

Signal Booster Installation Guide

DB Pro™ 4G Adjustable Gain

700 (Band 17,13) / 800 / 1900 (Band 25) /
AWS (1700 / 2100) MHz
In-Building Wireless
Smart Technology III™
Signal Booster



Contents:

How it Works	1
Quick Install Overview	4
Installation Diagram	5
Outside Antenna Installation	7
Finding the Strongest Signal	9
Inside Antenna Installation	10
Installing a Wilson Electronics Signal Booster	11
Powering up a Wilson Electronics Signal Booster	11
Signal Booster Lights	12
Warnings & Recommendations	14
Signal Booster Specifications	Back Cover

Appearance of device and accessories may vary.

Note: 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 Signal Booster.

Installation Instructions for the Following Wilson Electronics Signal Booster:

DB Pro™ 4G Adjustable Gain 700 (Band 17,13) / 800 / 1900 (Band) / AWS (1700 / 2100) MHz In-Building Wireless Smart Technology III™ Signal Booster
Model # 460003 FCC ID: PWO460003

How it Works

Wilson Electronics Signal Boosters are bi-directional devices that deliver service levels consistent with what would be expected in areas of high cell network coverage. The Outside Antenna will collect the cell tower signal and send it through the cable to the Signal Booster. The signal is then boosted and sent to the Inside Antenna. Your cell phone or data card then communicates with the improved signal. When the cellular device transmits, the signal goes through the Inside Antenna, is boosted by the Signal Booster and transmitted to the cell tower through the Outside Antenna.

Inside this Package



AC/DC Power Supply
5V / 2.5A (859948)



