



Flightcell Iridium Modem



Installation manual

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1 Introduction

The Flightcell Iridium Modem is a robust modem designed specifically for installation with a DZMx or as a standalone modem. The modem supports Iridium voice, SMS, SBD and data services.

If the modem is installed with a DZMx, the DZMx controls the modem and provides audio integration into the aircraft ICS/audio panel. The modem must be installed with an appropriate external Iridium antenna. Several antenna options are available from Flightcell International.

2 Flightcell Iridium Modem Specifications

Flightcell part number	MOP_00010		
Material	Faceplate and backplate – diecast Type 380 Aluminium with Alodine Chromate finish		
	Extrusion – 6063 Aluminium with clear anodized finish		
Input voltage	12-32 V DC		
Power supply current	Maximum current – 500mA @ 28V		
RF Frequency Range	1616MHz – 1624.5MHz		
Average RF TX Power	During a TX slot (max)	7W	
	During a frame (typ.)	0.6W	
RF RX Sensitivity	-118dBm		
Max cable loss¹	3dB		
Max Antenna gain	3dBi		
MIC audio	Input	Fully Differential – 50mVrms to 1Vrms Nominal 775mVrms	
	Input impedance	600Ω	
SPK audio	Output	Fully differential – Up to 1Vrms into 150 Ω Nominal 775mVrms	
	Output impedance	600Ω	
Data connection	Switchable RS-485/RS-232 For RS-232 - RTS/CTS Flow control only. USB 2.0		
Weight		240 grams	8.5 oz
Dimensions	Width	62mm	2.44"
	Height	33.9mm	1.35"
	Depth	144mm	5.67"
Main connector	DA-15F		
Antenna connector	TNC		
Certification	Designed to meet DO160G Sections: 4 (Temp), 6 (Humidity), 7 (Shock/Crash Safety), 8 (Vibration) 15 (Mag), 20 RF Susceptibility), 21 (EMI), 25 (ESD)		

1. The total implementation loss for antenna, connectors, cable and any other RF components between the modem and the antenna should not exceed 3dB.

Table 1. Flightcell Iridium Modem specification

3 Components required for installation

3.1 Connectors and fasteners

The modem is connected to a wiring harness which is in turn connected to a Flightcell DZM (or a PC/embedded device).

Table 2 shows the terminating connectors and fasteners used with the modem.

Connectors	
Main connector	M24308/4-2F (DA-15 Male)
Antenna connector	TNC
Fasteners	
4 x M4 screws or bolts sized to fit mounting surface	

Table 2. Connectors and fasteners required for your modem installation

3.2 Antenna

The Flightcell Iridium Modem requires an antenna installed on the outside of the fuselage, or in a location with a clear view of the sky (for standalone installations).

Table 3 shows recommended Flightcell antennas. These can be obtained from Flightcell International or your authorised Flightcell dealer.

Antenna	Suitable for	part number
Dual Flat Antenna L1 GPS/Iridium BNC/TNC White TSO Cert	All aircraft - DZMx	ANP_00012
Single Flat Antenna Iridium TNC	Stand alone	ANP_00010

Table 3. Recommended Flightcell Iridium antennas

4 Installing the Flightcell Iridium modem

4.1 Mounting the modem

The modem should ideally be located close to the DZMx (if installed with DZMx), preferably where it is reasonably readily accessible to enable easy access to the SIM card.

Appendix 2 includes drawing references for a dimensioned drawing of the modem, showing mounting details.

4.2 Wiring the modem

The data and audio connections should be made as per the wiring diagrams referenced in Appendix 2.

Modem pin	Function	
1	DC in	Power
2	Audio from Sat Lo	Output
3	Audio to Sat Lo	Input
4	Sat Data GND	Signal GND
5	RS-232 RTS / RS-485 RX-	Input
6	RS-232 CTS / RS-485 TX-	Output
7	USB GND	Signal GND
8	USB D-	I/O
9	Power GND	Power GND
10	Audio from Sat HI	Output
11	Audio to Sat HI	Input
12	USB VBUS / GPI	Input
13	RS-232 RXD / RS-485 RX+	Input
14	RS-232 TXD / RS-485 TX+	Output
15	USB D+	I/O

4.3 Guidelines for fabricating the wiring harness

For aviation applications, all wiring should be carried out with aviation specification fireproof cable.

Screened cable should be used where indicated in the wiring diagrams. Where cable screen connections are not explicitly shown, they should be left unterminated.

The following minimum wiring specification is recommended:

- Power supply - 22 AWG (0.325mm²)

- Other cabling - 24 AWG (0.205mm²).

4.4 Guidelines for the antenna cable

The antenna and associated cabling should have a nominal impedance of 50Ω with a maximum attenuation of 3dB over the cable run.

The antenna cable run length and intended frequency bands of operation should be checked before the antenna cable type is selected to ensure the above requirements are met.

5 Setting up your modem

5.1 Connecting to the Iridium network

The Flightcell Iridium modem operates on the Iridium satellite network. To enable connectivity an Iridium SIM card provisioned for the desired services is required. Please contact your preferred Iridium service provider for details.

