



## Flightcell DZM2

The world's most advanced all-in-one communications and tracking system

- Iridium satellite phone
- Cell phone
- GPS flight following
- External audio/MP3 integration



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## Installation Manual

(All DZM2 military and civil units)

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MAN\_DZ2\_ENGALL\_001  
3.0  
13<sup>th</sup> March 2012



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# 1. VERSION HISTORY

## DZM2 Installation Manual

Issue	Date	Author	Description	PCB Revision
1.0	7 <sup>th</sup> Dec 2009	A. Whitlock	Unit versions amalgamated	E
2.0	20 <sup>th</sup> June 2011	J. Glasgow	Removed wiring diagrams, added technical specifications (FCN0220)	G
2.1	26 <sup>th</sup> June 2011	J. Glasgow	Updated Interconnect drawing revision (FCN0265)	G
3.0	13 <sup>th</sup> March 2012	J. Mace	Addition of section numbers Full revision Provision for use of GPO for ring alert (FCN0317)	G

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## 3. ABOUT THIS MANUAL

### 3.1. Flightcell DZM2 models

The instructions and information contained within this manual are for three different models of the DZM2:

Flightcell DZM2 English Civil Unit

Flightcell DZM2 English Military Unit

Flightcell DZM2 Spanish Encrypted Military Unit

### 3.2. Who should use this manual?

This manual is intended for use by engineers installing and maintaining the DZM2. It describes the physical, mechanical and electrical characteristics and installation requirements for the DZM2 system.

Information on configuring and operating the DZM2 is provided in this manual. More detailed information is available in the Operation Manuals for each DZM2 unit.

Flightcell manuals are regularly updated. The latest version of each manual and the latest wiring diagrams are available on the Flightcell website at <http://www.flightcell.com/support.aspx>, or by contacting Flightcell International Ltd.

**NOTE!** Throughout this manual, the term “audio panel” is also used to refer to an intercom or interphone system (ICS).

## 4. FLIGHTCELL DZM2 FEATURES

The Flightcell DZM2 provides aircraft operators with global voice and data communications and asset tracking.

The DZM2 is installed fully integrated with the aircraft's audio panel or intercom/interphone system (ICS). This enables crew members to use the Iridium or cellphone network from their individual ICS locations and headsets.

In military units, an embedded encryption system allows secure transmission of all voice and data communications.

A GPS module and sophisticated active tracking software provide for transmission of position and mission critical data via satellite phone or cellphone (depending on configuration).

Incoming and outgoing messaging capability can be accessed using the DZM2 display and keypad. More extensive messaging and data transmission capabilities can be accessed by connecting a portable computer to the DZM2.

Three data communication modes are available:

- Iridium Short Burst Data (SBD)

- Short Messaging System (SMS)

- Iridium Circuit Switched Data

# 5. FLIGHTCELL DZM2 SYSTEM CONFIGURATION OVERVIEW

The Flightcell DZM2 can be used to interface a range of communications and audio devices into an aircraft or vehicle audio panel or intercom system (ICS). Your DZM2 system can be configured to meet your specific requirements.

This manual provides information on installation with an Iridium satellite phone and a cell modem. Other phones or radios may also be interfaced. Please contact Flightcell International Ltd for more information or a proposal.

## 5.1. DZM2 installation with Iridium satellite phone

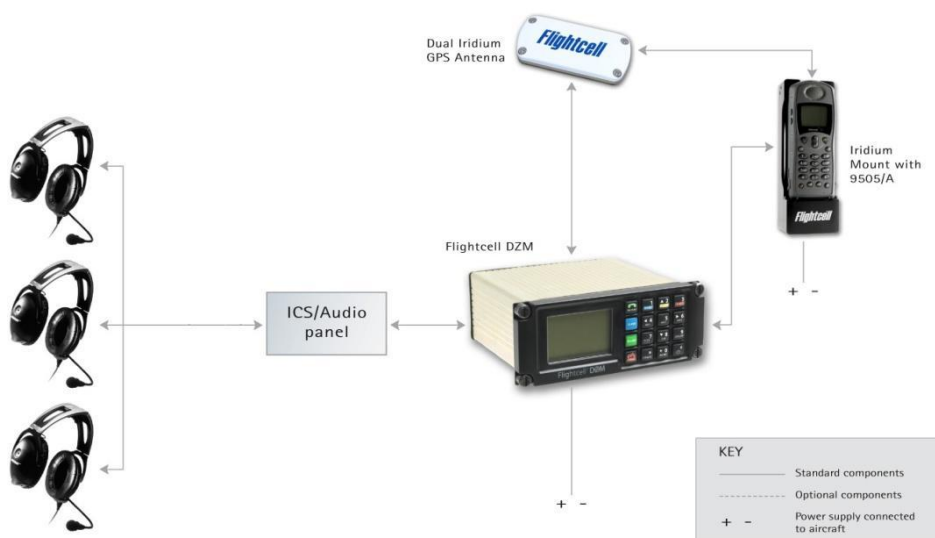


FIGURE 1: STANDARD INSTALLATION

The standard DZM2 installation includes:

- A Flightcell DZM2 unit
- An Iridium 9505, Iridium 9505A or Iridium 9555 satellite phone handset installed in a Flightcell Iridium Phone Cradle
- A Dual Iridium/GPS Antenna

## 5.2. DZM2 installation with Iridium satellite phone and cellphone modem

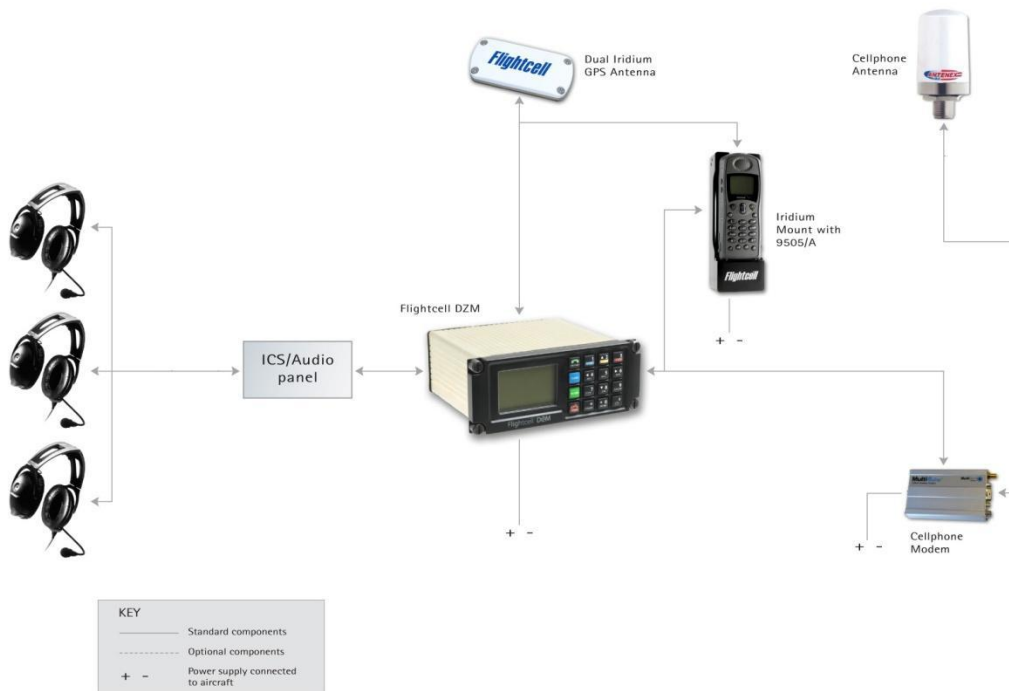


FIGURE 2: EXTENDED INSTALLATION

The DZM2 can be installed with an Iridium satellite phone and/or a cellphone modem:

A **cellphone modem** is installed to enable use of the cellphone network from the aircraft. The DZM2 is not designed to support cellphone handsets, due to the large number of models and rapid obsolescence.

Flightcell supplies a multi-band modem which supports most cellphone networks in the world. For further details, contact Flightcell International or your Flightcell supplier.