DB Pro™ 4G
Signal Booster

Antenna Kit Configurations

Inside Antenna Kit



- 311155-0630
- 75 Ohm Wall mount Panel Antenna
 - 30' RG-6 Cable

Outside Antenna Kit



- 314475-0630
- Wide Band Directional Antenna
 - 30' RG-6 Cable

Inside Antenna Expansion Kit Options

Kit 309900-50N

- 2 - Wall Panel antennas
- 1 - 50 ohm 3-Way Splitter

Kit 309902-75F

- 2 - Wall Panel Antennas
- 1 - 3-Way 75 Ohm Splitter

Kit 309905-50N

- 3 - Wall Panel Antennas
- 3 - 2-Way 50 Ohm Splitters

Kit 309903-75F

- 3 - Wall Panel Antennas
- 3 - 2-Way 75 Ohm Splitters

Kit 309904-75F

- 1 - Wall Panel Antenna
- 1 - 2-Way 75 Ohm Splitter

Inside Antennas

Kit 301121-40010

- 50 Ohm Dome Antenna
- 10' LMR400

Kit 301151-0610

- 75 Ohm Dome Antenna
- 10' RG6 Cable

Kit 311135-5820

- 50 Ohm Wall mount Panel Antenna
- 20' RG58 Cable

Kit 311135-40060

- 50 Ohm Wall mount Panel Antenna
- 60' LMR400 Cable

Kit 311155-40060

- 50 Ohm Wall Mount Panel Antenna
- 60' LMR400 Cable

Kit 301151-1110

- 75 Ohm Dome Antenna
- 10 ' RG11 cable

Kit 311155-1150

- 75 Ohm Wall mount Panel Antenna
- 50' RG11 Cable

Kit 301213

- Desktop Antenna w/ 5' RG174

50 Ohm Outside Antennas

Kit 314453-5825

- 50 Ohm Pole Mount Panel Antenna
- 25' RG58 Cable

Kit 314411-5825

- 50 Ohm Wide Band Directional
- 25' RG58 Cable

Kit 301111-5850

- Yagi Directional Antenna
- 50' RG58 Cable

Kit 311124-5840

- 1900 MHz Yagi Directional
- 40' RG58 Cable

Kit 311203-5820

- Omni-Directional antenna
- 20' RG58 Cable

Kit 311129-5830

- 800 MHz Yagi Antenna
- 30' RG58 Cable

Kit 314411-40075

- 50 Ohm Wide Band Directional
- 75' LMR400 Cable

Kit 311203-40020

- Omni-Directional antenna
- 20' LMR400 Cable

Kit 301111-400170

- Yagi Directional w/ N-Female
- 170' LMR400

Kit 311124-400100

- 1900 MHz Yagi Directional
- 100' LMR400 Cable

Kit 311129-400100

- 800 MHz Yagi Antenna
- 100' LMR400 Cable

Kit 314453-40075

- 50 Ohm Pole Mount Panel Antenna
- 75' LMR400 Cable

75 Ohm Outside Antennas

Kit 301111-0675

- Yagi Directional Antenna
- 75' RG6 Cable
- N-Male to F-Female adapter

Kit 311201-0620

- Omni Directional w/ F-Female
- 20' RG6 Cable

Kit 311124-0660

- 1900 MHz Yagi Directional
- 60' RG6 Cable
- N-Male to F-Female adapter

Kit 311129-0650

- 800 MHz Yagi Directional
- 50' RG6 Cable
- N-Male to F-Female adapter

Kit 314473-0640

- 75 Ohm Pole Mount Panel Antenna
- 40' RG6 Cable

Kit 311141-0620

- 75 Ohm Grey Brick Antenna
- 20' RG6 Cable

Kit 301111-11140

- Yagi Directional Antenna
- 140' RG11 Cable
- N-Male to F-Female adapter

Kit 311201-1120

- Omni Directional w/ F-Female
- 20' RG11 Cable

Kit 311124-11110

- 1900 MHz Yagi Directional
- 110' RG11 Cable
- N-Male to F-Female adapter

Kit 311129-1180

- 800 MHz Yagi Directional
- 80' RG11 Cable
- N-Male to F-Female adapter

Kit 314473 -1175

- 75 Ohm Pole Mount Panel Antenna
- 75' RG11 Cable

Kit 314475-1175

- 75 Ohm Wide Band Directional
- 75' RG11 Cable

Kit 311141-1120

- 75 Ohm Grey Brick Antenna
- 20' RG11 Cable

Quick Install Overview

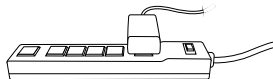
Refer to Installation Diagram on pages 5 & 6. Contact Wilson Electronics Technical Support Team with any questions at 866-294-1660.

1. Select a location to install the Signal Booster that is away from excessive heat, direct sunlight, moisture and has proper ventilation. Do not place the Signal Booster in an air-tight enclosure.
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 www.WilsonElectronics.com to find test mode function for your particular cell phone or refer to page 9.
3. Run the Outside Antenna cable to the Signal Booster and attach it to the connector labeled "Outside Antenna" on the Signal Booster. Run the Inside Antenna cable to the Signal Booster and attach it to the connector labeled "Inside Antenna" on the Signal Booster (refer to page 9 for more information on running cable). Lightning Surge Protection is recommended for all in-building installations (refer to page 8).
4. Select a location for the Inside Antenna, preferably in the center of where the signal needs to be amplified. A minimum separation distance of **20 vertical feet (within the null zone) or 50 horizontal feet** is necessary for proper operation. If the inside coverage is not sufficient you may need as much as **75 feet of horizontal** separation (refer to installation diagram on pages 5 & 6).
5. Before powering up the Signal Booster, verify that both the Outside Antenna and the Inside Antenna are connected and check that all connections are tight (refer to page 11). **Note:** *Be careful when plugging the connectors in so as not to bend the center pins on the connectors.*
6. The Signal Booster has been packaged with the gain control knobs adjusted to the highest gain position. If one or both of the lights are not green, please refer to pages 12 & 13.



