Flightcell® DZM

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

Iridium satellite phone

GPS flight following

Cell phone/Audio/MP3 integration

Technical Installation Manual

www.flightcell.com

Version history - DZM Technical Installation Manual

Issue	Date	Author	Description	PCB Revision
Issue 1	05 Sep 2005	G. Pronk-Jones	Document created.	D
Issue 2	18 Jan 2006	G. Pronk-Jones		D
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Issue 5	19 May 2007	J. Glasgow	Updated wiring diagrams.	E
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Issue 7	05 Nov 2008	J. Mace	General revision.	E
Issue 8	18 Nov 2008	A. Whitlock	General revision.	E
Issue 9 - CURRENT	01 Apr 2009	A. Whitlock	Change to DZM connector.	E

Contents

Registering your Flightcell® DZM

Please register your Flightcell® DZM product by completing and returning the registration card enclosed in the box.

We are continually enhancing Flightcell® DZM firmware. Registration will enable us to contact you with service updates and upgrade notifications.

Introducing your Flightcell® DZM

Flightcell® DZM features

The Flightcell® DZM provides aircraft operators with global voice and data communications and aircraft tracking. It simultaneously consolidates satellite phones, cell phones, tactical radios and other audio devices into your aircraft communications system.

The Flightcell® DZM is installed fully integrated with the aircraft's audio panel or intercom/interphone system (ICS). This enables crew members to use any of the connected audio equipment from their individual ICS locations and headsets.

An in-built GPS and sophisticated active tracking software provides for transmission of position and mission critical data via satellite or cell phone.

Limited messaging capability can be accessed using the DZM display and keypad. More extensive messaging and data transmission capabilities can be accessed by connecting the Flightcell DZM to a portable computer. Three data communication modes are available:

Iridium Short Burst Data (SBD)

Short Messaging System (SMS)

Iridium Direct Data

About this manual

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

Information on configuring and operating the Flightcell® DZM is provided in this manual. More detailed information is available in the Operation Manual for the Flightcell® DZM.

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.co/downloads.aspx, or by contacting Flightcell International Ltd.

Flightcell® DZM installation overview

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

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

Typical Installation with Iridium satellite phone
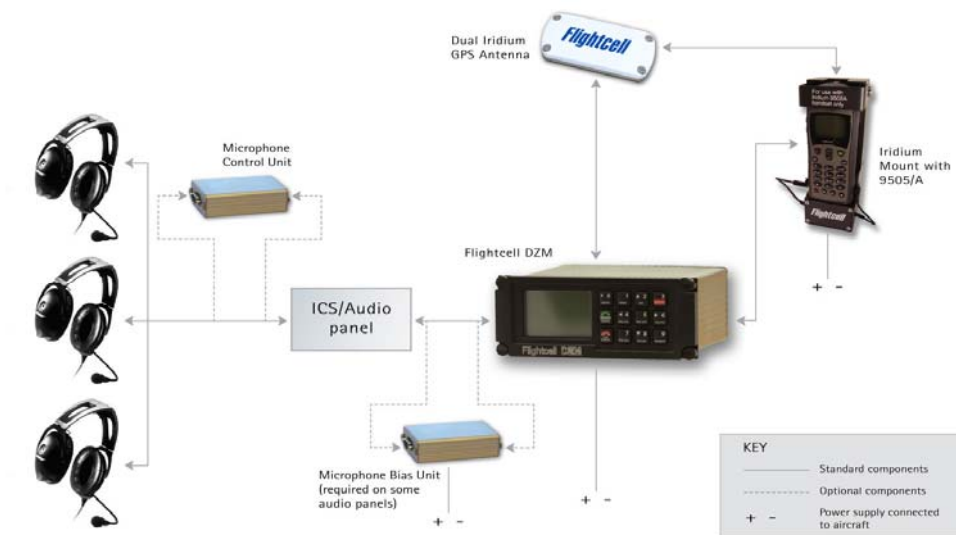
The standard Flightcell® DZM installation includes:

A **Flightcell® DZM unit**

An **Iridium 9505** or **Iridium 9505A** satellite phone handset installed in a **Flightcell® Iridium Phone Mount**

A **Dual Iridium/GPS Antenna**

The following additional components may also be installed:

A **Microphone Bias Unit** may be required where the Flightcell® DZM is connected to an audio panel. This provides bias power to the microphone bus. Refer to "Installing other optional components" on page 21 for further information about installing the microphone bias unit.