## 6. YOUR FLIGHTCELL DZM2 AT A GLANCE

### Front panel (English civil)



FIGURE 3: FRONT PANEL - ENGLISH CIVIL UNIT

### Front panel (English military)

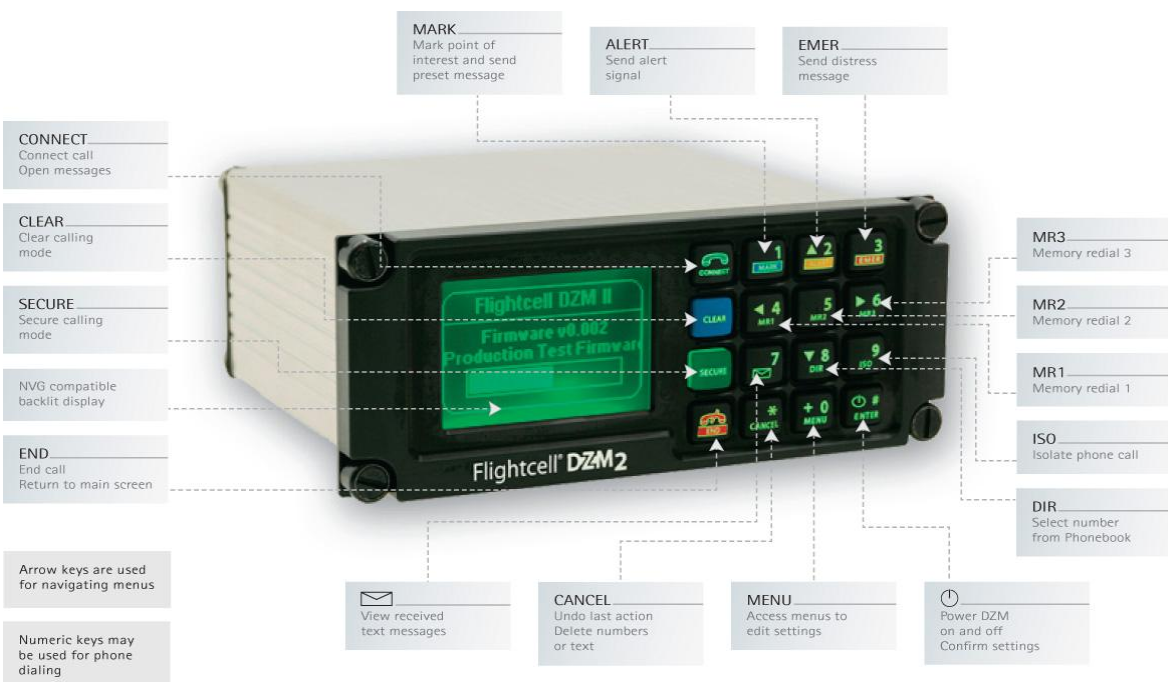


FIGURE 4: FRONT PANEL - ENGLISH MILITARY UNIT

## Front panel (Spanish military)



FIGURE 5: FRONT PANEL – SPANISH MILITARY UNIT

## Rear panel (All DZM2 units)



FIGURE 6: REAR PANEL – ALL DZM2 UNITS

## 7. BEFORE YOU START

### 7.1. Check components required for installing your Flightcell DZM2

Before you start, check you have all the components and connectors required for the installation. The table below shows the components and component connectors required for installations of the DZM2 English Civil, English Military and Spanish Military versions.

Item	Component	Flightcell Part Number	Connectors Required	Notes	DZM2 Unit		
					EC	EM	SM
<b>1</b>	Flightcell DZM2 unit		D38999/26WE-35SN and TNC	Connectors used on all DZM2 part numbers	●	●	●
<b>2</b>	Flightcell Iridium phone cradle for Iridium 9505/A satellite phones	CRP_03001 Or CRP_03002	D25 female and TNC or D38999/26WD-35SN and TNC		●	●	●
<b>OR</b>	Flightcell Iridium phone cradle for Iridium 9555 satellite phone	CRP_04001	D25 female and TNC		●	●	
<b>3</b>	Iridium 9505A satellite phone handset	IRP_00001			●	●	●
<b>OR</b>	Iridium 9555 satellite phone handset	IRP_00002			●	●	
<b>4</b>	Dual Iridium / GPS antenna	ANP_00003	BNC (GPS) and TNC (Iridium)	Other antenna options are available, including TSO'ed versions. Contact Flightcell International Ltd for further details.	●	●	●
<b>5</b>	Wiring harness	CLP_02001		Optional wiring loom. (1M part number shown) Specify length required when ordering	●	●	●

---

**Additional components for cellphone modem installation**

<b>7</b>	Airlink Fastrack XTend 3G Modem	MOP_00002	D15 high density SMA to antenna		●
<b>8</b>	Laird Cell Antenna White	ANP_00006	N-type	Other antenna options are available, including TSO'ed versions. Contact Flightcell International Ltd for further details.	●

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## 7.2. Check tools required for installing your Flightcell DZM2

Installation of the DZM2 system can be completed using the following tools:

Crimping tools

Insert/extract tool, for installation of pins in the D38999 main connector and other connectors

Wire strippers

Multimeter

General hand tools

## 8. INSTALLING YOUR FLIGHTCELL DZM2

### 8.1. Mounting the Flightcell DZM2

The DZM2 is designed to be installed in a DZUS mounting rack in the aircraft communications panel.

If the aircraft does not have a DZUS rack, the unit may be panel mounted using an alternative faceplate available from Flightcell International. Please contact your Flightcell supplier for details.

The DZM2 should be mounted where the flight crew or radio operator have clear view of the display and can access the keypad. Avoid mounting the unit where the display will be viewed at an oblique angle, as it may not be clearly readable.

