

The logo for Blue Sky Network features a large, stylized blue swoosh that starts at the top left, curves upwards and to the right, then loops back down and to the left, ending in a long, thin tail that extends towards the bottom left. The text "Blue Sky Network" is positioned in the center of the swoosh.

Blue Sky Network

**D411**

Installation Guide

Version 1.0

Part# 100505

**NOTICE**

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## INTRODUCTION

This guide is applicable to the following components:

- 100505 - D411 Iridium/GPS Vehicle Tracking Device
- AN-100107 - Iridium/GPS Antenna
- 100504 - D411 16-pin Power Cable and QPos Assembly
- 100297 - Cigarette Lighter Adapter (optional)
- CA-130210 - Coaxial cable SMA-SMA

**NOTE: Information, drawings and wiring diagrams contained in this manual are intended as a reference for engineering planning only. Drawings and wiring diagrams contained herein do not represent any specific installation. It is the installer's responsibility to create installation drawings specific to the mobile asset.**

## D411

The Blue Sky Network's D411 is an Iridium and GPS mobile tracking platform with 6-28 VDC input.

All data services are managed by the customer through our web-based SkyRouter portal. SkyRouter offers global asset tracking, account management features, such as user authorization, asset settings, messaging and billing information. For more information on SkyRouter please visit: <http://www.blueskynetwork.com>



Blue Sky Network D411

## SKYROUTER

The SkyRouter portal ties together Blue Sky Network data solutions in an integrated and user-friendly way. By accessing the SkyRouter Web-site users can do the following:

- ✓ Advanced device tracking on a global, layered map including satellite imagery and standard street maps.
- ✓ Event notification for emergency, take-off, landing, inactive unit, speeding, moving and not-moving and more.
- ✓ Playback past trips and view detailed reports.
- ✓ 2-way email messaging to and from devices in the field.
- ✓ Update and request the current state of parameters on devices in the field.
- ✓ Manage alert settings.
- ✓ Management of a device fleet, including assignment of units to groups and creation of additional user accounts.
- ✓ Manage naming of the units and many other visual characteristics.



## TECHNICAL SPECIFICATIONS

<b>Dimensions</b>	103.0mm x 61.2mm x 194.6mm
<b>Weight</b>	1.4lb or 0.63Kg
<b>Power Requirements</b>	6-28 VDC (maximum 3W)
<b>Current Draw</b>	0.091A @ 28VDC
<b>Operating Temperature Range</b>	-20 degrees C to + 70 degrees C
<b>Iridium Frequency</b>	1616.0 MHz – 1626.5 MHz
<b>GPS Frequency</b>	L-Band (1575.42 MHz)
<b>Antenna</b>	Iridium and GPS combined

## FEATURES

- Iridium satellite link:** The D411 communicates to SkyRouter using the Iridium network of 66 Low Earth Orbit (LEO) satellites.
- GPS:** The D411 has an integrated GPS receiver – Position reporting interval can be changed in SkyRouter.
- Asset Tracking:** Directly from our web-portal, SkyRouter ([www.blueskynetwork.com](http://www.blueskynetwork.com)), users can view the location of assets.

## CONNECTORS

The graphic below shows the D411 back panel and describes its connectors:



- A. Iridium antenna connector (SMA Female)
- B. GPS antenna connector (SMA Female)
- C. 16-pin power connector (Male)

## GETTING STARTED

### ACTIVATE

Your D411 device must be activated prior to use.

By default all Blue Sky Network tracking devices are shipped to customers in an un-activated state. All activation requests must be submitted by the Blue Sky Network SkyRouter Administrator on file.

An activation request can be submitted through our website, the link is shown below. You should receive an immediate email confirmation that your request has been submitted and another email once the requested services have been activated. Please make sure your contact details are accurate, this is how we contact you if there are any problems processing your request.

<http://www.blueskynetwork.com/>



## INSTALLATION

### MOUNTING

Choose a convenient mounting location – possible locations include: the trunk, on the firewall for covert installations or in the interior of a vehicle. Avoid locations that might expose the device to excessive heat or moisture.

- Hold the D411 in place and mark the location for mounting screw holes.
- Using the markings as a guide, drill mounting holes in those positions.
- Align the D411 in the drilled holes and secure it with mounting screws.

The mounting holes are designed for number 10 screws. After the holes are drilled, loosely install the four mounting screws, place the unit over the screws and slide to either the left or right to allow the screws to engage the notches in the flange. Tighten all four screws.

