

# INSTALLATION GUIDE

## MOBILE SIGNAL BOOSTER

# Nikrans BD-300FW 5G



Freq.: 2100, 700 MHz  
Coverage: 3300 ft<sup>2</sup>

## PREFACE

This user's manual describes the installation and maintenance of wide band consumer boosters. Please do read user manual carefully before installing and maintaining repeaters. The information in this manual is subject to change without prior notice.

## SAFETY WARNINGS

Users must follow the principles below◇



Repeater should follow system requirements; assure good grounding and lightning protection.



The power supply voltage of repeater should meet security requirements; any operation shall be carried out only after turning off power in advance. Only the professional is authorized for the operation.



Do not dismantle machine, maintain or replace its components by yourself, because this way the equipment may be damaged and you may even get an electric shock.



Do not open the repeater, touch the module of the repeater, or open the cover of the module to touch electronic component. The components will be damaged due to electrostatic.



Please keep away from heating equipment, because the repeater dissipates heat during working. And do not cover a booster with anything that influences heat dissipation.

# INTRODUCTION AND REASONS FOR WEAK CELLULAR SIGNALS

[Cell Phone Signal Booster](#) is a perfect solution for providing improvement of cellular signal reception inside a house, office, restaurant, VIP Room, apartment, building or shopping mall.

Generally cell phones cannot pick up or maintain a strong cellular signal due to one of the two following reasons:

- 1. Location of the Nearest Base Station** – Base stations are used to provide broad coverage. However there are many areas in which signal strength gets reduced due to topographic peculiarities or local Governmental restrictions regarding the height or location of base stations. Rural areas generally have fewer base stations than urban regions.
- 2. Natural and Man-Made Obstructions** – Signal strength can also be negatively affected by trees, hills, buildings, weather and other obstructions. You may be relatively close to a base station but still unable to make a call. This often occurs inside houses, offices and other buildings with stucco, concrete or metal walls that may block the signal.

The Signal Booster works with two antennas. An Indoor antenna communicates with your cell phone and an Outdoor antenna communicates with the base station (BS). The Outdoor antenna receives a signal from the BS and sends it through the cable to the Signal Booster, where it gets amplified and re-transmitted by the Indoor antenna throughout a building. When the Indoor antenna picks up a signal from your cellular device, the Signal Booster amplifies that signal and transmits it through the cable to the Outdoor antenna and back to the BS.

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

# MODEL DESCRIPTION

Nikrans BD-300FW 5G signal booster is designed to enhance **5G connectivity** in both residential and commercial spaces. It is compatible with **2100 MHz** and **700 MHz** frequency bands and can be used for areas up to 300 m<sup>2</sup>. The device is fully certified, meeting international standards for performance and safety. We process your order and try to send the booster the following day without delay.

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Want to Dive Deeper? [Ask a question](#)

## Coverage area

BD-300FW 5G mobile internet booster is designed to send the enhanced signal across a coverage area of up to **300 m<sup>2</sup>**. With such coverage, this repeater can be installed not only in private houses but also in cafes, gyms, educational centers, healthcare organizations, etc.

## Signal types supported

This innovative booster is able to increase the power of **5G** signal transmitted only at the **2100 MHz** and **700 MHz** frequency bands. Make sure that your service provider utilizes these frequencies. If you're unsure whether these frequencies are supported by your service provider, contact us, and we'll help you find the perfect booster for your needs!

## Benefits and features

BD-300FW 5G is a **modern device** that is able to meet even the strictest industry quality and safety standards. The device is very compact which means that it won't be a very challenging task to install it even in a small room. Plus, its user-friendly design ensures that you'll quickly grasp how it works, making it a hassle-free experience.

- **Easy installation**

Even if you do not have any technical background, you will manage to install a booster on your own. In case something isn't quite right during setup, the booster will alert you.

- **LCD screen**

This element makes it easier to track a current network state and shows changes in the outside/output signal strength.

- **Excellent price**

We guarantee the most attractive prices for our high-quality and fully reliable repeaters.

