

Amplifier Installation Guide



Dual-Band
Direct Connection
Amplifier with
GPS

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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.

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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Installation Instructions for the Following Wilson Amplifiers

Direct Connection Dual-Band Amplifier with GPS – Model # 2B1401 - Part #811200

Contains 1575 MHz bypass to allow for GPS reception.

FCC ID: PWO2B1401SA

IC: 4726A-2B1401SA

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

Antenna Options and Accessories



800 MHz Yagi Cellular Antenna



1900 MHz Yagi PCS Antenna



800 MHz Yagi Cellular Antenna



Mini Magnet Dual-Band



Magnet Mount Dual-Band



Trucker Mount Dual-Band



Marine Antenna Dual-Band



NMO Mount Dual-Band



Amplifier Soft Cases



Amplifier Hard Kit Cases

Before Getting Started

This guide will help you properly install Wilson's direct connection amplifiers in both in-vehicle and in-building applications. **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

- Direct connection amplifier
- DC plug-in power supply with On/Off switch
- 6 ' extension cable



Direct connection amplifier



DC plug-in power supply



6' extension cable

Additional Equipment

- Outside antenna for in-vehicle or in-building use (required)
(NOTE: specifically tuned iDEN antennas available)
- Cell phone-specific external antenna adapter (required)
- AC/DC power supply (optional – for in-building use)

How it Works

Wilson amplifiers are small, portable, bi-directional devices that deliver service levels consistent with what would be expected in areas of high cell network coverage. They amplify a weak or shadowed signal in mobile, marine and in-building applications.

When using a Wilson amplifier in conjunction with Wilson antennas, the outside antenna will collect the cell tower signal and send it through the cable to the amplifier. Cell phones and cellular data cards (laptops) then communicate with the improved signal. When a cell phone or cellular data card transmits, the signal is amplified by the amplifier and broadcast back to the cell tower through the outside antenna.

Installing a Wilson Outside Antenna

To receive the best cell signal, select a location in the center of the vehicle's roof at least 12 inches away from any other antennas and free of obstructions.

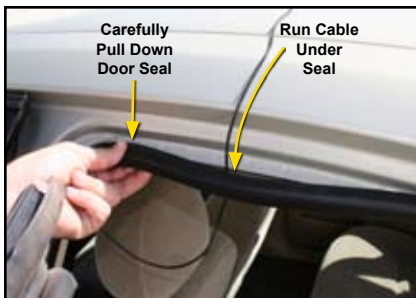
Follow the specific antenna installation instructions included with the outside antenna (sold separately).



The outside antenna must be installed vertically. Signal performance will be degraded if the antenna is not vertical.

The antenna cable may be run through the door to the amplifier.

NOTE: See RF Safety Warnings (p. 10)



For a more professional-looking installation, the antenna cable may be run under the door seal. Carefully pull down the door seal. Run the cable through the seal and push the seal back into place. This prevents constant wear and tear on the cable as the door opens and closes.



The antenna cable is small enough to easily tuck under the door seal or plastic molding.

In-Vehicle

Installing a Wilson Amplifier

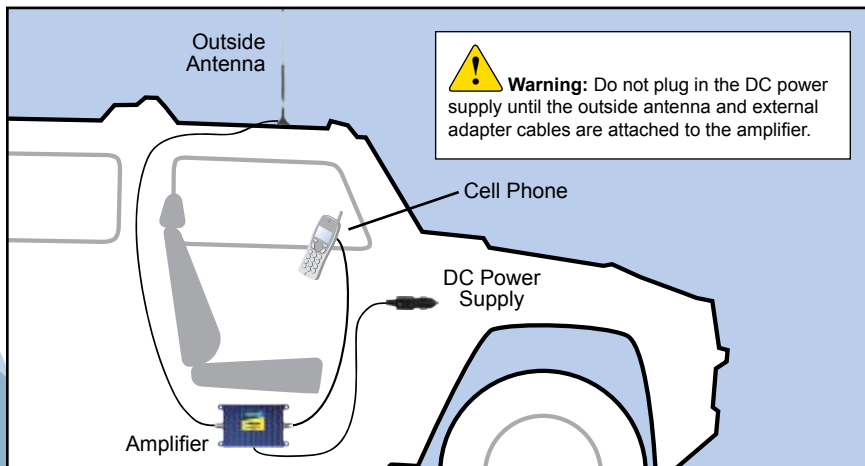


Select a location to install the amplifier that is away from excessive heat, direct sunlight, moisture and that has proper ventilation.

Recommended installation locations for in-vehicle are:

- Under the seat
- In the trunk
- Under the dash

Run the cable from the outside antenna and attach it to the FME-Male connector labeled "outside antenna" on the amplifier.



Installing a Wilson External Adapter

An 18-inch external adapter is required to connect the cell phone or cellular data card to the amplifier. The external adapter is cell phone/data card-specific and may be purchased through a local retailer.

**Sample
adapter**



Refer to Wilson's Adapter Guide to identify the right adapter for your cell phone or cellular data card. The adapter guide is available through a local retailer or visit www.wilsonelectronics.com.