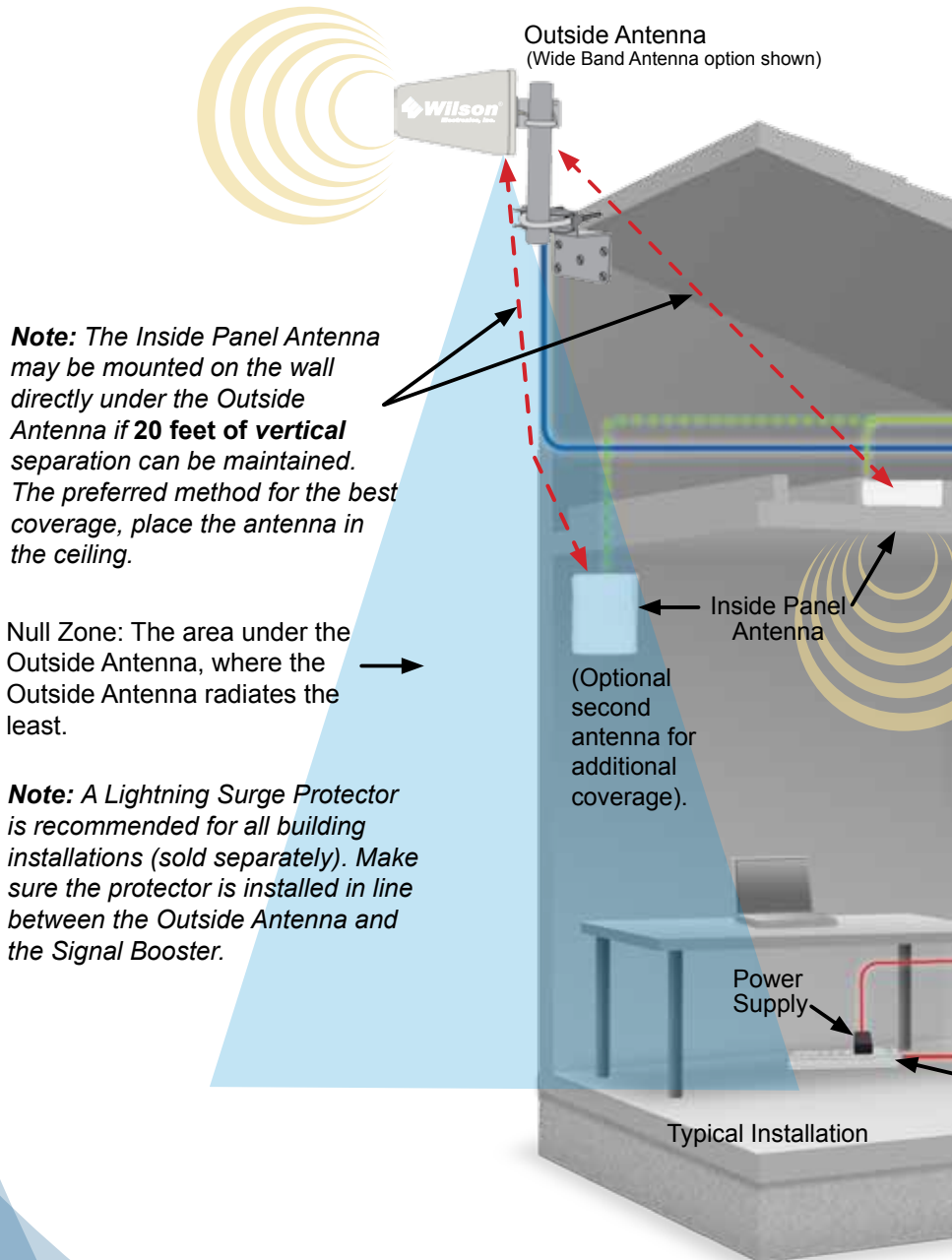
Warning: Connecting the Signal Booster directly to a cell phone with use of an adapter will damage the cell phone and/or the Signal Booster.