The **Microphone Control Unit** allows a connection from the microphone of one or more crew/passengers to the Flightcell® DZM to be activated or deactivated. This allows the connected crew or passengers to talk on the Flightcell® DZM phone call, while allowing others to use the intercom or radios as normal. Refer to "Installing other optional components" on page 21 for further information about installing the microphone control unit.

Typical installation with Iridium satellite phone and cell phone modem

The Flightcell® DZM can also be used to integrate a cell phone modem into the aircraft or vehicle communications system. This provides a second dial up communications option.
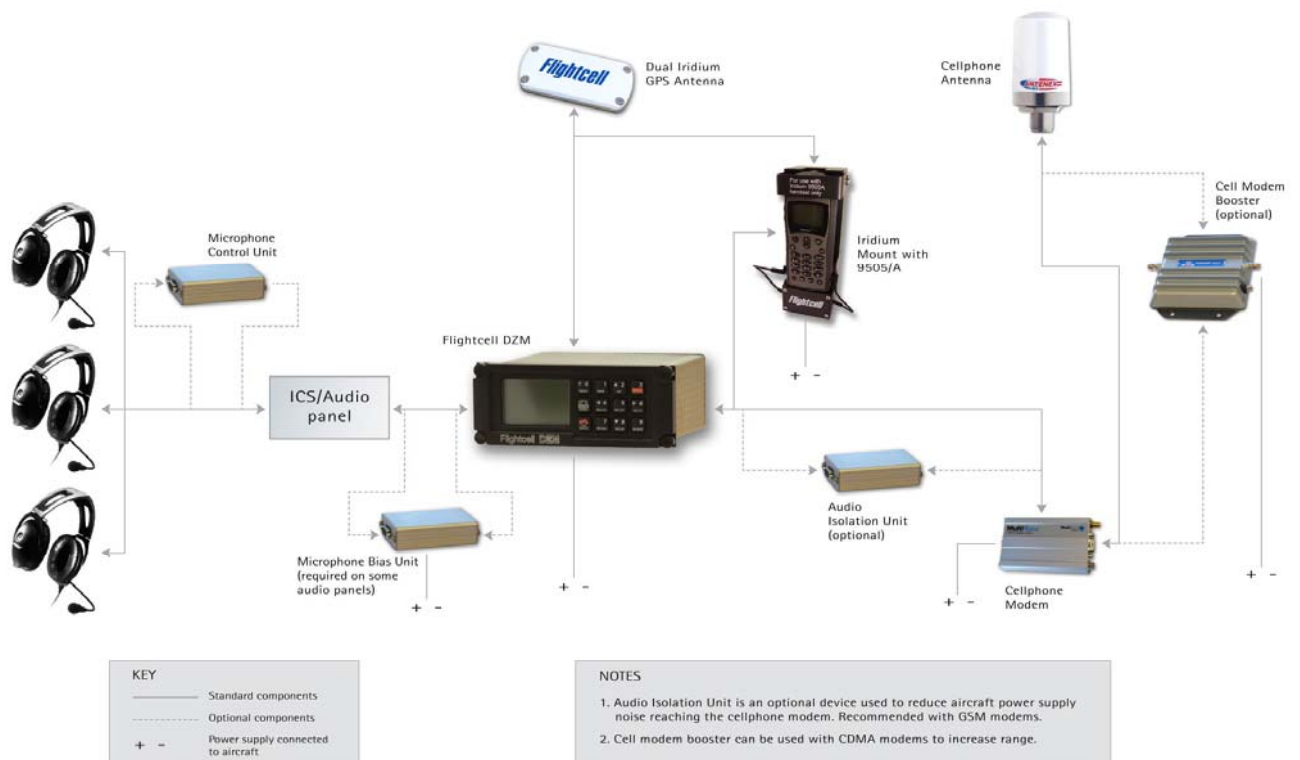
The operator can choose to use either satellite or cell phone for voice communications or for transmitting tracking data (subject to network capability).

The following additional components may also be installed:

A **Microphone Bias Unit** may be required where the Flightcell® DZM is connected to an audio panel. This provides bias power to the microphone bus. Refer to "Installing other optional components" on page 21 for further information about installing the microphone bias unit.

The **Microphone Control Unit** allows a connection from the microphone of one or more crew/passengers to the Flightcell® DZM to be activated or deactivated. This allows the connected crew or passengers to talk on the Flightcell® DZM phone call, while allowing others to use the intercom or radios as normal. Refer to

"Installing other optional components" on page 21 for further information about installing the microphone control unit.