**NOTE!** Refer to drawing: "DRW\_DZP\_02\_001\_MechanicalAssembly\_6.0.pdf" listed in Appendix C for mechanical dimensions and mounting details. CAD solid model files are also available from Flightcell International.

### 8.2. Wiring the Flightcell DZM2 installation

Installers may fabricate their own wiring harnesses, or a prefabricated main wiring harness may be purchased from your Flightcell supplier. If you require a prefabricated harness, please specify length of the main cable between the DZM2 and the Iridium phone cradle (allowing for enough slack to enable the DZM2 to be partially removed from the aircraft panel for service).

If you are making up your own wiring harness, most connectors are readily available from electronics or avionics component suppliers. The one specialized connector, the main connector to the DZM2 (D38999/26WE-35SN) is supplied with your Flightcell DZM2.

The interconnect document WRL\_DZP\_02\_001\_InterconnectDrawings\_1.2.pdf referenced in Appendix C of this manual provides detailed information on wiring the DZM2 and connected devices.

Two additional drawings provide details of typical DZM connections to audio panels, using the Garmin GMA-340 as an example.

#### 8.2.1. Guidelines for fabricating wiring harnesses

All wiring should be carried out with aviation specification fireproof cable e.g. MIL-C-M27500.

Screened cable should be used throughout the installation. Where cable screen connections are not explicitly shown, they should be left un-terminated.

The following minimum wiring specification is recommended:

Power supply - 22 gauge

Other cabling - 24 gauge

**NOTE!** The D38999 connector requires the use of 22 gauge wire and fitting of dummy plugs to any unterminated contact positions to maintain its environmental rating.

It is recommended that enough slack be left in the main cable to enable the DZM2 to be partially removed from the aircraft panel for service or to access the data port.

If the data port is not panel mounted, it should be secured to the loom near the D38999 connector, so that the D9 data connector can be accessed when required for firmware upgrades.

**NOTE!** Refer to “Installing a PC RS232 data port” on page 18 for further information about installing a PC Data Port.

## 8.2.2. Using prefabricated wiring harnesses

Flightcell International manufactures a prefabricated main wiring harness that contains the wiring and main connectors required for your installation. Use of this harness can substantially reduce installation time and minimize the risk of faulty connections.

The prefabricated harness includes the following connectors to the DZM2, Iridium phone cradle and data port. The remaining un-terminated connections are individually labeled.

Connector	Details
D38999/26WE-35SN	Main connector to DZM2
M24308/2-3F (D25 female)	Main connector to Iridium Phone Cradle
M24308/2-1F (D9 female)	Data port

Additional extension cables may need to be fabricated by the installer where the Iridium phone cradle or the cell phone modem are to be positioned further away from the DZM2 than the length of cable permits.

## 8.3. Installing a Flightcell Iridium phone cradle

Flightcell Iridium phone cradles are available for both 9505 series Iridium phones (9505 and 9505A) and for the Iridium 9555. The Iridium 9500 is not supported. A cradle for the Iridium 9575 will be released in early 2012.

### 8.3.1. Connections

The standard phone cradle uses a D25 main connector. This is shown on the wiring diagrams. Versions of the 9505 series cradles with D38999 connectors are also available for MIL-SPEC installations.

### 8.3.2. Mounting

The Flightcell Iridium Phone Cradles are fastened into the aircraft by means of 4 M5 screws into the back of the cradle. These need to be fixed from the rear of the cradle through a bulkhead (or some other similar mounting point). The recommended screw length is the thickness of the bulkhead plus 16mm.

**NOTE!** For further information about Flightcell Iridium phone cradle dimensions and fastening points, refer to the Cradle installation documents referenced in Appendix C. CAD solid model files are also available from Flightcell International to enable modeling of the installation if required.

## 8.4. Installing an Iridium/GPS antenna

### 8.4.1. Location

The Flightcell dual Iridium/GPS antenna should be installed on the top of the aircraft where it will have an unrestricted view of the sky, mounted as close to horizontal as possible.

The following should be considered when determining a mounting location:

Maintain good separation from other antennas. Preferred separation is 0.75m from an L-band (GPS), TCAS or transponder antenna, but a lesser separation can be applied if there is limited space on the aircraft

On a helicopter, avoid placing the antenna close to the rotor hub, as the hub and inner rotor can block the antenna's view of the sky

Keep coax cable lengths short to minimize attenuation of the transmit and receive signals.

### 8.4.2. Mounting

Refer to the antenna documents [DRW\\_ANP\\_001\\_FlightcellIridiumGPSAntennas\\_2.0.pdf](#) referenced in Appendix C for further information about mounting the Iridium/GPS antenna.

