

Iridium Edge[™]

User Manual



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Prior to using the Iridium Edge, read and understand this User Manual including the safety warnings and information. Failure to do so could result in serious injury or death.

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The Iridium Edge is controlled by the export laws and regulations of the United States of America. The U.S. Government may restrict the export or re-export of the Iridium Edge to certain individuals and/or destinations. Diversion contrary to U.S. law is prohibited. For further information, contact the U.S. Department of Commerce, Bureau of Industry and Security or visit www.bis.doc.gov.

Warranty

Iridium and its Service Providers stand by the Iridium Edge, and the Service Provider offers you a Limited Warranty which you should receive when you purchase the device. Please contact your Iridium Service Provider if you have any questions regarding repair or warranty. Do not contact Iridium.

Introduction

Thank you for purchasing Iridium Edge™.

This User Manual contains the procedures for the safe installation of Iridium Edge



Related Documents

The following Iridium product documentation is available to help you:

- [Iridium Edge Fact Sheet](#)
- [Iridium Edge Quick Installation Guide](#)



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Important Safety Information

WARNING

Prior to using Iridium Edge™, read and understand this User Manual including the safety warnings and information. Failure to do so could result in serious injury or death.

Installation



WARNING Always secure power cables. Failure to secure cables could result in fraying or failure of the power cable, resulting in fire and or failure of the device. These hazards could cause serious injury or death



CAUTION Install the Iridium Edge safely and securely. Failure to do so could result in dislodging of the Iridium Edge especially when operating in areas of high winds or when mounted on moving vehicles, which could result in injury or damage.

Grounding



WARNING Properly ground the Iridium Edge. Failure to properly ground the Iridium Edge could cause unexpected currents, which could cause serious injury or death.



Power cables

Use proper cables that have been supplied by a Service Provider. Use of improper cables can result in damages to equipment, property or persons.



WARNING Use power and ground conductors of proper gauge. Use of improper gauge power cables could result in exposing cables to excessive heat which could cause fire, resulting in serious injury or death.



CAUTION Use only molded back shell IP67 connector with Iridium Edge. Failure to do so could create an improper seal, allowing moisture and water vapor to enter the Iridium Edge's pigtail which in turn could lead to corrosion and damage to the device, resulting in injury or damage.

Explosive Atmosphere / Blasting areas



WARNING Power down or turn off the Iridium Edge when in a “blasting area” or in areas posted “Turn off two-way radio.” Obey all signs and instructions. Failure to do so could result in serious injury or death.



WARNING Turn your device OFF in any area with a potentially explosive atmosphere. Obey all signs and instructions. Sparks from your device in such areas could cause an explosion or fire resulting in serious injury or death.

Pacemakers



WARNING Persons with Pacemakers:

- Should ALWAYS keep Iridium Edge more than eight inches from their pacemaker when it is turned ON.
- Should turn Iridium Edge OFF immediately if there is any reason to suspect that interference is taking place.
- Failure to heed this warning could result in serious injury or death.



Mating Cables



CAUTION Use only qualified cables with a IP67 connector provided by your Service Provider with the Iridium Edge connectors. Failure to do so would create an improper seal, allowing moisture and water vapor to enter the device which in turn could lead to corrosion and damage to the device. This could cause the device to fail, and could result in injury or damage.

External fuse

NOTICE The Iridium Edge must be powered through a fuse or current-limited power supply. Failure to do so could cause large current drawings if unexpected or inadvertent shorts occur in either Iridium Edge device or its mating cable. Any large sustained current could result in damage to equipment.

1 Regulatory and Standards Compliance

Iridium Edge is certified as Model #9680. It is designed to comply with the standards for the United States, Canada, European Union, and Australia/New Zealand as per the table below.

Table 1-1 Regulatory and Technical Certifications.

Regulatory Approvals	Test Specification	
	EMC Tests	ETSI EN 301 489-20 V1.2.1 (2002-11) ETSI EN 301 489-1 V2.1.1 (2017-02)



		EN 55022 :2010/AC :2011 EN61000-4-2 : 2009 (Electrostatic Discharge) EN61000-4-3 : 2010 (Radiated RF Immunity) EN61000-4-4 : 2012 (Electrical Fast Transient) EN61000-4-6 : 2014 (Conducted RF Immunity) EN61000-4-8 : 2010 (Magnetic Immunity) EN55022:2010/AC :2011
	Safety	EN60950-1:2006/A2:2013 EN623311:2008
	RoHS	RoHS 2:2011/65/EU
FCC	FCC 47 CFR Part 25 (Contains a modular approved device: FCC ID Q639603N) FCC 47 CFR Part 15, Subpart B	
Industry Canada (ISED Canada)	ISED RSS 170. (Contains Modular approved device: IC 4629A-09603N) ICES-003, Issue 5 : 2012	
Australia/NZ	AS/NZS CISPR 22 (2009) + A1:2010 ACMA HES Standard (2014)	

1.1 RADIO FREQUENCY RADIATION SAFETY NOTICE AND OTHER INFORMATION REQUIRED BY THE U.S. FEDERAL COMMUNICATIONS COMMISSION AND OTHER GOVERNMENTS

Certifications in most regions, including the United States, require that the Iridium Edge must be installed such that it is at least 20 cm (7.87 inches) away from persons. Users are advised that this device must not be collocated with or operated in conjunction with any other antenna or transmitter than the one contained in this device, unless so permitted by the equipment authorization procedures of the U.S. Federal Communications Commission (FCC).

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference, and
- 2) This device must accept any interference received, including interference that may cause undesired operation.



Any unauthorized modifications or attachments could damage the Iridium Edge and may violate FCC regulations and void your authority to operate the device.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

1.2 Use Aboard Aircraft

The Iridium Edge has not been qualified or tested for operation in aircraft. In the United States, use of the device is subject to regulation including 47 C.F.R. 25.285(a), governing use of the device only by the pilot or with pilot consent. Learn about all of the rules, regulations and laws governing your use of the device before attempting to use on an aircraft.

1.3 Industry Canada (Innovation, Science and Economic Development Canada) Notice Statements

This device complies with Industry Canada (ISED Canada) license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

1.4 REACH (European Union)

The Iridium Edge complies with the REACH directives in the table below

REACH	REACH 1907/2006
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1.5 Device Disposal

Proper device disposal is not only important for safety but also benefits the environment. Consumers should recycle used devices in accordance with applicable national, state and or local laws and regulations.

For EU users, Iridium Edge falls under the EU's WEEE directive which requires that all electrical and electronic products must be taken to separate collection points at the end of their working life and must not be disposed of as unsorted municipal waste.

1.6 French Notices

1.6.1 Importantes consignes de sécurité

AVERTISSEMENT

Assurez-vous de bien lire et comprendre ce mode d'emploi, y compris les avertissements et les consignes de sécurité, avant d'utiliser Iridium Edge™. Le non-respect de ces consignes pourrait entraîner des blessures graves, voire la mort.

Installation



AVERTISSEMENT Protégez toujours les câbles d'alimentation. Manquer de protéger les câbles risque d'entraîner l'effilochage ou la défaillance de ces derniers, et donner lieu à un incendie et/ou la défaillance de l'appareil. Ces dangers sont susceptibles d'entraîner des blessures graves voire la mort.



MISE EN GARDE - Installez l'Iridium Edge solidement et en toute sécurité. Faute de quoi, l'Iridium Edge est susceptible de se déplacer, particulièrement en cas de fonctionnement dans des zones de grand vent ou lorsque l'appareil est installé sur des véhicules en déplacement. Cette situation pourrait donner lieu à des blessures ou à des dommages.



