Users Guide
Installation

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1. Precautions

This is a CONSUMER device.

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 20cm (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.

Reference : Direction/Information for the proper operation

Caution : Information for users to avoid malfunctions

Warning : Instructions for users to avoid unexpected hazard

1.1 Do not drop the device
- It may damage the product and its function

1.2 Do not place near magnetic materials
- It may cause of possible malfunction

1.3 Product is recommended to be used with the cigarette power cord. For any alternative cable use, please ask professional installers.
- There is a high risk of frying up the device if inaccurately powered.

1.4 Please unplug both Cigarette Power Supply and Fuse Cable during non-operation to avoid any possible battery discharge.

1.5 Install the product where it is recommended
- It may not properly operate on unadvised location

1.6 Do not repair or remodel
- It may cause malfunction. Please contact your store representative if there is a problem

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1.7 Do not install device while driving

- Please avoid any activities that may cause careless driving

1.8 Turn off the ignition before set up the device.

1.9 Do not install the device near any air bags in a car

- It may cause severe damage if air bags explode.

1.10 Do not touch the device with wet hands

- It may cause possible risk of an electric shock

1.11 Keep the installation location of inside and outside antenna clean

- Please organize cable lines and antenna locations to avoid any possible interference while operating a vehicle.

1.12 Stop and Turn Off the device immediately if a smog comes out of the product or any strange odor is detected from the product

- Do not attempt to fix the device. Please contact your store representative

1.13 Warning message for use of unauthorized antennas, cables, and/or coupling devices

- It may not properly operate

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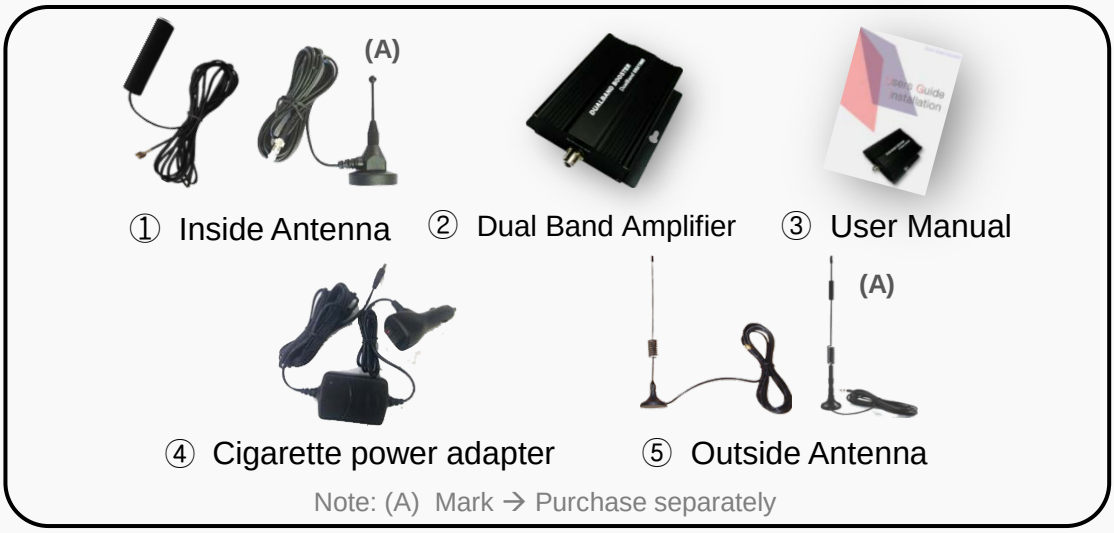
2. System Components

2.1 Components



①. Inside Antenna: connects signal between mobile phone and amplifier

②. Dual Band Amplifier: amplifies signal by receiving base station signals through Outdoor antenna to In-door Antenna