### 8.4.3. Cables

An appropriate cable should be selected to keep signal loss within acceptable levels. Total signal loss on the connection between the Iridium phone cradle and the antenna should not exceed 3dB at 1645MHz.

The maximum length recommended for different common antenna cable types is:

Cable Length	Cable Specification	Notes -
Up to 3m	RG58C/U	
Up to 6.5m	LMR200 RG142A/U-9006 cellfoil	-
Up to 8m	RG213	It is recommended that the antenna cable be reduced to RG58 for the last 300mm next to the DZM2 to assist with installation in the panel.
Up to 17m	LMR400	
Up to 26m	LMR600	

### 8.4.4. Connectors

The following connectors are used on the Iridium and GPS antenna:

Type	Antenna End	Other End
Iridium cable	TNC	TNC (Phone cradle)
GPS cable	BNC (SMA available on request)	TNC (DZM2)



## 8.5. Connecting to the aircraft audio system

The DZM2 can be installed in aircraft audio systems with either high impedance or low impedance microphones. Most (but not all) civil aircraft operate high impedance (electret) microphone systems. Most (but not all) military aircraft operate low impedance microphone systems.

The DZM2's audio inputs and outputs have a wide audio adjustment range, so can be adjusted through the setup menu or using the configuration utility to suit most installations.

### 8.5.1. General considerations

As the Iridium satellite phone and cell phone are both full duplex, it is preferable to use the DZM2 on a hot mic connection, rather than PTT.

The DZM2 will typically be installed in one of the following ways:

- To a spare transceiver position on the ICS **or**
- To a cell phone port on the audio panel (if available) **or**
- Direct to headset microphone line(s).

Further details of each option are detailed below.

### 8.5.2. Connecting to a transceiver position on the audio panel

On aircraft with separate audio control panels at each crew position (as is the case on many military aircraft) this option enables crew to use the DZM2 and connected phones on demand.

On low impedance audio panels (most military and some non-military aircraft), DZM2 MIC HI/LO can be connected directly to the audio panel output, and its levels adjusted using the DZM2 audio setup menu.

On aircraft using high impedance (electret, dynamic or carbon) microphones, a bias voltage is sometimes required on MIC HI lines to the audio panel, in order to energize the user's microphone when using the DZM2.

If a bias voltage is not required by the audio panel, the unbiased input to the DZM should be used as this input is a balanced transformer isolated input and will provide better noise rejection than the biased input.

The appropriate pins for use on biased and unbiased connections are as follows:

MIC	Biased connection	HI - Pin 26	LO - Pin 27
	Unbiased connection	HI - Pin 42	LO - Pin 34

Refer to interconnect drawing: WRL\_DZP\_02\_003\_InterconnectDrawingsTransceiverICSInterconnctionstoGMA-340\_1.1.pdf referenced in Appendix C for an example of this type of installation.

### 8.5.3. Connecting to a cell phone port on the audio panel

Some audio panels have a dedicated cell phone port, which provides a convenient connection option. The DZM2 unbiased MIC HI/LO lines are connected to the audio panel's cell phone output, and the DZM2 Phones HI/LO lines are connected to the cell phone input. Please consult your audio panel installation manual for more details.

Refer to Sheet 2 of interconnect drawing WRL\_DZP\_02\_001\_InterconnectDrawings\_1.2.pdf referenced in Appendix C for an example of this type of connection.

### 8.5.4. Connecting direct to a headset microphone line

On aircraft without either individual audio control panels or an audio panel cellphone port,

The DZM2 Phones HI/LO lines are connected to a spare audio input on the audio panel

The DZM2 MIC HI/LO lines are connected directly to one or more headset microphone inputs on the audio panel. As these microphone inputs have mic bias provided by the audio panel, the DZM2's unbiased microphone connection should be used.

The way this is configured will depend on how many headsets are to have access to the DZM2:

If only the pilot is to use the DZM2, its MIC HI is connected only to the pilot's microphone line.

If both pilot and co-pilot are to use the DZM2, its MIC HI line is connected to both microphone lines via a two-way selector switch mounted on the control panel, which is used to select either pilot or co-pilot use of the DZM2. Refer to interconnect drawing

WRL\_DZP\_02\_004\_InterconnectDrawingsDirectMicICSInterconnctionstoGMA-340\_1.1.pdf referenced in Appendix C

## 8.6. Connecting to the aircraft power supply

The DZM2 unit and other components require aircraft DC power for their operation. Operating range is 12 - 32VDC. The optimum power supply voltage is 28V DC.

