



# Iridium Antenna Guide

## Installation and User Manual



# Antenna Installation Guide

**Antenna installation is critical for optimum performance of your Iridium service.**

- Your antenna is your connection to the satellites and it needs as clear a line of sight to the horizon as possible.
- Every effort should be made to achieve maximum visibility at all times.
- There is a range of antenna options available and your Service Provider will advise the most appropriate antenna installation for your application.

## Installing Antenna Cables

When installing antenna cables, follow these guidelines:

- Route and restrain cables to prevent them from vibrating or moving under normal conditions, which could result in damage to the antenna, BEAM terminal, or the coaxial cable connections.
- Wherever the cables contact structures, protect the cables from chafing or abrasion. If a cable needs to be bent, avoid kinking it, and ensure that each bend radius follows the cable supplier limits.
- Use coaxial sealant, shrink-wrap tubing, electrical tape, or another suitable product to seal all cable connections appropriately to prevent moisture and corrosion damage from weather exposure.
- Connectors should be tightened as shown below in the absence of manufacturer advice specific to your cable:
  - *Tighten Type N connectors to a torque of 0.68 to 1.13 N-m (6 to 10 inch-lbs).*
  - *Tighten Type TNC connectors to a torque of 0.45 to 0.68 N-m (4 to 6 inch-lbs).*
- Use only cables supplied by BEAM for the Iridium network.
- Mount all antennas vertically and clear of nearby metal obstructions
- Minimize horizontal obstructions as much as possible because they can create areas of poor system coverage.
- To minimize the loss of radio signal from a passive antenna to the terminal, the specific coaxial cable system between a passive antenna and the other component should be less than 3db including connector loss.

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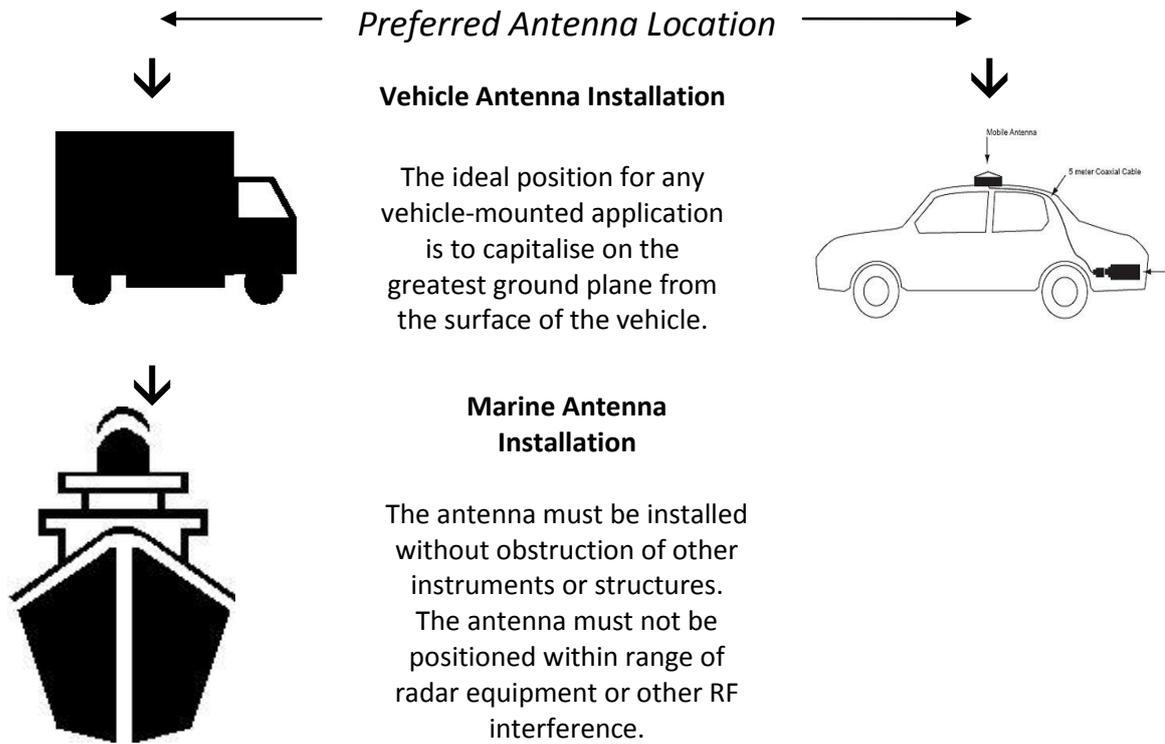
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Product name: IRIDIUM ANTENNA INSTALLATION & USER MANUAL Manual revision: 2 Part Number: USRMAN003001 Release date: April 2012
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## Installation Options

The antenna system is suitable for marine, vehicle and fixed applications and is designed to meet Iridium System performance requirements when installed according to the instructions in this guide.

The following figure shows typical Installations:



## Assuring Quality of Iridium Service

Iridium is committed to providing subscribers around the world consistent, reliable, quality voice and data access all day every day. The Iridium satellite system is monitored for call performance from numerous locations 24 hours a day, 7 days a week in order to achieve this.