MISE À LA TERRE



AVERTISSEMENT - Assurez-vous de mettre l'Iridium Edge correctement à la terre. Manquer de mettre l'Iridium Edge à la terre peut donner lieu à des courants inattendus susceptibles d'entraîner des blessures graves, voire la mort.

CÂBLES D'ALIMENTATION

Utilisez des câbles appropriés fournis par un prestataire de services. L'utilisation de câbles non adaptés peut entraîner des dommages à l'équipement, à la propriété ou aux personnes.



AVERTISSEMENT - Utilisez des câbles d'alimentation et de mise à la terre du bon calibre. L'utilisation de câbles d'alimentation de mauvais calibre peut entraîner l'exposition de ceux-ci à des chaleurs excessives entraînant un incendie susceptible de causer des blessures graves, voire la mort.



MISE EN GARDE - Utilisez uniquement un connecteur étanche IP67 à gaine moulée avec l'Iridium Edge. Une étanchéité imparfaite pourrait entraîner la pénétration d'humidité et de vapeur d'eau dans la queue de cochon de l'Iridium Edge. Cela provoquerait à son tour la corrosion et l'endommagement de l'appareil et pourrait donner lieu à des blessures ou à des dommages matériels.

ATMOSPHERE EXPLOSIVE/ZONES DE DYNAMITAGE



AVERTISSEMENT - Mettez l'Iridium Edge hors tension dans les « zones de dynamitage » ou dans celles indiquées comme suit : « Éteindre les radios bidirectionnelles ». Obéissez à tous les panneaux et consignes. Le non-respect de ceux-ci pourrait entraîner des blessures graves, voire la mort.



AVERTISSEMENT - Éteignez votre appareil lorsque vous vous trouvez dans une zone dont l'atmosphère est potentiellement explosive. Obéissez à tous les panneaux et consignes. Des étincelles provenant de votre appareil pourraient provoquer une explosion ou un incendie et donner lieu à des blessures graves, voire la mort.



SIMULATEURS CARDIAQUES



LES PERSONNES AVEC UN SIMULATEUR CARDIAQUE :

- Doivent TOUJOURS maintenir l'appareil Iridium Edge à plus de 20 cm (8 pouces) de leur simulateur cardiaque lorsque l'appareil est SOUS TENSION.
- Doivent immédiatement mettre l'appareil Iridium Edge HORS TENSION si elles soupçonnent une interférence quelconque.
- Le non-respect de ces consignes pourrait entraîner des blessures graves, voire la mort.

CÂBLES CORRESPONDANTS



MISE EN GARDE Utilisez uniquement des câbles appropriés avec un connecteur IP67 fourni par votre prestataire de services pour les connecteurs de l'Iridium Edge. Une étanchéité imparfaite pourrait entraîner la pénétration d'humidité et de vapeur d'eau dans l'appareil, ce qui à son tour entraînerait la corrosion et l'endommagement de ce dernier. Cela pourrait provoquer la défaillance de l'appareil et entraîner des blessures ou des dommages.

FUSIBLE EXTERNE

AVIS - L'Iridium Edge doit être alimenté par l'intermédiaire d'un fusible ou d'une alimentation électrique avec limitation de courant. Faute de quoi, d'importants débits de courant pourraient se produire en cas de court-circuit inattendu dans l'Iridium Edge ou son câble correspondant. Tout courant soutenu de forte intensité est susceptible d'endommager l'équipement ou de blesser des personnes.

1.6.2 Conformité aux normes

L'Iridium Edge est conçu pour se conformer aux normes des États-Unis, du Canada, de l'Europe et de l'Australie, comme indiqué dans le tableau ci-dessous.



Tableau 1-2 Certifications réglementaires et techniques.

Approbations réglementaires	Spécification des essais	
CE	Essais EMC	ETSI EN 301 489-1 V2.1.1 (2017-02) EN 55022 :2010/AC :2011 EN61000-4-2 : 2009 EN61000-4-3 : 2010 EN61000-4-4 : 2012 EN61000-4-6 : 2014 EN61000-4-8 : 2010 EN55022:2010/AC :2011
	Sécurité	EN60950-1:2006/A2:2013 EN623311:2008
	RoHS	RoHS 2:2011/65/EU
FCC	FCC CFR47 chapitre 25 (contient un appareil avec approbation modulaire : FCC ID Q639603N) FCC CFR47 Partie 15B (2013)	
Industrie Canada	Industrie Canada CNR-170. (contient un appareil avec approbation modulaire : IC 4629A-09603N) NMB-003, 5e édition : 2012	
Australie	RCM Mark	

1.6.3 Avis obligatoires de la FCC

Pour votre sécurité personnelle, placez l'appareil à au moins 20 cm (7,87 pouces) de votre corps lorsque vous vous en servez. Il est par ailleurs conseillé aux utilisateurs de ne pas placer cet appareil à proximité de toute autre antenne ou émetteur que ce qui est contenu dans cet appareil et de ne pas le faire fonctionner en même temps que ceux-ci, à moins d'en avoir reçu l'autorisation en vertu des procédures d'autorisation des équipements de la Commission fédérale des communications des États-Unis.

Cet appareil est conforme au chapitre 15 du règlement FCC. Son utilisation obéit aux deux conditions suivantes :

- 1) Cet appareil ne doit pas provoquer d'interférences nuisibles, et
- 2) Cet appareil doit accepter toute interférence reçue, y compris les interférences risquant de provoquer des effets non souhaités lors de son fonctionnement.



Toute modification ou accessoire non autorisé est susceptible d'endommager l'Iridium Edge et de contrevenir au règlement FCC, annulant votre autorisation à faire fonctionner l'appareil.

Cet équipement a été testé et avéré conforme aux limites définies pour un appareil numérique de classe B, en vertu du chapitre 15 du règlement FCC. Ces limites sont conçues pour assurer une protection raisonnable contre les interférences nuisibles lorsque l'équipement est utilisé dans un environnement résidentiel. Cet équipement génère, utilise et peut émettre une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions, peut créer des interférences nuisibles perturbant les communications radio. Toutefois, rien ne permet de garantir l'absence totale d'interférence dans une installation donnée. Si l'équipement perturbe la réception de radios ou de télévisions, ce qui peut être vérifié en éteignant et en rallumant l'équipement, l'utilisateur est invité à tenter de faire disparaître ces interférences en recourant à l'une des mesures suivantes :

- Réorienter ou déplacer l'antenne de réception.
- Augmenter l'écart entre l'équipement et le récepteur.
- Brancher l'équipement sur une prise située sur un circuit autre que celui auquel est raccordé le récepteur.

Consulter le revendeur ou un technicien expérimenté pour obtenir de l'aide.

1.6.4 RÉGLEMENTATION — AÉRONEFS

L'Iridium Edge n'a pas été testé ou certifié pour fonctionner à bord d'un aéronef. L'utilisation de l'appareil aux États-Unis est soumise à des réglementations, notamment 47 C.F.R. 25 285(a), qui régissent l'utilisation de l'appareil uniquement par le pilote ou avec le consentement du pilote. Renseignez-vous sur toutes les règles, réglementations et lois régissant votre utilisation de l'appareil avant de tenter son utilisation à bord d'un aéronef.

