

Flightcell International Ltd

DZMx Installation Manual

Firmware Version 3.5.0



REVISIONS & APPROVAL

Revision	Effective Date	Approved By	Reasons for Change
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2.0	18 Nov 2013	James Mace	Revised manual
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5.0	20 Jan 2014	James Mace	Correct error in descriptions of D25 connectors. Some formatting enhancements
6.0	28 Feb 2014	James Mace	Update manual for 3G data. Minor menu changes Some other corrections to menu drawings and changes.
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8.0	27 Aug 2014	James Mace	Manual change <ul style="list-style-type: none"> • Configuration of multiple remote heads. • Instructions for installation and activation of call annunciator light. • New altitude and high speed GPS settings.
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23.0	20 Dec 2018	James Mace	DZMx firmware release 3.1
24.0	01 Apr 2019	James Mace	DZMx firmware release 3.2
25.0	01 Jun 2020	James Mace	DZMx firmware release 3.5.0 Major change to the DZP_04 part number to include a 4 to 9-digit dash number e.g. DZP_04-xxx-xxxx.

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CONTENTS

SECTION 1: INTRODUCTION	4
APPLICABILITY OF THIS MANUAL	4
DOCUMENTATION	4
SECTION 2: DZMX EQUIPMENT	5
CONNECTORS	5
ETHERNET/USB CONNECTOR MODULE	5
SECTION 3: DZMX SPECIFICATIONS	6
VERSIONS AND PART NUMBERS	6
DIMENSIONS	7
ELECTRICAL	7
DZMX WI-FI AND BLUETOOTH TRANSMIT POWER	8
ENVIRONMENTAL QUALIFICATIONS	8
SECTION 4: INSTALLATION	9
MOUNTING THE DZMX	9
DZMX WIRING GUIDE	9
INSTALLING A DZMX REMOTE HEAD	15
DZMX ANTENNAS	16
SECTION 5: CONFIGURATION	17
CONFIGURING THE DZMX	17
AUDIO INSTALLATION AND CONFIGURATION	20
MODEM CONFIGURATION	23
BACKLIGHTING	25
DZMX WiFi	27
DZMX BLUETOOTH™	27
DZMX TRACKING	29
DZMX INPUTS AND OUTPUTS	35
CONFIGURING DZMX DATA	37
DZMX DATA LOGGING	38
DZMX EMAIL OUTBOX	39
RECORDING AND TRANSMITTING MAINTENANCE DATA	40
SECTION 6: DZMX APPLICATIONS	41
DZMX APPLICATIONS AND LICENCES	41
DZMX APPLICATIONS	41
SECTION 7: MAINTENANCE, DIAGNOSTICS AND SUPPORT	42
FIRMWARE UPGRADES	42
DIAGNOSTICS	43
FLIGHTCELL REMOTE ASSISTANCE	43
APPENDIX 1. CONNECTOR KITS PROVIDED WITH THE DZMX AND ASSOCIATED PARTS	45
CONTACT DETAILS	47
WARRANTY	48

Section 1: Introduction

This manual provides information on installation and configuration of the Flightcell DZMx. This manual has been updated for DZMx firmware release 3.5.0.

Applicability of this Manual

This manual applies to the Flightcell DZMx part number DZP_04 revisions 3.0 and 4.0.

- Rev. 3.0 operates firmware 3.x.x and has the DZP_04 part number with a 4 to 6-digit dash number e.g. DZP_04-xxx.
- Rev. 4.0 has a major change to the DZP_04 part number which now has 4 to 9-digit dash number e.g. DZP_04-xxx-xxxx. This revision operates firmware 3.5.0.

Documentation

Comprehensive documentation for the DZMx is available on the Flightcell website at www.flightcell.com/resources. This includes:

- » DZMx wiring diagrams (interconnect drawings)
- » DZMx mechanical assembly
- » Antenna specifications and drawings
- » Manuals
- » Certification documentation.

Section 2: DZMx Equipment

The DZMx should be inspected when unpacked to check for any visible damage or missing components.

