marked “Class 2” or “LPS” with an output rated 48 VDC, minimum 0.3 A, Tma: minimum 40 degrees C. Install PoE source in environmental location as directed by PoE source manufacturer.

9 This product's power is provided by the Ethernet cable plugged into the “LAN1” port, this is called “Power over Ethernet” or “PoE.” The PoE source should only be UL listed marked “Class 2” or “LPS” with an output rated 48 VDC, minimum 0.6 A, Tma: minimum 40 degrees C.

10 If PoE output on LAN2 is used to power an 802.3af compliant device, the PoE source should only be UL listed marked “Class 2” or “LPS,” with an output rated 48 VDC, minimum 1.26 A, Tma: minimum 40 degrees C. LAN2 PSE output is 48 VDC, maximum 0.3 A.

7

Wireless Access Point Placement Considerations

Physical placement of the SonicWave wireless access point has a measurable effect on who can and cannot access your wireless signal.

Access points should be kept clear of Radio Frequency (RF) interference sources. RF barriers can be circumvented by deploying multiple access points.

A site survey can help find the optimum wireless access point placement, but you can find usable locations without it.

Considerations include:

- **Number of Access Points Versus User Density** – If too many users connect to a single access point, maximum transfer rates are reached and that access point may become a bottleneck for the whole system.
- **Bandwidth** – How much data is moving upstream and downstream for a given type of user?
- **Ethernet Cabling** – Where are you running the powered Ethernet (PoE) cable to and how are you securing that cable? Are you using a multi-gigabit 802.3at-compliant PoE injector or switch to power all access points?

  To maintain power to the SonicWave access point, the recommended maximum length of CAT5e cable, from the 802.3at PoE injector, to the SonicWave access point is 100 meters (333 feet).
- **Hubs / Switches** – Your wireless deployment has to tie back into your network security appliance and LAN resources. Consider where your key networking devices are deployed and how they will connect efficiently with your wireless appliances. What speed is needed for your Ethernet connection to accommodate the number of access points you are installing? A Gigabit Ethernet interface is recommended when connecting a SonicWave access point to your SonicWall network security appliance.
- **Legacy Clients** - Older laptops and mobile devices might not support 802.11ac. Although clients with 802.11a/g/b hardware are supported by the SonicWall SonicWave, the presence of these legacy clients within range of your wireless network could affect the connection speed of your 802.11ac clients.

  For example, an 802.11b device authenticated to the SonicWave access point could limit all clients connected to that radio to 802.11b data rates.

Radio Frequency Barriers

Determining how to circumvent RF barriers can be a challenging part of the placement process, but RF barriers can also be used beneficially in an attempt to block signals where you do not want coverage. The 5 GHz frequency is more sensitive to RF barriers. A wall that allows a 2.4 GHz wireless network to operate can block a 5 GHz one.

Common RF Barrier Types

Barrier Type	RF Signal Blocking
Open air	Very Low
Glass, wood, drywall, cube partitions	Low
Floors and outer walls, aquariums (brick/marble/granite/water)	Medium
Concrete, security glass, wire mesh, stacked books/paper	High
Metal partitions, desks, reinforced concrete	Very High

RF Interference

RF interference from home, office, and medical equipment is a common challenge in wireless deployments.

When considering RF interference sources, remember that most cell/wireless phones and Bluetooth devices only utilize the 2.4 GHz frequency. As such, they should not cause significant interference with wireless networks operating in the 5 GHz frequency.

Common Sources of RF Interference

Interference Source	Possible Range	Bands Affected
2.4 GHz phones	100 feet	2.4 GHz (802.11 b/g/n)
Bluetooth devices	30 feet	2.4 GHz (802.11 b/g/n)
Microwave oven	10-20 feet	2.4 and 5 GHz, depending on shielding
Scientific and medical equipment	Short distance, varies	2.4 and 5 GHz, depending on shielding

8

Mounting Wireless Access Points

This section presents procedures on the mounting of SonicWave access points.

TIP: These procedures focus on attaching a mounting plate, or bracket, to a wall or ceiling. Typically, the access point has been connected (see Connecting Cables) and tested before the mounting plate is installed and the access point is attached to it.

NOTE: These procedures are available in the SonicWave Safety and Regulatory statements in translation: Japanese, Simplified Chinese, Traditional Chinese, Korean, and Brazilian Portuguese. To locate these, refer to Product Safety and Regulatory Information.

Topics:

- Mounting the SonicWave 231c
- Mounting the SonicWave 224w
- Mounting the SonicWave 231o
- Mounting the SonicWave 432e and 432i
- Mounting the SonicWave 432o

Mounting the SonicWave 231c

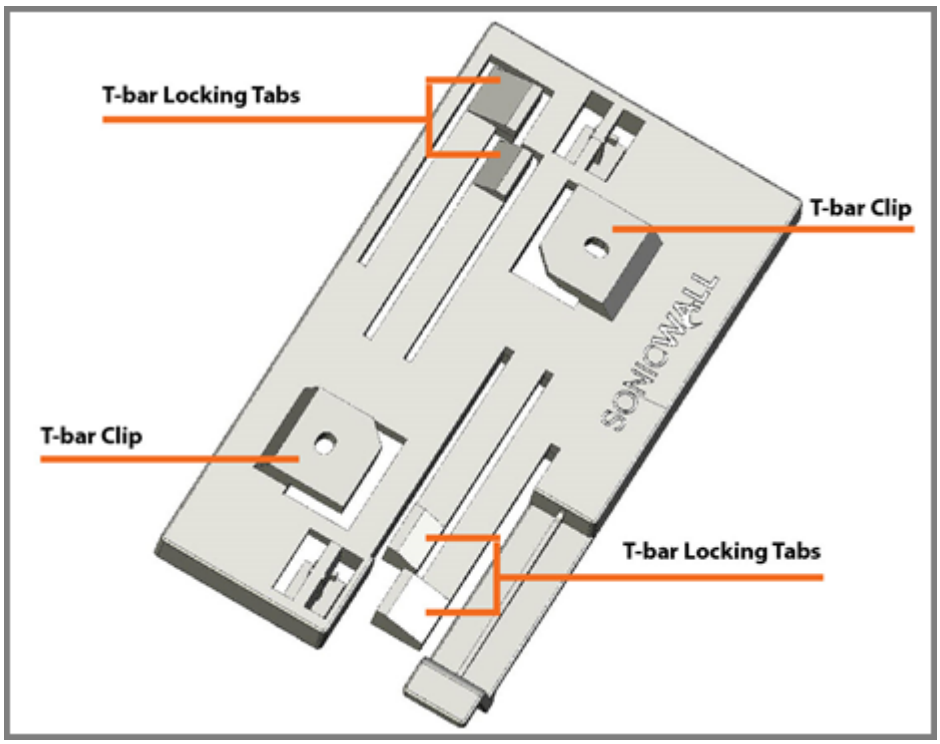
NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

The SonicWave 231c comes with a mounting bracket so it can be mounted on the ceiling or other flat surface. This section describes how to attach the mounting bracket to the ceiling or an indoor wall.

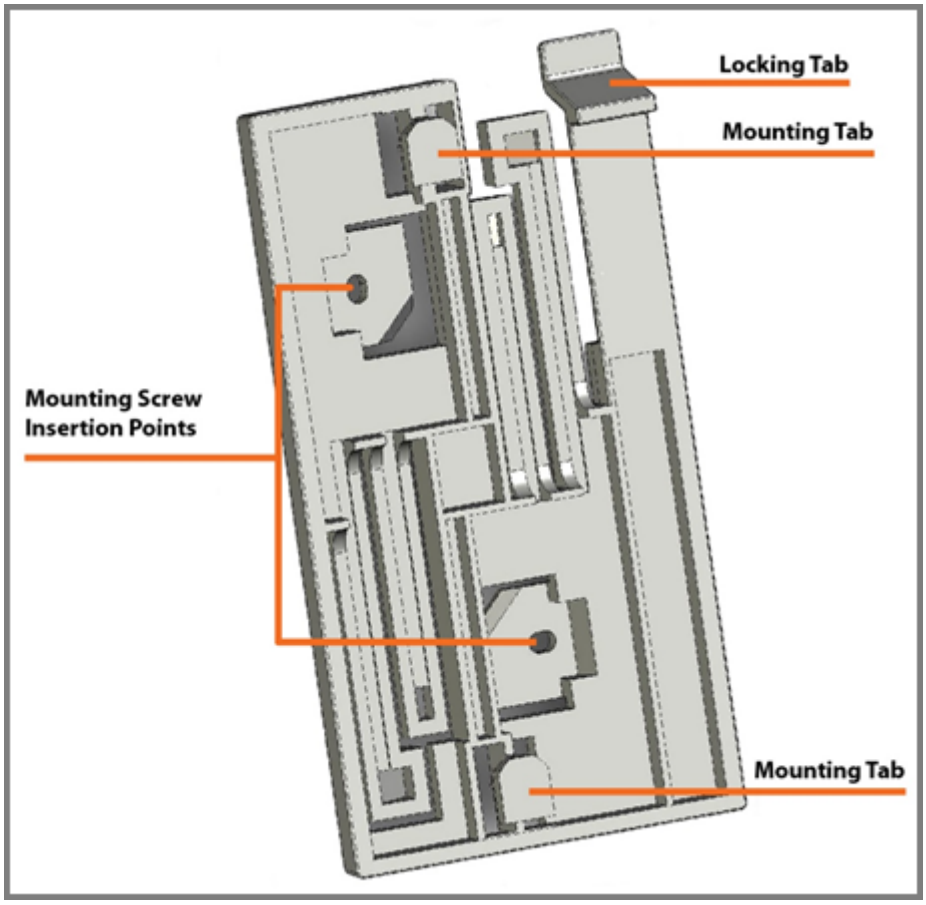
The mounting bracket provides two pairs of T-bar locking tabs that support two ceiling T-bar widths: 15/16 inch and 9/16 inch.

For mounting on a flat surface, holes in the T-bar clips on the bracket provide insertion points for screws. Use #6 (3.5mm) zinc plated pan head machine screws (sheet metal screws) of length 1.25 inches (31.75 mm). When mounting on drywall, anchors should be used. Anchors must accommodate the screws and be rated to hold at least 10 lbs (4.5 kg).