1.6.5 Industrie Canada

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

1.6.6 REACH

REACH	REACH 1907/2006
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1.6.7 Élimination des appareils

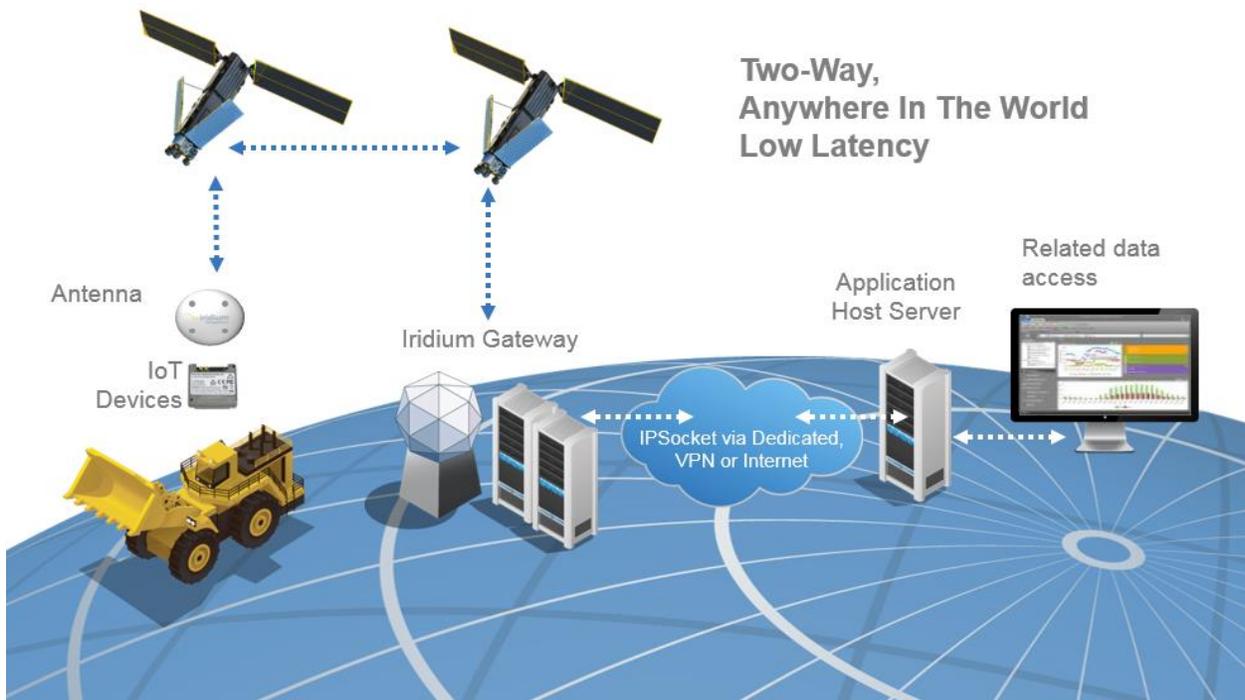
La bonne élimination des appareils est importante tant pour des raisons de sécurité que pour la protection de l'environnement. Les consommateurs doivent recycler les équipements usagés conformément aux lois et réglementations locales, provinciales ou nationales. En vertu des lois de l'UE, tous les équipements électriques et électroniques (EEE) en fin de vie utile doivent être recyclés dans un point de collecte pour déchets d'équipements électriques et électroniques (DEEE) et ne doivent pas être éliminés avec les autres déchets ménagers.



2 Product Overview

The Iridium Edge is a finished satellite device with a power supply and antenna in an environmentally sealed enclosure. It contains an Iridium Short Burst Data (SBD) modem which allows remote devices to send and receive satellite messages from anywhere in the world. Iridium SBD service has two message size classes. The larger message class supports message sizes up to 1960 and 1890 bytes for Mobile Originated and Mobile Terminated messages respectively. The Iridium Edge uses the smaller size message class which supports satellite messages of size 340 bytes for a Mobile Originated message and 270 bytes for a Mobile Terminated message. As per the figure below, all satellite messages are routed through Iridium's Gateway which provides a secure internet connection to an Application Host server, which is typically designed for a specific application or vertical market.

Figure 2-1 Iridium Edge Overview



Like Iridium's SBD transceivers, the Iridium Edge is sold to Iridium distribution partners for integration in a solution for a specific application or vertical market. Using an SBD transceiver, Iridium's partners can design and manufacture their own customized hardware. However, with the Iridium Edge, Iridium provides its partners a generic finished device such that they do not need to design, build and in many cases certify to add satellite capabilities to their existing terrestrial solutions.

The Iridium Edge is not a stand-alone satellite device. It must be integrated into an application or solution on the remote side to the Iridium Edge and the backend Application to the Iridium gateway. Remote host devices can control and monitor the Iridium Edge uses through AT commands over a RS232 interface. The AT commands are the same AT commands supported by the SBD transceivers. On the gateway side, the Application uses an Iridium's Direct IP connection to send and receive messages. More details on the SBD service and how applications can integrate the Iridium Edge can be found in Section 2.3 Reference Documentation.

Figure 2-2 Iridium Edge Integration in an Application



2.1 Key Benefits

The key benefits of the Iridium Edge are

- Iridium network certified
- Environmentally sealed device with IP67 rating
- Built in robust power supply
- Single part number for all installations
- Regulatory approvals in key regions
- Built in Iridium satellite antenna

2.2 Scope

The Iridium Edge User's Guide provides specifications for the Iridium Edge hardware along with installation guidelines. It does not provide developer information for software of the Iridium Edge and the Gateway services.

2.3 Reference Documentation

Development documentation is available from Iridium for qualified partners.

Iridium Developers are recommended to reference the following documents when building applications with Iridium Edge.

- 1) "Iridium Short Burst Data Developer Guide", MAN0025, Release 3.1
- 2) "ISU AT Command Reference" ,MAN0009, Version 5



2.4 Physical Specification

The following two figures show the Iridium Edge views from the top and bottom.

Figure 2-3 Iridium Edge Top View



Figure 2-4 Iridium Edge Bottom View

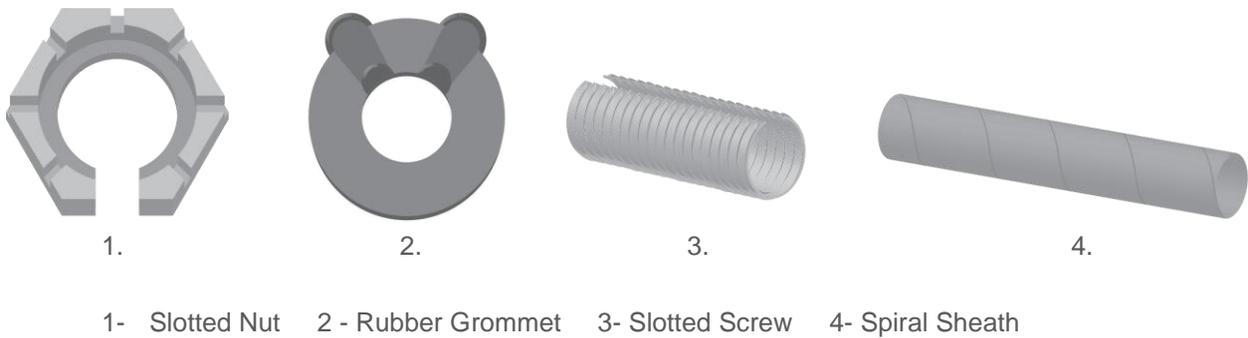


2.5 Accessories

The Iridium Edge ships with an Accessory Bag with parts for use when the Iridium Edge is installed with a bottom mount screw. More details on this installation is described in Section 5.6 Mounting the Iridium Edge.

The Accessory Bag contains the following items as illustrated in the figure below:

Figure 2-5 Accessory Bag Contents



2.6 Temperature

The Iridium Edge's temperature specifications are summarized in Table 2-1 below.

Table 2-1 Temperature Specifications

Parameter	Value
Operating Temperature Range	-40°C to + 85°C
Storage Temperature Range	-40°C to + 85°C

2.7 Environmental

The environmental specifications of the Iridium Edge are summarized in the table below. All Iridium Edge testing has been performed with a mated IP67 connector connected to its pigtail.