All components are usually connected to the aircraft radio power supply bus. Circuit breakers or fuses should be used between DZM2 system components and the power supply:

A 1 amp circuit breaker/fuse is recommended to protect the DZM2 system.

A 1 amp circuit breaker/fuse is recommended to protect the Iridium phone cradle.

**NOTE!** If combining both on a single circuit breaker, a 1.5A or 2A circuit breaker/fuse is recommended.

## 8.7. Installing a PC RS232 data port

A data port is an essential part of the DZM2 system. The data port is used to:

Send and receive data via the DZM2 and Iridium satellite phone link using a connected laptop or tablet PC

Configure the DZM2

Load new firmware.

It is recommended that the data port is installed in a position where it is readily accessible. If it will be used by passengers for messaging or data transfer, it should be installed in the passenger cabin.

If the data port is only to be used intermittently (for example, for firmware upgrades), it may be secured to the main harness behind the DZM2, so it can be accessed by removing the DZM2 from the control panel.

Pinouts for the PC data port are provided in Appendix B of this manual.

**NOTE!** If the PC data port connection is not installed, the DZM2 will need to be removed from the aircraft and connected to a bench test set-up each time a firmware upgrade or diagnostic testing is required.

## 8.8. Other connections

Pinouts and supplementary data are provided in Appendix B for all connections to the DZM2.

Following is additional information on other specialised connections.

### 8.8.1. Connecting to the aircraft dimmer control

The DZM2 display and keypad are backlit with NVG-compliant green LEDs. Backlighting can be controlled either manually (using the DZM2 menus), or from the aircraft dimmer control.

The automatic dimmer control function supports either DC or AC external control signals. To utilize these options, the DZM2 lighting control line should be connected to the aircraft panel lighting circuit.

Lighting levels can be calibrated to match illumination levels on the rest of the aircraft instruments using the DZM2 menus.

The DZM2 lighting control line is referenced to the aircraft chassis.

### 8.8.2. Connecting to a collective switch or squat switch on a helicopter

The DZM2 can be programmed to send special position reports on takeoff and landing. For fixed-wing aircraft, the DZM2 uses preset speed thresholds to trigger takeoff and landing reports.

On helicopters, it is recommended that a collective switch be used (if already fitted) or installed to provide information on takeoff and landing:

When the collective is up and speed exceeds 5 knots, a takeoff report is transmitted

When the collective is down and speed falls below 5 knots, a landing report is transmitted

This switch can be connected to either Digital Input 1 or Analogue Input 2 on the DZM2.

The DZM2 can be programmed to specify whether the position of the collective is denoted by either an open or closed switch (for the digital input) or by a high and low threshold (for the analogue input).

The External Inputs Diagnostics menu (Main Menu>Diagnostics Menu>External Inputs) displays the current state of the all the External Inputs. This can be used to determine the correct setting for the collective switch configuration. If the collective is raised while this menu item is open, the display will update once a second to show if the input is wired correctly.

Alternatively, a squat switch on the helicopter undercarriage can be used to initiate takeoff and landing reports. The Squat switch must be connected to Digital Input 1 or Analogue Input 2 and the DZM configured accordingly.

### 8.8.3. Connecting to the oil pressure system on a helicopter

The DZM2 can be programmed to send special position reports when the helicopter's engine(s) start and stop. This is usually done by a connection to the oil pressure circuit on the helicopter gearbox.

This can be done in one of two ways:

1. Digital Input 2 can be used if the Oil Pressure circuit provides a digital High/Low signal (i.e. voltage changes from +28VDC to 0VDC) when the engines start. The threshold for the Digital input is ~0.6V,
2. Analogue Input 1 can be used if the Oil Pressure circuit provides an analogue voltage that varies according to the engine Oil Pressure (0-28VDC). The Analogue input high and low thresholds can then be set to appropriate levels to indicate engine start/stop. The DZM2's default high and low levels of 70% and 10% (respectively) should suit most installations.

#### 8.8.4. Providing a ring alert or off-hook alert

A ring or off-hook alert can be provided by the Flightcell Iridium phone cradle to indicate when the satellite phone (or cell phone if installed) is ringing or off hook. Refer to the appropriate cradle (9505/9555) installation manual (referenced in Appendix C of this document) for further details on this output.

#### 8.8.5. Connecting a cabin phone via the SLIC connection

The DZM2 can support a POTS (Plain Old Telephone System) phone, which is typically used in the passenger cabin in an executive aircraft or airliner.

A POTS phone is connected to the DZM's SLIC (Subscriber Line Integrated Circuit) connection.

Typically an RJ11 socket is installed at the end of the SLIC line.

#### 8.8.6. RS422 data connection

The DZM2 has an RS422 data connection which can be used for specialised applications.