SonicWave 231o Mounting Bracket Top



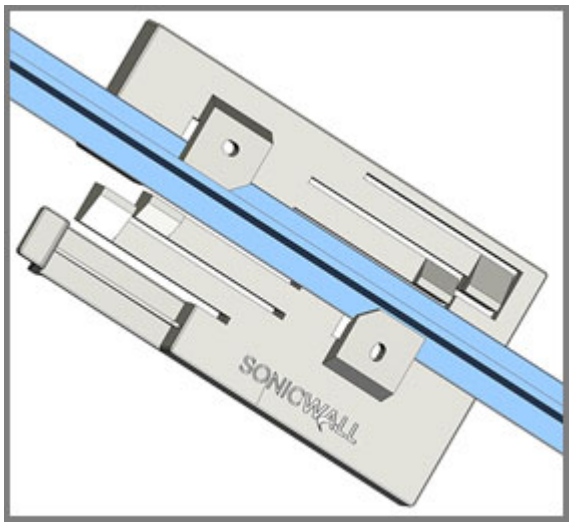
Mounting Bracket Bottom



To attach the mounting bracket to the ceiling using T-bar clips:

1. Press the top side of the mounting bracket against the ceiling tile T-bar so that the T-bar locking tabs on the mounting bracket are depressed.
2. Rotate the mounting bracket until the ceiling T-bar slides into the T-bar clips on the mounting bracket and the T-bar locking tabs click into place.

T-Bar with Mounting Plate



To attach the mounting bracket to the ceiling or to a wall using screws:

1. Place the top side of the mounting bracket against the ceiling or wall and mark the locations for the two screw insertion points.
2. Drill starter holes at the marked locations. For a wood wall, use a drill bit that fits the screws. For drywall, use a drill bit that fits the anchors.
3. For drywall, screw in the anchors.
4. Place the mounting bracket against the wall with the holes lined up on the marks or anchors.
5. Using the screws and a screwdriver, securely attach the mounting bracket to the ceiling or wall.

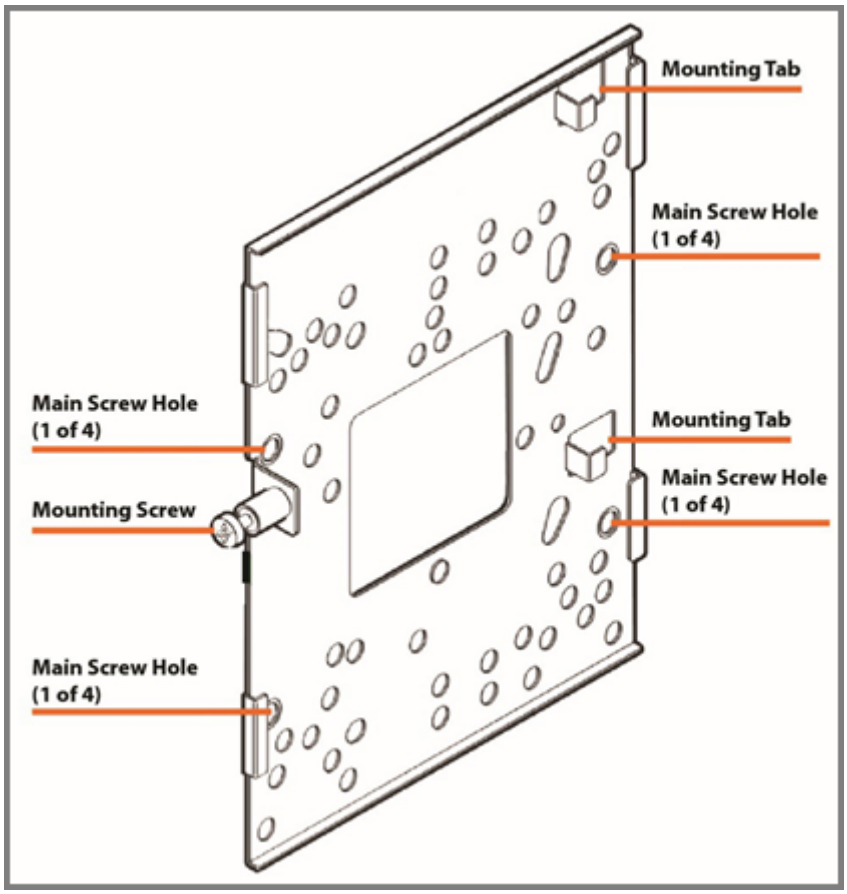
Mounting the SonicWave 224w

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

The SonicWave 224w comes with a mounting plate so it can be mounted on the wall. This section describes how to attach the mounting plate to an indoor wall or junction box.

The mounting plate has four holes that are intended for use with mounting screws, two on each side. Use #6 (3.5mm) zinc plated pan head machine screws (sheet metal screws) of length 1.25 inches (31.75 mm). When mounting on drywall, anchors should be used. Anchors must accommodate the screws and be rated to hold at least 10 lbs (4.5 kg).

SonicWave 224w Mounting Plate



To attach the mounting plate to a wall:

1. Place the smooth side of the mounting plate against the wall with the Ethernet ports showing through the center hole, and mark the locations for the screws. Use all four positions or select two holes that are far enough apart to hold the access point securely to the wall.
2. Drill starter holes at the marked locations. For a wood wall, use a drill bit that fits the screws. For drywall, use a drill bit that fits the anchors.
3. For drywall, screw in the anchors.
4. Place the mounting plate against the wall with the holes lined up on the marks or anchors.
5. Using the screws and a screwdriver, securely attach the mounting plate to the wall.

To attach the mounting plate to a junction box:

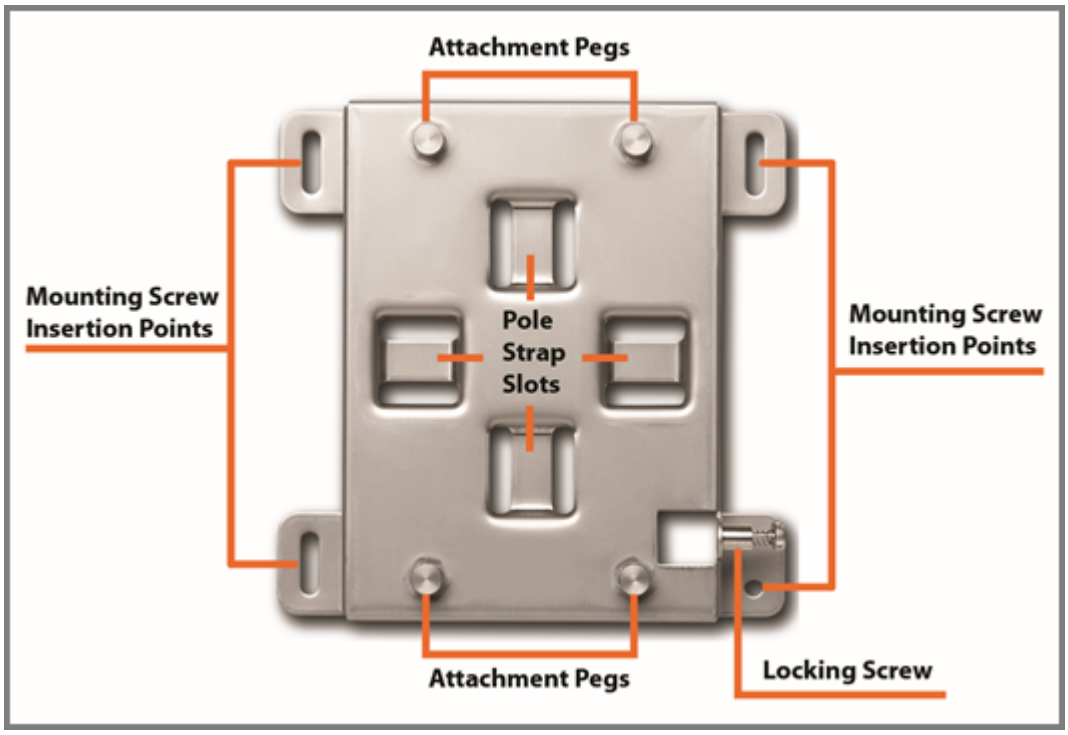
1. Place the smooth side of the mounting plate against the junction box with the Ethernet ports showing through the center hole.
2. Align at least two of the mounting plate holes with two holes on the junction box.
3. Using the screws and a screwdriver, securely attach the mounting plate to the junction box.

Mounting the SonicWave 231o

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

The SonicWave 231o mounting kit includes hardware for mounting the unit outside on a pole or post, or on a wall or other flat surface. The SonicWave 231o and mounting bracket are designed so that you can first attach the mounting bracket to the pole or wall and then slide the SonicWave onto the bracket.

Mounting Bracket



To attach the mounting bracket to a pole or post:

1. Using a screwdriver, loosen and free the ends of the two adjustable pole straps.
2. Insert each pole strap through an appropriate slot on the back side of the bracket.
3. Loop the straps around the pole or post.
4. Insert the strap ends into their respective fittings until snug around the pole.
5. Use the screwdriver to tighten each strap and securely attach the mounting bracket to the pole or post.

To attach the mounting bracket to a wall or flat surface:

1. Place the back side of the mounting bracket against the wall or surface and mark the locations for four screws positioned at the mounting screw insertion points.
2. Drill starter holes at the marked locations. For a wood wall, use a drill bit that fits the provided screws. For drywall, use a drill bit that fits the anchors. Use the screws or anchors that work best in your location.
3. For drywall, insert or screw in the anchors.
4. Place the mounting bracket against the wall with the mounting screw insertion points lined up on the marks or anchors.
5. Using the provided screws and a screwdriver, securely attach the mounting bracket to the wall or surface.

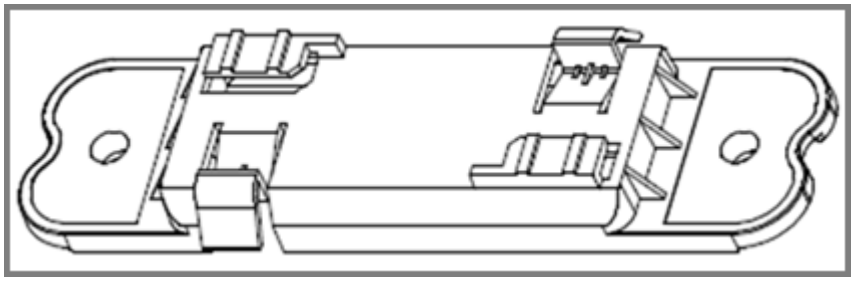
Mounting the SonicWave 432e and 432i

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

You can mount your SonicWave 432i to a wall or ceiling, or you can simply set it on a flat surface.