Table 2-2 Environmental Specifications

Test Name	Test Reference	Test Description
Vibration Testing	SAE J1555, Section 4.10	5 hours on each axis as per figures 6,7 and 8 in SAE J1455
Shock	SAE J1455	Drop 1m onto concrete in 3 perpendicular orientations (3 drops)
Immersion Testing	SAE J1455, Section 4.3.3.2	3 dunks Cable mated when dunked
Fungus Testing	SAE J1455, Section 4.6.3	Duration of 30 days
Humidity	SAE J1455, Section 4.2	Temperature Range : -40 to 85C Relative Humidity : 90% Number Cycles : 30 Duration of Cycle : 8 hours
Chemical Splash Resistance	SAE J1455, Section 4.4.3.2	Brush method
Salt Spray Resistance	SAE J1455, Section 4.3.3.1	Duration of 96 hours
Dust and Steam Cleaning	SAE J1455, Section 4.5.3	At level 4
Low Pressure Storage	SAE J1455, Section 4.9.3	At -40C for 48 hours

2.8 Connector

The Iridium Edge connector terminates with a pig tail cable that allows for side and bottom cable exits.



Figure 2-6 Connector



2.8.1 Connector Part Numbers

The Iridium Edge uses an eight (8) pin male M12 connector. Connector and recommended mating connector part numbers are provided in the table below.

Table 2-3 Connector Specifications

Parameter	Value
Connector Type	M12 – 8 Pin Male
Mating Connector Type	M12 -8 Pin Female with IP67 rating
Recommended Mating Connector	Digikey part# A122384-ND

2.8.2 Connector Pin-outs

Connector pin positions and the corresponding pin-out descriptions are given in the figure and table below.



Figure 2-7 Connector Pin Positions



Table 2-4 Iridium Edge Pin-outs

Pin No.	Signal Name	Signal direction (with respect to Iridium Edge)	Description
1	Spare		Unused
2	Ground	Input	for both signal ground reference and power return
3	RS232_RX	Input	RS232 Input
4	RS232_TX	Output	RS232 output
5	Power	Input	9 -32V
6	On/Off	Input	Optional control line to power down Edge
7	Network Available	Output	Data port, serial data output
8	Power Detect	Output	Active High when Edge powered

2.9 Enclosure

Dimensioned drawings for the side and top view of the Iridium Edge are shown below:



Figure 2-8 Enclosure Top View

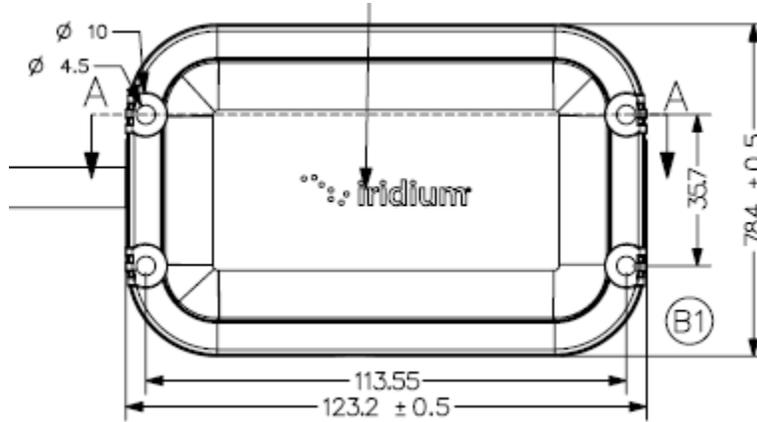


Figure 2-9 Enclosure Side View



2.9.1 Enclosure Dimensions

Table 2-5 Enclosure Specifications

Parameter	Value
Length	123.2 mm
Width	78.4 mm
Height	30.3 mm

2.9.2 Mount Holes

As per figure below, the Iridium Edge has two screw holes on each of its ends to mount the terminal. It is important to use screws with low profile heads so that satellite antenna performance is not affected.



Figure 2-10 Mount Holes Showing Two Screw Types

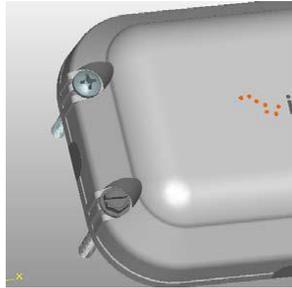


Table 2-6 Mounting Hole Specifications

Parameter	Value
Screw Hole Diameter	4.5 mm
Screw Head Clearance Diameter	10 mm
Screw Hole Length	14.5 mm
Recommended Mounting Screw	M4

2.9.3 Plugs

The Iridium Edge come factory installed with two grey plugs in each of the side channels. If a side exit cable installation is used the plug needs to be removed. As the plugs are included purely for aesthetic purposes both can optionally be removed. They can be removed by gently prying them out with a sharp flat head screw driver.

Figure 2-11 Side Channel Plugs



2.9.4 Enclosure Specifications

The table below outlines the specifications for the enclosure

Table 2-7 Enclosure Specifications

Parameter	Value
Material	Lexan EXL 9330
Weathering Rating	Y1
Grey Plug material	Formosacon FM090

2.10 Pigtail Cable

As shown in the figure below, the Iridium Edge has a pigtail cable that terminates with the Iridium Edge's connector.

Figure 2-12 Pigtail Cable



The pigtail cable allows the Iridium Edge to be mounted in two configurations from the Iridium Edge

- Cable coming out the side from underneath (from either the short or long side)
- Cable coming out the bottom

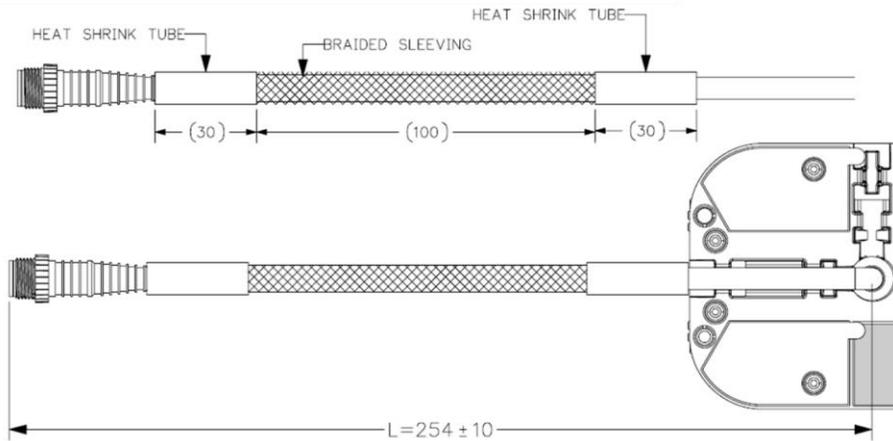
Each of the two side channel exits pinches the cable to provide strain relief.

2.10.1 Pigtail Drawings

The following figure provides the mechanical dimensions for the Iridium Edge's pigtail cable



Figure 2-13 Pigtail Cable Drawings



2.10.2 Mechanical Specifications

The following table lists the specifications for the Iridium Edge’s pigtail cable

Table 2-8 Pigtail Cable Mechanical Specifications

Parameter	Value
Cable Length	27 cm
Cable material	Half MATT PVC
Conductor (X8) Gauge	24 AWG
Braided Sleeve Material	Hellermann Tyton (PN#170-030429)
Cable Flammability Rating	VW-1
Bend Radius	65mm (on Outer Diameter)
Maximum Pull Strength	100 N
Connector Metal Material	Hpb59-1 (Leaded brass)
Connector Diameter	14.5 mm

The pigtail cable has a IP67 rating only when properly mated with a recommended mating connector. If a IP67 mating cable is not connected to the Iridium Edge, it must not be stored outdoors or in locations that are subject to water and condensing humidity.