IMPORTANT NOTICE



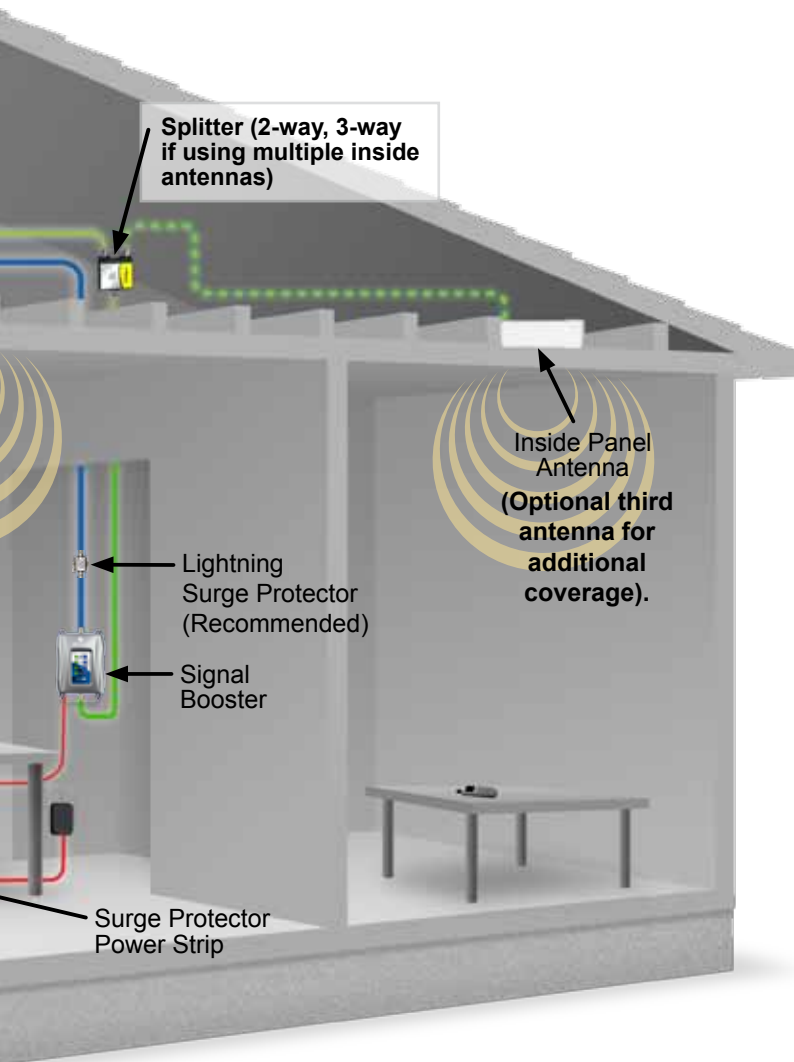
- It is very important to power your Signal Booster using a surge protected AC Power Strip with at least a **1000 Joule rating**.
- Failure to do this will void your warranty in the event of a power surge or lightning strike.

AG DB Pro Installation Diagram



Before Getting Started

This guide will help you properly install your Wilson Electronics Signal Booster. **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. Contact Wilson Electronics Technical Support Team with any questions at: 866-294-1660.



Reasons for Weak Cellular Signals

Anyone who uses a cell phone or cellular data card knows the frustration of not being able to connect to or maintain a strong cellular signal. When this occurs, it is generally due to one of two reasons:

1. **Location of the Nearest Cell Tower** – Cell towers are situated to provide broad coverage; however, there are many areas in which signal strength may be reduced by topographic features or by local government restrictions on the height or placement of the towers themselves. Rural areas generally have fewer cell towers than urban regions.
2. **Natural and Man-Made Obstructions** – Signal strength can also be negatively affected by trees, hills, weather, buildings, and other obstructions. You may be relatively close to a cell tower but still unable to make a call. This often occurs in homes, offices and other buildings in which stucco, concrete or metal walls may block the signal.

The Signal Booster works with two antennas. The Inside Antenna communicates with your cellular device and the Outside Antenna communicates with the cell tower. The Outside Antenna receives the cell tower signal and sends it through the cable to the Signal Booster, where it is amplified and re-transmitted much stronger through the Inside Antenna into the room. When the Inside Antenna picks up a signal from your cellular device, the Signal Booster amplifies that signal and transmits it through the cable to the Outside Antenna and back to the cell tower.

Note: *The Signal Booster will only operate if there is an adequate signal to amplify.*

Outside Antenna Installation



Note: *Use the directions included with your choice of antenna, the instructions here are meant for the Wide Band Antenna option shown above.*

The antenna should be mounted as shown in the illustration above. The included mounting bracket is adjustable and will accommodate pipe diameters from 1.25 inches to 2 inches (pipe sold separately #901117).