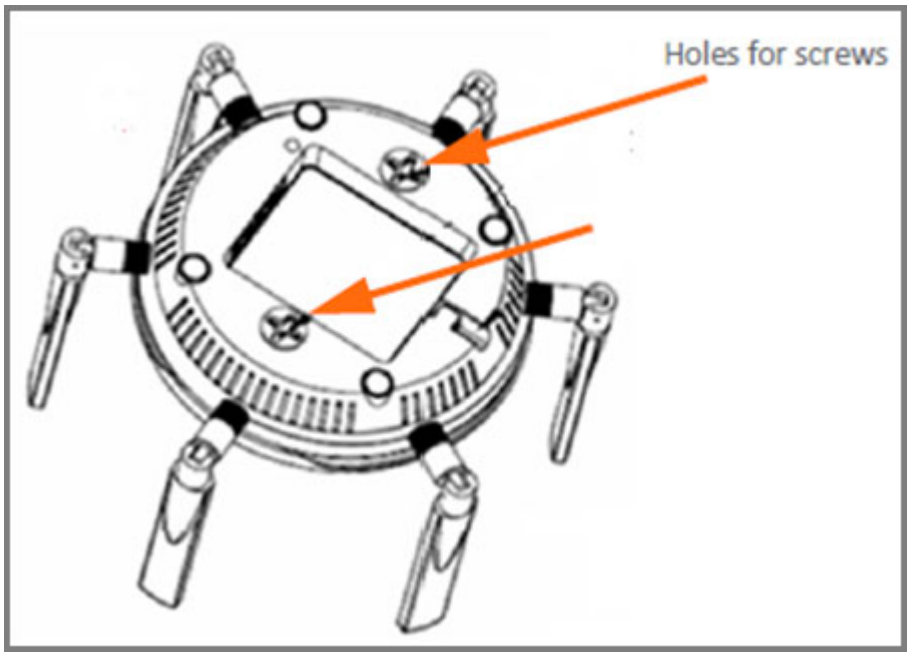
The mounting kit includes one of two large ceiling brackets depending on the configuration of the SonicWave you have purchased.

Large Ceiling Bracket (Original Configuration)

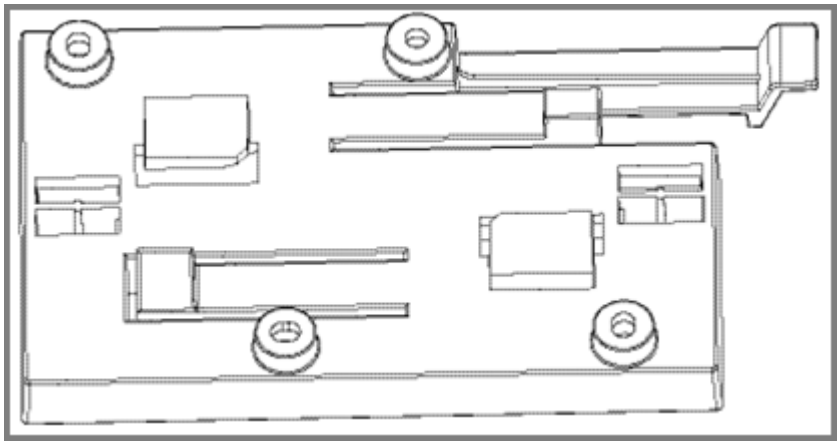


The underside of the orginal SonicWave 432i has two insertion points where you can insert the provided screws to help secure the bracket. You can use these insertion points to attach the large bracket to the SonicWave 432i.

NOTE: Your actual bracket may vary from what is shown here.

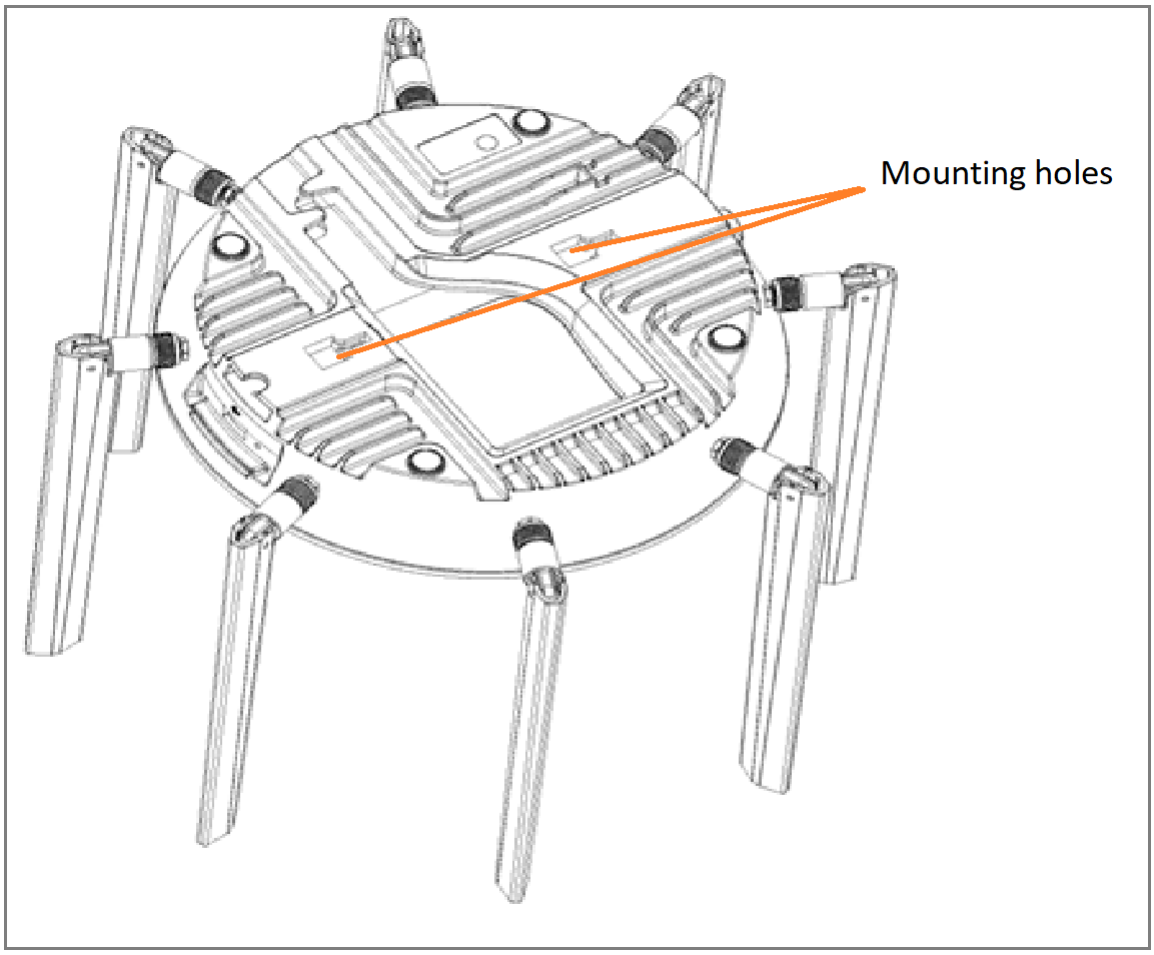


Large Ceiling Bracket (Later Configuration)



This ceiling bracket can be mounted on a ceiling (or wall) using either the four provided anchors and screws, or clipped to a ceiling t-crossbar for a less permanent solution. The underside of the later SonicWave 432i configuration has two insertion points where you can hang the SonicWave by two plastic insertion stubs located on the underside of the ceiling bracket. You can use these insertion stubs to attach the large bracket to the SonicWave 432i after the bracket has been installed on the ceiling or wall.

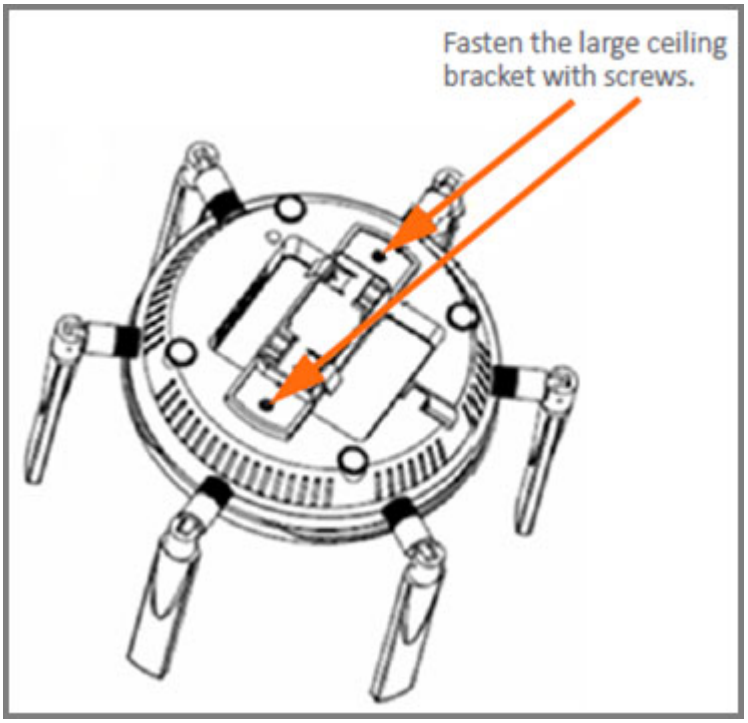
Holes to secure bracket



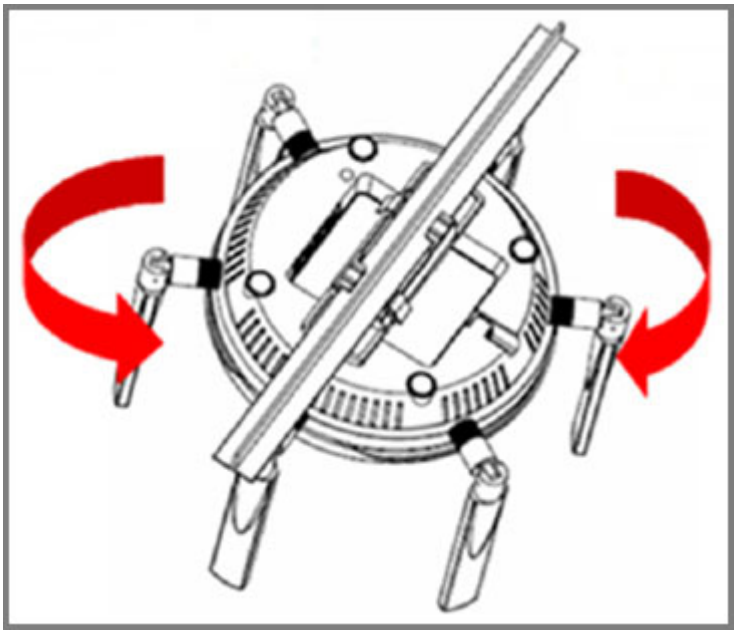
To mount the SonicWave 432i to a t-crossbar between ceiling panels using the original configuration large bracket:

1 Use the two provided screws to attach the original configuration large bracket to the underside of the SonicWave.

To Fasten to Large Ceiling Bracket



2 BracketSupporting the SonicWave in one hand, position the edge clips of the bracket over the edge of the ceiling tcrossbar and rotate the SonicWave counterclockwise (to the left when looking up at it) until the bracket is securely attached to the t-crossbar.