Connectors

Connector kits are supplied with the DZMx and with associated parts including the DZMx Remote Head and antennas.

The content of the connector kits depends on the version of the DZMx. Details of the connector kit contents are provided in Appendix 1.

Ethernet/USB Connector Module

A Flightcell USB/Ethernet connector module is provided with each DZMx. It is used for terminating the DZMx USB and Ethernet connections. It is compulsory that USB and Ethernet connections are installed on the aircraft. If the USB/Ethernet connections are not installed into the aircraft, it will severely limit troubleshooting and support capabilities.

The connector module is available with either D-type (commercial) or D38999 (military connectors). The connector module and its connector kit are provided in the DZMx connector kit (See Appendix 1 for details).

Section 3: DZMx Specifications

Versions and Part Numbers

The DZMx can be built in a wide range of configurations, with a range of hardware options. The DZMx part number is DZP_04. The 3 - 7 digit dash number immediately following DZP_04 designates the variant of the DZMx.

The available variants may change from time to time. The options available to build up the different variants are:

- » Installed modems (see "Modem Configuration" on page 24 for a list of supported modems)
- » Faceplate options:
 - » DZUS (5½") mount
 - » GA (6¼") mount
- » Type of main connector
 - » Standard - two D25 connectors
 - » Military - one milspec D38999 connector
- » NVIS compliance
 - » NVIS-B
 - » NVIS-A / Mil Std 3009 (only available on versions with military connectors)
- » Embedded Wi-Fi and Bluetooth capability
- » Expansion cards:
 - » ARINC 429
 - » Input Expansion Card (providing seven additional general purpose inputs)
 - » Second Ethernet

Dimensions

Dimension	DZUS mount	GA mount
Faceplate Width	146mm	158mm
Extrusion Width	126mm	126mm
Faceplate Height	57mm	60mm
Extrusion Height	54mm	54mm
Depth (from Front face to Rear face)	110mm	110mm

Electrical

Part/Item	Parameter	Value
Power	Input Voltage	12-32VDC
	Supply Current	Up to 1A @ 28VDC
ICS to DZMx	Input Levels (V_{RMS})	20mV to 1.15V, adjustable
		775mV nominal
	Input Impedance	600 Ω
DZMx to ICS	Microphone Bias Voltage	12V via 2.2k Ω
	Output Levels (V_{RMS})	Up to 5V, adjustable
		775mV nominal
Output Impedance	150 Ω	
Backlighting	Input Control	0 to 28VDC User calibrated High/Low set-points
	Colour	Green 520nm. Designed for NVIS-B compliance.
GPS	Antenna Bias	5V
	Antenna Current	Up to 100mA
	Sensitivity	-162dBm (with Flightcell Antenna)
	Time to First Fix	26s
General Purpose Inputs	Inputs Levels (V_{in})	0 to 28VDC
General Purpose Outputs	Levels (V_{out})	0 to 32VDC
	Max Current (I_{out})	500mA

DZMx Wi-Fi and Bluetooth Transmit Power

WiFi		
	Tx power (dBm)	17.3
	Antenna gain (dBi)	2.6
	Total power (dBm)	19.9
	Total power (mW)	97.7
Bluetooth		
	Tx power (dBm)	10.0
	Antenna gain (dBi)	2.6
	Total power (dBm)	12.6
	Total power (mW)	18.2

Environmental Qualifications

The DZMx is tested against and complies with RTCA-DO160G.

Details of the DO160G compliance are provided in the DZMx Declaration of Design and Performance (DDP), document TEC_DZ4_031, Issue 7 for DZMx Revision 3 and Issue 8 for DZMx Revision 4.

DO160 test results are available on request from tech@flightcell.com.

Section 4: Installation

Mounting the DZMx

The DZMx should be mounted where the flight crew or radio operator have a clear view of the display and can easily use the keypad.