An **Audio Isolation Unit** may be required to reduce transmission of extraneous noise (eg. from the aircraft power supply) into the cell phone modem; installation is recommended for a GSM modem but is optional for a CDMA modem. Refer to "Installing other optional components" on page 21 for further information about installing the audio isolation unit.

A **Cell Modem Booster** can be installed to boost antenna performance, increasing the effective range of CDMA modems. A booster is not required with a GSM modem. Refer to "Installing a cell phone booster" on page 21 for further information about installing the cell modem booster.

Flightcell® DZM at a glance

MENU
Access menus to
edit settings

NVG compatible
backlit display

ENTER
Confirm settings
Connect call

CANCEL
Exit Menu
End call
Enter * and #
when on PABX

DIAL CEL
Dial cellphone

SPD CEL
Speed Dial
Cellphone

MARK
Mark waypoint
and select
preset messages

AFF
Start/stop AFF

DISTRESS
Distress call

Arrow keys
are used for
navigating menus

Numeric keys are
used for phone
dialing

DIAL SAT
Dial sat phone

ISO PHONE
Isolate phone
call

AUX MUTE
Mute auxilary
audio input to
ICS

SPD SAT
Speed dial
sat phone

Serial number

Main connector
– 37 pin
D38999/20WD3
5PN

Vent patch to
equalize internal
pressure

GPS connector
– TNC

Flightcell® DZM specifications

Power supply voltage:	24-30 V DC	Auxiliary audio input:	6mVrms to 5Vrms	Max Velocity:	500m/s
Power supply current:	Up to 250mA		Adjustable gain	Max Acceleration:	4G
ICS transmit audio:	Input: 6mVrms to 5Vrms	Left input impedance:	1kΩ	Max Altitude:	18000m
	Adjustable gain	Right input impedance:	1kΩ	Ext Antenna:	
	Input impedance: 2k7	Sat phone data connection:	RS-232 levels. Settings adjustable	• Connector:	TNC
ICS receive audio:	Output: 53mVrms to		for different phone types.	• Bias Voltage:	3V
	5Vrms into 150Ω	Cell phone data connection:	RS-232 levels. Settings adjustable	• Antenna Current:	6–70mA
Sat phone input:	23mVrms to 1.75Vrms		for different phone types.	• Typical gain:	21dB
	Adjustable gain	PC data connection:	RS-232 levels	Dimensions:	
Sat phone output:	Typical electret mic levels	Backlighting control:	0-28V DC or 0-5V AC	Width: 5.75" (146 mm)	Height: 2.25" (57 mm)
	Adjustable gain	Fixed control:	Off, Low, Med, High	Depth: 5.1" (130 mm)	Weight: 17.6oz (500g)
Cell phone input:	23mVrms to 1.75Vrms	Backlight colour:	Green 540nm. Designed for	Mounting fasteners:	DZUS
	Adjustable gain		NVIS B compliance.	Main connector:	D38999/20WD35PN
Cell phone output:	Typical electret mic levels	GPS:		GPS connector:	TNC
	Adjustable gain	TTFS (Time to first fix):	Typ 44s	Compliance:	FAA (RTCA-D0160E), STC

Before you start

Check Flightcell® DZM components

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 the 2 main types of DZM installation:

The **standard Iridium installation**, where the Flightcell® DZM interfaces an Iridium handset into the aircraft

The **Iridium and cell phone installation**, where the Flightcell® DZM interfaces an Iridium handset and a cell phone modem into the aircraft

Standard Iridium Installation:

Item	Component	Flightcell® Part Number	Connectors Required	Notes
1	Flightcell® DZM unit	FCDZ337DIM **OR**	C38999/ 26WD35SN	DZM fitted with military keypad.
		FCDZ337DIC		DZM fitted with general aviation keypad.
2	Flightcell® Iridium phone mount	FC9505D2500C **OR**	D25 female	Fitted with D25 connector, for use with Iridium 9505 satellite phone.
		FC9505AD2500C **OR**	D25 female	Fitted with D25 connector, for use with Iridium 9505 satellite phone.
		FC9505D3899900M **OR**	C38999/ 26WD35SN	Fitted with C38999 main connector, for use with Iridium 9505 satellite phone.
		FC9505AD3899900M	C38999/ 26WD35SN	Fitted with C38999 main connector, for use with Iridium 9505 satellite phone.
3	Iridium 9505A satellite phone handset	IR9505A		May be purchased from Flightcell® International Ltd or from your mapping or Iridium service provider.
4	Dual Iridium / GPS antenna	ANTDTNCSMA3VC	SMA (GPS) and TNC (Iridium)	Alternative antennae may be used subject to compatibility. Contact Flightcell® International Ltd for further details.
5	Microphone control unit	FCDZMSAD2500C	Refer to Interconnect document	Optional component. Refer to "Installing other optional components" on page 21 for further information.
6	Microphone bias unit	FCDZAITD1500C	To DZM – DSub15 male To audio panel – DSub15 female	This component is only required if wiring the Flightcell® DZM into a spare transceiver position on an aircraft equipped with high impedance microphones. Refer to "Installing other optional components" on page 21 for further information.

