

Amplifier Installation Guide



In-Building
Wireless
Amplifier

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Warning: This manual contains important safety and operating information. Please read and follow the instructions in this manual. Failure to do so could be hazardous and result in damage to your amplifier.

30-Day Money-Back Guarantee

All Wilson Electronics products are protected by Wilson's 30-day money-back guarantee. If for any reason the performance of any product is not acceptable, simply return the product directly to the reseller with a dated proof of purchase.

1-Year Warranty

Wilson Electronics amplifiers are warranted for one (1) year against defects in workmanship and / or materials. Warranty cases may be resolved by returning the product directly to the reseller with a dated proof of purchase.

Amplifiers may also be returned directly to the manufacturer at the consumer's expense, with a dated proof of purchase and a Returned Material Authorization (RMA) number supplied by Wilson Electronics. Wilson shall, at its option, either repair or replace the product. Wilson Electronics will pay for delivery of the repaired or replaced product back to the original consumer.

This warranty does not apply to any amplifiers determined by Wilson Electronics to have been subjected to misuse, abuse, neglect, or mishandling that alters or damages physical or electronic properties.

RMA numbers may be obtained by phoning Technical Support at 866-294-1660.

The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.

Operation is subject to the following two conditions: (1) This device may not cause interference and (2) this device must accept any interference, including interference that may cause undesired operation of this device.

Disclaimer: The information provided by Wilson Electronics, Inc. is believed to be complete and accurate. However, no responsibility is assumed by Wilson Electronics, Inc. for any business or personal losses arising from its use, or for any infringements of patents or other rights of third parties that may result from its use.

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For additional Technical Support visit

www.wilsonelectronics.com

Phone: 866-294-1660

Fax: 435-656-2432

Installation Instructions for the Following Wilson Amplifiers:

DT In-Building Wireless Cellular Smart Technology™ Amplifier

Model # 271247-50 (50 ohm) 271247-75 (75 ohm)

FCC ID: PWO271247ASB IC: 4726A-271247ASB

The term "IC" before the radio certification number only signifies that Industry Canada technical specifications were met.

Before Getting Started

This guide will help you properly install Wilson's In-Building Wireless Smart Technology™ Amplifiers. **It is important to read through all of the installation steps for your particular application prior to installing any equipment.**

Read through the instructions, visualize where all the equipment will need to be installed and do a soft installation before mounting any equipment. If you do not understand the instructions in full, seek professional help, or contact Wilson Technical Support at 866-294-1660.

Inside this Package



DT Wireless
Amplifier



AC/DC Plug-in
Power Supply

Antenna Options & Accessories



- A 13 dB 800 MHz Yagi Cellular Antenna (301111)
- B 1900 MHz Yagi PCS Antenna (301124)
- C 800 MHz Yagi Cellular Antenna (301129)
- D 800/1900 MHz Omni-Directional Antenna (301201/301202)
- E Dual-Band Panel Antenna (301135)
- F Dual-Polarity Dome Antenna (301123)
- G Dual-Band Dome Antenna (301121)