The DZMx LCD is designed for optimum readability when viewed at angles between 60° above the display to 20° below. Avoid mounting the unit where the display will be viewed at an oblique angle, as it may not be clearly readable. It is preferable to mount the DZMx to minimise sunlight shining on the display. The ideal location is in the panel where it is readily viewed by, and accessible to the pilot or pilots.

If the DZMx is installed in the pedestal, for ease of use, it is preferable to install it as near to the front of the pedestal as possible.

Refer to the following mechanical drawings (latest versions are available from the Flightcell website at www.flightcell.com/resources) for dimensions and mounting details of for the DZMx:

- » *DZUS/GA Mech Assembly*, for versions with DZUS front plate and D25 main connectors
- » *GA/GA Mech Assembly*, for versions with GA front plate and D25 main connectors
- » *DZUS/Mil Mech Assembly*, for military versions with DZUS front plate and D38999 main connectors.

CAD solid model files are also available on request from Flightcell International. Contact tech@flightcell.com for more information.

DZMx Wiring Guide

Refer to the following wiring diagrams for the Flightcell DZMx and associated equipment (available from www.flightcell.com/resources):

- » Civilian Wiring Diagrams for versions of the DZMx with D25 main connectors
- » Military Wiring Diagrams for versions of the DZMx with D38999 main connectors.

Necessary Installations

The following are essential parts of the DZMx installation:

- » "Power Supply," below
- » "Ethernet/USB Connector Module" below
- » "Audio Configuration", see page 20
- » "DZMx Antennas", see page 16
- » "SIM Cards", see page 24.

Optional Installations

The following are optional parts of the installation.

- » "DZMx Remote Head", see page 15
- » "Backlighting control ", see page 25
- » "DZMx Inputs/Outputs", see page 35

Power Supply

The DZMx unit and other components require aircraft DC power. Operating range is 12-32VDC. It is recommended that the DZMx be connected to the emergency (primary) power bus on the aircraft. This is to ensure successful operation of tracking (including engine start/stop data) and emergency calls.

When operating on a nominal 28V supply, circuit breakers or fuses of the following rating should be used between DZMx system components and the power supply:

- » A 2 amp circuit breaker/fuse is recommended to protect the DZMx system
- » A 1 amp circuit breaker/fuse is recommended to protect an external modem (Iridium or cellular) module, if installed

» A 1 amp circuit breaker/fuse is recommended to protect a Flightcell Iridium phone cradle, if installed
If combining two or more circuits on a single circuit breaker, a 3A circuit breaker/fuse is recommended.

Ethernet/USB Connector Module

A Flightcell USB/Ethernet connector module (pictured) is supplied in the DZMx connector kit with the DZMx for terminating its USB and Ethernet connections.

Versions are available with either a D-type connector (part number IDP_00013) or D38999 connector (part number IDP_00012). Mating connectors for the wiring loom are included with the connector module.

The Ethernet/USB connector module should always be installed as it provides the following functions:


Ethernet - provides a connected device access to the DZMx data connections and to DZMx Connect.

USB - required for firmware upgrades and downloading diagnostics.

The cable run to the USB connector should be limited to 5m of proper USB Cable to ensure compliance with the USB 2.0 cable delay specification.

An alternative USB or Ethernet socket may be used if preferred, so long as the wiring guidelines above are followed.



 **Note:** It is essential that a USB and Ethernet connection is installed in an accessible location.

Fabricating Wiring Harnesses

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 stranded (0.325mm²)
- » **Other cabling** - 24 AWG stranded (0.205mm²).

It is recommended that enough slack be left in the main cable to enable the DZMx to be partially removed from the aircraft panel for service or to exchange the Iridium and/or cellular SIM card.

Grounding and Shielding Terminations

The DZMx provides a chassis ground connection on the primary connector. This can be connected to a local aircraft chassis ground point if required. If the DZMx is mounted in a DZUS rack, the housing is grounded to the DZUS rails via the DZUS connectors and contact between the front panel metalwork and the DZUS rails.