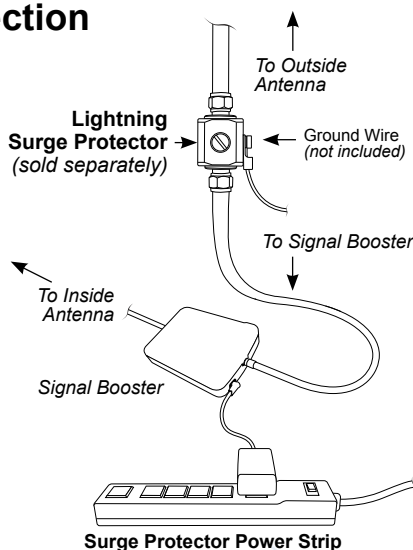
Mount the antenna so that there is at least 3 feet of clearance in all directions around it. Position the antenna so that it has an unobstructed line of sight to the cell tower's strongest signal. Make sure the antenna is not pointing across your own roof or at the Inside Antenna as this will cause the oscillation (feedback) protection circuitry to shut down the Signal Booster (refer to page 12).

⚠ Warning: Lightning protection is recommended for all installations (sold separately 75 ohm #859992). Take extreme care to ensure that neither you nor the antenna comes near any electric power lines.

Installing Lightning Protection

(sold separately)

Install the **Lightning Surge Protector (LSP)** close to the Signal Booster. Attach the cable from the Outside Antenna to the surge protector, using a short length of low loss cable; attach one end to the LSP and the other to the Outside Antenna connector on the Signal Booster. Ensure the LSP is properly grounded (ground wire not included). Visit www.WilsonElectronics.com or call 800-204-4104 to purchase.



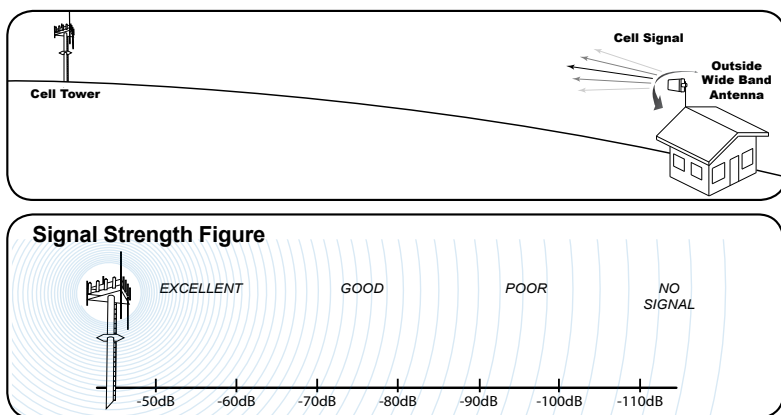
Selecting a Direction for the Outside Antenna

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. To get the strongest signal possible, it is very important to set up your Outside Antenna properly. The Inside and the Outside Antennas must be mounted in such a way that they are able to pick up the best possible cellular signal on the outside of the building and provide the best possible signal on the inside of the building. Mount the Outside Antenna as high as possible facing the cell tower in an area with the best possible signal coverage.

Note: Never point the front of a directional antenna toward the Inside Antenna. Refer to Figure 1 & 2 on page 12.

Finding the Strongest Signal

When installing your Signal Booster's Outside Antenna, aiming it towards the best signal source from your service provider is important. The best way to get the strongest signal is to have one person on the roof to rotate the Outside Antenna, which is connected to the Signal Booster. Turning the Outside Antenna about 45 degrees at a time, while the second person is watching the signal strength on the phone inside the building. This allows you to read the signal strength from the cell tower. It is preferable to have the phone in the test mode so the actual signal strength can be read, as bars are not the most accurate. Go to www.WilsonElectronics.com for help in finding the test mode for your phone. Always make sure the person inside the building gives the signal time to arrive and register on the phone. (Between 10-30 seconds for phone to reset the signal reading).



Signal readings usually appear as a negative number (for example, -86). The closer you get to zero the stronger the signal. (See graph above).

Mounting Tips for Running Outside Antenna Cable

If you are mounting the Outside Antenna on the roof of your building, we have found that it is easiest to run your cable underneath the down side of your roof's flashing. If you have satellite TV service installed at your home or office, you may be able to follow the same route as the satellite TV cables that are already running from the outside of your building to the inside.