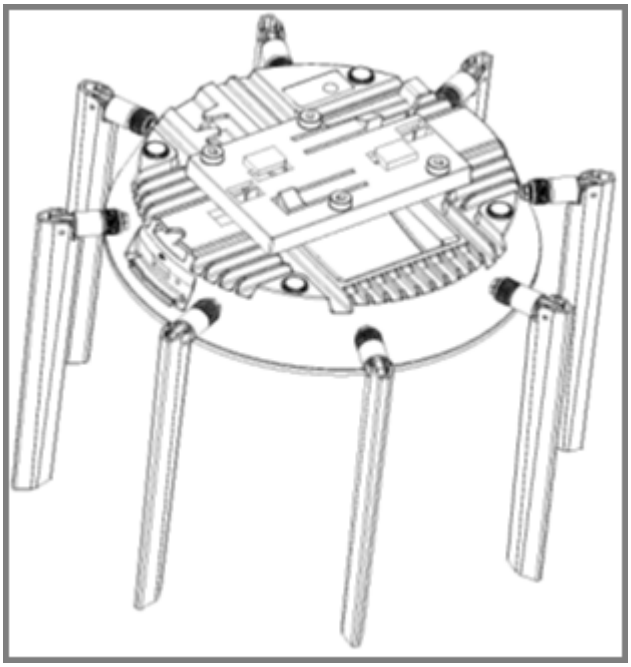


3 To remove the original configuration SonicWave 432i from the ceiling t-crossbar, gently pressing upward, rotate it *clockwise* (to the right when looking up at it) until the bracket detaches from the crossbar.

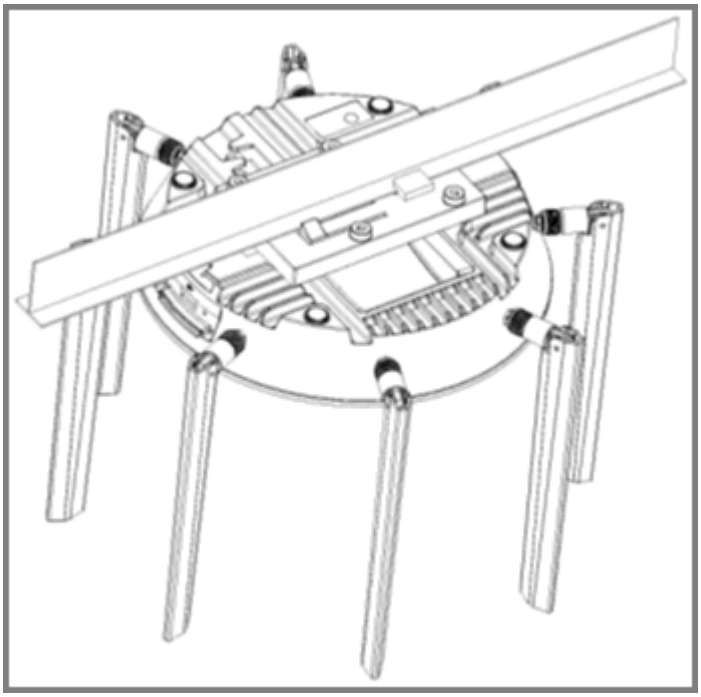
To mount the SonicWave 432i to a t-crossbar between ceiling panels using the later configuration large bracket:

1 Slide and click the bracket into place using the SonicWave's two insertion points and the bracket stubs located on the underside of the ceiling bracket to attach the bracket to the underside of the SonicWave.

NOTE: Your actual bracket may vary from what is shown here.



2 Supporting the SonicWave in one hand, position the edge clips of the bracket over the edge of the ceiling t-crossbar and rotate the SonicWave counterclockwise (to the left when looking up at it) until the bracket is securely attached to the crossbar.



3 To remove the SonicWave 432i from the ceiling t-crossbar, gently pressing upward, rotate it *clockwise* (to the right when looking up at it) until the bracket detaches from the crossbar.

Mounting Using Anchor Screws

To mount the original configuration SonicWave 432i using anchor screws:

1 On the mounting surface, mark the location to make two screw holes. The marks should be horizontally parallel to each other.

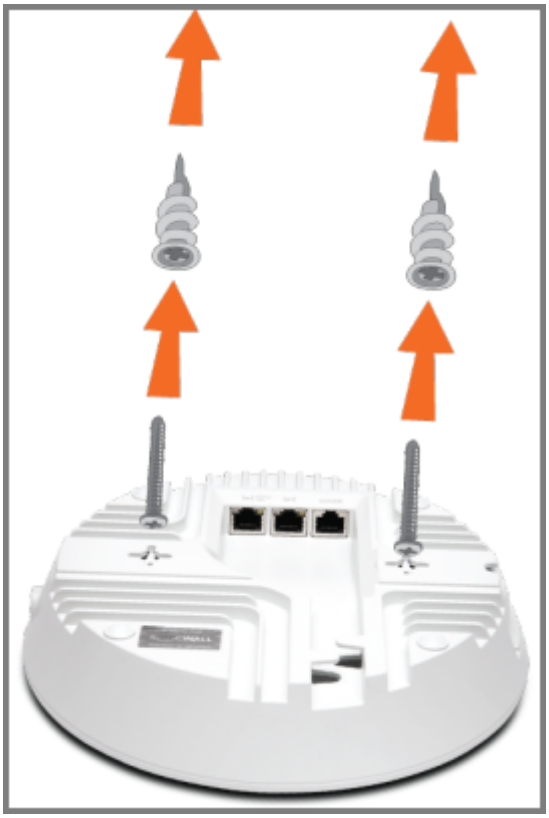
2 Screw the anchor screws into the ceiling tile or drywall to their full depth.

3 Insert the screws into the anchors, and screw them in deep enough to leave minimal space between the screw heads and the wall surface.

4 Supporting the SonicWave in your hands, securely fit the underside slots of the SonicWave onto the screw heads.

NOTE: Your actual hardware may differ from what is shown.

Using Anchor Screws

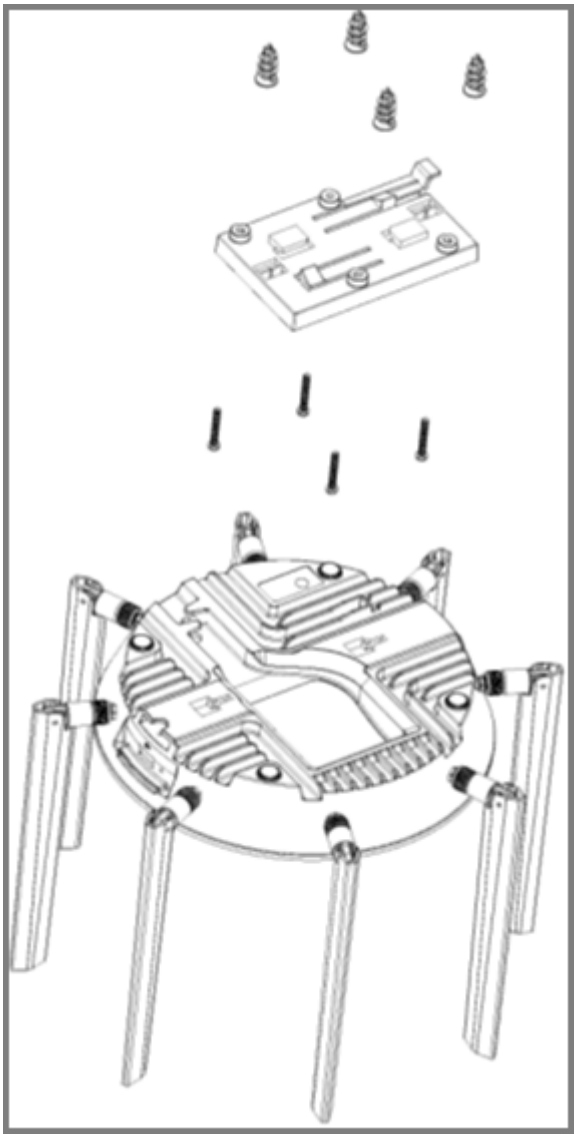


To mount the later configuration SonicWave 432i using anchor screws:

1. On the mounting surface, mark the location to make four screw holes. The marks should match the holes of the later configuration mounting bracket.
2. Screw the anchor screws into the ceiling tile or drywall to their full depth.
3. Align the bracket with the anchors. Insert the screws into the anchors through the bracket holes, and then screw them in securely.
4. Supporting the SonicWave in your hands, securely slide and click the SonicWave onto the bracket stubs.

NOTE: Your actual hardware may differ from what is shown.

Mouting Plate with Access Point



Mounting the SonicWave 432o

NOTE: Complete installation and mounting instructions for this product are available in translation in the Safety and Regulatory Reference Guide for this product. See Product Safety and Regulatory Information.

Ground Connection

The ground connection for the SonicWave 432o is located on the back of the device. Attach the green ground to earth cable to the grounding terminal.

To attach the green ground to earth cable to the grounding terminal:

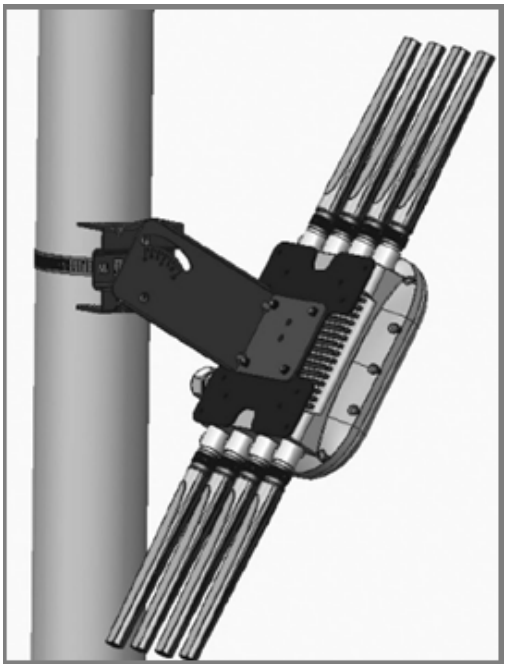
1. Use the ground screw assembly with the star washer to attach the ground wire's ring terminal to the SonicWave 432o. The wire should be as close to the SonicWave bottom as possible.
2. Tighten the screw securely.

Mounting the SonicWave 432o on a Pole or Post

Attach the SonicWave 432o to a surface that can support it and withstand its environment. It can be mounted to a post or pole, and the surface material can be concrete, brick, wood, metal, or plastic.