### INSTALLING CABLES

During installation, the following precautions will help ensure proper operation of the D411:

- Remove power from the D411 until all other connections have made and verified.
- Do not create loops, sharp bends or crimps in the cables
- All cables should be mounted in such a way as to reduce stress or wear caused by vibration generated by moving vehicles
- Use proper terminations on all power cables to prevent electrical shorts.

**POWER CABLE - 100504**

BSN 100504 D411 Power Cable is supplied with the D411. This power cable includes a 16-pin power connector (to D411), a 2-pin Molex power connector (to power source), and a Quick Position remote switch. The D411 has an input voltage of 6-28 VDC.

- Use of the device outside of the specified voltage range may result in damage to the device and/or undesirable results.
- Blue Sky Network is not liable for damage to the D411 caused by an improper installation.
- The D411 is designed to operate on 6-28 VDC. The user is responsible for ensuring the voltage supplied to the D411 remains in this voltage range to include transient voltage spikes and load dump voltages. Failure to comply with this warning may result in damage to the D411.
- The 16-pin Power Connector connects directly to the D411 Power Port. The connector must be securely connected and screwed down using the black plastic bezel.

The D411 Power Cable:



- A. QuickPosition Switch
- B. 2-pin Molex connector (Male)
- C. 16-pin Power Connector (Female)

**CIGARETTE LIGHTER ADAPTER - 100297**

This is the quickest way of getting the D411 up and running;

1. Plug the D411 male 2-pin Molex connector (from D411 power cable 100504) into the female 2-pin Molex connector of the cigarette lighter adapter (Part# 100297.)
2. Plug the D411 cigarette lighter adapter into the cigarette lighter port on the vehicle. Power is supplied to the D411.

Please note that we strongly recommend that you use your vehicle's cigarette lighter outlet that has a Switched power source (power is on when vehicle is on). This will prevent the D411 from draining the main battery while vehicle is turned off. If a Constant power source is used (power always on), we recommend that you disconnect the cigarette lighter adapter before leaving the vehicle.

**FIXED INSTALLATION (VEHICLE)**

This is the standard method for permanently connecting to your vehicle's electrical panel (below) to supply power your D411 unit. Each D411 comes with a power cable (100504) which has a white 2-pin male Molex connector, as shown below:



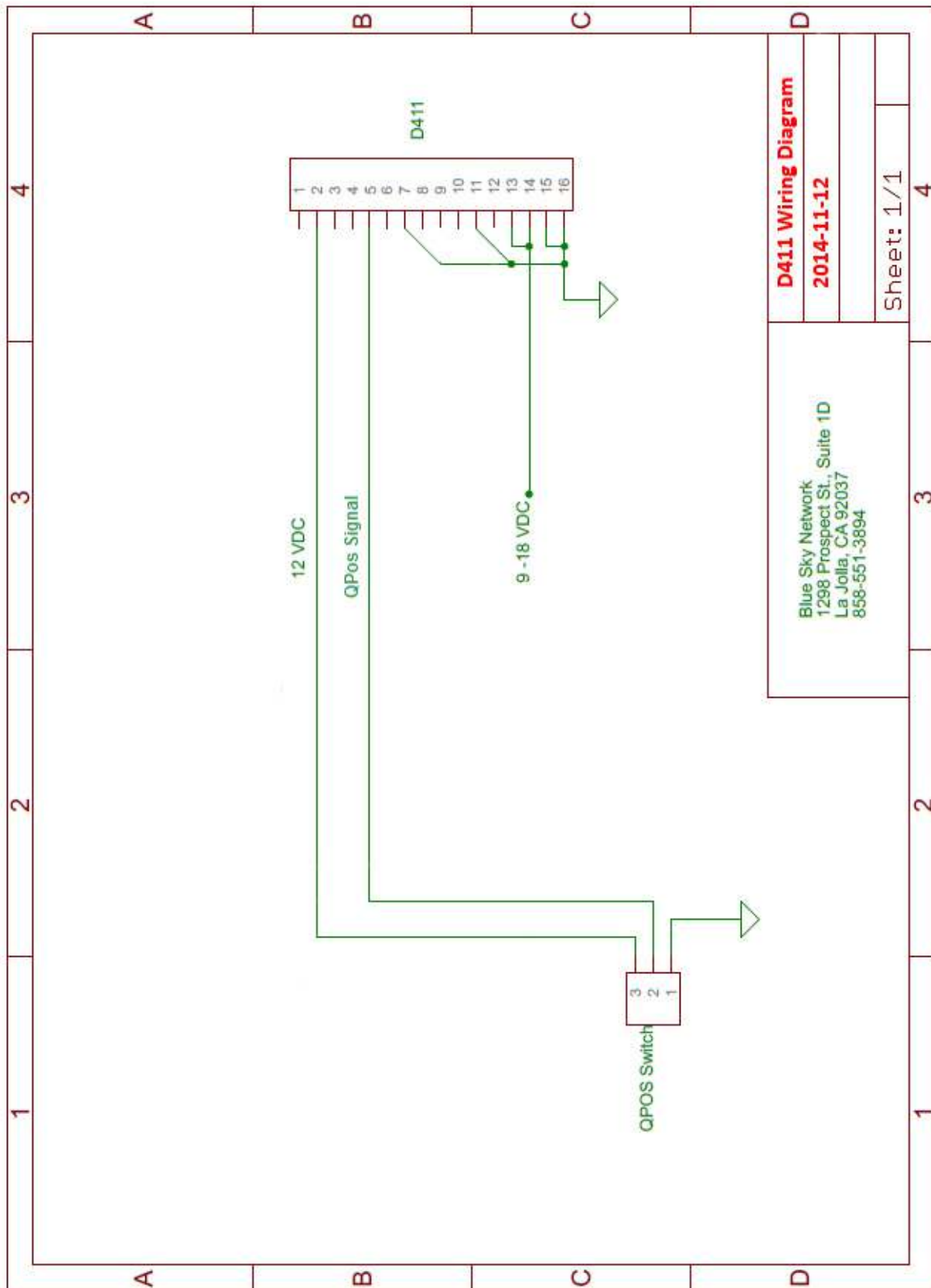
The male 2-pin Molex connector can be used to connect to a female 2-pin Molex connector which will be wired into the power source such as a vehicles 12VDC system.