The external adapter plugs into the included antenna extension cable and directly into a socket on the cell phone or cellular data card as shown in Figure 1.

The external adapter and the included extension cable are long enough to reach the amplifier location. This allows for ease and convenience of use.

Run the extension cable from the external adapter and attach it to the FME-Male connector labeled "cellular phone" on the amplifier.



NOTE: Depending on your specific cell phone, the adapter socket may be located beneath a rubber plug.

Figure 1

Installing a Wilson Outside Antenna – In-Building

Select a location on the roof of the building to install the outside antenna that has the most unobstructed line of sight to the cell tower.

Follow the specific antenna installation instructions included with the outside antenna.

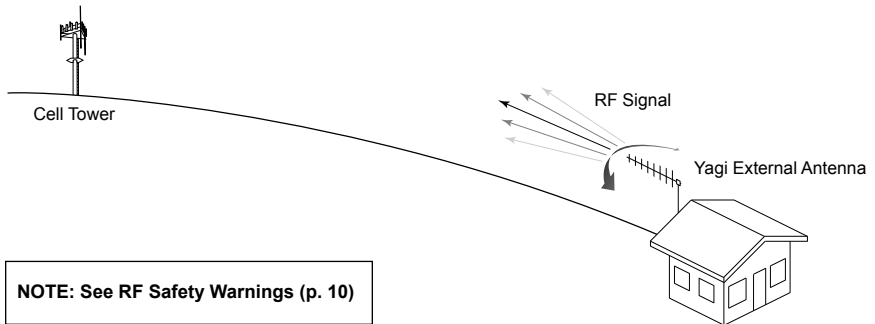
Lightning protection is recommended for all in-building installations. Take extreme care to ensure neither you nor the antenna come in contact with any electrical power lines.

A Yagi antenna must be installed horizontally with the elements vertical and the drip hole on the bottom. Ensure there are three feet of clearance in all directions surrounding the antenna.

To obtain maximum performance, the antenna should point toward the cell tower. Follow the instructions included with the outside antenna.

Installing a Wilson Amplifier

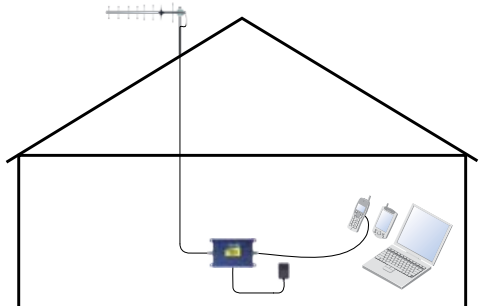
Select a location to install the amplifier that is away from excessive heat, direct sunlight, moisture and that has proper ventilation. Ensure the amplifier is installed within six feet



of where the cell phone or cellular data card will be used (to accommodate the six-foot adapter extension cable). Run the cable from the outside antenna and attach it to the FME-Male connector labeled “outside antenna” on the amplifier. Connect the AC/DC power supply (sold separately) to the power input labeled “DC 12 V IN” on the amplifier.

Recommended installation locations for in-building are:

- On a wall
- On the ceiling
- Near a power outlet



Installing a Wilson External Adapter

An 18-inch external adapter is required to connect the cell phone or cellular data card to the amplifier. The external adapter is cell phone/data card-specific and may be purchased through a local retailer.

**Sample
adapter**



Refer to Wilson's Adapter Guide to identify the right adapter for your cell phone or cellular data card. The adapter guide is available through a local retailer or visit www.wilsonelectronics.com.

The external adapter plugs into the included six-foot extension cable and directly into a socket on the cell phone or cellular data card as shown in Figure 1 on page 6. (NOTE: See the user's manual for your specific phone or data card to determine the socket location.)

Run the extension cable from the external adapter on the cell phone or cellular data card and attach it to the FME-Male connector labeled "cellular phone" on the amplifier.

Extension Cable Chart

The following Wilson extension cables are available to help you customize your installation for peak performance.

951101	5' Extension Cable RG58U Low Loss Coax	0.6 dB loss
951102	10' Extension Cable RG58U Low Loss Coax	1.2 dB loss
951103	15' Extension Cable RG58U Low Loss Coax	1.8 dB loss
951104	20' Extension Cable RG58U Low Loss Coax	2.4 dB loss, N-Male to FME-Female
951108	20' Extension Cable 9913 Equivalent Ultra Low Loss Coax	Only use 9913 Equivalent Low Loss Coax for extensions 20' or longer, 0.8 dB loss
951105	30' Extension Cable 9913 Equivalent Ultra Low Loss Coax	1.2 dB loss
951106	50' Extension Cable 9913 Equivalent Ultra Low Loss Coax	2.0 dB loss
951117	75' Extension 9913 Equivalent Ultra Low Loss Coax	3.0 dB loss
951107	100' Extension 9913 Equivalent Ultra Low Loss Coax	4.0 dB loss
951113	2' Extension 9913 Equivalent Ultra Low Loss Coax (N-Male to N-Male Ends)	0.08 dB loss, Jumper Coax - Can be used to connect a splitter behind an amplifier.
951110	2' Extension RG58U Low Loss Coax (N-Male to FME-Female)	Used with the Yagi antenna to help find the optimum signal strength (for installation purposes only).