③. User Manual: shows how to operate system

④. Cigarette Power Adapter: Power Source

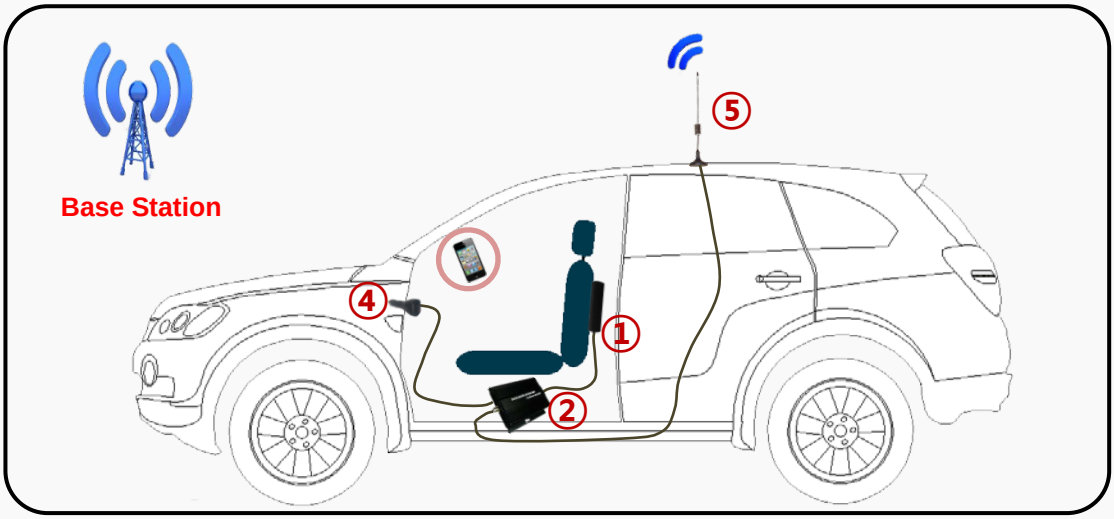
⑤. Outside Antenna: connects signal between base station and amplifier

⑥. List of approved antennas

Inside Antenna	TQC-900/1800E	TS210380
Outside Antenna	TQC-900/1800CII	TS210580

⑦. List the default antenna, cable, and/or coupling device that are shipped with the booster

2.2 Installation



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3. General Information

3.1 Features

3.1.1 Summary

The device may be installed on cars, trucks, trailers, boats and homes to improve user's mobile phone signal.

I. **Decrease dropped call**
II. **Increase 2G/3G data speed**
III. **Battery life extension**
IV. **Voice quality improvement**

(Please see page 13 for Operating Frequency)

3.1.2 Features

I. **Strong coverage area**
   - **Gain 48dB**

II. **Automatic Overload Protection & Detection System**
   - **Plug and Operate Systems**

III. **23dBm(0.2W) Output power**
   - **Provides High Data Communication rate**

IV. **Complete Repeater Kit.**
   - **All components included for installation**

V. **Dual Band Frequency Broadband**
   - **800MHz / 1900MHz**

VI. **LED Alarm System**

VII. **GUI(Graphic User Interface)**
   - **Please ask professional installers about GUI program.**

VIII. **Cost Effective Application for Vehicles, Boats, and Homes**
   - **For any Home & Boats applications, optional antennas (inside & out) and connectors may be required.**

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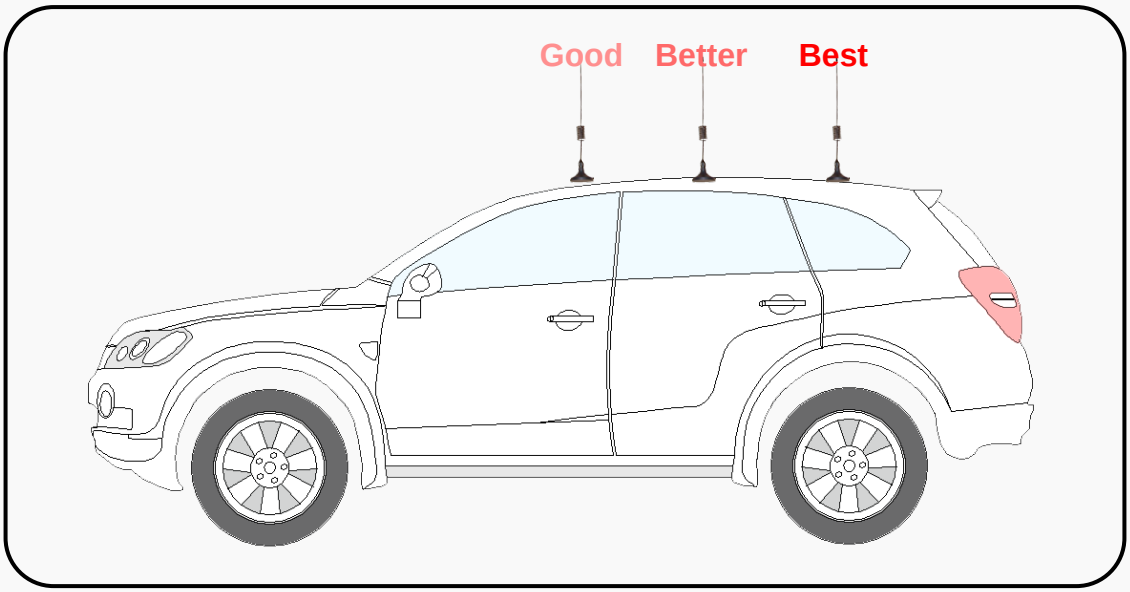
4. Installation