- The red line connects to the Positive 12v line
- The black line connects to the Negative 12v line or chassis ground

Typical wire colors found in some popular vehicles:

	VEHICLE			
FUNCTION	Toyota	Dodge/Chrysler	Mazda	Ford
12V Switched	Gray	Red	Blue/White	Yellow/Black
12V Constant	Blue/Yellow	Red/White	Blue/Red	Green/Yellow
Ground	Brown	Black or Silver	Black	Black or Fat Red

POWER CABLE WIRING DIAGRAM



## CONNECTING THE ANTENNA – AN100107

The user must supply the BSN AN-100107 Iridium/GPS antenna (available for purchase from sales@blueskynetwork.com.) The proper antenna must have:

- A nominal impedance of 50 Ohms
- A VSWR less than 2.0:1
- A gain 0 – 3 dB for optimum performance
- An SMA female for Iridium and SMA female connector for GPS
- An active GPS antenna (3.3VDC)

The GPS antenna connector is labelled 'GPS'. Make certain that the GPS cable is connected to the GPS output on the antenna to the GPS input on the D411, and that the Iridium cable is connected to the Iridium connector on both the D411 and the antenna. **Failure to do so can damage both the antenna and D411.**

The antenna must be placed in an area where it can have an unrestricted direct view of the sky for better GPS/Iridium reception. **It is recommended that the antenna cables are connected prior to supplying power to the D411 unit.**

## ANTENNA POSITIONING

For optimum performance, the antenna must be installed on the upper surface of the vehicle and with an unrestricted view of the sky down to eight degrees above the horizon (similar to a GPS antenna).

Transmission from the antenna may be affected by, and can affect the operation of other systems and it is the installer's responsibility to evaluate the location for any possible RF interference. In particular, the Iridium frequency is near the allocated GPS and Inmarsat band. The antenna should be at least 39 inches (1 meter) from any L-band antennas, particularly GPS, TCAS and Transponder antennas.

Observe all appropriate sections of AC 43.13-1B and AC 43.13-2A.

Strict maximum attenuation requirements for the coax cable and connectors that link the Antenna to the D411 Unit must be observed. The signal loss budget, including the antenna cable and all connector, from the antenna to the D411 Unit is < 2dB @1626MHz.