If the DZMx has a GA front panel it is recommended to bond the DZMx to aircraft chassis ground via either the hardpoint on the rear of the DZMx or the chassis ground pin on the primary connector.

Installing Data Ports

The DZMx has several data connections wired off the main or secondary connector:

- » **Ethernet** - used for connecting a PC or other Ethernet-capable device
- » **USB** - used for firmware upgrades and connecting USB-only devices
- » **RS232** - available for serial data connections to legacy devices and as a debug port
- » **RS422/RS485** - used for serial data connections, and connection to one or more DZMx Remote Heads.

Two additional data connections are available as options:

- » **ARINC429** - used to send and receive over the aircraft ARINC429 data bus.
- » **Second Ethernet** - used to provide a second ethernet connection.

Connector Pinouts (civilian versions)

Refer to the Civilian wiring diagrams for the Flightcell DZMx and associated equipment (available from the Flightcell Support website).

The standard civilian variant of the DZMx uses two D25 connectors for its main connectors. Refer to the figure below for the layout of the DZMx backplate.



DZMx backplate, standard civilian variant



Note: DZMx variants with Iridium 9603 (SBD) modems have an additional SMA female connector.

Primary Connector

Connector type: DB25M

Pin No	Function	Direction	Notes
1	POWER GROUND	Ground	DC power supply ground
2	DC SUPPLY POSITIVE	Power	DC power supply
3	I/O GND	Ground	
4	GENERAL PURPOSE INPUT 2	Input	
5	GENERAL PURPOSE INPUT 3	Input	
6	RS485 Tx+	Output	
7	RS485 Rx-	Input	
8	AUDIO FROM DZM1 LO	Output	LO audio output to ICS 1
9	MIC TO DZMx 1 HI	Input	Unbiased/biased (configurable)
10	MIC TO DZMx 2 HI	Input	Unbiased/biased (configurable)
11	POTS TIP	I/O	For optional telephone handset
12	AUX DATA TX	Input	
13	AUX DATA Rx	Output	
14	CHASSIS GND	Ground	Internally connected to DZMx Chassis
15	GENERAL PURPOSE INPUT 5	Input	Lighting dimmer input (optional)
16	GENERAL PURPOSE INPUT 1	Input	
17	GND	Ground	
18	GENERAL PURPOSE INPUT 4	Input	
19	RS485 Tx-	Output	
20	RS485 Rx+	Input	
21	AUDIO FROM DZM1 HI	Output	HI audio output to ICS 1
22	MIC TO DZMx 1 LO	Input	Return for audio input from ICS 1
23	MIC TO DZMx 2 LO	Input	Return for audio input from ICS 2
24	POTS RING	I/O	For optional telephone handset

25	AUX DATA GND	Ground	
D25 shell	CHASSIS GND	Ground	

Secondary Connector

Connector type: DB25F

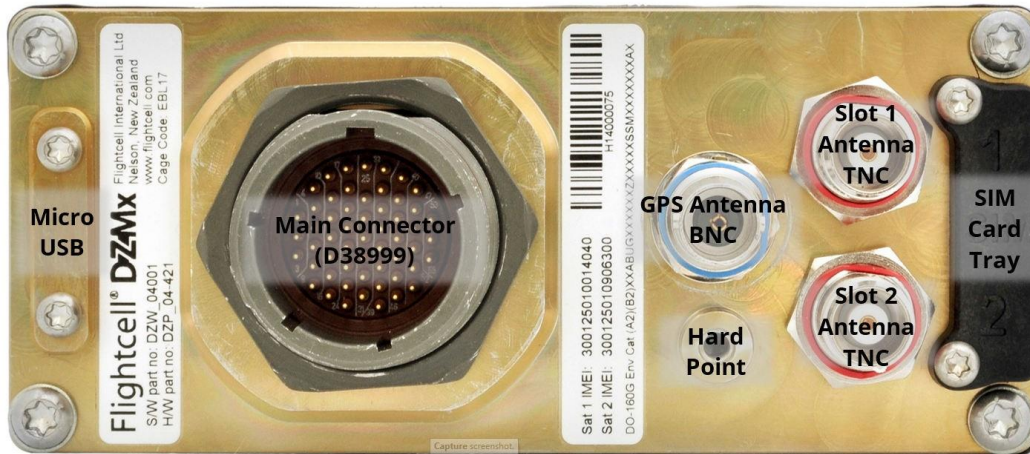
Mating Part: M24308/4-3F (or equivalent)