5.2 Configuring your DZMx to work with the modem

Your DZMx will need to be configured to use the Flightcell Iridium Modem. Instructions for configuring a DZMx to work with the modem can be found in the operators' manuals for DZMx products. These manuals are provided on a USB memory device supplied with your DZMx, or available from the Flightcell support page at <http://www.flightcell.com/support.aspx>.

5.3 Using the Modem Standalone

If the modem is to be used in standalone mode it will need to be connected to a PC (or embedded device) which can control the internal Iridium transceiver directly. The Iridium modem uses the Iridium 9523 transceiver, contact Flightcell for details of the Iridium 9523 AT interface.

5.4 Configuring Data Interface

The Flightcell Iridium modem can be set to use either an RS-232 or RS-485 data interface. This selection can be made using the switch which is accessible under the SIM card holder. The switch is sampled on start-up and should be in the left position for RS-232 and the right position for RS-485.

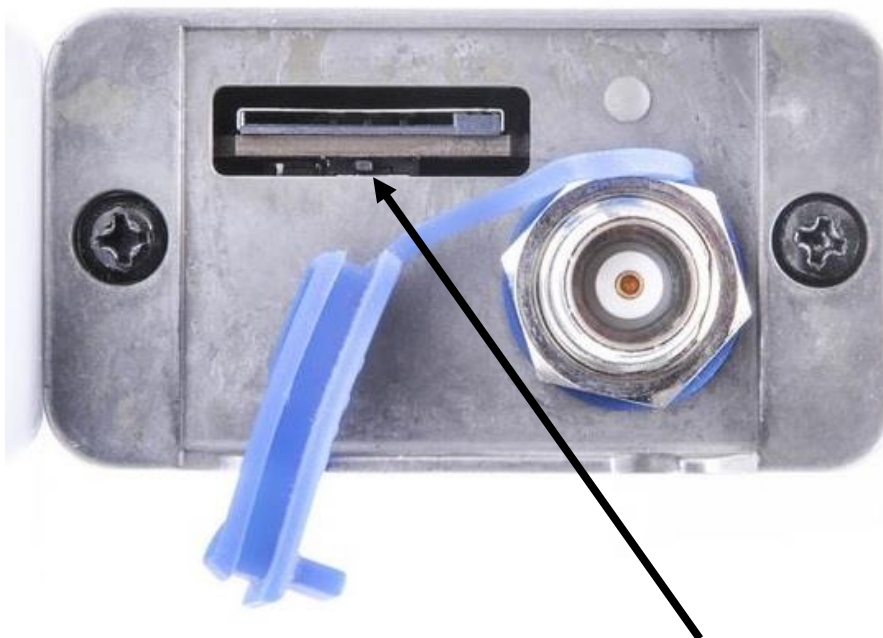


Figure 1 SIM card slot showing data format selection switch.

5.5 Installing a SIM card

The Flightcell Iridium Modem will not register on a network until a valid SIM card with a current account is installed.

The DZMx will provide an error message if either there is no SIM card installed, or there is an invalid SIM installed. Please see the Operators' manual for your DZMx for more details on error messages.

If the modem is standalone, the connected device will need to interrogate the modem via the AT interface to determine the SIM / network registration status.

To install the SIM card:

- Remove the rubber plug in the end of the modem;
- Insert the SIM card in the slot and press till it clicks into place;
- Reinsert the rubber plug.

The correct orientation of the SIM card is with the gold contacts down, and with the end of the card with the diagonal cutout inserted first. The SIM card will not fully insert in the wrong orientation.

6 Warranty and contact details

Limited warranty for your Flightcell Iridium Modem

Flightcell International Ltd's quality products are proudly designed and manufactured to the highest standards in New Zealand.

Your Flightcell Iridium Modem is warranted for one year from date of sale.

The warranty is void if any labels are removed or if it is determined that your modem has been:

- Connected to a power supply delivering more than 32 Volts;

- Connected with reverse polarity;

- Installed in direct contravention to the guidelines outlined in the installation manual;

- Physically damaged, or a fault has occurred due to the product being used beyond what is considered normal use, causing unusual deterioration of the product.

If the product is deemed to be faulty or in need of repair, please contact Flightcell International Ltd to obtain a Returned Materials Authorization or download from <http://www.flightcell.com/support.aspx>.

Flightcell International contact details

Flightcell International Ltd

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Appendix 1: Version history

Version	Date	Author	Change Note Number	Description
1.0	2 nd November 2016	J. Glasgow	FCN0708	Initial release.

Appendix 2: Wiring and installation drawings

The following references list the Iridium modems wiring diagrams and mechanical drawings which are available on the Flightcell website: <http://www.flightcell.com/support.aspx>

Interconnect drawings for DZMx & Standalone installations:

WRL_MO4_001	-	DZMx ICD
WRL_MO4_001	-	Standalone ICD

Mechanical drawings:

DRW_MO4_001	-	Mechanical Outline Drawing
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