Additional components required for cell phone installation:

Item	Component	Flightcell® Part Number	Connectors Required	Notes
7	Multitech cellular modem **OR** Wavecom Fastrack cellular modem	MTCB-C-N5 **OR** FSU001-9GBN00	DSub15 male Power connector supplied with modem	The specific modem required depends on country and network. Contact Flightcell® International Ltd for more details.
8	Cell phone antenna	ANTCELLTRA806/ 17103P	N type	Alternative antenna may be used at customer's discretion.
9	CDMA cell phone 3W booster	CA-819-800MHz	2 x TNC	Not used with GSM modems. Refer to "Installing a cell phone booster on page 21 for further information.
10	Audio isolation unit	FCDZMSAD2500C	To DZM – DSub15 male To audio panel – DSub15 female	Recommended for use with GSM modems, optional for use with CDMA modems. Refer to X for further information about installing the audio isolation unit.

Check tools required for installing your Flightcell® DZM

Installation of the Flightcell® DZM system can be completed using the following tools:

Crimping tools

Insert/extract tool, for installation of pins in the C38999 main connector and other connectors

Wire strippers

Multimeter

General hand tools

Identifying aircraft locations for installation

The exact location of components in the aircraft is at the discretion of the installer. However, the 2 main components, the Flightcell® DZM unit and the Iridium Phone Mount should be installed in accessible locations to suit operational requirements.

Flightcell® DZM Unit (Item 1)

The Flightcell® DZM is the main control unit for the system, used to manage all connected satellite phones, cell phones and other audio devices, and to display incoming messages. It should be installed in the aircraft control panel or between the pilot and co-pilot seats in a position where its display is clearly visible.

Some typical installations are shown in the photographs to the right.

The Flightcell® DZM unit is designed for installation in a DZUS rack. If your aircraft does not use the DZUS mounting system, the Flightcell® DZM can be supplied with an alternative faceplate to enable panel mounting. Please contact your Flightcell® supplier for more details.

To assist with Computer Aided Design of your Flightcell® DZM installation, CAD solid models of the DZM unit are provided with this manual.

FIG: Flightcell® DZM unit mounted in Eurocopter EC135

FIG: Flightcell® DZM unit mounted in DZUS rack in Beech King Air

Iridium Phone Mount (Item 2)

The Iridium Phone Mount is usually installed so the Iridium handset can be quickly removed from the phone mount when crew leave the aircraft.

Depending on the configuration of your aircraft and space available, you could consider one of the following options for the phone mount:

    On the back of the center console

    On the forward bulkhead in the passenger compartment

    On the aft bulkhead between the passenger seats

    In the gear locker

Some typical installations are shown in the photographs to the right.

To assist with Computer Aided Design of your Flightcell® DZM installation, CAD solid models of the Flightcell® Iridium Phone Mount are provided with this manual.

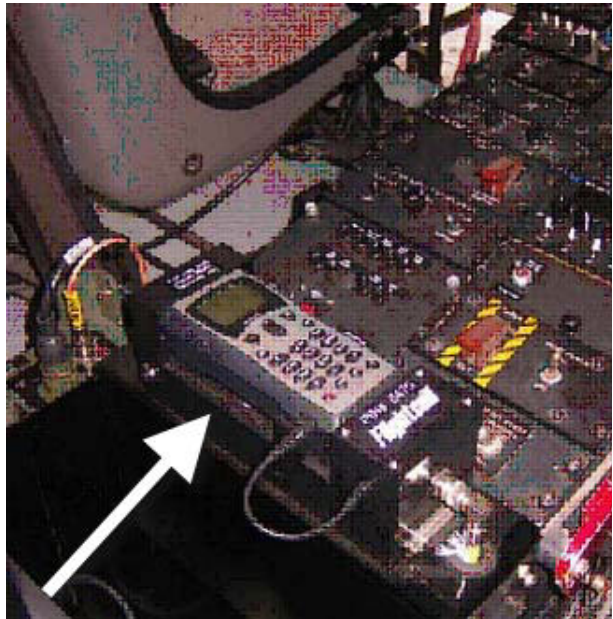FIG: Iridium 9505A Phone Mount installed in side locker in Eurocopter AS350