Pin No	Function	Direction	Notes
1	AUDIO FROM AUX TXCVR HI	Input	
2	AUDIO FROM AUX TXCVR LO	Input	
3	AUDIO FROM DZMx 2 HI	Output	HI audio output to ICS 1
4	OUTPUT 1A	Output	Isolated output 1 Terminal A
5	OUTPUT 2A	Output	Isolated output 2 Terminal A
6	GPIO3	Input	Reserved for Optional Capabilities
7	USB VBUS	Power	
8	USB D+	I/O	
9	USB D-	I/O	
10	GPIO5	Output	Reserved for Optional Capabilities
11	GPIO6	Output	Reserved for Optional Capabilities
12	ETH 10/100 TX+	Output	
13	ETH 10/100 TX-	Output	
14	AUDIO TO AUX TXCVR HI	Output	
15	AUDIO TO AUX TXCVR LO	Output	
16	AUDIO FROM DZM2 LO	Output	LO audio output to ICS 2
17	OUTPUT 1B	Output	Isolated output 1 Terminal B
18	OUTPUT 2B	Output	Isolated output 2 Terminal B
19	GPIO4	Input	Optional: ARINC-429 RX Channel 2 -
20	USB GND	Ground	
21	GPIO7	I/O	Reserved
22	GPIO1	Input	Reserved
23	GPIO2	Input	Reserved
24	ETH 10/100 RX-	Input	
25	ETH 10/100 RX+	Input	
D25 shell	CHASSIS GND	Ground	

Connector Pinouts (military versions)

Refer to the Military wiring diagrams for the Flightcell DZMx and associated equipment (available from the Support page of the Flightcell website).

The standard military variant of the DZMx uses a single D38999 connector. Refer to the figure below for the layout of the DZMx backplate.



DZMx backplate, military variant



Note: Variants with Iridium 9603 (SBD) modems also have an SMA female connector.

Military Connector

Connector type: D38999/24WE-35PN

Mating part: D38999/26WE-35SN (or equivalent)

Pin No	Function	Direction	Notes
1	ETH 10/100 TX-	Output	
2	ETH 10/100 RX+	Input	
3	ETH 10/100 RX-	Input	
4	AUDIO FROM DZMx 2	Output	LO audio output to ICS 2
5	ETH 10/100 TX+	Output	
6	SHIELD	Shield	Spare Shield Connection
7	SHIELD	Shield	Spare Shield Connection
8	CHASSIS GND	Ground	
9	GPIO5	Output	Reserved for Optional
10	AUDIO FROM DZMx 2	Output	HI audio output to ICS 2
11	AUDIO TO AUX TXCVR	Output	
12	AUDIO FROM DZMx 1	Output	HI audio output to ICS 1
13	OUTPUT 1B	Output	Isolated output 1
14	OUTPUT 1A	Output	Isolated output 1
15	OUTPUT 2B	Output	Isolated output 2
16	GPIO6	Output	Reserved for Optional
17	POWER GROUND	Ground	DC power supply
18	AUDIO TO AUX TXCVR	Output	
19	AUDIO FROM DZM1 LO	Output	LO audio output to ICS 1
20	RS485 RX+	Input	
21	RS485 RX-	Input	
22	GPIO2	Input	Reserved for Optional
23	OUTPUT 2A	Output	Isolated output 2
24	GPIO7	I/O	Reserved for Optional
25	DC SUPPLY VOLTAGE	Input	DC power supply
26	MIC TO DZMx 2 HI	Input	HI audio input from ICS