IMPORTANT: This device must be professionally installed using either the supplied antennas or with approved alternate antennas available from SonicWall.

1. Fasten the mounting base securely to the back of the SonicWave 432o using the provided mounting screws.
2. Tighten the strap with an appropriate screw driver and ensure that the device is firmly in place.
3. Attach the pole-mount bracket to the mounting base using the provided screws. The pole-mount bracket can be attached either vertically or at a tilt of up to 30 degrees, depending on your requirements.
4. Loop the provided pole strap through the slots on the pole-mount bracket and then around the pole.



Software Configuration

- Configuring SonicOS for Wireless Access
- Integration with other SonicWall Software

9

Configuring SonicOS for Wireless Access

Introduction

Starting in 2019, there are two processes available for configuring SonicWave access points. The first, older approach involves configuring the SonicWave access points from the SonicWave firewall interfacing it to your secured network. In the newer approach, network administrators use SonicWall's Wireless Cloud Manager to deploy and manage SonicWave access point. In the following paragraphs we will outline the relative advantages of these two approaches: firewall and cloud.

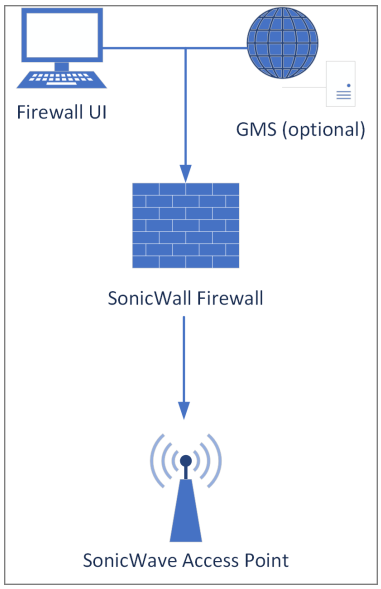
Firewall-Based Configuration

The firewall-based approach is quick and potentially very simple. However, in a larger network environment it may be clumsy. Changing the interface details of SonicWave access points connected to a firewall requires either using the console port on the on the firewall or SonicWave access point and may involve locational challenges. However, if administrators are unable to establish and SSL/VPN link to the firewall, this may be necessary. Although the firewall approach can support complex SonicWave configurations, when multiple access points in different locations are involved, the SonicWall Wireless Cloud Manger offers definite advantages.

For details on the firewall approach to SonicWave deployment:

- Configuring SonicOS for 200 Series SonicWave Access Points
- Configuring SonicOS for 400 Series SonicWave Access Points

Firewall-Based Configuration

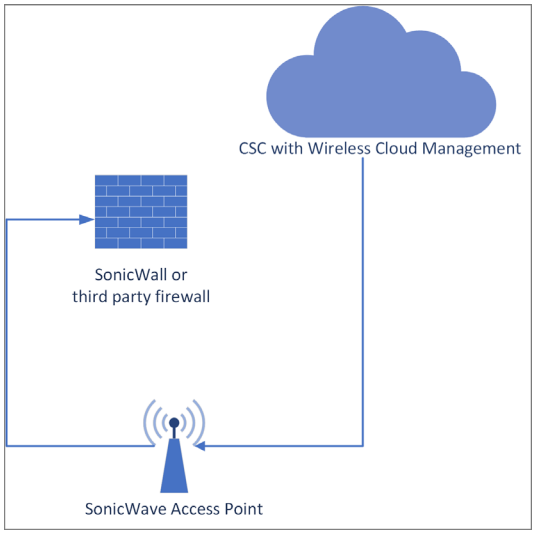


Cloud-Based Configuration

Wireless Cloud Manager is offered within SonicWall Capture Security Center. With it, an administrator can manage SonicWall access points globally regardless of their hardware environments.

Integration with other SonicWall Software provides references to manuals on Wireless Cloud Manager tools.

Cloud-Based Configuration



Configuring SonicOS for 200 Series SonicWave Access Points

This section provides instructions for configuring SonicOS on your SonicWall network security appliance to connect your 200 series SonicWave to the WLAN zone and manage it as a Layer 2 device. This includes:

- Configuring the SonicWave Provisioning Profile for radio frequency, mode, authentication type
- Configuring the Network Interface to which the 200 series SonicWave will connect
- Configuring the WLAN Zone for trust, security, and SonicWave provisioning profile

NOTE: For addition information, see the online help with your firewall.

Configuring the SonicWave Provisioning Profile

SonicWave provisioning profiles include all of the settings that can be configured on a 200 series SonicWave access point. The profile is then selected when you configure the wireless zone (WLAN by default). When your 200 Series SonicWall access point connects to that zone, it is automatically provisioned with the profile settings.

To configure the SonicWave provisioning profile:

1 Log into your SonicWall firewall as an administrator (default: *admin / password*).

2 In the **MANAGE** view, navigate to the **Connectivity | Access Points > Base Settings** page.

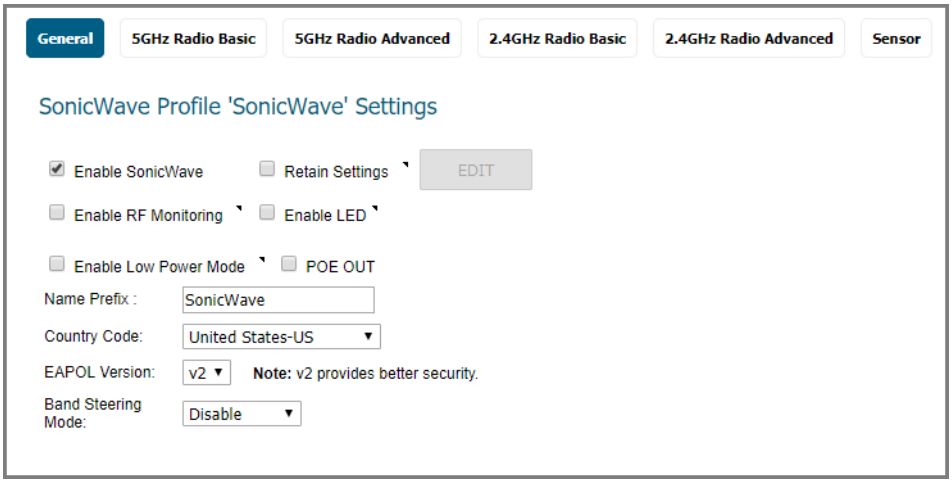
3 In the **SonicWave Provisioning Profiles** section, do one of the following:

- To modify the default **SonicWave** profile, click the **Configure** icon in the **SonicWave** row.
- To create a new profile, select **SonicWave Profile** from the **Add New Profile** drop-down list.

The **Add/Edit SonicWave Profile** dialog is displayed.

General screen settings:

1 Select **Enable SonicWave**. This is selected by default.



2 To turn on the LEDs for SonicWaves using this provisioning profile, select **Enable LED**. The LEDs are turned off by default.

3 If adding a new profile, type a simple, descriptive name into the **Name Prefix** field. This is the name of the provisioning profile. Optionally change the **Name Prefix** if editing the default SonicWave profile.

4 Verify the **Country Code** for the area of operation.

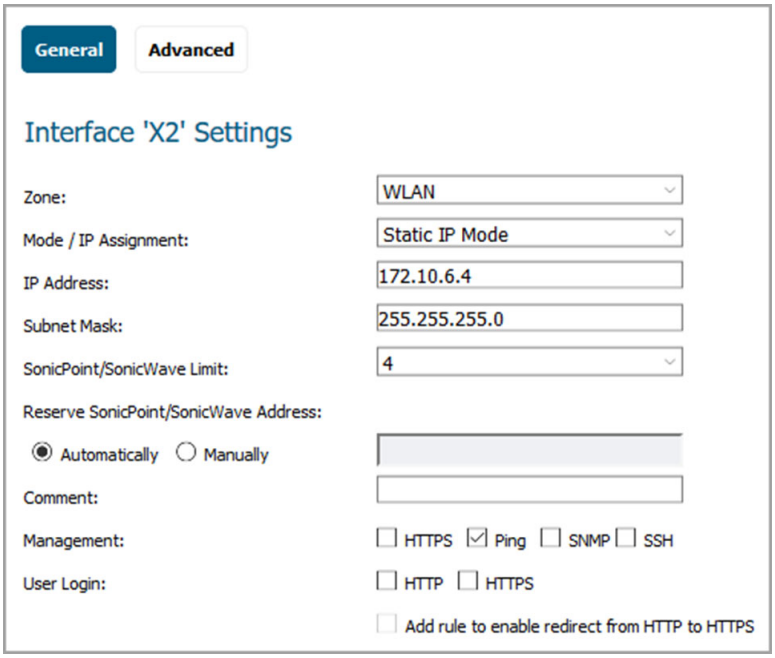
5 Accept the defaults or configure the remaining options as necessary. For more information, see the *SonicOS Connectivity Administration* documentation.

Configuring the Network Interface

Each SonicWave or group of SonicWaves must be connected to a physical network interface that is configured in a wireless zone. SonicOS provides a standard wireless zone (WLAN) which can be applied to any available interface.

To configure the network interface in SonicOS:

1 In the **MANAGE** view, navigate to the **System Setup | Network > Interfaces** page and click the **Configure** icon for the interface to which your SonicWave will connect.



2 Select **WLAN** or another (custom) wireless zone from the **Zone** drop-down list. The default wireless zone is **WLAN**.

3 Select **Static IP Mode** for the **Mode/IP Assignment**.

4 In the **IP Address** field, type in any private IP address that does not interfere with the IP address range of any other interfaces on the appliance. Wireless clients will be assigned an IP address in this subnet.

5 Enter a **Subnet Mask**. The default is 255.255.255.0.

6 Select a non-zero number for **SonicWave Limit**. If **No** is selected, no access points can be discovered on this interface.