4.1 External Antenna Installation

4.1.1 Outside antenna has magnetic feature to mount on the roof of vehicle
4.1.2 Outside antenna distance should be at least 5 feet from inside antenna
4.1.3 Recommended to mount outside antenna near rear end of the roof.



4.2 Inside Antenna Installation

4.2.1Inside antenna is mounted using the self-adhesive. It must be placed in a location that will be at least 0.5m (20 inches) from where cell phones will be located.
4.2.2 Before installation, please remove attached paper
4.2.3 Recommended to mount indoor antenna near suggested area as below

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4.3 Amplifier and Antenna Connection

4.3.1 Place the amplifier under the seat or appropriate location.

4.3.2 Connect inside and outside antenna connector to Amplifier.

4.4 Operating Instructions

4.4.1 Plug in cigarette power cord and press the button to turn ON as shown below. The red LED light should be ON indicating its operation.

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4.4.2 Connect DC Jack as shown below

4.4.3 Turn ON the Switch as shown below

4.4.4 After turning ON the switch, green LED light will be on.
Green LED indicates that system is in a normal mode.
Green and Red LED will flash 3 times simultaneously.
After the initial loading, the green LED light will be on during operation.

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5. Trouble Shooting

5.1 LED Alarm

ITEM		GREEN LED	RED LED	Problem Reference
Setting/Resetting		ON (after 3 times blinks)	3 times blinks	See 4.1.1
Normal Mode		ON	OFF	See 4.1.2
Cellular	Overload	Blink(once)	-	See 4.1.3
	Oscillation	Blink(twice)	-	See 4.1.4
	Insufficient Isolation	Blink(3 times)	-	See 4.1.5
	Alarm Checking	Blink(Consecutively)	-	See 4.1.6
	Sleep Mode	Blink(4 times)	-	See 4.1.7
PCS	Overload	-	Blink(once)	See 4.1.3
	Oscillation	-	Blink(twice)	See 4.1.4
	Insufficient Isolation	-	Blink(3 times)	See 4.1.5
	Alarm Checking	-	Blink(Consecutively)	See 4.1.6
	Sleep Mode	-	Blink(4 times)	See 4.1.7

5.1.1 ① Check if the LED light is ON, on the cigarette power adapter
□ Verify that DC cord is connected correctly

5.1.2 □ Green LED light is normal mode. If it blinks 2-4 times in a few seconds, please see 4.1.3 ~ 4.1.7

5.1.3 □ This is normal mode that checking on input power signal and shows signal status to users.
□ It will go resume normal operation mode after Overload Detection.

5.1.4 □ There is an oscillation between inside and outside antenna.
□ This status is caused by surrounding structural interferences that can temporarily disturb mobile signals. The amplifier will auto detect available signals as you drive to other locations.
The Green LED light will turn ON once normal mode resumes.

5.1.5 □ The isolation may occur between inside and outside antenna
□ If LED light blinks three times during installation, move the inside and outside antenna away from each other and RESTART the amplifier.
□ If LED light blinks three times after the installation, it could be caused by surrounding structure.
The device will auto adjust as vehicle moves.