Powering up a Wilson Amplifier



Carefully insert the power cable.



Warning: Verify that both the outside antenna and the adapter extension cable are connected to the amplifier before powering up the amplifier.

For **in-vehicle**, first connect the power cable to the amplifier input marked “DC 12 V IN” and then insert the large end into a 12 V DC power socket or cigarette lighter outlet.

The amplifier may remain on all the time; however, leaving the amplifier on in a vehicle when it is not running can discharge the battery in a day or two.

A good option is to power the amplifier through the ignition switch so that the amplifier turns off and on with the vehicle.

For **in-building**, first connect the optional AC/DC power supply to the amplifier input labeled “DC 12 V IN” and then into a wall outlet.



In-vehicle 12-volt DC power supply (included)



In-building AC/DC power supply (optional)







Warning: Use only a Wilson power supply. Use of a non-Wilson product could damage your equipment.

Testing a Wilson Amplifier

To test your amplifier, go to a weak signal area where your cell phone registers only 1-2 bars without the amplifier turned on. Then, connect the amplifier to the phone and you should see a signal improvement of 2 or more bars. Note: many phones take up to 20 seconds to reset the bar indicator.

Warnings and Recommendations

-  Warning: Verify that both the outside antenna and the adapter extension cable are connected to the amplifier before powering up the amplifier.
-  Warning: **RF Safety:** In-vehicle - The outside antenna must be installed with a separation of at least 20 inches from any of the vehicle's occupants or nearby persons and must not be located or operating in conjunction with any other antenna or amplifier. Use of a cellular amplifier with an antenna gain higher than 6.12 dBi is in violation of FCC regulations, for which the offender is fully liable. All Wilson mobile antennas are 6.12 dBi or less.
-  Warning: **RF Safety:** In-vehicle - All roof-mount antennas should be centrally located on the roof of the vehicle. Glass-mount antennas should be located in the middle of either the front or back windshield. Mirror-mount antennas should be at least six feet from the ground and at least 20 inches from any persons in or around the vehicle.
-  Warning: **RF Safety:** In-Building - The outside antenna must be installed on an outdoor permanent structure with a separation of at least 26 inches from all persons during normal operation. The outside building antenna must not have a gain that exceeds 15 dBi. All Wilson outside building antennas have gains of 15 dBi or less.

Lightning protection is recommended for all in-building installations.

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 inside of a car can reach 140 degrees Fahrenheit, the amplifier temperature may be 150 degrees or higher. The casing will be hot to the touch, similar to a metal door handle or a steering wheel. Such high temperatures will not damage the amplifier, nor do they pose a fire risk to the vehicle. As recommended in these instructions, install the amplifier in a location with adequate ventilation, such as under the seat, in the trunk or under the dashboard. Keep the area free of items that could block air flow to the amplifier.

Amplifier Specifications

		Dual Band 800/1900 MHz Specifications	
Model Number / Part Number	2B1401 / 811200		
Connectors	FME-Male		
Impedance (input/output)	50 ohms		
Dimensions	5 x 3.5 x 1.2 inch or 12.7 x 8.9 x 3 cm		
Weight	1.03 lbs or 0.468 kg		
Frequency	824-894 MHz / 1850-1990 MHz / 1575 MHz		
¹Passband Gain (nominal)			
	800 MHz and 1900 MHz	20 dB	
	1575 MHz	8 dB	
²20 dB Bandwidth (nominal)			
	800 MHz (uplink/downlink)	50 MHz / 49 MHz	
	1900 MHz (uplink/downlink)	121 MHz / 94 MHz	
³Power output for single cell phone (uplink)			
	800 MHz	1900 MHz	
	CDMA	33 dBm	29.6 dBm
	GSM	32.6 dBm	27.3 dBm
	EDGE	33.1 dBm	27.8 dBm
	WCDMA	33.5 dBm	29.7 dBm
³Power output for single received channel (downlink)			
	800 MHz	1575 MHz	1900 MHz
	CDMA	9.7 dBm	13.6 dBm
	GSM	8.7 dBm	9.6 dBm
	EDGE	9.1 dBm	12.3 dBm
	AMPS	10.3 dBm	11.9 dBm
	GPS	18 dBm	
⁴Power output for multiple received channels (downlink). The maximum power is reduced by the number of channels:			
	Number of channels	Maximum Power	
		800 MHz	1900 MHz
	2	10.1 dBm	10.9 dBm
	3	6.5 dBm	7.4 dBm
	4	4.0 dBm	4.9 dBm
	5	2.1 dBm	2.9 dBm
	6	0.5 dBm	1.4 dBm
Noise Figure (typical)	3 dB nominal		
Isolation	> 90 dB		
Power Requirements			
Amplifier Usage	12 V, 5 A - 1.5 A (subject to uplink power)		

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.



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