7 Use the default settings or select appropriate settings for the other fields and then click **OK**.

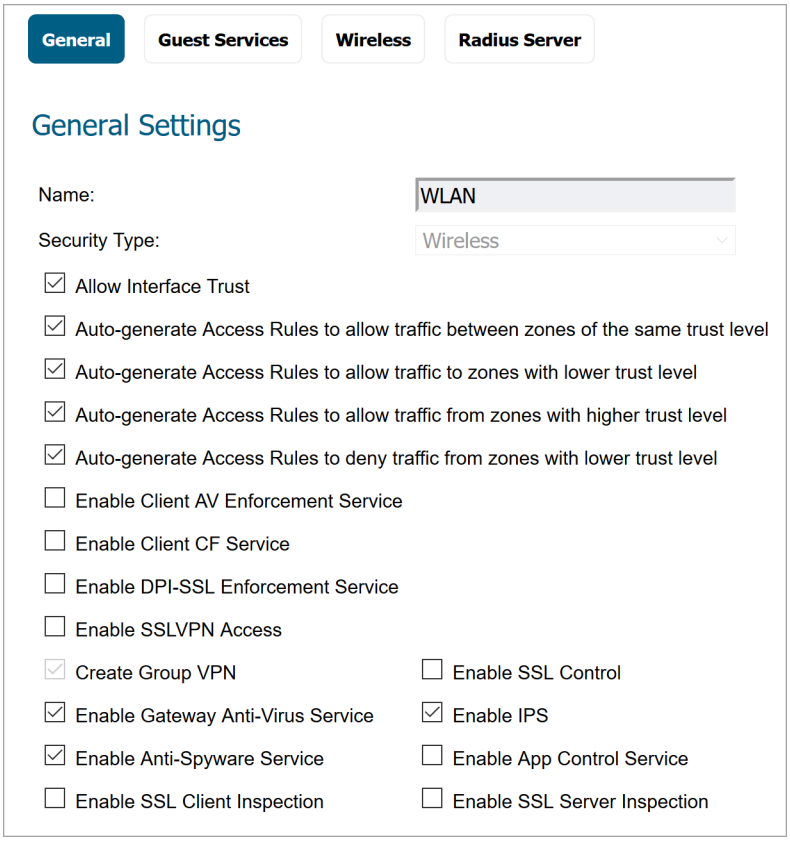
Configuring the WLAN Zone

To configure the WLAN zone in SonicOS:

1 In the **MANAGE** view on the **System Setup | Network > Zones** page, click the **Configure** icon in the WLAN row.

2 On the **General** screen, select the **Allow Interface Trust** option to automate the creation of Access Rules to allow traffic to flow between the interfaces within the zone, regardless of the interfaces to which the zone is applied.

For example, if the WLAN zone has both the X2 and X3 interfaces assigned to it, selecting **Allow Interface Trust** creates the necessary access rules to allow hosts on these interfaces to communicate with each other.



3 Select the checkboxes to enable security services on this zone. Minimally, you would select **Enable Gateway Anti-Virus Service**, **Enable IPS**, and **Enable Anti-Spyware Service**. If your wireless clients are all running SonicWall Client Anti-Virus, select **Enable Client AV Enforcement Service**.

4 In the **Guest Services** screen, optionally configure guest Internet access. For information about Guest Services, see the *SonicOS Connectivity Administration* documentation.

5 In the **Wireless** screen under **SonicWave Settings**, select the desired provisioning profile from the **SonicWave Provisioning Profile** drop-down list. If you added a new profile, select it here.

6 Select **Only allow traffic generated by a SonicWave** to allow only traffic from SonicWall wireless access points to enter the WLAN zone interfaces, providing maximum security.

7 When finished, click **OK**.

Configuring SonicOS for 400 Series SonicWave Access Points

You only need to complete three simple configuration tasks in SonicOS to prepare your SonicWave access point to provide secure wireless access.

1 Configuring the Network Interface

2 Configuring the WLAN Zone

3 Configuring the 400 Series Access Point Settings

NOTE: For addition information, see the online help with your firewall.

Configuring the Network Interface

Each SonicWave or group of SonicWaves must be connected to a physical network interface that is configured in a wireless zone. SonicOS provides a standard wireless zone (WLAN) which can be applied to any available interface.

To configure the network interface in SonicOS:

1 Log into SonicOS as an administrator (default: admin / password).

2 In the **MANAGE** view, navigate to the **System Setup | Network > Interfaces** page and click **Configure** for the interface to which your SonicWave is connected.

3 Select **WLAN** zone for the **Zone** type.

4 Select **Static IP Mode** for the **Mode/IP Assignment**.

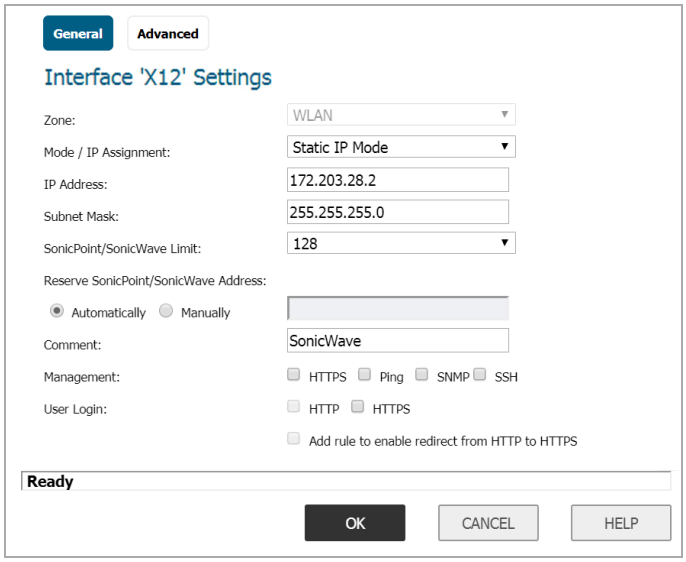
5 In the **IP Address** field, type in any private IP address that does not interfere with the IP address range of any other interfaces on the appliance.

6 Enter a **Subnet Mask**. The default is 255.255.255.0.

7 Use the default settings or select appropriate settings for the other fields and then click **OK**.

CAUTION: Allowing **Management** and **User Login** to the appliance from a wireless zone can pose a security threat if you or your users have not set strong passwords.

SonicOS 6.5 Interface Settings



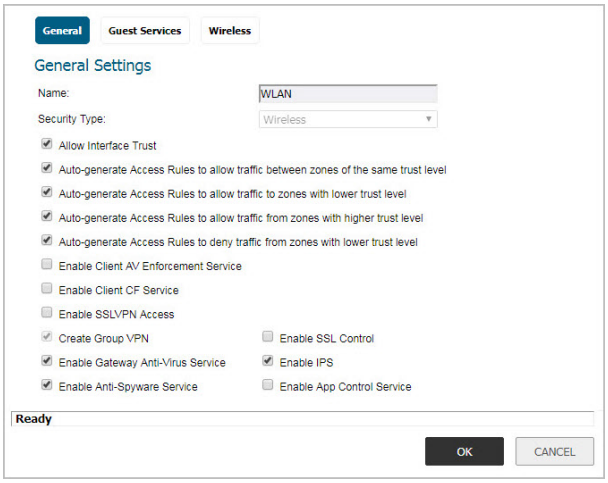
Configuring the WLAN Zone

To configure the WLAN zone in SonicOS:

1 In the **MANAGE** view on the **System Setup | Network > Zones** page, click the **Edit** icon in the **Configure** column of the **WLAN** row.

2 On the **General** page, under **General Settings**, select the **Allow Interface Trust** option to automate the creation of Access Rules to allow traffic to flow between the interfaces within the zone, regardless of the interfaces to which the zone is applied.

For example, if the WLAN zone has both the **X2** and **X3** interfaces assigned to it, selecting **Allow Interface Trust** creates the necessary access rules to allow hosts on these interfaces to communicate with each other.



3 Select the checkboxes to enable security services on this zone. Minimally, you would select **Enable Gateway Anti-Virus Service**, **Enable IPS**, and **Enable Anti-Spyware Service**. If your wireless clients are all running SonicWall Client Anti-Virus, select **Enable Client AV Enforcement Service**.

4 In the **Guest Services** page, optionally configure guest Internet access. For information about Guest Services, see the *SonicOS Connectivity Administration* documentation.

5 In **Wireless** under **SonicWave Settings**, select **Only allow traffic generated by a SonicWave** to allow only traffic from SonicWaves to enter the WLAN zone interfaces, providing maximum security.

6 When finished, click **OK**.

Configuring the 400 Series Access Point Settings

When a 400 series access point is initially connected to an interface, the firewall uses a default provisioning profile to create a 400 series access point entry. It can take up to five minutes for the entry to be created.

You can modify the 400 series access point entry to configure the access point name, radio frequency mode, authentication type, and other settings specific to your 400 series access point.

TIP: For deployments of multiple SonicWaves that need the same provisioning settings, you can create a custom provisioning profile in the upper section of **Connectivity | Access Points > Base Settings** page in the **MANAGE** view. In **System Setup | Network > Zones** page, you can edit the WLAN zone and specify this profile on the **Wireless** page. Any SonicWaves connecting to an interface in the WLAN zone can then be provisioned with the assigned profile.

You might want to use the new **Floor Plan View** and **Topology View** features as well. See the *SonicOS Connectivity Administration* documentation for more information.

To modify the 400 series access point entry in SonicOS:

1 In the **MANAGE** view, navigate to **Connectivity | Access Points > Base Settings**.

2 In the **SonicWave Objects** table, click the **Configure** icon in the row for the SonicWave 432o entry you wish to modify.

General page settings:

1 On the **General** page, select **Enable SonicWave**.

2 In the **Name** field, optionally type in a new name for this SonicWave 432o. The existing name is assigned by the provisioning profile based on the name prefix in the profile with a unique number appended.

This is the access point name that appears in clients' lists of available wireless connections.

3 Verify the **Country Code** for the area of operation.

4 Configure the remaining options as necessary. For more information, see the *SonicOS Connectivity Administration* documentation.

5 GHz Basic / 2.4 GHz Basic Settings:

1 Click **5 GHz Basic**, or **2.4 GHz Basic**.

The configuration is very similar for both 5 GHz Basic and 2.4 GHz Basic. The main differences are the radio frequencies:

Frequency	Default Mode
5 GHz	5GHz 802.11ac/n/a Mixed
2.4 GHz	2.4GHz 802.11n/g/b Mixed

2 Select **Enable Radio**.

3 Select a **Mode** or use the default.

4 Under Wireless Security, select the **Authentication Type** for your wireless network. SonicWall recommends using **WPA2** as the authentication type if all client devices support it.

TIP: *PSK* uses a personal passphrase for authentication, *EAP* uses an Enterprise RADIUS server.

5 Select the **Cipher Type**. When using WPA and WPA2, SonicWall recommends **AES** for maximum security.

NOTE: Older client devices might not support AES.

6 Fill in the fields specific to the authentication type that you selected. The remaining fields change depending on the selected authentication type.

7 Optionally, under **ACL Enforcement**, select **Enable MAC Filter List** to enforce Access Control by allowing or denying traffic from specific devices. Select a MAC address object group from the **Allow List** or **Deny List** to automatically allow or deny traffic to and from all devices with MAC addresses in the group. The **Deny List** is enforced before the **Allow List**.

Virtual Access Point Encryption Settings:

NOTE: This section displays only if a VAP was selected from the 5 or 2.4 GHz Radio Virtual AP Group drop-down menu in the **Virtual Access Point Settings** section of the **General** page.