2.11 Mass

The table below provides the mass specification for the Iridium Edge

Table 2-9 Mass Specification

Parameter	Value
Mass	205 (+/- 10 g)

3 Electrical and RF Specifications

The following subsections contain interface information for the electrical interfaces of the Iridium Edge.

3.1 Power Interface

3.1.1 Input Specification

The table below provides the voltage input specification for the Iridium Edge. The power and ground inputs are reverse polarity protected.

Table 3-1 Input Power Specification

Parameter	Value
Input Range	9 – 32V DC
Reverse Polarity Protection	32 VDC

3.1.2 Current Limiting

The Iridium Edge restricts the input current draw to minimize the voltage difference between the Iridium Edge's internal ground reference and the external power supply. The maximum current specification is provided in the table below.



Table 3-2 Current Limit Specification

Parameter	Value
Power On – Maximum Current	0.5A
Operational – Maximum Current	0.3A

3.1.3 Mating Cable Guidelines

The mating cable connects the Iridium Edge to external power and external controller with RS232 and optional control inputs. The below lists the conductor gauge recommendations based on the external cable length.

Table 3-3 Mating Cable Gauge Specification

Parameter	Value
Minimum Gauge Cable Length <20m)	24 AWG
Minimum Gauge (Cable Length < 30m)	22 AWG



CAUTION Use only qualified cables with a IP67 connector provided by your Service Provider with the Iridium Edge connectors. Failure to do so would create an improper seal, allowing moisture and water vapor to enter the device which in turn could lead to corrosion and damage to the device. This could cause the device to fail, and could result in injury or damage.

3.1.4 Load Dump Protection

The Iridium Edge is designed to operate through voltage transients as per SAE J1455 and survive input large load voltages. The Iridium Edge survives large load dumps by internally disconnecting the input voltage when large voltages are detected. Once the input voltage is restored to a valid operational input, the Iridium Edge resets the SBD modem and resumes operation.



Table 3-4 Load Dump Specification

Parameter	Value
Load Dump Disconnect voltage	40V
Load Dump Disconnect time	400 ms

3.1.5 Internal Fuse

The Iridium Edge contains an internal, non-serviceable internal surface mount fuse to limit the current in the event of an internal short.

Table 3-5 Internal Fuse Specifications

Parameter	Value
Fuse Rating	3 A

3.1.6 Startup Times

The Iridium Edge uses an internal super capacitor to limit the current which in turn minimizes the voltage drops on the power and ground return. Before the Iridium Edge can reliably start operation, its internal super capacitor must be at least partially charged. The internal super capacitor is charged when a valid voltage is present and when the Iridium Edge is not powered down with the On/Off control line.

The table below outlines the specifications for the startup times for the Iridium Edge to startup its internal SBD modem.

Table 3-6 Startup Times

Parameter	Value
Cold Startup (if not powered on in last 24 hours)	< 12s
Warm Startup Duration (if powered on in last 24 hours after fully charged)	<8s
Fully Charged Duration	< 20s



3.1.7 Brown Out

The Iridium Edge monitors the input voltage. If the input voltage drops too low for reliable operation after a valid input voltage is applied, the internal SBD modem's is turned off and remains turned off until a valid input voltage is restored.

Table 3-7 Brown out Specifications

Parameter	Value
Minimum Reset Voltage	6 V

3.1.8 Operating Power Consumption

The Iridium Edge power consumption can vary for a number of reasons:

- View of the sky which determines the quality of the signal received by the Iridium Edge
- The rate Host Controller system activates/deactivates the Iridium Edge on the SBD network
- Manufacturing and component tolerances variations

3.2 Serial RS232 Interface

The Iridium Edge uses a 3-wire RS232 interface which supports an AT command interface.

Table 3-8 Serial Interface Specifications

Parameter	Value
RS232 Rx & TX (Absolute Maximum Voltage)	32 VDC
ESD Protection	15 kV human body model
Short to Ground Protection	Yes
Tx Low Maximum	-3.7 V
Tx High High Minimum	3.7 V
Rx Input Low Threshold	0.6V
Rx Input High Threshold	2.4 V



3.2.1 Baud Rate

Host equipment connecting to the Iridium Edge should be configured to the baud rate settings in the table below. Auto baud is not supported.

Table 3-9 Baud Rate Settings

Parameter	Value
Baud rate	19200 b/s
Data Bits	8
Parity	None
Stop Bits	1

The baud rate can be set via the AT+IPR command. However, users are strongly advised to not change the baud rate so the Iridium Edge uses a reliable, fixed baud rate. If the baud rate is changed with the appropriated AT command, be advised that the SBD's default is restored whenever factory defaults are loaded.

3.2.2 Flow Control

It is strongly recommended to use the Iridium Edge with SBD's flow control disabled.

The SBD's flow control setting can be set by AT commands. For Iridium Edge units, the internal SBD's flow control setting has been updated and saved to flash to disable flow control. However, if the SBD's factory default configuration is reloaded, flow control is re-enabled. To restore flow control to the Iridium Edge's shipped defaults, issue the AT&K0 and AT&W0 as per the table below.

Table 3-10 Flow Control Parameters

Parameter	Value
Disable Flow Control	No Flow Control (AT&K0)
Save Configuration in Non-volatile	AT&W0
SBD Factory Flow Control Default (Do not use this setting)	Flow Control (&K3)



3.2.3 DTR Settings

The SBD's DTR setting can be set by AT commands. For Iridium Edge units, the internal SBD's DTR setting has been updated and saved to flash although the SBD's internal DTR signal is grounded internally on the Iridium Edge and comes out externally on the Iridium Edge connector. In the event the SBD's factory default configuration is reloaded, the default DTR setting will be re-enabled. To restore the SBD's DTR setting to the Iridium Edge's shipped defaults, issue the AT&D0 and AT&W0 as per the table below.

Table 3-11 Internal SBD DTR Settings

Parameter	Value
Disable Flow Control	No Flow Control (AT&D0)
Save Configuration in Non-volatile	AT&W0
SBD Factory Flow Control Default (Do not use this setting)	Flow Control (&D2)

3.3 On/Off Control Input

The Iridium Edge can be powered down using its On/Off input. When the Iridium Edge is powered down, its internal SBD modem is turned off and the Iridium Edge cannot send or receive satellite messages. As well, the RS232 drivers are not powered, which disables the AT interface communications with a Host Controller.

The On/Off control line inputs are described in the table below. If the On/Off input is left floating, or if it is high, the Iridium Edge is powered on. When the On/Off control input is grounded or a negative voltage, the Iridium Edge is powered off.



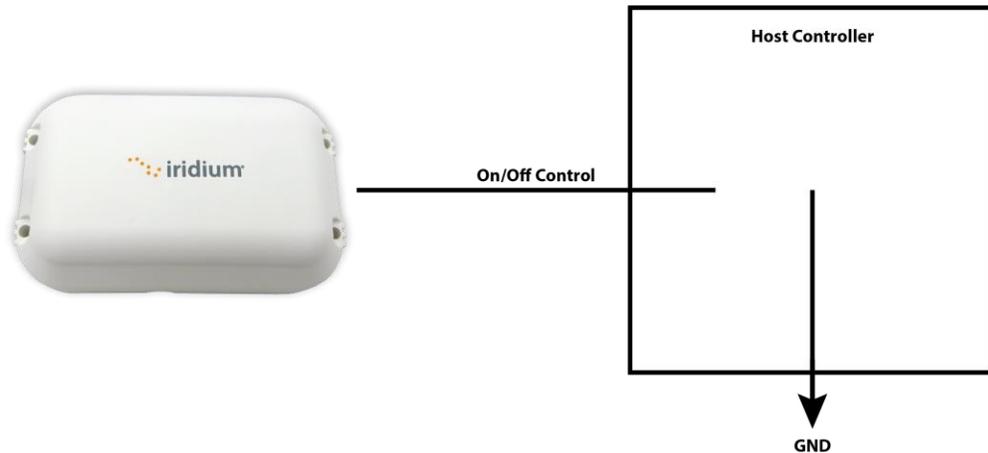
Table 3-12 On/Off Control Specifications

