SKYLINK 7100 INSTALLATION GUIDE

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SkyLink 7100

Installation Guide

Version 2.2

Part Number: SL7100

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Blue Sky Network

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INTRODUCTION

This installation guide demonstrates the process of installing SkyLink in an aircraft.

About SkyLink

SkyLink 7100 delivers next-generation global satellite connectivity for autonomous communications and data monitoring beyond visual line of sight (BVLOS). Its slim design allows for easy UAV integration and installation, enabling low latency data streaming from onboard sensors, photo transferring, and real-time command & control. It is IP65 Certified and FCC Part 15 & 25 Certified.

SkyLink Cloud Services is a performance-driven, cloud-based analytics platform for remote, mobile, and global operations. With SkyLink 7100 and SkyLink Cloud Services, achieve total connectivity for all assets, in every location, across the globe.

Installation Components

Installation components are based on the desired configuration for each unit; the list below describes some of the most common components available in the 7100 kit or purchased. All adapter assemblies come with a length of cable that is acceptable for typical installations.

- SkyLink Dual-Mode Data Gateway
- An Iridium-approved, single channel antenna
- DC pigtail harness with Ethernet kit
- RS232 adapter
- Coaxial cable with TNC male connector on one side and SMA male on other. Allowed cable loss for this SKU shall be 0.6dB.

NOTE: If a longer length is needed, you can purchase an extender offered in multiple lengths. Additionally, cable diagrams can be created for specific installations upon request. Please contact us for more information about available accessories, installation kits, and diagrams.

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Top Panel Description

The top panel contains a power LED indicator and 2 SMA connectors for an Iridium and cellular antenna. The descriptions below reference the photo above in accordance with the numerical value.

1. **Iridium Antenna Connector**
   - Furthest connector from power LED indicator
   - “IRI” etched into connector recess

2. **Power LED Light**
   - Green = Initial Power On
   - Red = Unit in Bootloader Mode
   - Blue Blink = OS is Booting
   - Blue Steady = Device is Ready
   - Red Blink = Iridium Firmware Upgrade
   - Blue Blink = SkyLink Firmware Upgrade

3. **Cellular Antenna Connector**
   - Closest connector to power LED indicator

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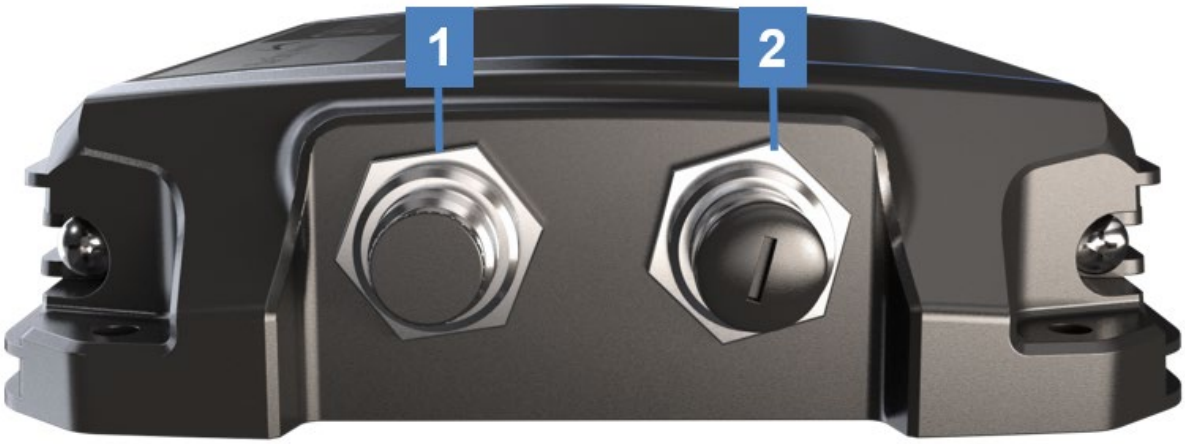
Bottom Panel Description



The bottom panel contains a power port and a connectivity port that connects to multiple adapters. The descriptions below reference the photo above in accordance with the numerical value.