After routing the cable, we recommend sealing any areas where the cable passes into the building with silicone, cable bushings or other waterproof sealant to keep your installation from leaking. If you are mounting the

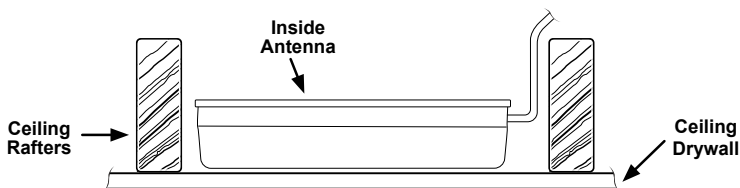
Outside Antenna to the outside wall of your home or building, the simplest way is to run the cable on the outside of the wall and attach it to the exterior of your home or office. Then drill a hole through the wall where you want the cable to appear on the inside of the building. Before drilling, make sure that there are no electrical outlets, sewer or water pipes, or electrical wiring in the wall that you are about to drill through as this could potentially harm you or damage the building.

After drilling the required hole, run the cable through and seal it with silicone, cable bushings or other waterproof sealant to enclose the hole that you have created. In some instances, it may be possible to run the cable up into the fascia of the attic overhang. In this circumstance, the cable will be accessible in the attic for further routing.

Inside Antenna Installation

(Included in some kits)

Select a location for the Inside Antenna, preferably in the center of where the signal needs to be amplified. A minimum separation distance of **20 vertical feet (within the null zone) or 50 horizontal feet** is necessary for proper operation. If the inside coverage is not sufficient you may need as much as **75 feet of horizontal** separation. Refer to installation diagram on pages 5 & 6.



In some cases, multiple Inside Antennas may be required if you have multiple rooms with poor signal. A signal may be split by using a splitter (included in some kits). Refer to configuration on pages 5 & 6.

Installing a Wilson Electronics Signal Booster

Select a location to install the Signal Booster that is away from excessive heat, direct sunlight, moisture and that has proper ventilation. Do not place the Signal Booster in an air-tight enclosure. Recommended installation locations for in-building Signal Boosters are near a power outlet and in a closet or on a shelf.

Note: *It is important to have adequate air ventilation. Maintain at least 6 inches of clearance from surrounding objects.*

Note: *Be careful when plugging the connectors in to avoid bending the center pins on the connectors.*

Run the Outside Antenna cable to the Signal Booster and attach it to the connector labeled “Outside Antenna” on the Signal Booster. Run the Inside Antenna cable to the Signal Booster and attach it to the connector labeled “Inside Antenna” on the Signal Booster.

Powering up a Wilson Electronics Signal Booster

1. Never point the front of a directional Outside Antenna toward the Inside Antenna. Refer to Figure 2 on page 12.
2. Ensure that both the Outside Antenna cable and the Inside Antenna cable are connected to the Signal Booster **and the connections are tight** before powering up the Signal Booster.
3. Plug the power supply into the Signal Booster input marked “POWER” (carefully, to avoid damaging the center pin) and then into a **Surge Protector Power Strip**.
4. If the Signal Booster does not have green light(s), please refer to pages 12 & 13.
5. If you know the frequency bands that are available in your coverage area (or going to be used), reduce the gain control on the frequency bands that are NOT in use to the lowest dB setting. This will reduce the power consumption of the Signal Booster.
6. Using multiple Signal Boosters in one installation may cause interference to the cell tower (except for the Wilson Electronics In-Line Signal Booster #806715).
7. Contact Wilson Electronics Technical Support Team with any questions at 866-294-1660 or email tech@wilsonelectronics.com. Technical Support hours are Mon.- Fri. 7 am to 6 pm MST.

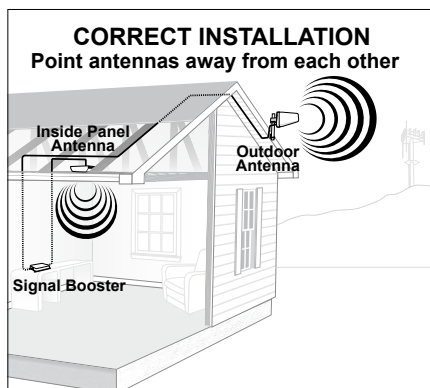


Figure 1

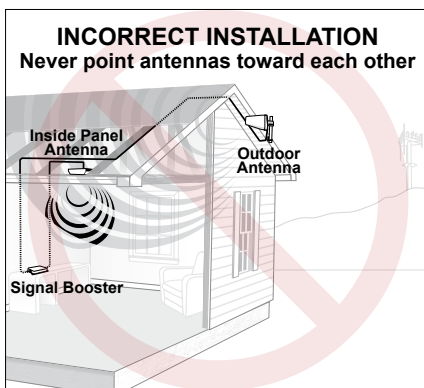


Figure 2

Signal Booster Lights and Troubleshooting

Note: The Signal Booster can be reset by disconnecting and reconnecting the power supply from the Signal Booster.