FIG: Iridium 9505A Phone Mount installed aft of center console in Bell 212

Other components

Other components don't need to be accessible during normal aircraft operation, so are usually installed in-line and out of the way, for example:

    In an avionics bay

    Under the floor

    Behind the control panel

Preparing wiring harnesses for installation

Installers may fabricate their own wiring harnesses or a prefabricated main wiring harness may be purchased from your Flightcell® DZM supplier.

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 DZM (C38999/26WD35SN) can be purchased from your Flightcell® DZM supplier.

Guidelines for fabricating wiring harnesses

All wiring should be carried out with aviation specification fire proof cable.

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

The following minimum wiring specification is recommended:

    Power supply - 22 gauge

    Other cabling - 24 gauge

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

Using prefabricated wiring harnesses

A wiring diagram for the Flightcell® DZM system is provided with this manual (refer to Drawing 1). Note that the backshell colours in this drawing refer to the connectors used in the prefabricated harness.

The harness includes the following connectors to the Flightcell® DZM, Iridium phone mount, data port and cell phone modem. The remaining unterminated connections are individually labeled.

Connector	Backshell Colour	Details
C38999/26WD35SN	N/A	Main connector to DZM
D25 female	Black	Main connector to Iridium Phone Mount
D9 female	Blue	Data port
DSub15 male	Black	Cell phone modem

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

Wiring diagrams

The following drawings are provided with this manual. These are best printed on A3 paper.

DZM main wiring harness

Firmware upgrade loom; this is used in the workshop for testing or upgrading firmware

Installing your Flightcell® DZM

Connecting to the aircraft communications system

The way in which the Flightcell® DZM is connected into your aircraft communications system (audio panel/ICS) will depend on your system configuration and operational requirements.

As the Iridium satellite phone and cell phone are both full duplex, it is preferable to use the Flightcell® DZM on a hot mic connection, rather than PTT. The DZM will typically be installed in one of the following ways:

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

The Flightcell® DZM's audio inputs and outputs have a wide audio adjustment range, so can be adjusted through its setup menu to suit most configurations.

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 DZM MIC HI line is connected to the audio panel's cell phone input, and the DZM Audio HI line is connected to the cell phone output. Please consult the installation manual for the audio panel for more details.

Connecting direct to a headset microphone line:

The Flightcell® DZM Audio HI line is connected to a spare audio input on the audio panel.

The Flightcell® DZM MIC HI line is connected directly to one or more headset microphone inputs on the audio panel. The way this is configured will depend on how many headsets are to have access to the Flightcell® DZM:

> If only the pilot is to use the Flightcell® DZM, its MIC HI is connected only to the pilot's microphone line
>
> If both pilot and co-pilot are to use the Flightcell® DZM, 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 Flightcell® DZM
>
> If all crew and passenger positions are to use the Flightcell® DZM, a Flightcell® Microphone Controller may be installed. This enables the active microphones to be selected at any time using the Flightcell® DZM menus. This component can be ordered from your Flightcell® supplier. An installation manual for the Microphone Controller is available on request from Flightcell® International Ltd.

Connecting to a spare 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 Flightcell® DZM and connected phones on demand.

On low impedance (most military and some non-military aircraft) microphones, Flightcell® DZM MIC HI can be connected direct to the audio panel input, and its levels adjusted using the Flightcell® DZM audio setup menu.

On aircraft using high impedance (electret, dynamic or carbon) microphones, a bias voltage is commonly required on MIC HI lines to the audio panel, in order to energize the user's microphone when using the Flightcell® DZM. The Flightcell® DZM does not supply mic bias on its MIC HI line.

It is recommended that MIC bias power be provided by fitting a purpose-built adaptor designed to provide DC power free of noise. Options include:

A Flightcell® Mic Bias Unit. Refer to "Installing other optional components" on page 21 for further information about installing a microphone bias unit.

A third-party unit, such as the AA34-300 Universal Radio Interface from Northern Airborne Technology. Refer to http://www.northernairborne.com/showproduct.php?product_id=113&BRSR=0) or a corresponding product from PS Engineering.