Parameter	Value
Absolute Minimum Voltage	-12V
Absolute Maximum Voltage	32V
Power Off Level	< 1.5 V
Power On Level	Floating or > 1.5 V
ESD Protection	15 kV Human Body Model

3.3.1 Recommended Operation

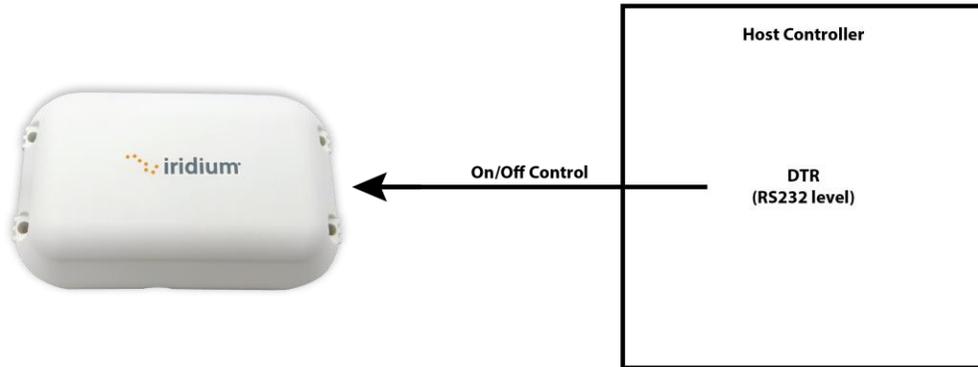
It is recommended that the On/Off control line, if used, is switched to ground to power down the Iridium Edge. A switch to ground circuit, rather than a switch to power circuit, is recommended as this circuit avoids exposing the On/Off input to power supply transients. Although the On/Off accepts the maximum input supply voltage, the On/Off input does not have load dump and transient protection like the supply input. In no case should the On/Off input exceed the absolute maximum voltage ratings.

Figure 3-1 On/Off Control Using Switch to Ground



Alternatively, the On/Off control line can be driven directly by a RS232 signal level such as DTR.

Figure 3-2 On/Off Using DTR



Prior to turning off the Iridium Edge, a “flush memory” (AT*F) command should be issued to ensure all internal SBD modem’s flash memory write activity is completed.

3.3.2 Power Down Consumption

The table below shows typical average current draw when the Iridium Edge is powered down.

Table 3-13 Power Down Specifications

Parameter	Value
Power Down Current (typical)	200 uA

3.4 Network Available Indicator

The Iridium Edge’s Network Available (pin #7) indicator is driven directly by the internal SBD modem. When active, the Network status indicates if the Iridium Edge has visibility to an Iridium satellite. As an alternative to using the Network Available hardware output, a host can use AT commands to poll the



Iridium Edge's network status. If the Network Indicator function is not required, this pin should be left disconnected.

Network Available is not a guarantee that a message can be successfully sent; instead it reports if it can see an Iridium satellite by measuring the level of the incoming satellite channel. The Network Available state is evaluated every time the satellite channel is received or missed. If the satellite channel is visible, then the update interval is typically every 4 seconds. If the satellite is not currently visible, then the update period can be as long as 2 minutes, depending on how long the lack of satellite visibility existed. The duration increases during lack of satellite visibility as the SBD modem backs off its attempts to conserve power by increasing the satellite channel search interval. Every time a satellite search fails, the time to wait is increased and eventually limits at 120 seconds.

The specifications for the Network Indicator are listed in the table below. The Network Indicator is an output and should not be driven by an external source.

Table 3-14 Network Available Output Specifications

Parameter	Value
Active (Satellite in view)	> 2.4 V
Inactive (No Satellites in view)	<0.5 V
ESD Protection	15 kV

Complete details on the Network Indicator behavior can be found in the documents listed in Section 2.3 Reference Documentation

3.5 Power Detect Indicator

The Iridium Edge's Power Detect (pin #8) indicator is RS232 compliant signal. The output specifications for the Power Detect indicator are given in the table below.

Table 3-15 Power Detect Specifications

Parameter	Value
Maximum Output Level (when powered and ready)	6V +/- 0.5V
Minimum Output level (when powered but not ready)	-6V +/- 0.5V
ESD Discharge	15 kV



The Power Detect indicator could potentially be used in applications when the host wants to detect if an Iridium Edge Cable has been tampered. It could also be used during installation to provide feedback if the Iridium Edge has power applied.

3.6 RF Specifications

The RF specifications for the Iridium Edge are listed in the table below. These specifications are not required to use the Iridium Edge, but may be required for some local regulatory equipment approvals

Table 3-16 RF Specifications

Parameter	Value
Frequency Range	1616 MHz to 1626.5 MHz
Duplexing Method	TDD (Time Domain Duplex)
Polarization	RHCP
Multiplexing Method	TDMA/FDMA
Multiplexing Method	TDMA/FDMA
Average Power during Transmit Slot (maximum)	1.6 W

4 Mating Cable Guidelines

Iridium's Service Providers are responsible to provide the end users with quality mating cables that meet the required specifications for a particular installation type. These specifications will vary depending on geography, industry requirements, local regulations, environment and specific end user needs.

Service Providers not equipped to fabricate mating cables should contact a qualified cable assembly house. For those Service Provides qualified to make cables, Iridium offers a general purpose Blunt Cut cable to accelerated prototypes and early production deployments. It is important that the Service Provider ensures that the Blunt Cut cable's specifications meets the installation requirements before



incorporating it in a final cable assembly. The specifications for Iridium's Blunt Cut cable are in the appendix.

The following general guidelines should be followed to when building mating cables for the Iridium Edge

4.1 Molded Back-shell

The mating cable must have a molded back-shell and use IP67 rated cable connectors.



CAUTION Use only molded back shell IP67 connector with Iridium Edge. Failure to do so could create an improper seal, allowing moisture and water vapor to enter the Iridium Edge's pigtail which in turn could lead to corrosion and damage to the device, resulting in injury or damage.

4.2 Mating Cable Gauge

The cable must be designed to minimize voltage drop across the. The table below lists recommended gauges for all conductors based on the cable length. For operation with cable lengths longer than 30m, contact Iridium support.

Table 4-1 Mating Cable Specifications

Cable Length	Minimum Wire Gauge
<20 m	24 AWG
20m to 30 m	22 AWG



WARNING

WARNING Use power and ground conductors of proper gauge. Use of improper gauge power cables could result in exposing cables to excessive heat which could cause fire, resulting in serious injury or death.

4.3 Cable Jacket Properties

Select a cable jacket that meets all installation requirements such as temperature, vibration, flammability and chemical resistance. Any cable that is exposed to sun light, should have adequate UV protection.

4.4 Shielding

A shield cable is recommended to minimize any EMI/EMC that could affect operation of the cable. The cable's braid should be connected to a single point ground either near the power supply or at the Iridium Edge connector depending on application requirements.

4.5 RS232 Ground Wiring

The serial RS232 is a 3 wire interface. In addition to RS232 Rx and Tx, the RS232's signal ground (distinct from the RS232 frame ground) must be connected to the Iridium Edge's ground.

A "Y" connection for the ground connection in the mating cable is recommended to minimize voltage differences between the Iridium Edge, the power source and the host controller.

WARNING

WARNING Properly ground the Iridium Edge. Failure to properly ground the Iridium Edge could cause unexpected currents, which could cause serious injury or death.