1. **Power Port**
   - Connects to DC Power or Ethernet
   - Remove connector cap before attaching the mating connector

2. **Connectivity Port**
   - Connects to 2 wire voice (USB-POTS) and RS232
   - Remove connector cap before attaching the mating connector

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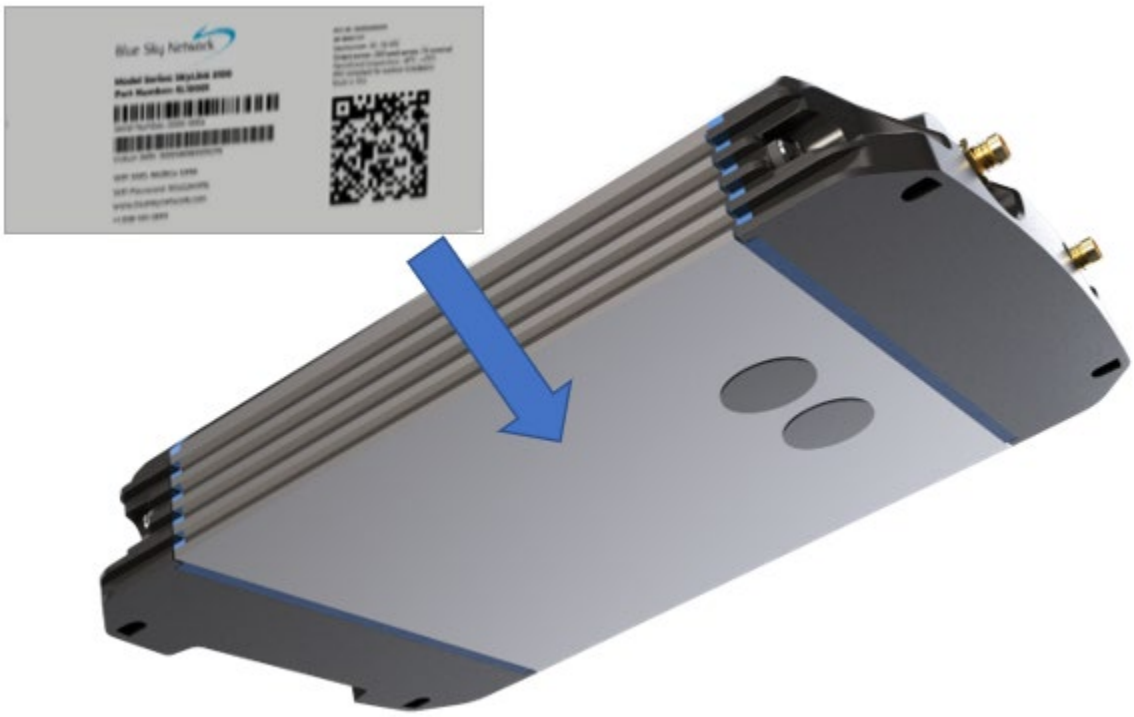
Back Panel Description

The back panel of the unit contains a label with the following information:

- Model series number
- Part number
- Product serial number
- Iridium IMEI
- WiFi SSID and password
- Required certification notifications
- Power and mechanical specifications
- Scannable QR code to access device WiFi

An additional label with this information can also be found in the device's box.



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FAA/JAA APPROVAL

General

Acceptance for SkyLink 7100 installation and use must be sought through the appropriate offices of the Federal Aviation Administration (FAA), Joint Aviation Authorities (JAA), or other certifying agency.

Installation & Operational Approval Procedures

A functional ground test procedure and operational flight check procedure should be used to verify proper installation, functional performance, and electromagnetic compatibility with existing aircraft systems.

Instructions for Continued Airworthiness

The SkyLink 7100 components require no routine servicing or maintenance. The installation has no additional overhaul time limitations.

Environmental Qualification

The SkyLink 7100 terminal is tested and qualified to D0160G sections 4-12, 15-21, and 25. The Iridium-approved, single channel antenna is tested and qualified to DO160G sections 4-8, 10-14, 23, 24, and 26. It is also TSO'd to TSO C159d.

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MOUNTING & INSTALLATION

General Information

Generally, aircraft modification consists of installing a dedicated single Iridium antenna with connections for the SkyLink 7100.

NOTE: **ALL aircraft antennas require professional installation.**

License Requirements

The SkyLink 7100 has no licensing requirements.

Cooling Air Requirements

The SkyLink 7100 has very low power usage, so forced air cooling is not required for any of the components. However, terminals should be kept away from heat sources.