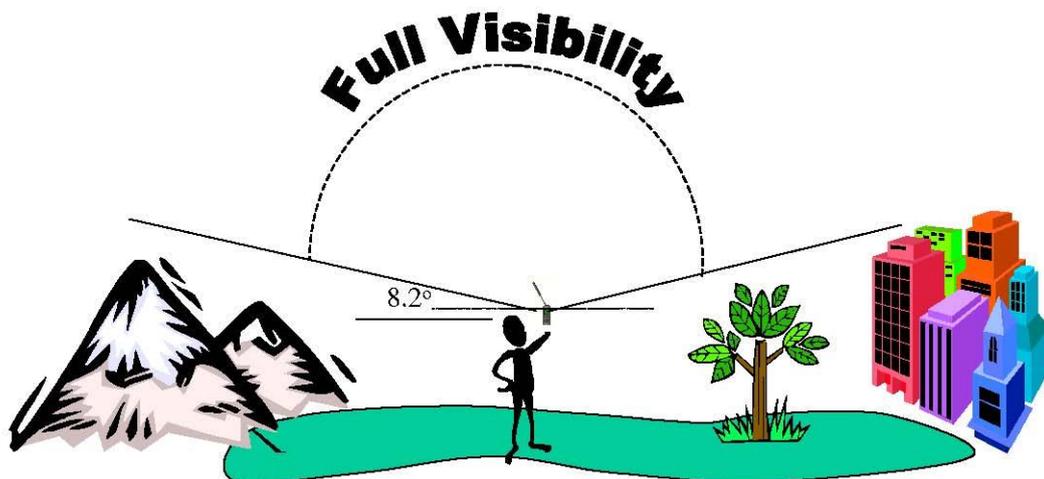
There are conditions that can compromise the quality of the service you may receive. These include:

- Obstructions
- Cabling
- RF Interference

### 1. Obstructions

The antenna must be able to “see” the entire sky from approximately 8 degrees above the horizon. Nearby tall buildings or similar structures, heavily leafed trees and mountains can all degrade performance as they block the signal between the antenna and the satellites. Having a completely open view of the sky plays a very important role in maximising performance, as the Iridium satellites cross the sky from North horizon to South horizon during a connected call.

All surrounding obstructions must be lower than the top of a fist extended at arms length and the bottom of the fist placed on the horizon. Iridium performance is immune from natural environments such as clouds, fog, rain, snow, wind and smoke.



## 2. Cabling

Using an externally mounted antenna provides an ideal solution for many applications. If you have or plan to install an external antenna, it is very important that the cables used meet the Iridium guidelines established for proper performance.

For optimal performance, we recommend using the shortest length of cable and the fewest number of connectors possible.

## 3. RF Interference

All wireless devices, including satellite telephones, are susceptible to RF (radio frequency) interference from other electronic devices. This problem is more evident when numerous antennas and broadcasting devices are located within close proximity to each other.

The location of the INMARSAT antenna in relation to the Iridium antenna plays a significant role in determining the degree of signal degradation that an Iridium subscriber can expect to experience. Given the inherent system differences (LEO versus GEO), all Iridium units are susceptible to this interference, regardless of the type of antenna being used.

Generally speaking, an Iridium unit; either handset or fixed terminal with an external antenna, located within 15 and 45 meters (50 to 150 feet, respectively) of an operating INMARSAT mini-M or Standard-C terminal, will likely experience degraded performance.

Other sources of RF interference such as Globalstar units, radar devices and broadcast stations can provide interference for Iridium units, but usually are not encountered as frequently as INMARSAT terminals.

### Symptoms of RF Interference

Symptoms of RF interference include:

- erratic or no signal strength indication,
- dropped calls or warbled or otherwise distorted voice.

These symptoms may be intermittent or persistent, depending largely on the interference source, its distance, strength and frequency relative to the Iridium unit.

### Mitigation of RF Interference

Degradation of service due to RF interference to the Iridium unit can be significantly improved by:

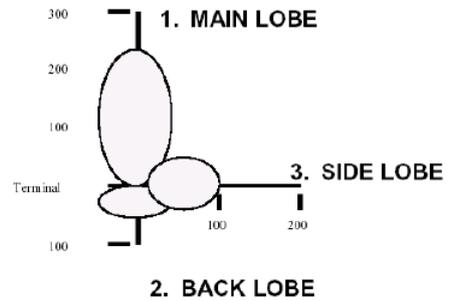
- a) Increasing the distance and moving the Iridium antenna off-axis from the source of the interference (therefore: to the side or behind the INMARSAT antenna, above or below it),
- b) Using an external band pass filter and an external antenna.