Note: All red lights must be resolved before orange lights.

The Signal Booster is equipped with 4 lights and will do one of the following 6 things:

1. GREEN

If the indicator lights on the Signal Booster are green, the unit is powered up and working properly.

2. ORANGE

The Signal Booster is experiencing receiver overload. If one or more of the lights are orange, this indicates that the Signal Booster has automatically reduced its gain due to close proximity to a cell tower. First, turn down the gain on the band that is orange until you get a green light. The Signal Booster is now working with reduced gain. If the gain is not adequate for good coverage, you will need to turn the gain to maximum and then turn the Outside Antenna away from the cell tower until the lights turn to green. If the Signal Booster will not respond, turn the gain down 5 dB and move the Outside Antenna. Continue to adjust the gain and the antenna position until the light turns green. Contact Wilson Electronics Technical Support Team for assistance.

3. RED

If one or more lights on the Signal Booster are red, this indicates that the Signal Booster has shut down on that frequency to prevent an

oscillation (feedback). First, make sure that all connections are tight. Then turn gain to minimum and slowly increase the gain until the light turns red. Reduce the gain to the previous setting that had a green light. It will take 1 minute for the light to turn back to green, or unplug and plug in the Signal Booster to reset it. When you turn down the gain, you are reducing the inside coverage area. If the amount of coverage area is sufficient for your needs, and the light is green, the installation is complete. If the coverage area is not large enough, it is necessary to increase the separation distance of the antennas by moving them horizontally or vertically farther apart, or both. Then increase the gain until the red light comes on, and then slightly keep decreasing the gain until the green light appears, waiting one minute in between increments or resetting the Signal Booster by unplugging and plugging it back in. If after separating the antennas your coverage area is still too small, contact Wilson Electronics Technical Support Team for assistance.

4. BLINKING ORANGE & RED

If one or more of the lights on the Signal Booster are blinking orange and red, this indicates that the Signal Booster is experiencing extreme receiver overload and has shutoff. The outside antenna must be turned away from the cell tower until the light is no longer flashing orange and red. Contact Wilson Electronics Technical Support Team for assistance.

5. BLINKING RED








If one or more of the lights on the Signal Booster are blinking red, this means that the Signal Booster has shutoff due to close proximity to the handset or mobile device. Increase the distance between the handset and the Inside Antenna until the light is no longer flashing red. Contact Wilson Electronics Technical Support Team for assistance.

6. LIGHT OFF

If one or more of the lights on the Signal Booster are off, this means that the gain has been turned all the way down and the band is in Power Save Mode. Increase the gain until the light turns on. If there are bands that are not being used in the local coverage area, this will reduce energy consumption.

Note: *Oscillation (feedback) can occur when the Outside Antenna is too close to the antenna inside the house. An oscillation in a Signal Booster is similar to when a microphone is too close to a speaker in a sound system, resulting in a loud whistle. An oscillation in the Signal Booster, if allowed to occur, can affect nearby cell towers ability to handle calls.*

Warnings & Recommendations

-  **Warning:** The directional antenna must always be located so the back or side points to the Inside Antenna. Never point the front of the Outside Antenna toward the Inside Antenna – this is to prevent oscillation.
-  **Warning:** Connecting the Signal Booster directly to the cell phone with use of an adapter may damage the cell phone.
-  **Warning:** Use only the power supply provided in this package. Use of a non-Wilson Electronics product may damage your equipment.
-  **Warning:** **RF Safety:** Any antenna used with this device must be located at least 8 inches from all persons and can be found on pages 1, 2, & 3 of the Install Guide.
-  **Warning:** The Outside Antenna must be installed no higher than 10 meters (32'9") above ground.
-  **Warning:** To uphold compliance with network protection standards all active wireless devices must maintain at least 6 feet of separation distance from Panel and Dome antennas and 4 feet of separation distance from Desktop Antennas.
-  **Warning:** Verify that both the Outside Antenna and the Inside Antenna are connected to the Signal Booster before powering up the Signal Booster.