The **Virtual Access Point Encryption Settings** section of both **5 GHz Radio Basic** and **2.4 GHz Radio Basic** are the same for the **802.11n Radio**.

5 GHz Radio Advanced / 2.4 GHz Advanced Settings:

1 Click **5 GHz Radio Advanced** or **2.4 Radio Advanced**.

The configuration is very similar for Radio 0 Advanced and Radio 1 Advanced. For most advanced options, the default settings give optimum performance. For a full description of the fields on this page, see the *SonicOS Connectivity Administration* documentation.

2 Optionally select the **Hide SSID in Beacon** checkbox.

The *SSID* refers to the access point name that appears in clients' lists of available wireless connections.

Hiding the SSID provides additional security because it requires that you know the access point name before connecting.

3 When finished configuring all options, click **OK**.

Sensor page

On the Sensor page, enable or disable **Wireless Intrusion Detection and Prevention (WIDP) mode**.

NOTE: If this option is selected, Access Point or Virtual Access Point(s) functionality is disabled automatically.

1 Select **Enable WIDF sensor** to have the SonicWave operate as a dedicated WIDP sensor. This option is not selected by default.

2 From the drop-down menu, select the schedule for when the SonicWave operates as a WIDP sensor or select **Create new schedule...** to specify a different time; default is **Always on**.

Wireless Cloud Management Overview

SonicWall® Wireless Cloud Management provides a simple wi-fi deployment and management solution. The WiFi Cloud Manager, WiFi Planner, and WiFi Cloud Manager App are used to deploy, configure, and manage your wireless network.

Integration with other SonicWall Software provides references to manuals on Wireless Cloud Manager tools.

WiFi Cloud Manager

SonicWall® WiFi Cloud Manager is an intuitive Wi-Fi network management system designed to simplify Wi-Fi access, control, and troubleshooting. The Secure Wireless Cloud Management System can be deployed across multiple regions, and it is accessible from anywhere with an Internet connection.

You can access the WiFi Cloud Manager by clicking the **Wireless** tile from the Capture Security Center. The first time you access the WiFi Cloud Manager, you are asked to configure a wireless network hierarchy on the **Zones & Policies > Locations** page. Create your network hierarchy by adding locations, child locations, and zones under your tenant. Additional tenants can be created from your MySonicWall account.

After you configure the network hierarchy you can use the wireless mobile app to add access points. Login to the app with your MSW credentials and select **Register APs** to open the QR code scanner. After scanning the QR code, the devices are registered and listed on MSW. You can change access point configurations from the **Devices** page.

WiFi Planner

The SonicWall WiFi Planner is an intuitive, web-based, Wi-Fi planning tool that enables you to assess and update your Wi-Fi deployments as well as make deployment configuration changes. The WiFi Planner is available in the WiFi Cloud Manager **Tools** menu. You can use the WiFi Planner tools to simulate a wireless deployment by creating/managing floor plans and placing/configuring/adjusting Access Points (APs).

WiFi Cloud Manager Mobile App

The SonicWall WiFi Cloud Manager Mobile App is available for Android and iPhone devices. The mobile app provides a simple option for registering access points and creating a wireless mesh network. Login to the app with your MySonicWall credentials to register your access points. The mobile app allows you to scan the QR code on the back of the device or package to register the device. Registered devices appear on the **MSW > Product Management > My Products page.**

Create a mesh network by selecting the **Setup Mesh** option then follow the prompts. The app will scan for devices then ask you to connect a device to the Internet. Create or choose a profile, then enter a **Name** and **PSK** for the network. The app prompts you to apply and review the network settings. Accept the settings and return to the menu. You can add additional access points by clicking **Add Aps** and scanning the QR code on the back of the device.

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Integration with other SonicWall Software

SonicWall provides systems to help deploy, manage, and secure wireless networks:

- Secure Mobile Access (SMA)
  Operating on SonicWall hardware or as a virtual machine on a standard server, Secure Mobile Access provides policy-enforced SSL-VPN access and role-based privileges for mobile users.

  With the Mobile Connect app on mobile devices, mobile users can initiate a VPN connection with an SMA appliance and gain quick and appropriate access to the local network.

  For more information, go to the SonicWall technical documentation portal at:
  https://www.sonicwall.com/support/technical-documentation/
  In the select a product box, choose **Secure Mobile Access** and then **100 series** or **1000 series**. A list of available manuals will appear.

- WiFi Cloud Manager (WCM)
  This is a cloud-based component of SonicWall's Capture Security Center.

  WCM handles only the management plane functions of the SonicWave APs, ensuring that control and data plane functions are handled locally. Thus, in case of an Internet outage, although there is a temporary loss in management capability, the APs continue to work. WCM can manage up to thousands of access points and enforce security policies at a granular level.

  Refer to details in Cloud-Based Configuration for using WiFi Cloud Manager to deploy SonicWave access points.

  For more information, go to the SonicWall technical documentation portal at:
  https://www.sonicwall.com/support/technical-documentation/
  In the select a product box, choose Secure **Cloud Wireless**. A list of available manuals will appear.

- WiFi Planner
  A component of WiFi Cloud Manager, this planner helps make sound WiFi coverage decisions that account for different types of office spaces, floor plans, building materials, power requirements, signal strengths, channel widths and radio bands, to obtain maximum coverage with the fewest number of APs. It is ideal for new AP deployments or to ensure excellent coverage in existing wireless networks. Auto-channel assignment prevents interference in deployments on a best effort basis.

  For more information, go to the SonicWall technical documentation portal at:
  https://www.sonicwall.com/support/technical-documentation/
  In the select a product box, choose **Secure Cloud Wireless**. The WiFI Planner User Manual will be among the listed publications.

- SonicWiFi Mobile App
  The cellphone (Android of iOS) app provides a simple zero-touch option for registering access points as well as creating a wireless mesh network.

  Refer to details in Cloud-Based Configuration for using WiFi Cloud Manager to deploy SonicWave access points.

  For more information, go to the SonicWall technical documentation portal at:
  https://www.sonicwall.com/support/technical-documentation/
  In the select a product box, choose **Secure Cloud Wireless**. In the model box select .

Tests and Troubleshooting

- Verifying Operation
- Troubleshooting

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Verifying Operation

This section presents steps to take to ensure your SonicWave wireless access point is working.

Topics:

- Verifying SonicWave 200 series Operation
- Verifying SonicWave 400 Series Operation

Verifying SonicWave 200 series Operation

To verify that the SonicWave is provisioned and operational:

1. Log into your SonicWall firewall as an administrator (default: *admin / password*).
2. In the **MANAGE** view, navigate to the **Connectivity | Access Points > Base Settings** page.
3. In the **SonicPoint/SonicWave Objects** table, the **Status** column displays the <Short Product Name> status. It might display ***Initializing***, ***Updating Firmware***, ***Writing Firmware***, and ***Rebooting***. After rebooting, the **Status** should display ***Operational***.
4. If the **Status** displays ***Operational (Not Licensed)*** and does not change to ***Operational*** soon, contact SonicWall Support for assistance with licensing the SonicWave.
5. Connect a client device to the SonicWave by selecting the appropriate access point name (SSID).
6. Ensure that the client device is not connected to any other network connections (wired LAN, 3G/4G WWAN).
7. In a browser, enter “https://www.sonicwall.com/” in the address bar and press **Enter**. The SonicWall website should display. If you are unable to browse to a website, refer to Troubleshooting.

Verifying SonicWave 400 Series Operation

To verify that the SonicWave is provisioned and operational, in the **MANAGE** view, navigate to the **Connectivity |Access Points > Base Settings** page in SonicOS. In the **SonicPoint/SonicWave Objects** table, the **Status** column displays the <Short Product Name> status. It should say **Operational**.

To verify Internet connectivity through the SonicWave:

1. Connect a client device to the SonicWave by selecting the appropriate access point name (SSID).
2. Ensure that the client device is not connected to any other network connections (wired LAN, 3G/4G WWAN).
3. In a browser, enter “https://www.SonicWall.com/” in the address bar and press **Enter**. The SonicWall website displays. If you are unable to browse to a website, refer to Troubleshooting.

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Troubleshooting

Topics:

- SonicWave 200 Series Troubleshooting
- SonicWave 400 Series Troubleshooting

SonicWave 200 Series Troubleshooting

When the 200 series wireless access point is connected to a SonicWall network security appliance, the two units perform an encrypted exchange, and an entry for the 200 series wireless access point is automatically created in the **SonicPoint/SonicWave Objects** table. In the **MANAGE** view, navigate to the **Connectivity | Access Points > Base Settings** page in SonicOS.

If the entry does not appear in the table within five minutes of connecting the 200 Series wireless access point:

- Make sure the 200 series wireless access point is connected to an interface that is configured as part of a wireless zone. Either the default WLAN zone or a custom zone with type set to “wireless” is required.
- Ensure that the 200 series wireless access point is properly connected with an Ethernet cable to an 802.3at compliant PoE device.
- If an 802.3at compliant PoE injector is being used, verify that the 200 series wireless access point is connected to the PoE port labeled **Data & Power Out**.
- If the 200 series wireless access point has an entry in the table, but reboots frequently or seems non-functional:
  - Verify that your PoE switch/injector is 802.3at compliant and rated to deliver sufficient power to each PoE port. 802.3af compliant PoE devices do not provide sufficient power to properly run current generation 802.11 devices.
  - Click **SYNCHRONIZE ACCESS POINTS** on the **Connectivity | Access Points > Base Settings** page in the **MANAGE** view to force SonicOS to download a new SonicWave firmware image from the SonicWall back-end server.

If the SonicWave becomes unresponsive or seems erratic, you can use the **Reset** button to reset the SonicWave to factory default settings or put it into SafeMode. Use a narrow, straight object, like a straightened paper clip to press the **Reset** button.

- To reboot the SonicWave with factory default settings, press **Reset** for 3 seconds until three LEDs begin to flash slowly. If the SonicWave is connected to your firewall, it reboots again after the provisioning profile settings are applied.
- To reboot the SonicWave into SafeMode, press **Reset** for 8 seconds until three LEDs begin flashing at a medium rate.

> **TIP:** SafeMode allows you to log into the SonicWave directly at 192.168.1.20 (default: *admin/password*) to manually update the firmware in rare situations when other troubleshooting fails. Contact SonicWall Support for assistance.

SonicWave 400 Series Troubleshooting

When the 400 series wireless access point is connected to a SonicWall network security appliance, the two units perform an encrypted exchange, and an entry for the 400 series wireless access point is automatically created in the **SonicPoint/SonicWave Objects** table. In the **MANAGE** view, navigate to the **Connectivity | Access Points > Base Settings** page in SonicOS.