We always do our best to reach the highest user satisfaction. That's why **we sell boosters in a full kit**. It means that after you place an order for a device, you do not need to care about ordering any additional elements. As soon as your parcel is delivered, you can start installing your mobile signal booster. And after the successful installation, it will start functioning practically immediately.

**The booster installation process is a very simple task.** Your signal will be improved automatically but it is crucial to install a device correctly. We recommend following the User's guide that comes with your booster to ensure you get the most powerful and stable signal.

If you don't have enough cable length in the standard kit - we will help you. Just contact our team by phone, email or online chat.

On our website, you can find lots of valuable information on the use and installation of our repeaters and we believe that our tips will greatly facilitate your interaction with our devices.

Nikrans BD-300FW is undoubtedly the best option if you're searching for a reliable way to improve your 5G signal! It will help you enhance 2100 MHz and 700 MHz frequencies in just a few seconds.

## SPECIFICATION

|                     |                                 |
|---------------------|---------------------------------|
| Indoor coverage:    | 3300 ft <sup>2</sup>            |
| Up-link freq:       | 703-733 , 1920-1980 MHz         |
| Down-link freq:     | 758-788 , 2110-2170 MHz         |
| Up-link Gain:       | 68 dB                           |
| Down-link Gain:     | 70 dB                           |
| Power Output:       | Input AC110-240, output DC6V,2A |
| Energy Consumption: | 0,003 kW/h                      |
| Working t °C:       | -25/+55                         |
| Humidity:           | 5 - 95%                         |
| Size (mm):          | 120×106×25                      |
| Booster Weight:     | 0.45 kg                         |
| dBm:                | 22 dBm                          |

# REPEATER SYSTEM OVERVIEW

The picture below shows how simple and fast booster installation is and how effectively it works.

A Yaggi or panel antenna (it depends on the booster model and its power), as donor/outdoor antenna, is installed at the top of the roof to pick up good mobile signals from the base station, and sends them through the cable to the booster where the signals get amplified significantly; and then the output signals are distributed throughout the area by the indoor/server antenna. Clear phone calls or high speed mobile data are immediately achieved within the area.

A repeater kit includes:

- **Outdoor Antenna** ◇

Outdoor panel or wide band Yaggi is recommended.

Function: To pick up outside signals from the base station and send them by cable to the repeater; outdoor antenna also transmits the uplink signals from the repeater back to the base station.