This is a CONSUMER device.

BEFORE USE, you **MUST REGISTER THIS DEVICE** with your wireless provider and have your provider's consent. Most wireless providers consent to the use of signal boosters. Some providers may not consent to the use of this device on their network. If you are unsure, contact your provider.

You **MUST** operate this device with approved antennas and cables as specified by the manufacturer. Antennas **MUST** be installed at least 20 cm (8 inches) from any person.

You **MUST** cease operating this device immediately if requested by the FCC or a licensed wireless service provider.

WARNING. E911 location information may not be provided or may be inaccurate for calls served by using this device.

Recommendation: Lightning Surge Protection is recommended for all in-building installations.

This device complies with Part 15 of FCC rules. Operation is subject to two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by Wilson Electronics could void the authority to operate this equipment.

30-Day Money-Back Guarantee

All Wilson Electronics products are protected by Wilson Electronics 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.

2-Year Warranty

Wilson Electronics Signal Boosters are warranted for two (2) years 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.

Signal Boosters 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 Electronics 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 if located within the continental U.S.

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

Failure to use a surge protected AC Power Strip with at least a 1000 Joule rating will void your warranty.

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

Disclaimer: The information provided by Wilson Electronics, LLC is believed to be complete and accurate. However, no responsibility is assumed by Wilson Electronics, LLC 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.

Before use, you must register this consumer device with your wireless provider and have their consent. The majority of wireless providers have consented to the use of signal boosters. You must operate this device with approved antennas and cables as specified in the install guide. If requested by the FCC or a cellular service provider, the device will need to be turned off immediately. Warning: E911 location information may be inaccurate for calls placed while using this device.

Copyright © 2013 Wilson Electronics, LLC. All rights reserved.

U.S. Patent Nos. – 7,221,967; 7,729,669; 7,486,929; 7,409,186; 7,783,318; 8,583,034; 8,583,033

Signal Booster Specifications

	DB Pro 4G Specifications				
Model Number	460003				
Antenna connectors	F-Female				
Antenna impedance	50 ohms				
Dimensions	6.5 x 4.5 x 1.75 inch (16.5 x 11.4 x 4.4 cm)				
Weight	1.28 lbs (0.580 kg)				
Frequency	704-746 MHz, 776-787 MHz, 824-894 MHz, 1850-1995 MHz, 1710-1755/2110-2155 MHz				
Power output for a single phone (uplink) dBm	Maximum Power				
	700 MHz Band 17	700 MHz Band 13	800 MHz	1900 MHz	1700/2100 MHz
	22.5	24.2	24.4	22.6	24.1
Power output for a single received channel (downlink) dBm	Maximum Power				
	700 MHz Band 17	700 MHz Band 13	800 MHz	1900 MHz	1700/2100 MHz
	4.7	4.5	6.9	10.4	2.4
Noise Figure (typical downlink/uplink)	5 dB nominal				
Isolation	> 110 dB				
Power Requirements	110-240 V AC, 50-60 Hz, 8 W				

Each Signal Booster is individually tested and factory set to ensure FCC compliance. The Signal Booster cannot be adjusted without factory reprogramming or disabling the hardware. The Signal Booster will amplify, but not alter the incoming and outgoing signals in order to increase coverage of authorized frequency bands only. If the Signal Booster is not in use for five minutes, it will reduce gain until a signal is detected. If a detected signal is too high in a frequency band, or if the Signal Booster detects and oscillation, the Signal Booster will automatically turn the power off on that band. For a detected oscillation the Signal Booster will automatically resume normal operation after a minimum of 1 minute. After 5 (five) such restarts, any problematic bands are permanently shut off until the Signal Booster has been manually restarted by momentarily removing the power from the Signal Booster. Noise power, gain, and linearity are maintained by the Signal Booster's microprocessor.

Wilson Electronics, LLC

3301 East Deseret Drive, St. George, UT 84790

For additional Technical Support visit www.WilsonElectronics.com

or email at: tech@wilsonelectronics.com

Phone: 866-294-1660 Local: 435-673-5021 Fax: 435-656-2432

www.twitter.com/WilsonCellular www.facebook.com/WilsonCellular

111202_DBPro4G_RevP_01.23.14