## ANTENNA SPECIFICATIONS

**BSN AN-100107** - High performance GPS antenna with high-gain, low noise amplifier with an integrated passive Iridium antenna:

- Mounting screw with slot for easy through hole stud installations
- Low profile, waterproof
- Operating frequency: 1616.0-1626.5 MHz RX/TX (Iridium), 1575MHz (GPS)
- Operating temperature range: -40°C to +80°C / -40°F to +176°F
- Protection Class: IP66
- VSWR  $\leq$  1.8
- GPS Gain: 2 dBic
- Dimensions: 124mm (L) x 80mm (W) x 21mm (H)
- Polarization: RHCP

It is ideal for those applications that require durability, compact size, covert installation and ruggedized construction. **DO NOT PAINT THE ANTENNA**



BSN AN-100107 Antenna

## ANTENNA CABLE SPECIFICATIONS

**BSN CXTK24K-15** – 15ft Low loss, flexible SMA Male to SMA Male coaxial cable.

- Jacket color: Black
- Jacket material: Non-halogenated PE
- Impedance: 50 Ohms
- Operating temperature: -40 °C to +85 °C  
/ -40 °F to +185 °F
- Minimum bend radius: 19.10 mm
- Attenuation (15ft @ 1575-1626.5MHz):  
1.7-1.8 dB



## QUICK POSITION SWITCH

The D411 comes with an LED wired remote Quick Position switch. The Quick Position switch is already wired into the supplied D411 harness.

When the Quick Position mode is enabled this causes the D411 to transmit a series of QPOS (Quick Position) events to SkyRouter. The number of messages and the time between messages can be configured from SkyRouter (see Configure section of this guide for further information.)

When the Quick Position switch is in the ON position the LED inside the switch is ON. When the Quick Position switch is in the OFF position the LED inside the switch will be OFF.



D411 Quick Position cable and switch

## CONFIGURE

### PARAMETERS

Before using your D411 it is recommended that you take time to check and update the parameters on the device to prevent unexpected data usage. By default Blue Sky Network configures the D411 at the factory default setting of 120 second reporting (reports once every 2 minutes.)

The D411 system parameters are all managed using the SkyRouter system. Administrators of SkyRouter can customize the parameters from the SkyRouter interface and update devices remotely (device must be powered on and have sufficient signals to receive the update.) Please consult your SkyRouter user manual for more specific information about sending parameter updates.

Adjusting the parameters on your device will change the behavior of your device. Some parameters control the frequency at which normal position reports are sent, and other will generate events that will be sent in addition to your normal position reports.

#### SKYROUTER PARAMETER UPDATE SCREEN

The following images show the available D411 parameters as seen in the SkyRouter user interface, these are the default settings:

**General Information**

**Device Model:** D411      **Assigned to Device:** BSNBEACOND411\_1

**Device Settings**

Get Factory Defaults    Get Custom Defaults    Copy To    Copy From

Save as custom defaults

Only send modified device parameter values below

Check to enable Inactive Timer (HH:mm)    0 : 10

**GPS Position Report**

Enabled:

Reporting Interval (sec): 120

**Quick Position**

Reporting Interval (sec): 15

Count: 1000

#### D411 PARAMETER EXPLANATION

Normal Position Reports	
GPS Position Reporting	
Enabled	This option will enable or disable normal position reports to be generated based upon a timer.
Time Based Interval	Normal position reports will be generated at this interval.
Event Reporting	
Quick Position Events	
Reporting Interval (sec):	Reporting interval when Quick Position is activated.
Count	Number of Quick Position messages to be sent.



**APPENDIX**

**APPENDIX A – REVISION HISTORY**

Date	Revision	By	Description
2014-11-17	1.0	MP	Initial version D411 Installation Guide
2017-03-21	1.1	AN	Updated the address

## APPENDIX B – POWER UP TEST

After D411 is installed and Power and Antenna connections are properly secured, a Power-Up Test (PUT) is strongly recommended. BEFORE YOU START; please make sure the unit has been registered in your SkyRouter user account and is activated.

### Power-Up Test:

1. Ensure that the Power Connector is securely connected to the D411
2. Ensure that the GPS and Iridium antenna connectors (at both the D411 and Antenna end) are securely connected to the correct terminals.
3. Supply power to the D411 unit.
4. Wait 5 minutes.
  - a. The D411 should acquire GPS and Iridium signals and begin reporting within 5 minutes assuming the antenna a clear view of the sky.
5. Confirm that the D411 is sending reports
  - a. Log into SkyRouter using the login information provided by your account administrator and verify that the D411 sending Position Report Data to SkyRouter.

If you are having problems with any of the steps above; make sure the power connection is reliable, antenna cables are securely connected and the Antenna has a clear view of the sky.

## SUPPORT

Please do not hesitate to contact us either via email, phone or, for self-help, see <http://www.blueskynetwork.com/Support/Support.php> (case sensitive). Thank you for choosing Blue Sky Network!



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