Connecting to the aircraft power supply

The Flightcell® DZM unit and other components require aircraft DC power for their operation. Operating range is 24-30VDC. The optimum power supply voltage is 28V DC.

The Flightcell® DZM unit and other components are usually connected to the aircraft radio power supply bus. Circuit breakers or fuses should be used between DZM system components and the power supply:

A ½ amp circuit breaker/fuse is recommended to protect the DZM system.

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

Installing a PC data port

A data port is an essential part of the Flightcell® DZM system. The data port is used to:

Send and receive data via the Flightcell® DZM and Iridium satellite phone link using a connected laptop or tablet PC or a PDA

Test the Flightcell® DZM or load new firmware

It is recommended that the data port be installed on the control panel where it is readily accessible.

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

NOTE! If the PC data port connection is not installed, the Flightcell® DZM 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. Wiring details for the Firmware Upgrade Loom are provided in Drawing 2 included with this manual.

Connecting to the aircraft dimmer control

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

The automatic dimmer control function supports either 0-5V AC or 0-28V DC external control signals. To utilize these options, the Flightcell® DZM lighting control should be connected to the aircraft lighting circuit.

Installing a collective switch on a helicopter

The Flightcell® DZM can be programmed to send special position reports on takeoff and landing. For fixed-wing aircraft, the Flightcell® DZM 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 or greater knots, a takeoff report is transmitted

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

This switch is connected to one of the general purpose digital inputs on the Flightcell® DZM. Refer to Drawing 1 attached to this manual.

The Flightcell® DZM can be programmed to specify whether the position of the collective is denoted by an open or closed switch, by going to **Menu > Setup Menu > Collective Switch**. If the collective is raised while this menu item is open, the Flightcell® DZM display will show if the collective setting is correct.

Installing a Flightcell® Iridium phone mount

The Flightcell® Iridium Phone Mount comes in 2 versions, for Iridium 9505 and Iridium 9505A.

The 9505 mount can be converted to accommodate a 9505A, or vice versa, by a competent technician. Please contact Flightcell® International Ltd for details of the changeover procedure.

Connections:

The standard phone mount in each version comes with a D25 main connector. Refer to Drawing 1 attached to this manual. Phone mounts with an alternative C38999 connector are available by special order.

Mounting:

The Flightcell® Iridium 9505A Satellite Phone Cradle is mounted into the installation by means of 4 x M5 screws in the back of the cradle. These need to be mounted from the rear of the cradle through a bulkhead (or some other similar mounting point). The length of the screws should be the thickness of the bulkhead plus 15mm.
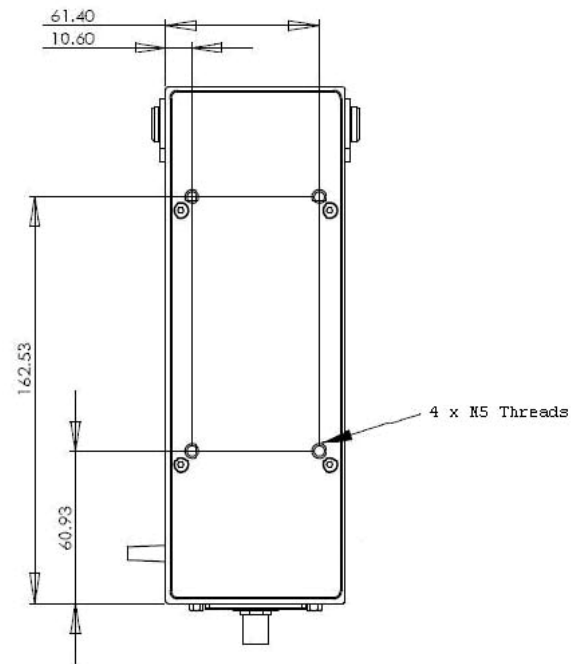
Installing an Iridium/GPS antenna

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.

The following should be considered when determining a mounting location:

Maintain good separation from other antennae. Preferred separation is 0.75m from L-band (GPS), TCAS or transponder antennae, 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.