In particular, the RS422 connection can be used to connect a second DZM2 to provide remote control of the primary DZM2. Details of installation of a second DZM2 for remote control of the primary DZM2 are provided in the drawing [WRL\\_DZP\\_02\\_002\\_InterconnectDrawingsMasterSlaveInterconnections\\_1.1.pdf](#) referenced in Appendix C to this manual.

#### 8.8.7. Auxiliary Audio

The DZM2 can support audio from an external device, such as an audio player or another radio.

## 9. CONFIGURING YOUR FLIGHTCELL DZM2

When you have completed installing your DZM2 system, you need to:

- Configure the DZM2

- Activate your phone and tracking services

Your DZM2 is factory fitted with default settings which will suit many aircraft installations. The DZM2 can be configured using the keypad menu system. However, it is usually quicker and more efficient to adjust settings and load phone book entries using the Flightcell DZM Manager configuration utility.

Refer to the Flightcell DZM2 Operation Manuals for each DZM2 unit for full details on how to adjust these settings. This manual and DZM Manager are supplied on a USB Flash Drive with your DZM2 or can be downloaded from the Flightcell International Ltd website at <http://www.flightcell.com/support.aspx>.

## 10. WARRANTY AND CONTACT DETAILS

### 10.1. Limited warranty for your Flightcell DZM2

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

Your DZM2 is warranted for two years from date of sale. This warranty covers Flightcell manufactured items only. Any ancillary items may be covered by individual manufacturer warranties.

The warranty is void if any labels are removed or if it is determined that your DZM2 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>.

### 10.2. Flightcell International contact details

Flightcell International Ltd

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Website <http://www.flightcell.com>

# 11. APPENDICES

## 11.1. APPENDIX A: DZM2 technical specifications

Part number		DZP_02000 – Civilian DZP_02100 – Military DZP_02105– Spanish Encrypted Military
Material		Faceplate and backplate – machined from 6061-T6 aluminium Extrusion – 6061-T6 aluminium
Input voltage		12-32 V DC
Power supply current		Up to 250mA
ICS transmit audio	Input	6mVrms to 5Vrms, adjustable. 775mVrms nominal
	Input impedance	2700Ω
Microphone bias voltage		6.65v via 560Ω
ICS receive audio	Output	53mVrms to 5Vrms 775mVrms nominal
	Output impedance	150 Ω
satellite phone data connection		RS-232 levels. Settings configurable for different phone types
Backlighting control		0-5VDC, 0-28V DC or 0-5V AC Note that where an AC lighting input is used that is not referenced to DC ground, a suitable isolating transformer should be used.
Backlight colour		Green 540nm. Designed for NVIS B compliance. Note: NVIS A compliant units available on request.
Weight		780grams                      27.5 oz
Dimensions	Width	146mm                      5.75"
	Height	57mm                      2.25"
	Depth	130mm                      5.1"
GPS	Time to first fix	Typically 44s
GPS Antenna	Connector	TNC
	Bias Voltage	5V
	Antenna Current	6-70mA
	Typical gain	21dB
Main connector		D38999/24WE-35PN
GPS connector		TNC
Certifications		DO160E Sections 8 (Vib) 15 (Mag) 21 (EMI) MIL-STD-704 (Voltage)

## 11.2. APPENDIX B: DZM2 connector pinouts

Pin Nbr	Function	Direction	Notes
1	AUX AUDIO IN L	Input	Left channel of the auxiliary audio input (unbalanced)
2	SAT DATA RI	Input	Flow control signal from satellite phone
3	LBT POWER TOGGLE	Output	Output can be used to switch 9522 LBT on/off (where installed)
4	AUDIO TO CELL -		Unbalanced audio output to a cell modem
5	AUX AUDIO GND	Reference	Ground reference for auxiliary audio
6	AUX AUDIO IN R	Input	Right channel of the auxiliary audio input (unbalanced)
7	SAT DATA DTR	Output	Flow control signal to satellite phone
8	SAT DATA GND	Reference	Ground reference for satellite phone RS232
9	RESERVED	No connection	DO NOT CONNECT
10	AUDIO TO CELL +	Output	Balanced audio output to cell modem
11	AUDIO TO SAT +	Output	Balanced audio output to satellite phone
12	AUDIO TO ICS +	Output	Balanced audio output to ICS
13	SAT DATA DSR	Input	Flow control signal from satellite phone
14	CELL DATA RX	Input	RS232 data from cell modem
15	SAT DATA RTS	Output	Flow control signal to satellite phone
16	RESERVED	No connection	DO NOT CONNECT
17	GND	Power	Ground connection for power
18	AUDIO TO SAT -	Output	Balanced audio output to satellite phone
19	AUDIO TO ICS -	Output	Balanced audio output to ICS
20	RS422 RX +	Input	RS422 data input
21	RS422 RX -	Input	RS422 data input
22	CELL DATA TX	Input	RS232 data from cell modem
23	SAT DATA CD	Input	Flow control signal from satellite phone
24	RESERVED	No connection	DO NOT CONNECT
25	DC IN	Power	10-30 VDC at 0.5A
26	AUDIO FROM ICS + (biased)	Input	Unbalanced biased audio input for high impedance ICS systems
27	AUDIO FROM ICS - (biased)	Reference	Reference ground for audio input from high impedance ICS systems
28	RS422 TX +	Output	RS422 data output
29	RS422 TX -	Output	RS422 data output
30	SAT DATA CTS	Input	Flow control signal from satellite phone
31	USB DP	Bidirectional	USB data signal