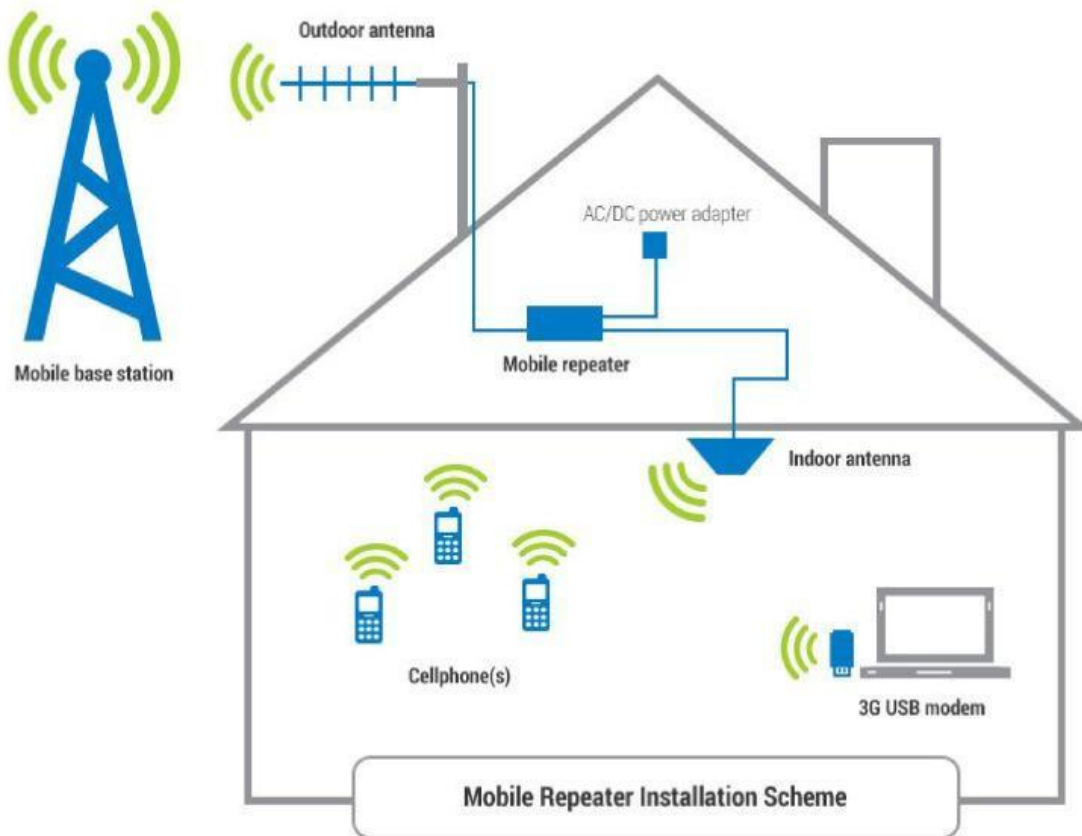
- **Indoor Antenna:**

It is mounted inside a building to transmit the improved signals throughout the coverage area.

- **Cables:** Coaxial cables for indoor and outdoor antennas.
- **Mountings:** Special mountings for antennas and the booster (depends on a booster model)
- Power Supply

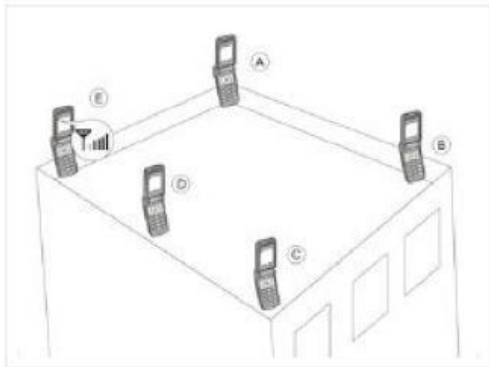
**Optionally:**

- **Splitters** or couplers: when the building structure is too complicated or there is big loss due to thick walls or other reasons, splitters or couplers shall be used so that more antennas can be installed in separate zones to distribute the signals to each corner of the coverage area.
- **Additional indoor antennas:** when the building structure is too complicated



# ANTENNAS AND CABLES SETTING UP

## Outdoor antenna installation



The repeater's main function is to improve weak RF signals in an area. The formula is:  $\text{Input power} + \text{Gain} = \text{Output power}$ . The signal strength from an outdoor antenna directly affects the efficiency of the indoor coverage. It is very important to choose the correct outdoor antenna location in order to get the best signal.

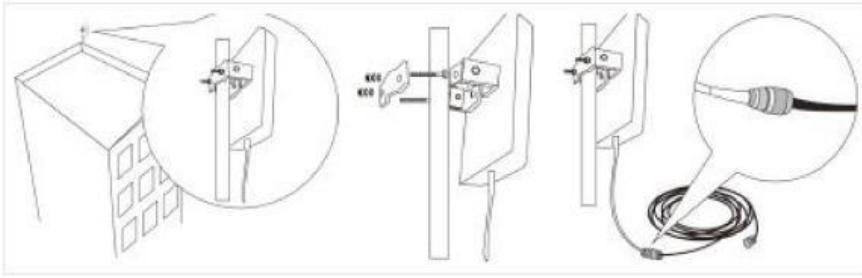
If you don't know exactly where your operator's base station is located, go through the antenna aiming process for getting the best result. To aim the antenna correctly, follow the steps below:

1. Setup the entire booster system, including antennas and cables, and power it on.
2. A person on the roof aims the antenna in a certain direction. The other person inside waits for 1 minute and checks signal level on the phone.
3. Then rotate the antenna its 1/8th of the way around, which equals 45 degrees. The person inside does the same procedure with signal testing.
4. Repeat the process 8 times until you try all 8 directions, in every 45 degrees sector.
5. Compare the results of signal testing – the closer dB parameter to 0, the better booster performance you get.
6. Fix the antenna in the direction with better signal result.