## Co-operation with Inmarsat:

### Inmarsat Mini-M

Recommended Distance Between an Iridium Unit and an Active Inmarsat Mini-M Terminal Antenna

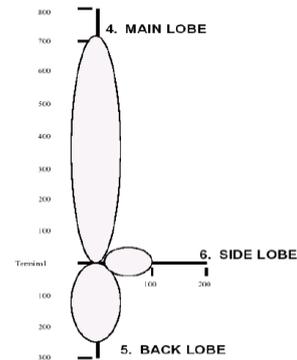
- Main Lobe = directly in front and in line with the Inmarsat terminal antenna:  
225 feet (68 meters)
- Side Lobe = directly to the side and in line with the Inmarsat terminal antenna:  
100 feet (30 meters)
- Rear Lobe = directly to the rear and in line with the Inmarsat terminal antenna:  
50 feet (15 meters)



### Inmarsat M-4

Recommended Distance Between an Iridium Unit and an Active Inmarsat M-4 Terminal Antenna

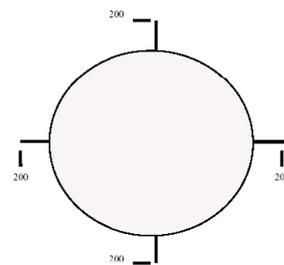
- Main Lobe = directly in front and in line with the Inmarsat terminal antenna:  
715 feet (217 meters)
- Side Lobe = directly to the side and in line with the Inmarsat terminal antenna:  
100 feet (30 meters)
- Rear Lobe = directly to the rear and in line with the Inmarsat terminal antenna:  
250 feet (76 meters)



### Inmarsat-C (CAPSAT)

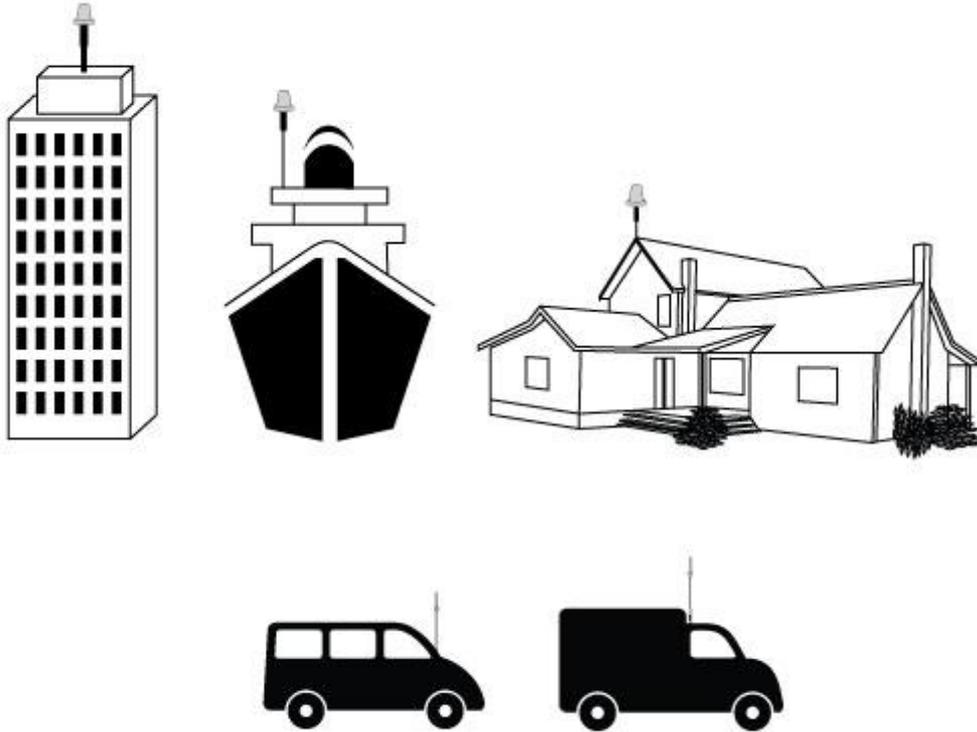
Recommended Distance Between an Iridium Unit and an Active Inmarsat-C (CAPSAT) Terminal Antenna.

- Main Lobe = directly in front and in line with the Inmarsat terminal antenna:  
150 feet (45 meters)
- Side Lobe = directly to the side and in line with the Inmarsat terminal antenna:  
150 feet (45 meters)
- Rear Lobe = directly to the rear and in line with the Inmarsat terminal antenna:  
150 feet (45 meters)



Protection Distances (ft) for Capsat Terminal

## Sample Installations



All these Antenna installations provide the best possible view to the horizon – therefore optimising the Iridium system by providing the best connection with the satellites.

To optimise Iridium performance ALL possible obstructions need to be removed between the top of the antenna and the horizon

## Lightning Protection

Antennas mounted in fixed installations can be exposed to lightning strikes.

As complete protection is difficult, BEAM recommends incorporating specialized lightning arrestor/surge suppression components into the antenna system to provide this protection. Install this suppressor at either of the following locations:

- Nearest the point at which the coaxial cable enters a building structure
- Where the cable first passes close to a grounded structure

Follow manufacturer installation instructions and if you are uncertain about any aspect of your installations seek assistance from a professional antenna installer.



For more information about **BEAM** Satellite products visit us @ [www.beamcommunications.com](http://www.beamcommunications.com)

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