Mounting:

Mounting details for the Flightcell® Dual antenna are provided on the drawing to the right. Refer to the specification sheet included with this manual for further details.
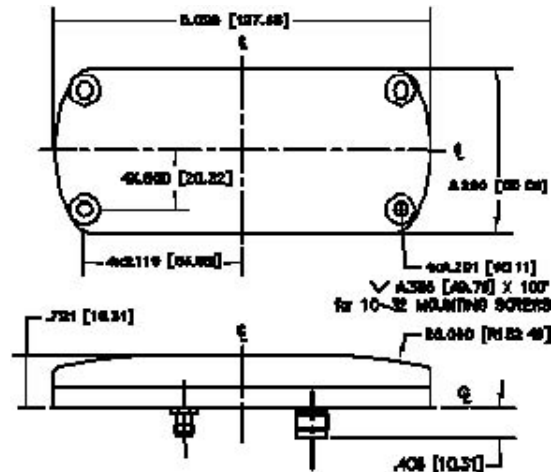
Cables:

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 Flightcell® DZM to assist with installation in the panel.
Up to 17m	LMR400	
Up to 26m	LMR600	

Connectors:

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

Type	Antenna End	Other End
Iridium cable	TNC	TNC (Phone)
GPS cable	SMA	TNC (Flightcell® DZM)

Installing a cell phone modem

The Flightcell® DZM currently supports the following standalone cellular modems, allowing both audio and data connections:

GSM network - Wavecom Fastrack M1306B

CDMA network - Multitech MultiModem MTCBA-C (New Zealand) or equivalent in other countries

Other cell phone modems may be able to be supported. Please contact Flightcell® International Ltd for details and a proposal.

Connections:

Audio and data are connected to the Multitech MultiModem and Wavecom Fastrack modems via a DSub15 connector.

Pinouts for the 2 modems are identical.

Both modems are supplied with power plugs and flyleads for connection to the aircraft power supply.

Installing a cell phone antenna

An externally-mounted cell phone antenna is required if a cellular modem is installed in the aircraft. The ANTCELLTRA806/ 17103P antenna is available from your Flightcell® DZM supplier.

Location:

The cell phone antenna should be located on the underside of the aircraft to provide good reception at any altitude.

The antenna should be located where it is protected from damage by passengers or ground crew, or from contact with the ground or obstructions

Cables and connectors:

The ANTCELLTRA806/ 17103P cell phone antenna is connected using RG58C/U 9006 cable with SMA or N Type connectors at each end.

Installing a cell phone booster

A cell phone booster can be installed with a CDMA modem to improve its performance in remote areas.

>   **NOTE!** A booster cannot be used with a GSM modem.

Connections:

The cell phone booster is connected in-line between the antenna and the CDMA cell phone modem. The booster is fitted with TNC connectors.

The booster can be connected to a supply voltage of up to 30V.

Installing other optional components

Microphone Control Unit:

A microphone control unit can be used to control which microphones are connected to the Flightcell® DZM. Microphone allocation can be changed at any time using the Flightcell® DZM menus.

Details on installation and configuration of a microphone control unit can be obtained from Flightcell® International Ltd. Details on connectors required can obtained from the manufacturer's Interconnect document.

Microphone Bias Unit:

The microphone bias unit provides bias power where required to energize the microphones of crew using the Flightcell® DZM.

This component is installed in-line between the Flightcell® DZM unit and the audio panel. A Dsub15 male connector to the the Flightcell® DZM unit and a Dsub15 female connector to the audio panel are required.

A DC power source providing up to 30V is required for operation of the Microphone Bias Unit.

Audio Isolation Unit:

The audio isolation unit is installed in-line between a cell phone modem and the Flightcell® DZM, and is used to minimize the effect of noise (for example, from the aircraft power supply) on the cell phone modem.

A Dsub15 male connector to the the Flightcell® DZM unit and a Dsub15 female connector to the audio panel are required. This unit does not require a power supply.

Configuring your Flightcell® DZM

When you have completed installing your Flightcell® DZM system, you need to:

Configure the Flightcell® DZM

Activate your phone and tracking services

Your Flightcell® DZM is factory fitted with default settings which will suit many aircraft installations. Refer to the Flightcell® DZM Operations Manual for full details on how to adjust these settings. This manual is supplied on a disc with your Flightcell® DZM or can be obtained from the Flightcell® International Ltd website at http://www.flightcell.com/downloads.aspx.

Information required to complete the configuration

You will need to obtain the following information to set up these services:

Iridium phone IMEI – the IMEI is the number that identifies your Iridium phone when it uses the Iridium SBD service. To find the IMEI, remove the battery cover and battery on the back on the Iridium handset. The IMEI is a 15-digit number on a sticker under the battery.

Iridium phone number – this is the phone number for your Iridium handset, starting with "8816". Your will be provided with this number when you purchase the phone.