5 Installation Guidelines

The following section contains installation guidelines to install the Iridium Edge.

5.1 Installer Qualifications

All installations must be done by an appropriated qualified installer. Do not install the Iridium Edge without adequate training. If there are any questions or concerns regarding any installation instructions, contact your Service Provider before installing the Iridium Edge.

5.2 Handling

The Iridium Edge should be carried by its enclosure.

Never carry Iridium Edge by its pigtail connector.

5.3 IMEI Recording

Before an installation, the Iridium Edge's IMEI number must be recorded along with the installation location. The Iridium Edge's IMEI number is the network address for the Iridium Edge and it is used for provisioning, billing and to send or receive messages to and from the device.

The IMEI number is located on the bottom of the Iridium Edge as per the picture below.

Figure 5-1 IMEI Location



The Iridium Edge includes four additional IMEI labels. These labels are located on the bottom of the Iridium Edge shipping box as per the figure below. If the Iridium Edge is mounted in a difficult to reach place or if its IMEI label is covered, the spare IMEI label can be optionally affixed to an accessible location such that the IMEI can be easily read.

Figure 5-2 Additional In-Box IMEI Labels



5.4 Restricted Installations

The Iridium Edge has not been qualified or tested for operation in aircraft. In the United States, use of the device is subject to regulation including 47 C.F.R. 25.285(a) governing use of the device only by the pilot or with pilot consent. Learn about all of the rules, regulations and laws governing your use of the device before attempting to use on an aircraft.

5.5 Select a Mounting Location

The mounting location is critical to ensure a safe installation and reliable operation. For reliable operation and optimal satellite performance, the installer should consider the following guidelines

- The location must provide a safe and secure installation





CAUTION Install the Iridium Edge safely and securely. Failure to do so could result in dislodging of the Iridium Edge especially when operating in areas of high winds or when mounted on moving vehicles, which could result in injury or damage.

- The Iridium Edge is not intended to be operated near a person. Always ensure that the Iridium Edge is mounted more than 20 cm from persons for compliance with RF exposure limits.
- Select a flat, horizontal mounting location for optimal uniform satellite performance.
- Make sure that the mounting location provides a clear unobstructed 360 degrees' view of the sky in all directions. Typically, this means selecting a mounting location that is on top of an asset.
- Do not install the Iridium Edge inside a building or under metal surfaces.
- Make certain that the mounting location will not heat up the Iridium Edge causing its temperature to exceed the maximum operating temperature. If the surface can get hot, especially in the direct sun, an insulating material should be used between the mounting surface and the Iridium Edge.
- Never mount the Iridium Edge close to any other communication equipment or antennas.
- Never install the Iridium Edge in a location where water can collect.
- Never install the Iridium Edge near an exhaust which can deposit fumes and carbon and which can affect satellite operation.

5.6 Mounting the Iridium Edge

The Iridium Edge can be mounted in three methods, depending on the installation requirements: screw mount, bottom mount and side/tape mount.

The red tape should be left on the Iridium Edge unless the Iridium Edge is double-side mounted with tape.

5.6.1 Screw Mount

The Iridium Edge has 4 mounting holes designed to accommodate M4 screws.

- **Do not remove the red plastic over the double side tape.** Removing the red tape, exposes the



double sided tape which may cause the tape to inadvertently adhere the Iridium Edge to the mounting surface.

- The installer needs to provide all mounting hardware for the Screw Mounting installation. Screw selection is installation specific depending on the mounting surface thickness and its material type.
- The Accessory Bag contents are not required for the Side Mount installation. These can be set aside.
- Use Iridium Edge to carefully mark the mounting holes.
- Drill four (4mm) holes in the mounting surface and/or the bracket that secures the Iridium Edge.
- Select a side channel for the cable to exit, depending on cable routing and installation restrictions.
- Remove the grey plug from the selected channel by gently prying it out with a sharp flat head screwdriver. If the plug needs to be re-inserted, ensure the plug is flat to the baseplate before pressing in with your thumb. Do not use any instruments to re-insert. Optionally remove the second grey plug as it is provided for aesthetic purposes only.
- Firmly press the pigtail cable into the selected channel, making sure that the cable is flush with the baseplate. Do not use any sharp instruments.
- In the event that the pigtail cable must be removed from the side channels, always keep a thumb over the center of the Iridium Edge where the pigtail connector exits. It is very important to be careful with the pigtail cable when it is not secured in the side channel.
- If the supplied aesthetic grey plug is not used, optionally fill the unused channel with silicon sealant to prevent the insertion of sharp tools under Iridium Edge.
- Insert mounting screws and tighten the screws and nuts. Do not exceed torque over 40 N-m.



Figure 5-3 Screw Mount Installation



- Secure all mounting nuts with an appropriate thread locker that meets the installation requirements for factors such as vibration and temperature

5.6.2 Bottom Mount

In the bottom mount configuration, the Iridium Edge is held in place with a single screw. The items in the Accessory Bag are required for this type of installation.

- **Do not remove the red plastic over the double side tape.** Removing the red tape exposes the double sided tape which may cause the tape to inadvertently adhere the Iridium Edge to the mounting surface.
- Drill a single 15mm hole at the desired location for the Iridium Edge. Ensure that the surface is flat to avoid water ingress under the Iridium Edge.
- Insert the Slotted Screw into Iridium Edge baseplate and screw until finger tight.



Figure 5-4 Slotted Screw Installation



- Carefully press the Rubber Grommet into the baseplate until it is flush with the Iridium Edge.

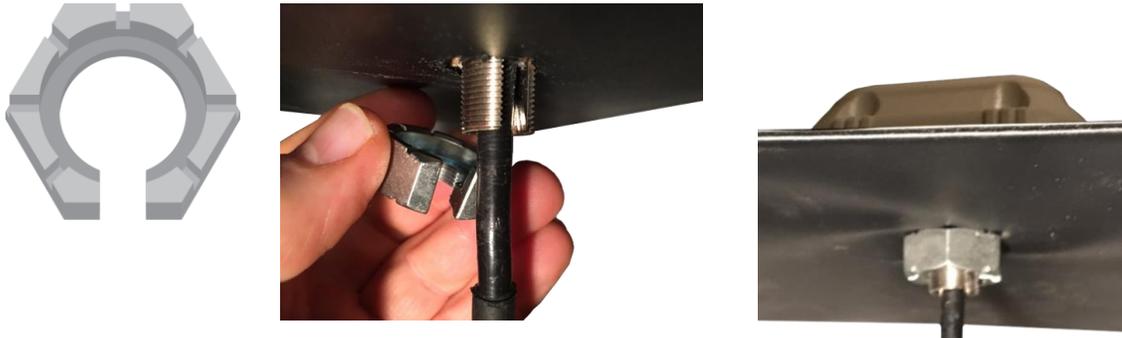
Figure 5-5 Grommet Installation



- Optionally, fill the two side channels with silicon sealant, taking care that it does not unseat the rubber grommet. The two grey plugs shipped with the Iridium Edge can be optionally retained.
- Mount the Iridium Edge and drop the pigtail connector through the drilled hole.
- Place the Slotted Nut over the top of the pigtail cable above the heat shrink such that the wide side of the tapered Slotted Nut goes over the cable first.