Aircraft Interfaces

The SkyLink 7100 operates independent of aircraft navigation systems. Therefore, no aircraft interface is required other than 10 – 34 VDC power input, power return, and chassis ground.

PIN Assignments

The SkyLink power port is a male M12 (P1) that accepts Amphenol M12A-12BFFA-SL7001. The connectivity port is a female M12 (P2) that accepts Amphenol M12A-12BMMA-SL7001.

P1 (Gateway Left Side)	
PIN	**Description**
1	ETH Green/White
2	ETH Green
3	ETH Orange/White
4	ETH Orange
5	ETH Blue/White
6	ETH Blue
7	ETH Brown/White
8	ETH Brown
9	VDC IN +
10	VDC IN – (GND)
11	SOS (Active High)
12	N/C

P1: Amphenol M12A-12PMMS-SF8001

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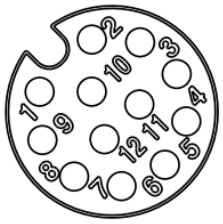
P2 (Gateway Right Side)	
PIN	**Description**
1	USB
2	USB
3	USB
4	USB OTG – N/C
5	USB
6	RS232 - TX
7	RS232 – RX
8	RS232 – GND
9	RS232 - CTS
10	RS232 – RTS
11	N/C
12	N/C



P2: Amphenol M12A-12PFFS-SF8001

Power Input

The only component of the SkyLink 7100 requiring aircraft power is the terminal. The SkyLink 7100 power interface supports wide voltage input in the range of 10 – 34 VDC. The following input connections are the most commonly used:

- 28 VDC nominal, typically less than 0.5A
- 12 VDC nominal, typically less than 1A

A single 3-amp circuit breaker is recommended to protect the aircraft power distribution system.

Power Wiring

To ensure the SkyLink 7100 will operate properly down to its rated minimum input voltage, verify that power wires are shielded, 2 conductor, 24 AWG. It is recommended that power and ground wires are a twisted pair to reduce signal noise.

Ground Bonding

To ensure installation characteristics match the DO-160 RF and lightning test conditions, verify that ground wires of at least the recommended size are installed, and these wires are connected to a bonded aircraft ground.

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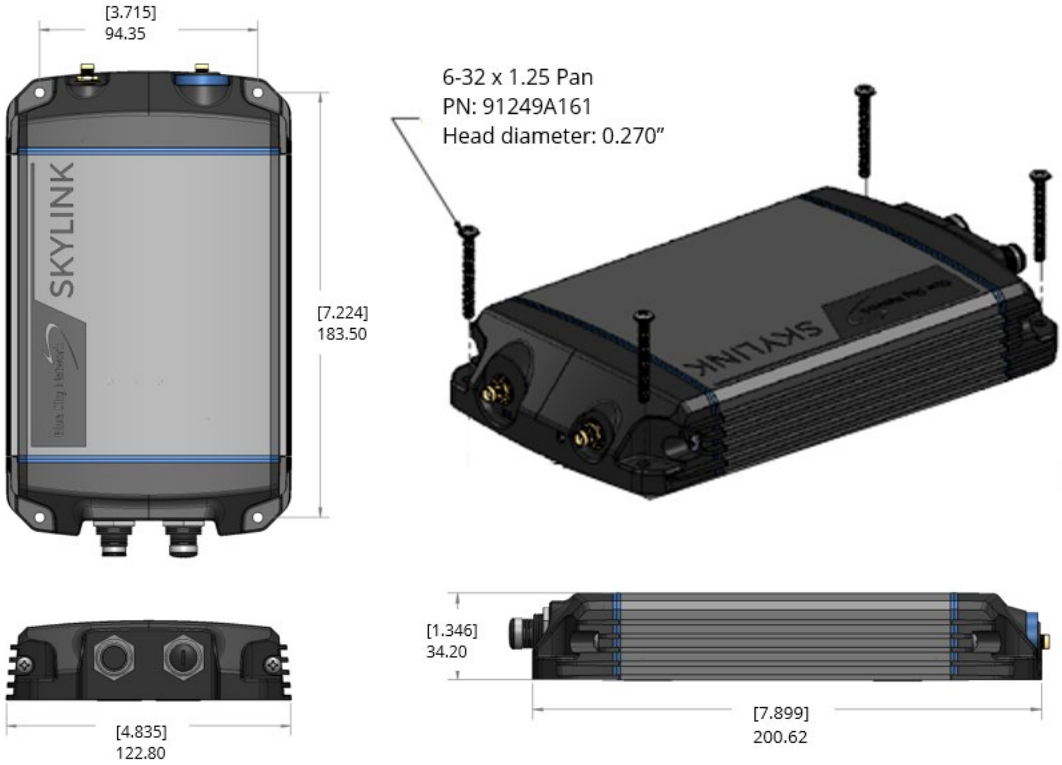
Cable (including Antenna) & Wire Harness Routing Considerations