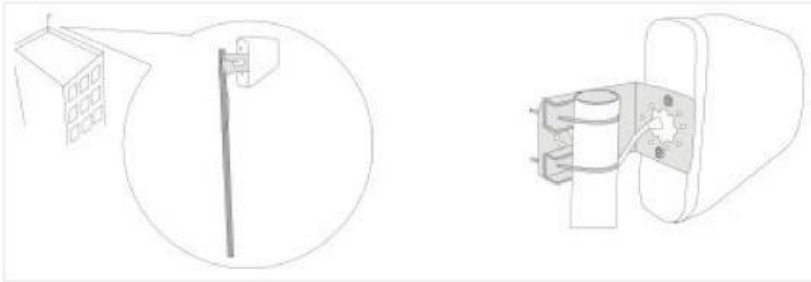
Note! We recommend mounting the antenna on the side of the building aiming away from the building, which will reduce amount of possible obstacles. For your convenience and acceleration of the process perform the testing in pair.

- The mobile phone shall display full bar signals in location where the outdoor antenna is installed  
Phone calls or data transmission shall be smooth and stable. It is recommended to test the signal 3 times in location where an outdoor antenna is to be installed  
As shown from the illustration above, you should test the signals in points from A to E, and select a best place that displays full bar signals.
- Outdoor antenna installation Requirements:  
Outdoor antenna should be installed on the roof of the house or in some other place where your mobile device is within coverage zone. Mobile signal should be as strong that at least three-four bars are indicated on your phone display.  
Outdoor antenna should be fixed in straightly.  
It is necessary to waterproof connectors of the outdoor antenna and feeder lines.  
Repeater is a two-way signal amplifier. So proper isolation between outdoor antenna and indoor antenna is necessary in order to avoid self-oscillation. A perfect example of self-oscillation is when you take a MIC and a loudspeaker for example; if they are too close to each other, it could cause big noise.  
If isolation can't be achieved due to limited distance, the roof of the building, walls or any other barriers can be used between antennas to increase isolation.

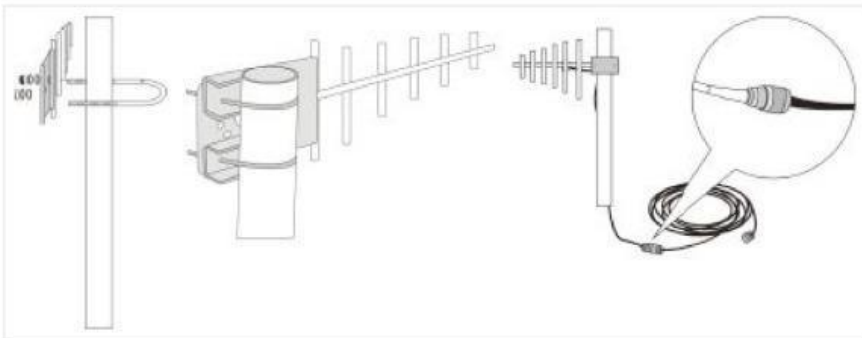
## Installation of a panel antenna as an outdoor antenna



## Installation of Yagi wide band antenna as an outdoor antenna



## Installation of a Yaggi antenna as an outdoor antenna



## Cable layout and connector assembly

1. Keep the type, specifications, routing direction, location and curvature radius of cables in compliance with the model requirements. Place cables in correct order, bend them smoothly, and protect the surface from any damage.
2. Place RF cables separately from power cables. Take proper isolation measures if they have to be placed on the same cable racks owing to the site condition restrictions.
3. Fasten all connection parts of the whole system in correct order, from the antenna to repeater interfaces, and make sure that the electrical interfaces are well contacted. Give waterproof treatment to outdoor connection parts.
4. Take lightning protection measures for the antenna and feeder system in accordance with the system requirements. Avoid deforming the antenna feeder where grounding clips are placed, and give waterproof treatment to the feeder.