<b>Pin Nbr</b>	<b>Function</b>	<b>Direction</b>	<b>Notes</b>
32	SLIC RING	Bidirectional	'ring' connection to PABX
33	AUDIO FROM SAT -	Input	Balanced audio input from satellite phone
34	AUDIO FROM ICS – (unbiased)	Input	Balanced audio input for low impedance ICS systems
35	PROG DATA RX	Output	RS232 data for programming port
36	PROG DATA GND	Reference	RS232 ground for programming port
37	CELL DATA GND	Reference	RS232 ground for cell modem
38	USB VBUS	Input	USB power input
39	USB DM	Bidirectional	USB data signal
40	SLIC TIP	Bidirectional	'tip' connection to PABX
41	AUDIO FROM SAT +	Input	Balanced audio input from satellite phone
42	AUDIO FROM ICS + (unbiased)	Input	Balanced audio input for low impedance ICS systems
43	PROG DATA TX	Input	RS232 data for programming port
44	SAT DATA TX	Input	RS232 data output to satellite phone
45	SAT DATA RX	Output	RS232 data input from at phone
46	USB GND	Reference	Ground reference
47	AUDIO FROM CELL +	Input	Balanced audio input from cell modem
48	AUDIO FROM CELL -	Input	Balanced audio input from cell modem
49	ANALOG INPUT GND	Reference	Ground reference for analog inputs
50	DIGITAL INPUT 2	Input	General purpose digital input, connect to ground to activate
51	DIGITAL INPUT 1	Input	General purpose digital input, connect to ground to activate
52	LIGHTING INPUT	Input	Apply AC or DC voltage to set backlight level.
53	ANALOG INPUT 1	Input	General purpose analog input, range is 0 to +28V
54	ANALOG INPUT 2	Input	General purpose analog input, range is 0 to +28V
55	DIGITAL INPUT GND	Reference	Ground reference for digital inputs

## 11.3. APPENDIX C: Associated documents

The following documents referred to in this manual. These documents are supplied on the USB drive supplied with your DZM2, or can be downloaded from the Flightcell website at <http://www.flightcell.com/support.aspx>.

### 11.3.1. Interconnect Drawings

WRL\_DZP\_02\_001\_InterconnectDrawings\_1.2.pdf

WRL\_DZP\_02\_002\_InterconnectDrawingsMasterSlaveInterconnections\_1.1.pdf

WRL\_DZP\_02\_003\_InterconnectDrawingsTransceiverICSInterconnectionsToGMA-340\_1.1.pdf

WRL\_DZP\_02\_004\_InterconnectDrawingsDirectMicICSInterconnectionsToGMA-340\_1.1.pdf

### 11.3.2. Mechanical Assembly Drawings

DRW\_DZP\_02\_001\_MechanicalAssembly\_6.0.pdf

### 11.3.3. Flightcell Dual Iridium/GPS Antenna Drawings

DRW\_ANP\_001\_FlightcellIridiumGPSAntennas\_2.0.pdf

### 11.3.4. Flightcell Iridium Phone Cradle Documents

MAN\_CR3\_ALL\_001\_InstallationManual\_8.0.pdf

DRW\_CRP\_03\_001\_D25WithPhoneRetainerMechanicalAssembly\_6.0.pdf

DRW\_CRP\_03\_002\_GPSMechanicalAssembly\_2.0.pdf.pdf

DRW\_CRP\_03\_003\_D38999MechanicalAssembly\_2.0.pdf

DRW\_CRP\_03\_004\_D25MechanicalAssembly\_1.0.pdf

MAN\_CR4\_ALL\_001\_InstallationManual\_1.0.pdf

DRW\_CRP\_04\_001\_D25MechanicalAssembly\_2.0.pdf

## 12. USER NOTES