- Cable length and routing must be carefully planned before starting the installation.
- Avoid sharp bends in the cable. Exceeding the minimum bend radius of the antenna coax cable may result in permanent degradation of the cable loss.
- Do not locate the cable near aircraft controls.
- Observe all appropriate sections of FAR Parts 23, 25, 27, and 29 as well as AC43.13-1B and AC43.13-2A. Damage caused by improper installation will void product warranty.
- To ensure optimal performance, the SkyLink 7100 and associated wiring should be kept a minimum of 3 ft. from high noise sources and not routed with cables from high power sources.
- Total RF loss (including any connectors, adapters, etc.) shall be 0.6dB, which is 3m (10ft) in case of LMR-400.

Mounting

To ensure optimal functionality, install the SkyLink device with bolts to a flat metallic surface.



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Location Requirements

The following must be observed when installing the SkyLink terminal and antennas:

SINGLE-CHANNEL IRIDIUM ANTENNA

NOTE: A Certus-certified antenna for SkyLink is required.

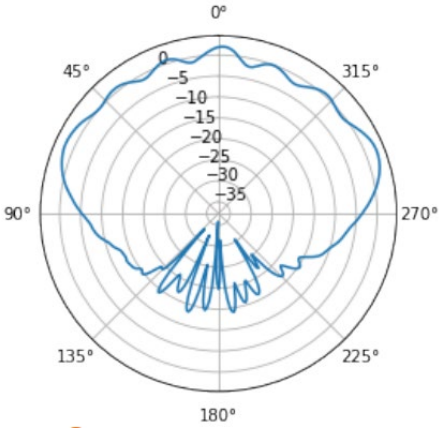
Antenna installation should be completed prior to installing the SkyLink 7100. The antenna must be installed on top of the aircraft fuselage, away from the vertical stabilizer and with an unrestricted view of the sky down to 8 degrees above the horizon (similar to a GNSS antenna).

Maximum cable loss: 0.6dB

SPECIFICATIONS

ELECTRICAL	
Frequency	1616.0-1626.5 MHz
VSWR	≤ 1.8:1
Gain	3 dBic Max.
Polarization	RHCP
Impedance	50 Ω
MECHANICAL	
Weight	13 oz.
Diameter	3.50 in.
Material	6061-T651 Aluminum Alloy/Thermoset Plastic
Finish	Skydrol Resistant Polyurethane Enamel
Connector	TNC Female
ENVIRONMENTAL	
Temperature (Operating)	-55°C (-67°F) to +70°C (+158°F)
Altitude	55,000 ft.

RADIATION PATTERN



To prevent radiation exposure, personnel should maintain a safe distance of 30 cm. (11.8 in.) minimum from the antenna while the unit is operating.

NOTE: Transmission from the antenna may be affected by, and can affect, the operation of other systems; the owner should carefully evaluate the location for any possible RF interference. In particular, the Iridium frequency is near the allocated GNSS band. The device should be positioned at least 39 in. (1 m) from any L-band antennas, particularly GNSS, TCAS, and transponder antennas.