## Lightning Surge Protector Usage

If the area where you live is exposed to thunderstorms, it is highly advisable to protect a mobile repeater with a lightning surge protector. Installed in-line between the outdoor antenna and the signal repeater, the surge protector prevents equipment from damages.

## Lightning Surge Protector Setup

Please read carefully the instructions provided with the coaxial surge protector to ensure safe and effective installation in terms of grounding and maintenance.

1. Connect the male N-connector of the surge protector to the female N-connector of the outdoor antenna.
2. Connect the female N-connector of the surge protector to the male N-connector of the cable that leads to the signal booster.
3. Clinch a copper wire to the grounding lug and then attach it to a master ground bar or earthing system in order to ensure low impedance path to ground. The ground wire must be as short as possible and straight. It is essential that the ground wire isn't looped or coiled. The suitable grounding locations can as follows: a ground rod (a metal rod normally buried outside the house), an electrical service panel (it is connected to the ground rod of the house), metal structure of a building (provided that this structure is grounded itself).
4. Since the surge protector is not waterproof, tape it firmly with water resistant adhesive tape.
5. Connect other components of the repeater set according to the instructions given in this manual.



## Lightning Surge Protector FAQ

### How does a lightning surge protector work?

These devices divert excess voltage and current from transient and surge into grounding wire, preventing it from flowing through the electrical and electronic equipment while at the same time allowing the normal voltage to continue along its path.

### How can I understand that a surge protector is correctly installed?

The lightning surge protector can be installed in different manners. However, for maximum safety and efficiency we recommend installing the surge protector between the outdoor antenna and the signal repeater. Thus all the subsequent elements of the amplifying system will be protected.

To understand if the surge protector is installed correctly, check up your repeater functioning. If the booster works well and gets incoming signals normally, it means the surge protector setup was correct.

### What do I do if the lightning strikes a surge protector?

It's advisable to check the wiring after the lightning strike. To find a break, an electrician will use a circuit tracer to determine the location of the damage. Once the damaged wiring is located, the electrician will evaluate the extent of the damage. This will help determine whether the wire can be repaired or if the entire circuit will have to be replaced.

*Please note that the warranty doesn't cover damage from lightning strikes.*

## Indoor antenna installation

Correct antennas types shall be used according to the site conditions and the requirement.

1. Omni antenna (ceiling Omni or whip antenna) shall be installed in the center and radiate all directions.



2. It is better to use a directional panel antenna or Yaggi antenna when the area shape is long and narrow (corridors, long row of houses in two sides, tunnels or elevators or rural open space).



### Requirements to indoor antenna installation:

- indoor antenna should be 10-15 meter distance from an outdoor antenna
- indoor antenna should be at least 2 meters above the ground
- indoor antenna should be fixed vertically with the ground.

# REPEATER INSTALLATION

## Installation requirements

### Installation Location Requirements

1. The repeater shall be installed indoor in a cool, dry and ventilated room without erosive gas or smoke, or on a cool and ventilated wall to ensure excellent heat dissipation.
2. Installation height should be sufficient for RF cable wiring, heat dissipation and maintenance.
3. Independent and stable power supply is necessary.