Satellite phone destination – this is the address to which tracking data is sent when using Iridium SMS. This is provided by your tracking service provider.

Cell phone destination – this is the address to which tracking data is sent when using the cell phone modem to send position data. This is provided by your tracking service provider.

Configuring satellite phone service center number

The service center must be set up on your Iridium satellite phone before you can send SMS messages.

NOTE! The service center number is set up only once, after which it is permanently stored in the satellite phone.

Setting the service center number on the satellite phone handset:

Press the 'Envelope' key on the keypad of the Iridium satellite phone.

Scroll to 'Message Settings' and press 'OK'.

Scroll to 'Service Center' and press 'OK'.

Enter 00881662900005

Press 'OK'.

Activating services

The following services are required to operate your Flightcell® DZM system for voice and tracking services:

Service	Used For	Obtained From	Service Provider Requires
Iridium voice contract	Satellite voice calls Sending position reports and sending/receiving SMS data	Iridium service provider **OR** tracking service provider	
Iridium SBD contract	SBD data transmission	Tracking service provider	IMEI
Tracking service	Receiving and displaying tracking data	Tracking service provider	Flightcell® DZM serial number Iridium phone number IMEI
Cellular voice contract	Cell phone voice calls	Cellular service provider	
Cellular SMS bulk plan	Cell phone data transmission (New Zealand only)	Cellular service provider	

Upgrading Flightcell® DZM firmware

Flightcell® products are shipped with the latest firmware, however newer firmware releases may have become available since your product was shipped. We recommend you check for, and upgrade to, the latest firmware when you install your Flightcell® DZM.

Download the latest firmware from the Flightcell® International website at http://flightcell.net/advancedcustomerdownloads.aspx. To download firmware upgrades from the Flightcell® International website you require a valid login and password. Contact Flightcell® International to obtain these details.

STEP 1 - Installing the Flightcell® DZM Firmware Download Utility:

The Flightcell® DZM Firmware Download Utility program needs to be installed onto your computer in order to upgrade your Flightcell® DZM with the latest firmware version. The utility is made available on the CD-ROM at the time you receive your Flightcell® DZM, or may also be downloaded from the Flightcell® International website at http://flightcell.net/advancedcustomerdownloads.aspx.

Save the DZM Firmware Download Utility files to your computer (as these are provided in a zip file, all files will need to be extracted to an appropriate location on your computer).

Double-click the **Setup.exe** file and follow instructions to install the DZM Firmware Download Utility. The message "DZM download setup was completed successfully" will display when installation is complete.

STEP 2 - Preparing to perform a firmware upgrade:

From the CD-ROM or Flightcell® International website, save the latest firmware file to an appropriate location on your computer. (If this is provided in a zip file, the file will need to be extracted to an appropriate location on your computer).

Connect your computer to the Flightcell® DZM data connection.

STEP 3 - Opening and preparing the DZM Download Utility:

Open the Flightcell® DZM Download Utility. This may be found in the programs list on your laptop computer by Selecting Start and All Programs (and may be labelled as DZM Download).

Using the drop-down menu in the 'COM port' field, select a COM port. You may have to try several ports until you locate one that is available. The 'DZM Information' window will display information when the Flightcell® DZM is connected through an available port.

NOTE! If you are using a serial port on your computer you will normally select **COM1**. If you are using a USB connection on your computer, you will usually use the highest numbered COM port.

STEP 4 - Performing the firmware upgrade:

Click and drag the latest firmware upgrade file (from where it was saved in Step 2 above) into the large white 'Firmware Loaded' box.

Click the **START FIRMWARE UPGRADE** button to the left of the 'Firmware Loaded' box.

Follow the instructions that display on the top of the DZM Programmer. This will also advise when the firmware upgrade is complete.

Follow any further instructions that display on the Flightcell® DZM LCD screen.

STEP 5 - Setting SMS destination:

The Flightcell® DZM Firmware Download Utility may also be used to check or change the satellite or cellular modem SMS destinations.

Click the **Query** button to check SMS destinations.

To change an SMS destination, enter the new destination into the **Cellular SMS Destination** or **Satellite SMS Destination** field. Click the **Set** button alongside the amended field to confirm the change.

Warranty and contact details

Limited warranty for your Flightcell® DZM

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

Your Flightcell® DZM is warranted for 12 months 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 Flightcell® DZM 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 technical 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.

Flightcell® International contact details

Flightcell® International Ltd

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User notes