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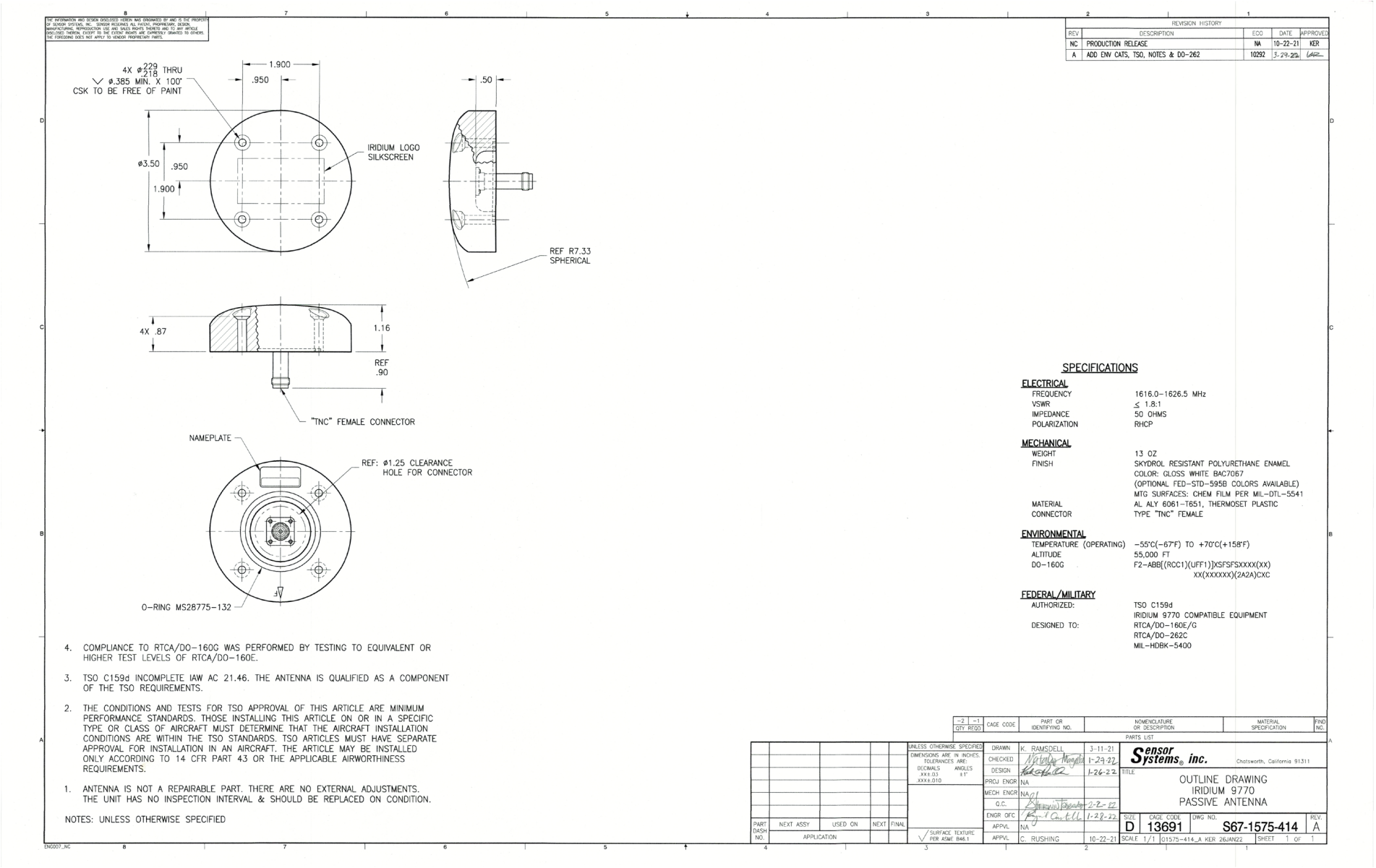
Antenna Diagram