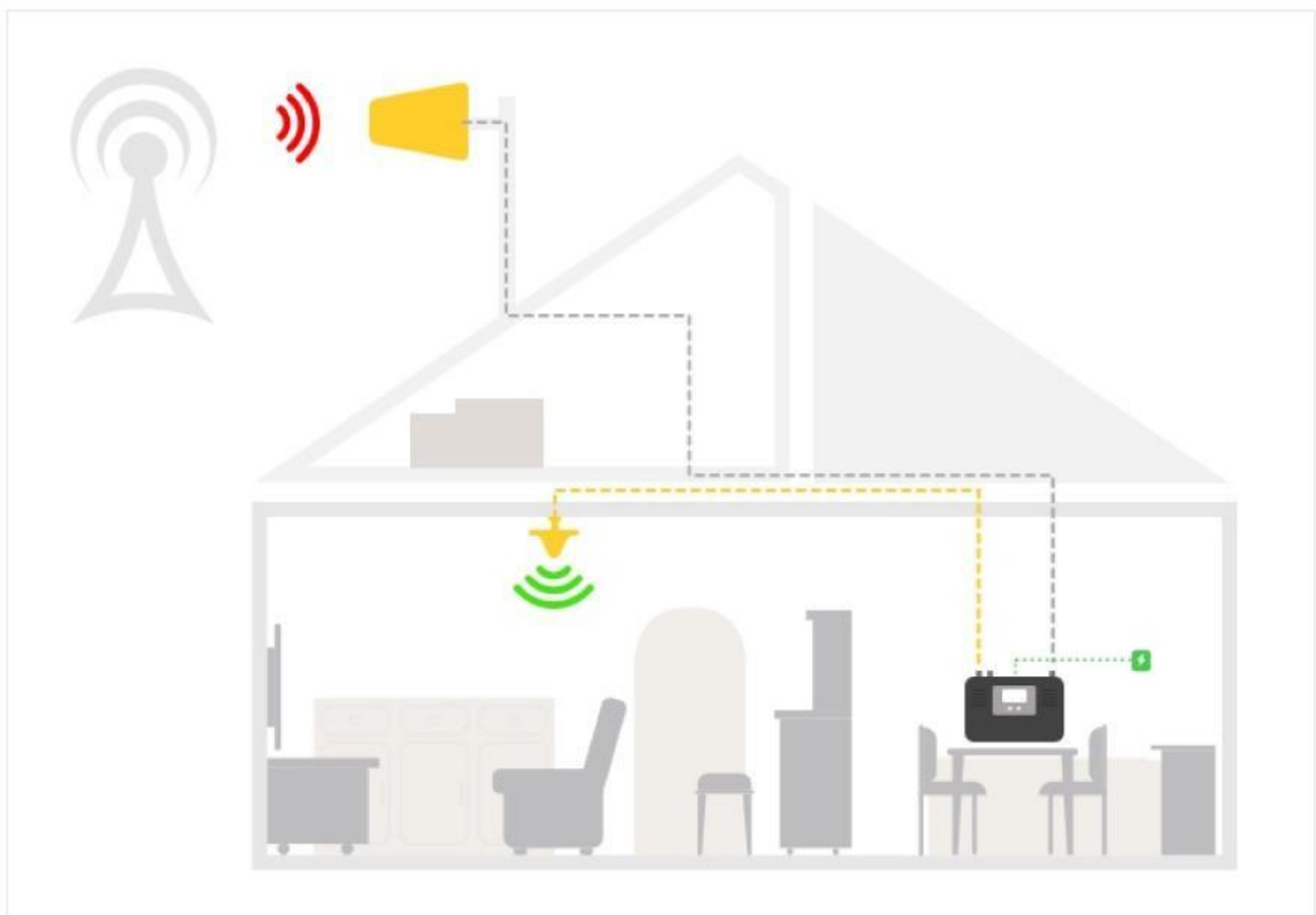
### Power requirement

Generally AC 100~264V AC / 50±5Hz power supply is required.

## Installation Steps

### Installation schemes

Installation with 1 indoor antenna



## INSTALLATION STEPS

1. Find an appropriate position for an outdoor antenna. (see the requirements in 6.1. sect. )
2. Plug in the outdoor antenna to the mobile booster from BS side and fasten tightly.
3. Plug in the indoor antenna to the mobile booster from MS side and fasten tightly.
4. Connect the signal booster to the Power Supply.

!Some models have an inbuilt Power Supply. Please, examine the manual applied to your model, if your signal repeater kit doesn't include separate Power Supply, skip this step!

If the light indicator on the booster turns on it means the installation has been implemented correctly.