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5.1.6 ① The Overload Protection System includes the following:

AGC (Automatic Gain Level Control)
AIC (Automatic Isolation Detection)
ASC (Automatic Reset Control)

- During Alarm checking process, the Amplifier may not operate.

5.1.7 - When LED is green or red with a flash four times at working, Sleep Mode is operated. Because reverse signal has not been existed for a certain time.
- If Reverse signal occur at the Sleep Mode, repeater is working normally and LED does not flash.

5.2 Insufficient Outside Signal Problem

Even after installation, if there is no base stations around your vehicle (Ex. No Service Enabled Zone), you may not receive any cellular signals.

5.3 Vehicle Battery Discharge Problem

Verify cigarette power adapter has LED light ON as shown below. If not, check either vehicle key is appropriately positioned or engine is ON. In case of battery discharge, replace the battery.

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6. Safeguard features

6.1 Summary

This equipment have functions to protect as follows.

I. Isolation check mechanism
II. Oscillation check mechanism
III. Sleep Mode mechanism
IV. ALC(Auto Level Control) mechanism
V. RF Shut Down mechanism

6.2 Feature

6.2.1 Isolation check mechanism

- The booster automatically checks the isolation by increasing the DL path gain by 1dB when the power supply is switched on and/or the oscillation occurs.
  It works normally when the isolation is over the maximum gain(48dB) plus 10dB, 58dB.

6.2.2 Oscillation check mechanism

- Anti-oscillation function is to protect Booster by D/L path off when oscillation in service. D/L shutdown by isolation check function when D/L path output power exceed oscillation limit value.

6.2.3 Sleep Mode mechanism

- When there is no U/L path Input signal, Booster shall be shut down after 30 seconds.
  Under the Sleep Mode condition, if U/L path input signal is above -92dBm, U/L path shall be turned on.

6.2.4 ALC(Auto Level Control) mechanism

- ALC function is always working to protect Booster.

6.2.5 RF Shut Down mechanism

- AMP is automatically shut down when the system output power exceeds the set point over five seconds.

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7. Specification

7.1 Amplifier Specification

Items		Cellular	PCS	Remarks
Operating Frequency	Downlink	869 ~ 894 MHz	1930 ~ 1990 MHz	
	Uplink	824 ~ 849 MHz	1850 ~ 1910 MHz	
Gain	Downlink	48dB±2.0dB	48dB±2.0dB	
	Uplink	48dB±2.0dB	48dB±2.0dB	
Output Power Level	Downlink	+5dBm	+5dBm	@ 1FA
	Uplink	+23dBm	+23dBm	
Ripple	Downlink	< 5dB	< 5dB	
	Uplink	< 5dB	< 5dB	
Noise Figure	Downlink	< 5dB	< 5dB	Frequency Center
	Uplink	< 5dB	< 5dB	Frequency Center
ALC Level	Downlink	+5dBm ±1dB	+5dBm ±1dB	@ 1FA
	Uplink	+23dBm ±1dB	+23dBm ±1dB	
Shutdown Level	Downlink	+6dBm ±1dB	+6dBm ±1dB	After ALC
	Uplink	+24dBm ±1dB	+24dBm ±1dB	
Modulation Type		GSM. EDGE, CDMA, EVDO, WCDMA, LTE		
Input Voltage		6.0Vdc / 3.5A		Cigar Charger ‘s Vdc
Power Consumption		6.0Vdc / 1050mA		@ No call
RF Connector Type		FME-male		
Operating Temperature		-40°C ~ +50°C (-40°F ~ 122°F)		
Size(L*W*H)		5.5”*4.8”* 1.3” (140.5 * 123 * 34 mm)		

- **Additional Information:**
  The EUT is a bi-directional amplifier for the boosting of cellular phone signals and data communication devices.
  The following frequency bands and emission types are utilized.

Frequency Band		
Uplink	824~849	1850~1910
Downlink	869~894	1930~1990

Emission Designators					
CDMA	HSPA	LTE	EVDO	EDGE	GSM
F9W	F9W	G7D	F9W	G7W	GXW

- **EUT Operation during Tests**
  The EUT was in a normal operating condition.