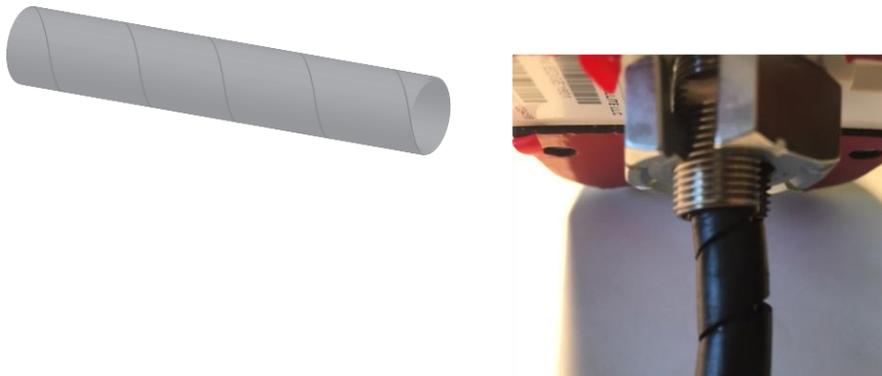


Figure 5-6 Slotted Nut installation



- Tighten the Slotted Nut into the screw. The Slotted Nut should be tightened sufficiently to compress the Rubber Grommet and to prevent water from getting under the Iridium Edge and then down inside of the installation. Do not exceed a 5N-m when tightening the nut.
- The Spiral Sheath protects the pigtail from chaffing. Unwrap the sheath and wrap it around the pigtail just above the heat shrink.

Figure 5-7 Spiral Sheath



- Firmly press the sheath so that it makes contact with the Iridium Edge's baseplate and goes inside the Slotted Screw.



- Connect and screw the mating cable to the Iridium Edge's pigtail connector. Tighten until finger tight. Do not use any wrenches or tools to tighten the cable connectors.
- **Ensure that the Iridium Edge pigtail cable is strain relieved.** It is very important that the hanging cable is properly strain relieved and not left hanging such that the cable's weight and vibration pulls on the Iridium Edge's pigtail connector.

5.6.3 Tape Mount

The tape mount is for a permanent installation only. Iridium Edge devices that are installed with tape cannot be removed without damaging or removing the double sided tape.

- The Accessory Bag contents are not required for the Side Mount installation. These items can be set aside.
- **Do not use the tape mount for testing or prototyping. When the tape is applied properly to a smooth clean surface, the Iridium Edge is very difficult to remove.**
- **Do not tape the Iridium Edge to the mounting surface until the mating cable is successfully installed and the Iridium Edge is operating correctly.**
- Ensure that the mounting location is clean and smooth, without any surface abrasion.
- Skip to the Mating Cable installation instructions to install the cables and test the installation. When the installation is verified, continue with the instructions below.
- Verify that the Iridium Edge pigtail cable is securely pressed into the baseplate.
- Mark the location and corners for the desired location of the Iridium Edge.
- Clean the mounting surface with rubbing alcohol.
- Remove the red plastic tabs covering the Iridium Edge's double side.
- Carefully press the Iridium Edge on the marked location.



If the Iridium Edge needs to be removed, do not pry it off the asset. Prying can damage both Iridium Edge or the mounting surface. It is recommended to remove Iridium Edge using a thin wire that is sawed back and forth under Iridium Edge to cut the double sided tape.

5.7 Mating Cable Installation

Once a mounting location is determined, use the guidelines below when installing the cable:

- Verify and follow all local electrical codes
- Identify a DC power source that complies with the input voltage and maximum current specification of the Iridium Edge listed on the label. Never connect the Iridium Edge to an AC power source.
- Only use cables provided from an Iridium Service Provider that meet cable the specifications listed in Section 4 Mating Cable Guidelines on page 44 .



CAUTION Use power and ground conductors of proper gauge. Use of improper gauge power cables could result in exposing cables to excessive heat which could cause fire, resulting in serious injury or death.

- Ensure that the device is not routed near exhaust pipes or other hot surfaces.
- Do not bend the cable excessively around sharp corners so as to violate its bend radius specification provided by the Service Provider.
- Route or protect the cable to avoid damages against persons walking or tripping.
- The cable must be securely connected to the power supply return ground, close to the power source. The ground connection must be connected prior to connecting power to the device.



WARNING

WARNING Properly ground the Iridium Edge. Failure to properly ground the Iridium Edge could cause unexpected currents, which could cause serious injury or death.

- Ensure that the Iridium Edge is connected to the power source through a quick tripping fuse. The fuse should be located close to the power source.
- Secure all cables including the Iridium Edge's pigtail cable.

WARNING

WARNING Always secure power cables. Failure to secure cables could result in fraying or failure of the power cable, resulting in fire and or failure of the device. These hazards could cause serious injury or death.

- Screw the mating cable onto the Iridium Edge so that it is finger tight. **Do not use a wrench to tighten the mating cable to the Iridium Edge.**

5.8 Operational Practices

The following guidelines must be followed when using the Iridium Edge.

5.8.1 Blasting Areas

The Iridium Edge contains a transmitter and it must be considered as a two-way radio in blasting areas.



WARNING

WARNING Power down or turn off the Iridium Edge when in a “blasting area” or in areas posted “Turn off two-way radio.” Obey all signs and instructions. Failure to do so could result in serious injury or death.

5.8.2 Hazardous Locations

The Iridium Edge is not approved for operation in hazardous locations with potentially explosive atmospheres.

WARNING

WARNING Turn your device OFF in any area with a potentially explosive atmosphere. Obey all signs and instructions. Sparks from your device in such areas could cause an explosion or fire resulting in serious injury or death.

5.8.3 Pacemakers

The Iridium Edge is designed to and certified for operation such that it is normally more than 20cm (8 inches) from humans.

WARNING

People with pacemakers:

- Should ALWAYS keep Iridium Edge more than eight inches from their pacemaker when the device is turned ON.
- Should turn Iridium Edge OFF immediately if there is any reason to suspect that interference is taking place.
- Failure to heed this warning could result in serious injury



5.8.4 Disconnecting Mating Connector

The Iridium Edge must not be disconnected from its mating connector and left outdoors or in other environments where water can get inside the Iridium Edge's pigtail connector and potentially corrode contacts, and void the warranty.

5.8.5 Painting

Never paint the Iridium Edge. Paint could negatively affect the Iridium Edge's satellite performance. Further, painting voids all warranties.

5.8.6 Cleaning

Only use mild soaps or detergents to clean the Iridium Edge.



6 Appendix A: Blunt Cut Cable

A Blunt Cut cable accessory is available from Iridium for its distribution partners. It can be ordered using the part number in the table below

Part Number	Description
EDGE10MBC1601	10m cable with Iridium Edge mating connector

It is recommended that partners cut the cable to the required length to ensure a simple clean installation.

The cable drawings including color codes for the optional Blunt cables are shown below. As per notes in the Pin Out Configuration drawing below, the shielded drain wire is connected to the ground pin. The braid wire at the blunt cut side, should be left unterminated to ensure that there is a single point ground for the cable shielding.

Figure 7-1 Blunt Cut Cable



Figure 7-2 Pin Out Configuration

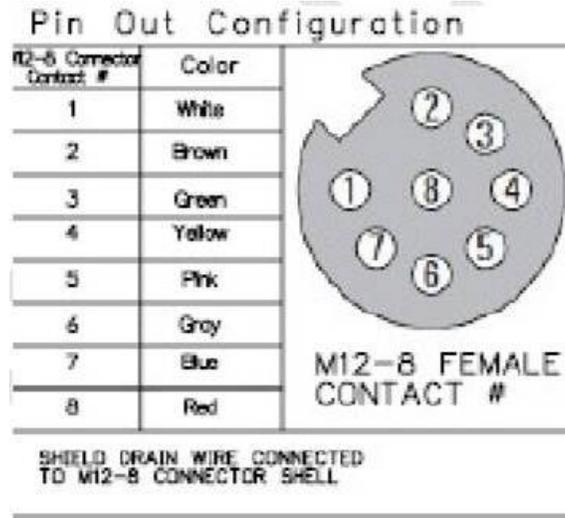


Figure 7-3 Connector