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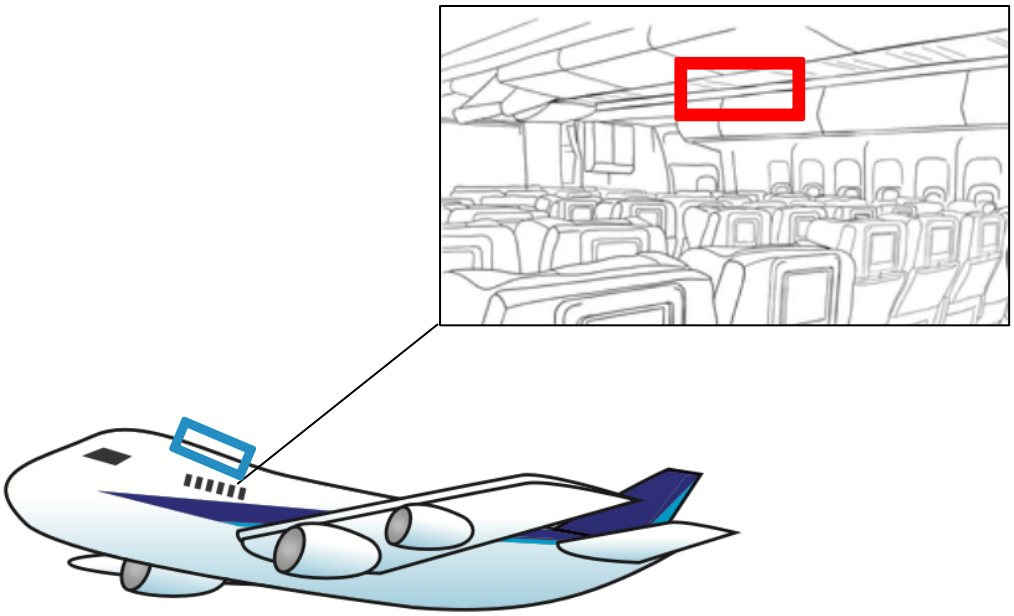
SKYLINK TERMINAL

On an aircraft, the terminal must be installed in a location with total RF loss (including any connectors, adapters, etc.) of no more than 0.6dB, which is 3m (10ft) in case of LMR-400, from the topside fuselage-mounted antenna.

Location Suggestions

For the diagram below, placement suggestions for SkyLink are in **RED** and for the antenna in **BLUE**. There is also a brief description of each location.



SkyLink

- In the cabin, or above headliner, within proximity of the fuselage-mounted antenna

Antenna

- Atop fuselage

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EQUIPMENT SETUP

Step 1 – Install Cellular & Iridium SIM Cards

NOTE: If you purchased your SkyLink device through Blue Sky Network, the unit will come with cellular and Iridium SIM cards already installed.

To install your cellular and Iridium SIM cards:

1. Carefully remove the entire bottom panel of the unit by unscrewing the Phillips screw on each side of the panel.

2. Insert the cellular SIM card into the slot located behind the connectivity port, taking care to ensure wires remain tucked in.

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3. Flip the device over to the back panel (where the white label is located) and insert the Iridium SIM card into the slot.

NOTE: A micro SD slot is also present behind the connectivity port. Confirm that the SIM cards are placed into the correct holders and not the micro SD slot. If the device does not work after installing the SIM cards, they may be in the wrong slots.

4. Re-attach bottom panel by re-screwing Phillips screws.

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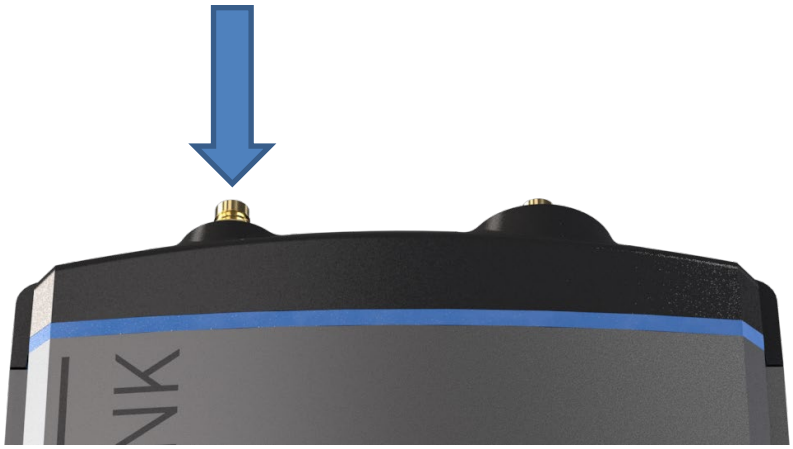
Step 2 – Attach Cellular & Iridium Antennas

CELLULAR ANTENNA

The SkyLink device can integrate with off-the-shelf cellular antennas with multiple outputs. Connect one end of the coax cable to the cellular antenna and the other end to the cellular antenna connector located on the top panel of the unit.



IRIDIUM ANTENNA

The SkyLink 7100 device utilizes a single-channel Iridium antenna with remote connection to the unit. Use the Iridium antenna connector located on the top panel ("IRI" will be etched into the connector's recess).