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7.2 Outside Antenna Specification

● TQC-900/1800CII

Items	Frequency Range	Remarks
Operating Frequency	890 ~ 960 MHz 1710 ~ 1990 MHz	-
Gain	5dBi	-
VSWR	≤ 2.0 : 1	-
Impedance	50 Ω	-
Max Power-W	50W	
Polarization	Vertical	-
Connector	FME(Female)	-
Antenna Length	11.02 inch (28Cm)	-

● TS210580

Items	Frequency Range	Remarks
Operating Frequency	700 ~ 800 MHz 824 ~ 894 MHz 880 ~ 960 MHz 1710 ~ 1880 MHz 1850 ~ 1990 MHz 2110 ~ 2170 MHz	-
Gain	5dBi	-
VSWR	≤ 2.0 : 1	-
Impedance	50 Ω	-
Max Power-W	50W	
Polarization	Vertical	-
Connector	FME(Female)	-
Antenna Length	12.25 inch (31Cm)	-

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7.3 Inside Antenna Specification

● TQC-900/1800E

Items	Frequency Range	Remarks
Operating Frequency	820 ~ 890 MHz 1710 ~ 1990 MHz	-
Gain	2dBi	-
VSWR	< 2.1 : 1	-
Impedance	50 Ω	-
Max Power-W	25W	
Polarization	Vertical or Horizontal	-
Connector	FME(Female)	-
Antenna Length	4.73 inch (12cm)	-

● TS210380

Items	Frequency Range	Remarks
Operating Frequency	700 ~ 800 / 824~ 894 MHz 880~960 / 1850 ~ 1990 MHz	-
Gain	3dBi	-
VSWR	< 1.8 : 1	-
Impedance	50 Ω	-
Max Power-W	25W	
Polarization	360º	-
Connector	FME(Female)	-
Antenna Length	3.4 inch (8cm)	-

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7.4 Cigarette Power Code Specification

7.4.1 Input Specification

Items	Min	Typical	Max
Normal DC Input Voltage	12V	-	24V
DC Input Voltage Range	12V	-	24V
DC Input Voltage Current	-	-	3.0A

7.4.2 Output Specification

Items	Min	Typical	Max
Normal DC Output Voltage	-	6.0Vdc	-
DC Output Voltage Range	5.7Vdc	-	6.3Vdc
Load Current Range	-	-	3.5A
Ripple	-	-	350mV
Over Current Protection	4.2	-	7.0A
Short Circuit Protection	-	Yes	-

8. Certificates

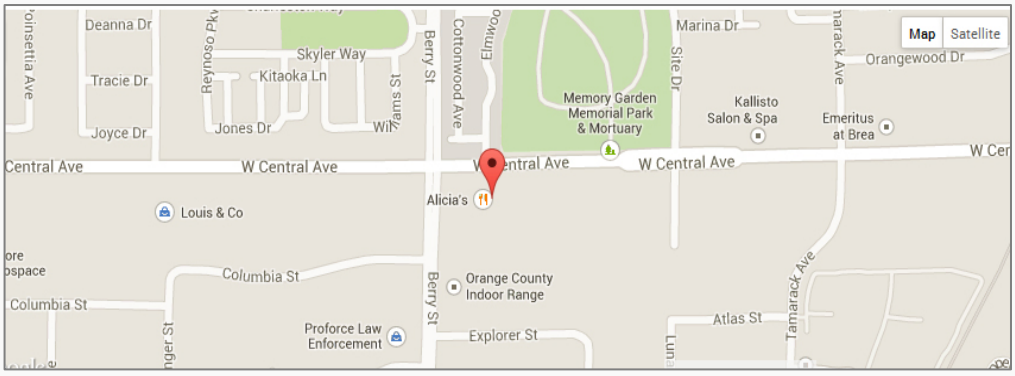
8.1 FCC Certification

Model : AVHR-5000N

- **Certificate Data : April 18, 2014**
- **Certificate Number: Q4EAVHR-5000N**

9. Manufacturers

9.1 Location



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AVHR-5000N

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