Pin No	Function	Direction	Notes
27			LO audio input from ICS
28	RS485 TX+	Output	
29	RS485 TX-	Output	
30	GPIO1	Input	Reserved for Optional
31	USB D+	I/O	
32	POTS RING	I/O	For optional cabin phone
33	AUDIO FROM AUX	Input	
34	MIC TO DZMx 1 LO	Input	LO audio input from ICS
35	SHIELD	Shield	Spare Shield Connection
36	SHIELD	Shield	Spare Shield Connection
37	AUX DATA GND	Ground	
38	USB VBUS	Power	
39	USB D-	I/O	
40	POTS TIP	I/O	For optional cabin phone
41	AUDIO FROM AUX	Input	
42	MIC TO DZMx 1 HI	Input	HI audio output from ICS
43	SHIELD	Shield	Spare Shield Connection
44	AUX DATA TX	Input	
45	AUX DATA RX	Output	
46	USB GND	Ground	
47	GPIO3	Input	Reserved for Optional
48	GPIO4	Input	Reserved for Optional
49	I/O GND	Ground	
50	GENERAL PURPOSE	Input	
51	GENERAL PURPOSE	Input	
52	GENERAL PURPOSE	Input	Optional: Lighting
53	GENERAL PURPOSE	Input	
54	GENERAL PURPOSE	Input	
55	I/O GND	Ground	

Installing a DZMx Remote Head

A Flightcell DZMx Remote Head is a remotely located control panel for the DZMx, with identical display and keypad. One or two remote heads may be installed to provide other crew or mission specialists with full remote control of the DZMx.

Wiring the Remote Head

The remote head connects to the DZMx using the RS422/RS485 serial data connections. The remote head also requires a 12-32VDC power supply. Two additional connections are a ground connection to the chassis, and a lighting input for external lighting control. Backlighting of the DZMx and remote heads can be configured individually, see page 32 for details on adjusting the brightness and the installing the external lighting input.

Refer to the Flightcell website at www.flightcell.com/resources for the wiring diagram of the remote head and DZMx.

Configuring the DZMx for a Remote Head

First, the DZMx needs to be configured to recognise the remote heads:

- » Press **MENU>Hardware Config>Head B Enable**. Select **On** to enable, or **Off** to disable the remote head
- » Press **ENTER** to save the setting

If a second remote head is installed, repeat these steps for **Head C Enable**.

Configuring the Remote Heads

The remote heads now need to be allocated a head ID so that the DZMx can identify each remote head.

- » Press and hold the **BACK** key on the designated remote head for 2 seconds, then release. Scroll down to **Advanced>Head ID**
- » Use the **RIGHT** and **LEFT** arrow keys to select the correct head ID (either Head B or Head C), then press **END** to save.

DZMx Antennas

Flightcell supplies a range of antennas, the choice of which will depend on DZMx modem configuration:

- » Single Iridium modem: Use a Flightcell dual Iridium/GPS antenna
 - » Where the antenna needs to be certified to a TSO, part number: ANP_00043
 - » Where TSO certification is not required, ANP_00003.
- » Dual Iridium modems: Use a Flightcell Iridium/GPS antenna, P/N ANP_00043, and a single Iridium antenna, ANP_00045
- » Single cellular modem: Use a Flightcell cellular antenna, P/N ANP_00033.
- » Dual cellular modems: Use a Flightcell dual cellular antenna, P/N ANP_00031.

Installation of Iridium and GPS Antennas

Installation drawings for the above antennas are available at www.flightcell.com/resources.

The Flightcell Iridium/GPS antenna and Iridium 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 750mm from L-band (GPS), TCAS or transponder antennas, but a lesser separation can be applied if there is limited space on the aircraft
- » On a helicopter, the antenna can be installed below the rotor blades, but avoid installing it 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 transmit and receive signals.

Installation of Cellular Antennas

A Flightcell cellular antenna should preferably be installed on the underside of the aircraft to provide best connection to the cellular network. Typical location is below the cockpit to minimise antenna cable length. The minimum recommended separation between the cell antenna and other antennas is 600mm.