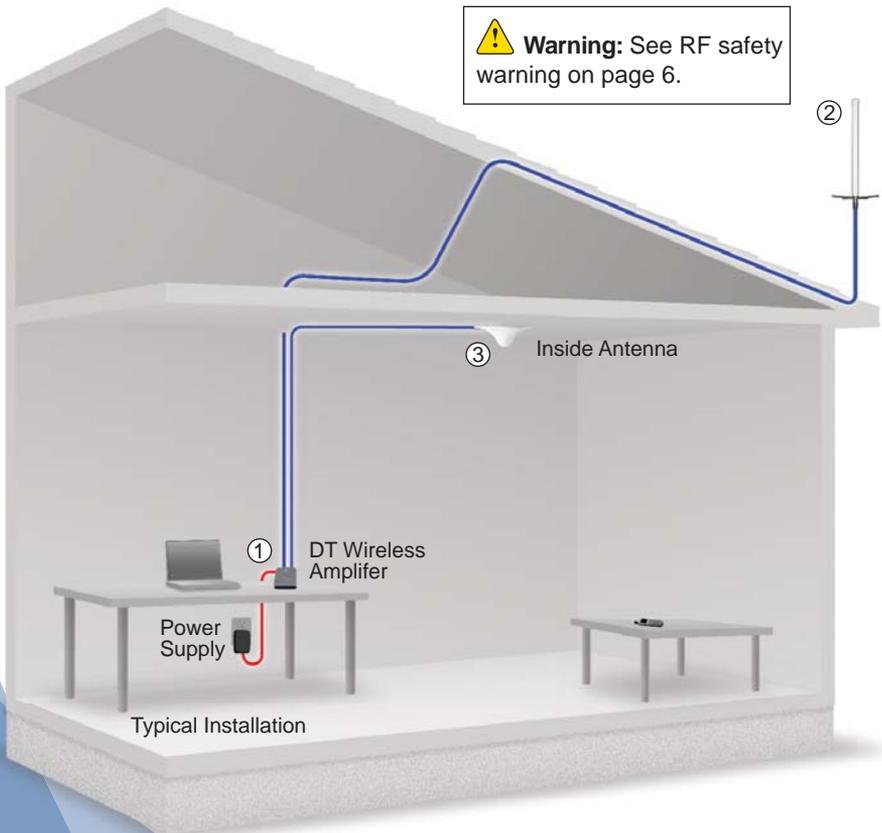
EASY TO INSTALL

Wilson Electronics designs and manufactures a full range of wireless amplifiers for in-building applications.

The following steps provide a summary of the amplifier/antenna installation process. However, they are **not** a substitute for the complete installation instructions on the following pages, which you should read thoroughly. Contact Wilson's Technical Support Department with any questions at 866-294-1660.

- 1 Select a location to install the amplifier that is away from excessive heat, direct sunlight and moisture.
- 2 Select a location on the roof of the building to install the outside antenna. Use a cell phone in test mode to find the strongest signal from the cell tower. Visit wilsonelectronics.com to find test mode function for your particular cell phone.
- 3 Select a location for the inside antenna, preferably in the center of where the signal needs to be amplified.
- 4 Verify that both the outside antenna and the inside antenna are connected before powering up the amplifier.

Lightning protection is recommended for all in-building installations.



Installing a Wilson Amplifier

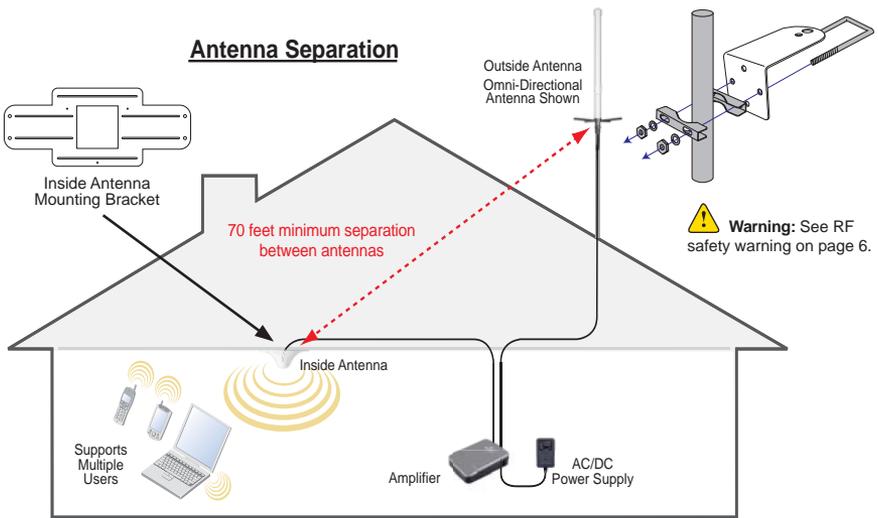
Select a location to install the amplifier that is away from excessive heat, direct sunlight, moisture and that has proper ventilation. Do not place the amplifier in an air-tight enclosure.