If the entry does not appear in the table within five minutes of connecting the 400 series wireless access point:

- Make sure the 400 series wireless access point is connected to an interface that is configured as part of a wireless zone. Either the default WLAN zone or a custom zone with type set to “wireless” is required.
- Ensure that the 400 series wirelss access point is properly connected by Ethernet cable to an 802.3at compliant PoE device or to the supplied power adaptor.
- If an 802.3at compliant PoE injector is being used, verify that the 400 series wireless access point is connected to the PoE port labeled **Data & Power Out**.

If the 400 series wireless access point has an entry in the table, but reboots frequently or seems non-functional:

- Verify that your PoE switch/injector is 802.3at compliant and rated to deliver sufficient power to each PoE port. 802.3af compliant PoE devices do not provide sufficient power to properly run current generation 802.11 devices. A multi-gigabit 802.3at compliant PoE injector or switch is required to power the 400 series wireless access point over Ethernet.
- Click **Synchronize Access Points** on the **Connectivity | Access Points > Base Settings** page in **MANAGE** view to force SonicOS to download a new SonicWave firmware image from the SonicWall back-end server.

Support and Product Registration

- Registration and Support
- Online Support and Training
- Product Safety and Regulatory Information

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Registration and Support

All SonicWave wireless access points include an initial subscription to SonicWall 24x7 Support.

SonicOS automatically registers your SonicWave wireless access point on MySonicWall, if connected to the Internet. It could take up to 24 hours for your SonicWave wireless access point to be automatically registered.

Optionally, you can manually register the SonicWave wireless access point on MySonicWall by logging into your account at:

http://www.MySonicWall.com.

The SonicWave access point is also associated in MySonicWall with the registered SonicWall network security appliance to which it is connected. See the Associated Products section at the bottom of the appliance Service Management page in MySonicWall.

For the access point to operate, and to receive technical support, your SonicWave access point must have a current “Activation and Support” license.

IMPORTANT: If the license expires, the access point will cease to function until the license is renewed.

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Online Support and Training

SonicWall offers a variety of online support and training options for your convenience.

Customer Support

SonicWall offers telephone, email and Web-based support to customers who have a valid Warranty or who purchased a Support Contract. Review our Warranty Support Policy for product coverage. SonicWall also offers a full range of consulting services to meet your needs.

For more information, visit https://www.sonicwall.com/support

Knowledge Base

The Knowledge Base allows users to search for SonicWall documents by browsing the knowledge base, searching for keywords, or using full-text search.

For more informantion, see https://www.sonicwall.com/support/knowledge-base-category

Training

SonicWall offers an extensive sales and technical training curriculum. SonicWall Training provides the ETraining, instructor-led training, custom training, technical certification, and uses authorized training partners.

For more information, visit: https://www.sonicwall.com/partners/sonicwall-university/

Technical Documentation

- *SonicOS Connectivity Administration* documentation
- *SonicOS Release Notes*, available on MySonicWall
- SonicOS Configuration or Deployment Guides
- *SonicWave Safety and Regulatory Reference Guides*
  One is available for each model in the 200/400 series.

For more information, visit: https://www.sonicwall.com/support/technical-documentation/

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Product Safety and Regulatory Information

On-line safety and regulatory reference guides for each SonicWave model provide important safety information and complete details on international regulatory compliance.

Installation details are provided in Chinese (Traditional and Simplified), French (Canada), German, Japanese, Korean, and Portuguese (Brazil).

To locate these search for your SonicWave model at : https://www.sonicwall.com/support/technical-documentation

Glossary

User Experience

High-speed wireless performance and range

SonicWave access points are based on the 802.11ac Wave 2 standard, which can achieve a PHY rate of up to 2.34 Gbps while maintaining a higher performance level than other standards with greater ranges depending on evironmental conditions.

Enhanced signal quality

The 802.11ac standard operates in the 5 GHz frequency band, which has fewer wireless devices competing for airspace and is therefore less prone to signal interference.

Increased wireless reliability

The increase in bandwidth capacity and greater number of spatial streams combined with MU-MIMO and the improved processing offered by 802.11ac result in more reliable wireless coverage.

MU-MIMO

MU-MIMO (Multipe-user, multiple-input, multiple-output) technology enables simultaneously transmission from the access point to numerous wireless clients instead of just one.

Band steering

Band steering improves the user experience by steering dual-band clients to automatically connect to the less crowded 5 GHz frequency band leaving the more crowded 2.4 GHz frequency for legacy clients.

Beamforming

Beamforming improves wireless performance and range by focusing the wireless signal on an individual client instead of spreading the data transmission equally in all directions.

AirTime Fairness

AirTime Fairness distributes air time equally among connected clients, ensuring faster clients get more data in their time while slower clients receive less.

Wireless Mesh

A wireless mesh enable to extend wifi coverage instantly without requiring cables.

FairNet wireless bandwidth allocation

FairNet guarantees a minimum amount of bandwidth to each wireless client in order to prevent disproportionate bandwidth consumption by a single user.

Wireless Security

Reassembly-free deep packet inspection

SonicWall next-generation firewalls tightly integrate Reassembly-Free Deep Packe Instpection (RFDPI) technology to scan all inbound and outbound traffic on wired and wireless networks and eliminate intrusions, ransomware, spyware, viruses and other threats before they enter the network.

Real-Time Deep Memory Inspection (RTDMI)

This patent-pending cloud-based technology detects and blocks malware that does not exhibit any malicious behavior and hides its weaponry via encryption. By forcing malware to reveal its weaponry into memory, the RTDMI engine proactively detects and blocks mass-market, zero-day threats and unknown malware.

SSL/TLS decryption and Inspection

The SonicWall firewall decrypts and inspects SSL/TLS traffic on the fly, without proxying, for malware, intrusions and data leakage, and applies application URL and content control policies in order to protect against threats hidden in SSL/TLS-encrypted traffic.

Dedicated third scanning radio

Most SonicWave access points include a dedicated scanning radio that performs continual scanning of the wireless spectrum for rogue access points plus additional security functions that help with PCI compliance.

Wireless intrusion detection and prevention

Wireless intrusion detection and prevention scans the wireless network for unauthorized (rogue) access points and then the managing firewall automatically takes countermeasures, such as preventing any connections to the device.

Wireless guest services

Wireless guest service enables administrators to provide internet-only access for guest users. This access is separate from internal access and requires guest users to secure authenticate to a virtual access point before access in granted.

Lightweith hotspot messaging

LIghtweight hotspot messaging extends the SonicWall wireless guest services model of differentiated internet access for guest users, enabling extensive customization of the authentication interface and the use of any kind of authentication scheme.

Captive portal

Captive portal forces a user's device to view a page and provide authentication through a web browser before internet access is granted.

Virtual access pont segmentation

Administrators can create up to eight SSIDs on the same access point, each with its own dedicated authentication and privacy settings. This provides logical segmentation of secure wireless netword traffic and secure customer access.

Cloud ACL

An extension to local ACL, cloud ACL is deployed and managed from a centralized RADIUS server in the cloud. This eliminates local ACL scalability issures, enabiling organizations to confiugure authentication accounts base on their specific requirements. In addition, MAC authentication can be enforced on all WiFI-enabled device even if they are not capable of 802.1x support. This adds another layer of protection to the wireless network.

Multi-RADIUS authentication

Multi-RADIUS Authentication provides enterprise-class redundancy by enabling organizations to deploy multiple RADIUS servers in actively/passive mode for high availability. Should the primary RADIUS server fail, the managing SonicWall firewall discovers the failure and switches to the secondary server, ensuring wireless devices can continue to authenticate. Further, multi-RADIUS authentication can be supported on each virtual access point and configured for WPA-Enterprise WPA2-Enterprise or WPA2-Auto-Enterprise mode.

Granular security policy enforcement

Network administrators can implement and enforce firewall rules on all wireless traffic and control all wireless client communications to any host on the network — wired or wireless.

Deployment and Management

Simplified setup and centralized management

SonicWave access points are automatically detected, provisioned and updated by the cloud or through SonicWall next-gen firewalls. WLAN administration is also handled directly from the managing firewall, simplifying setup and centralizing ongoing management.

WiFi planner

To optimize access point placement before deployment, the WiFi planning tool provides comprehensive visualization of the WiFi environment including obstacles that impact signal performance plus both covered and non-covered zones.

Floor plan view

Floor plan view is a WiFi planning tool that enables user to upload or create a floor plan and the SonicWave access points appropriately to ensure required wireless coverage.

Topology view

Topolopgy view is a WiFI tool that automatically maps devices and how they are connected in the wireless network architecture in order to aid in troubleshooting.

Plenum rated

SonicWave access points are plenum rated for safe installation in air-handling space such as in or above suspended ceilings.

Multiple power options

SonicWave access points are powered from a SonicWall Power over Ethernet (PoE) injector or third-party device fore easy deplyment where electrical outlets are not readily accessible.

Broad standards and protocols support

SonicWave access points support a wide range of wireless standards and security protocols, including 802.11 a/b/g/n/ac, WPA2 and WPA. This allows organizations to leverage prior investments in devices that are incapable of supporting high encryption standards.

Cost of Ownership

Low TCO

Features such as simplified deployment, single pane of glass management for both wireless and security and no need to purchase a separate wireless controller drastically reduce an organization's cost to add wireless into a new or existing network infrastructure.

MiFi extender

MIFi extender enables the attachment of a 3G/4G/LTE modem to the SonicWave access point for use as either the primary WAN or as a secondary failover WAN link for business continuity.

Bluetooth Low Energy

SonicWave access points include a Bluetooth Low Energy radio that enables the use of ISM (industrial, scientific and medical) applications for healthcare, fitness, retail beacons, security, and home entertainment over a low energy link.

USB port

Access ponts with USB ports support 3G/4G failover. Plug in a dongle to the port and network continues to function over cellular connection, in case of WiFi network outage.

Green access points

SonicWave access points reduce costs by supporting green access points, which enables both radios to enter sleep mode for power saving when no clients are actively connected. The access point will exit sleep mode once a client attempts to associate with it.

SonicWall Support

Technical support is available to customers who have purchased SonicWall products with a valid maintenance contract and to customers who have trial versions.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. To access the Support Portal, go to https://www.sonicwall.com/support.

The Support Portal enables you to:

- View knowledge base articles and technical documentation
- View video tutorials
- Access MySonicWall
- Learn about SonicWall professional services
- Review SonicWall Support services and warranty information
- Register for training and certification
- Request technical support or customer service

To contact SonicWall Support, visit https://www.sonicwall.com/support/contact-support.

About This Document

Legend

WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.

CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

IMPORTANT, NOTE, TIP, MOBILE, or VIDEO: An information icon indicates supporting information.

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