NOTE: All antennas should be positioned in a location where they have an unobstructed, full view of the sky. Please see Location Requirements for a full list of considerations.

Connect the BSN-provided cable to the respective antenna, then attach the other end to the Iridium antenna connector.

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Step 3 – Connect Power

To power on the device, remove the connector cap from the power port located on the bottom panel of the unit. Connect the power cable into the port and interconnect to suitable aircraft power source.

Confirm Unit Status

To confirm the unit status, use the power LED indicator located on the top panel of the device. It will show green, followed by red, then flashing blue as it boots. A steady blue LED indicates that the unit is ready to use.

Power Off Unit

When you are ready to turn the unit off, simply unplug the power adapter from the power port located on the bottom panel. The power LED indicator will show green and slowly fade. Once the indicator is completely dark (approximately 60 seconds), the unit has turned off.

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Step 4 – Connect Adapters

Listed below are the most common adapters that can be connected to your SkyLink device for additional functionality.

- USB Adapter
  NOTE: An FXS or FXO adapter needs to be plugged into the USB adapter in order to use a POTS phone or phone system. Use an FXS adapter to connect a POTS phone to SkyLink and an FXO adapter to connect a phone system.
- RS232 Adapter
  NOTE: The RS232 cables are proprietary and available only from Blue Sky Network. The SkyLink RS232 cable kit comes with a DB9F connector and conforms to the RS232 standard pinout for a DB9. Please contact sales@blueskynetwork.com or your reseller to purchase.

To attach the adapter, remove the connector cap from the connectivity port located on the bottom panel of the unit. Connect the cable into the port and the adapter into the appropriate device (e.g., modem or POTS adapter).

Step 5 – Complete Setup

Congratulations on successfully installing your SkyLink device! To complete unit setup, including configuring your settings, see the SkyLink User Guide.

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GROUND TEST & OPERATIONAL FLIGHT CHECK PROCEDURE

A functional ground test procedure and an operational flight check procedure should be used to verify proper installation and functional performance. After installing the unit, position the aircraft outside of the hangar with no overhead obstructions. With all other aircraft systems powered down, apply aircraft power to the SkyLink 7100 terminal.

1) Connect the power cable into the power port and the adapter into the appropriate power source.

2) Observe the LEDs. When power is first applied to the SkyLink 7100, the light will show green, red, then flashing blue as it boots. A steady blue LED indicates that the unit is ready to use.

3) For device management and configuration, please refer to the SkyLink User Guide for a singular unit or the SkyLink Cloud Services User Guide for a fleet of devices.

If you experience any difficulty with the SkyLink 7100 functionality or operational performance, please contact Blue Sky Network for assistance.

The required logbook entries and FAA approvals are the responsibility of the installer. Blue Sky Network assumes no responsibility for either obligation.

MAINTENANCE CONSIDERATIONS

Inspection

Blue Sky Network recommends that the following checks are performed before each use:

- Visually inspect the integrity of the mount and mounting bracket.
- Visually inspect the antenna installation for loose fasteners or corrosion.
- Perform a functional check of the system (transmitting and receiving data).

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APPENDIX A - TROUBLESHOOTING

If you are unable to activate your SkyLink device, please contact the Blue Sky Network support team and we will be happy to help!

1) Check to ensure the antennas on your device are functioning and attached to the appropriate connectors located on the top panel. The Iridium antenna should be attached to the connector that is furthest from the power LED indicator. It has “IRI” etched into the connector recess.

2) Ensure the SkyLink LED illuminates. If the power LED indicator is stuck on red, this is an indication of a hardware issue. Remove the power cable from the power port and wait approximately 60 seconds, until the power LED indicator fades from green to dark. Once the unit has completely shut down, reapply power. If the device continues to display red, please contact us for technical support.

The power LED indicator located on the top panel will cycle through multiple colors as it loads. Please see the Top Panel Description section for a description of each color in the cycle.

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SUPPORT

Blue Sky Network is committed to providing the highest level of service and support. If you have any questions or concerns, please feel free to contact us by email or phone; contact information is available at the bottom of this page. For self-help, please visit https://support.blueskynetwork.com/.

Thank you for choosing Blue Sky Network!

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