Recommended installation locations for in-building amplifiers are:

- On a wall
- On a desk
- Near a power outlet

Run the outside antenna cable to the amplifier and attach it to the connector labeled “outside antenna” on the amplifier. Run the inside antenna cable to the amplifier and attach it to the connector labeled “inside antenna” on the amplifier.

Note: Be careful when plugging the connector in so as not to damage the center pins on the connectors.



Connect the outside antenna to the amplifier with low loss coax cable (available from Wilson Electronics). Place the inside antenna in the center of the area needing the amplified signal. It is important to have at least 70 feet of separation between the antenna and amplifier.

Warning: Connecting the amplifier directly to the cell phone with use of an adapter will damage the cell phone.

Powering up a Wilson Amplifier

1. **IMPORTANT!** Ensure that all cell phones and cellular data cards within 50 feet of the inside antenna are turned off.
2. To verify proper installation of the amplifier and antennas, make sure that the distance between the inside and outside antennas is a minimum of 68 feet of separation distance for the 60 dB PCS amplifier, and 75 feet for the 60 dB cellular amplifier.
3. If you are using an outside Yagi antenna, never point the front of the Yagi toward the inside antenna.
4. Ensure that both the outside antenna coax cable and the inside antenna coax cable are connected to the amplifier before powering up the amplifier.
5. Plug the 6-volt power supply into the amplifier input marked “power” (carefully, to avoid damaging the center pin) and then into a wall outlet.

 **Warning:** Verify that both the outside antenna and the inside antenna are connected to the amplifier before powering up the amplifier.

 **Warning:** Use only the power supply provided in this package. Use of a non-Wilson product may damage your equipment.

NOTE: The aluminum casing of a Wilson amplifier will adjust very quickly to the ambient temperature of its environment. For example, in the summer, when the attic of a house can easily exceed 100 degrees Fahrenheit, the amplifier temperature may be 10 or more degrees higher. The casing will be hot to the touch. Such high temperatures will not damage the amplifier, nor do they pose a fire risk. As recommended in these instructions, install the amplifier in a location with adequate ventilation. Keep the area free of items that could block air flow to the amplifier.

Understanding the Indicator Light

- GREEN:**  The indicator light on the top of the amplifier will be **GREEN** when the unit is powered up and working properly.
- ORANGE:**  A solid **ORANGE** light indicates the amplifier has cut back its gain by either 4 dB or 8 dB due to the amount of oscillation it is experiencing.
- ORANGE:**  A blinking **ORANGE** light indicates the receiving or downlink signal on either the 800 or 1900 band or both is overloaded and the amplifier has shutdown either that particular downlink signal or both.
- RED:**  A **RED** light indicates amplifier shut-down as a result of oscillation between the outside antenna and the inside antenna. When this occurs, greater separation distance is required between the two antennas. If you see the red light come on, followed by a green light and then back to red, the amplifier is in the process of shutting down. It will attempt to reset itself every five seconds; however, if proper separation is not achieved between the antennas, the light will change to a constant red after four tries. If that occurs, increase the separation distance between the antennas, then unplug and re-plug the power supply cable to manually reset the amplifier.

To reset the amplifier, unplug and re-plug the power supply.

Warnings and Recommendations

-  Warning: The Yagi antenna must always be located so the back or side points to the inside antenna. Never point the front of the Yagi antenna toward the inside antenna – oscillation will result, causing amber light and gain reduction.
-  Warning: The outside antenna must be installed on an outdoor permanent structure with a separation of at least 20 feet from all persons during normal operation.
-  Warning: Connecting the amplifier directly to the cell phone with use of an adapter will damage the cell phone.
-  Warning: Connect both the outside and inside antenna cables to the amplifier before powering up the amplifier.
-  Warning: Use only the power supply provided in this package. Use of a non-Wilson product may damage your equipment.
-  Warning: **RF Safety:** FCC regulations require that any antenna (inside or outside) used with this amplifier may not have gain that exceeds 15 dBi. All Wilson Antennas meet this requirement. Inside antennas must have at least 8 inches of separation from all persons. Outside antennas must be farther than 39 inches from all persons.