*NOTE: Switch on the signal booster only after you connect outdoor and indoor antennas in the proper way!*

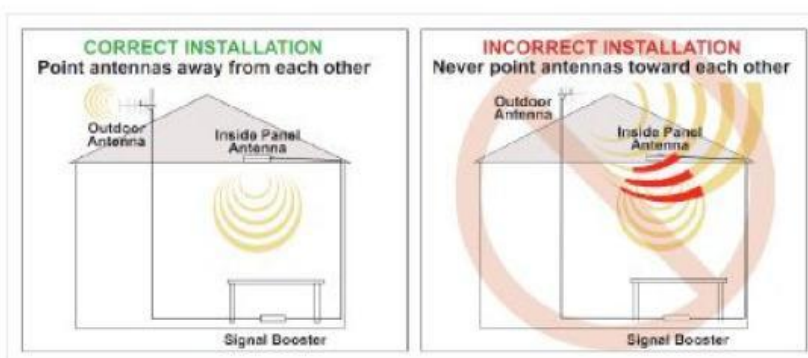
5. Test the signal of your mobile telephone – a maximum quantity of bars should be indicated on the display of your phone in each corner of the location within booster coverage zone. In case the mobile signal is still instable try to change the position of the outdoor antenna for more proper one.

### Important notes for installation:

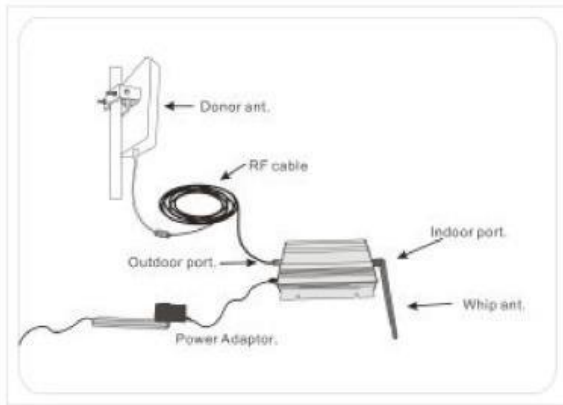
1. Cables from outdoor antenna should not be wound and be placed as straight as possible in order not to create any hindrance for signal reception and its transmission.
2. Cables should be shortened to the acceptable maximum so that not to waste or decrease mobile signal coverage range.
3. In order to prevent water from coming into the mobile phone booster through the cable make a loop in it.
4. Keep the outdoor antenna as far as possible from frequency aerials, high voltage cables, metal nets or transformers.
5. Don't put the antennas (outdoor and indoor) too close to each other. Recommended distance is 10-20 m. Be sure to point them to the opposite directions to avoid the risks of malfunctions such as self-oscillation or interference. It's also recommended that they are not placed in direct vision to each other (use metallic obstacles, wall, ceiling, slab, etc).
6. Plug the power supply into the Signal Booster input (carefully, to avoid damaging the center pin) and then into a wall outlet.

**Note:** It is recommended to plug all AC power supplies for home electronics into a Surge Protector Power Strip.

7. Switch the booster on only after having positioned the antennas correctly, according to the instructions above.
8. Using multiple Signal Boosters in one installation could cause interference to the base station (except for the In-Line Signal Boosters).



## Repeater's ports description



1. Outdoor port: connected with the outdoor antenna by cable
2. Indoor port: connected with indoor antenna directly or by cable
3. DC IN: connected with power supply.

## Accessories selection

Choosing accessories pay attention to the two characteristics – frequency and impedance. All accessories shall support the repeater's frequencies. For example, if the repeater's frequency is GSM900, all the accessories must support the GSM900 frequency.

## Repeater Settings

### Indicator Light Instructions



**BS** - Outdoor port for connecting an external antenna.

**MS** - Indoor ports for connecting an internal antenna.

**DC 6V-9V:** for connecting a power supply.

**Note:** You can use more than 1 indoor antenna (up to 3) if the covered area has several floors or many walls and partitions. To connect additional antennas you will need a signal splitter.

### Additional accessories selection.

Choosing additional accessories for your signal booster, you should pay attention to the two characteristics: frequency and impedance. All accessories shall support the device frequencies (refer to specs.)

### LCD screen indicators.

1. Introduction screen which is displayed for a few seconds during the system loading.