Lightning protection is recommended for all in-building installations.

Finding Signal Strength and Calculating Coverage Distance

Signal strength and the corresponding coverage distance you can expect to achieve with your amplifier/antenna system are based on a combination of several factors: the received signal strength of your cell phone alone, the signal gain achieved by your amplifier and antennas and the signal loss from cables, taps and splitters you may be using.

To calculate your approximate signal coverage distance, you can enter this information into our Coverage Area Calculator on the Technical Support page on our website (www.wilsonelectronics.com). If you prefer, you can manually calculate your approximate signal coverage distance.

First, measure the Outside Signal Level (OSL) at the intended outside antenna location using a cell phone in test mode. (For assistance, visit the Phone Test Modes section on the Technical Support page on our website or call 866-294-1660.) The OSL will always be a negative number. (Even if the cell phone shows a positive number, you will need to change it to a negative for this calculation.) Maximum signal strength is usually about -50. When the signal weakens to about -100 or worse, the call may be dropped.

Your inside and outside antennas will also add signal gain, again depending on the antenna models you are using. You will also experience some signal *loss* from cables, splitters and taps used to connect your system.

Amplifier Specifications

		Dual-Band Wireless 800/1900 MHz Specifications	
Model Number		271247-50	271247-75
Outside antenna connectors		F Female	F Female
Outside antenna impedance		75 ohms	75 ohms
Inside antenna connectors		TNC Female	F Female
Inside antenna impedance		50 ohms	75 ohms
Dimensions		6.2 x 4.2 x 1.5 inch (15.7 x 10.7 x 3.8 cm)	
Weight		0.64 lbs (0.29 kg)	
Frequency		824-894 MHz / 1850-1990 MHz	
*Passband Gain (nominal)			
	800 MHz	60 dB Typical, 65 dB Maximum	
	1900 MHz	60 dB Typical, 65 dB Maximum	
**20 dB Bandwidth (nominal)			
		Uplink	Downlink
	800 MHz	44 MHz	48 MHz
	1900 MHz	95 MHz	91 MHz
Power output			
		800 MHz	1900 MHz
	Power output for single cell phone (uplink)	33.2 dBm	34.0 dBm
	Power output for single received channel (downlink)	15.7 dBm	10.7 dBm
*Power output for multiple transmitted channels (uplink)			
		Maximum Power	
The maximum power is reduced by the number of channels:	Number of channels	800 MHz	1900 MHz
	2	23 dBm	21.3 dBm
	3	19.5 dBm	17.8 dBm
	4	17.0 dBm	15.3 dBm
	5	15.1 dBm	13.3 dBm
	6	13.5 dBm	11.8 dBm
*Power output for multiple received channels (downlink)			
		Maximum Power	
The maximum power is reduced by the number of channels:	Number of channels	800 MHz	1900 MHz
	2	6.2 dBm	5.2 dBm
	3	2.7 dBm	1.6 dBm
	4	0.2 dBm	-0.9 dBm
	5	-1.7 dBm	-2.8 dBm
	6	-3.3 dBm	-4.4 dBm
Noise Figure (typical)			
		3.5 dB nominal	
Isolation (uplink/downlink)			
		> 90 dB	
Power Requirements			
		110-240 V AC, 50-60 Hz, 8 W	

Notes:

1. Nominal gain is the maximum gain at any frequency in the passband.
2. Nominal bandwidth is the difference between two frequencies that are adjacent to the passband where the amplification is 20 dB lower than the passband amplification. One of the frequencies is lower than the passband and the other is higher.
3. The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.
4. The maximum power for 2 or more simultaneous signals will be reduced by 6 dB every time the number of signals is doubled.