Guidelines for Antenna Cables

Iridium antenna cables must be selected to keep signal loss within accepted levels. Total signal loss on the Iridium connection between the DZMx or Iridium phone cradle and the antenna should not exceed 3dB at 1645MHz.

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

Cable Length	Cable Specification
Up to 3m	RG58C/U or RG400
Up to 6.5m	LMR200 or RG142A/U-9006 cellfoil
Up to 8m	RG213
Up to 17m	LMR400
Up to 26m	LMR600

It is recommended that the antenna cable be reduced to RG58 for the last 300mm to the DZMx to assist with installation in the panel.

Antenna connectors on the DZMx and Flightcell antennas (as well as the supplied mating connectors) are colour coded to reduce installation errors, as follows:

Antenna Type	Colour (as seen in the Pinout images)
Iridium	Red
Cellular	Green
GPS	Blue

Section 5: Configuration

Configuring the DZMx

The DZMx can be configured using its user interface (keypad and display) or using the DZMx Connect application. Most settings are available on both interfaces.

However, it is recommended that DZMx Connect is used to configure your DZMx and change its settings as it is faster and provides a more intuitive interface than using the DZMx UI.

Use of the UI for configuration may be preferred in two cases where this provides real-time feedback on the configuration:

- » Adjusting audio settings
- » Configuring the General Purpose Inputs.

Accessing Installation and Configuration Settings

Many of the DZMx configuration settings are hidden during normal operation. To access these settings, the Installer Menu needs to be activated. The Installer Menu will remain active until the DZMx is next powered off. Since this installation manual assumes that the Installer Menu has been activated, if a menu item indicated in this manual cannot be found, ensure that the Installer Menu has been activated.

Configuring using DZMx Connect

DZMx Connect is a browser application utility that is that can be used to configure the DZMx, including changing settings and editing the DZMx phonebook and message library, as well as providing a range of other functions. DZMx Connect is available as an iOS and Android application (available from the respective app stores), or as a browser application on a PC.


It is highly recommended that DZMx Connect is used to alter your DZMx settings as it provides a more intuitive interface than using the front panel. DZMx Connect also allows users to edit or import and export phonebooks, edit the quick response messages and import/export DZMx settings files.

There are three ways to use DZMx Connect:

Hardwired Computer Connection

- » Connect a computer to the DZMx Ethernet port
- » Power up the DZMx and wait for it to fully initialise
Open a web browser, type in 192.168.4.1 in the address bar and press enter. The home screen of DZMx Connect will open in the browser
If the DZMx has been allocated a fixed IP address, or the DZMx is set up as a DHCP client, then it is necessary to enter this address (this could be, for example, 192.168.4.100). This IP address can be determined by going to **MENU>Diagnostics Menu>About DZMx**.

Wireless Laptop Connection

- » Power up the DZMx and wait for it to fully initialise.
- » Check that WiFi is enabled. Look for a WiFi icon  located at the top right-hand side of the DZMx display. If the WiFi icon is not present it can be checked and enabled in one of three ways:
 - » Press and hold the **MODE** key until “Enabling WiFi” is displayed on the display. WiFi can also be disabled with a subsequent press of the MODE key.
 - » Using the DZMx keypad, navigate to: **MENU>Hardware Config>Wireless and Networks>WiFi Enable** and select **Yes**.
 - » Connect a PC or laptop to the DZMx via an Ethernet cable. Type 192.168.2.1 into a web browser and navigate to **Connectivity>WiFi** and toggle the switch to ON.
- » Open a web browser on the laptop and type in 192.168.2.1 then press enter; the home screen of DZMx Connect will open within the browser.

[Click here](#) to watch a short video explaining the DZMx Connect capabilities (demonstrated on the app version).

Smart Device Connection

- » Configure the smart device to connect to:

- » Default SSID: DZMx WiFi
 - » Default password: flightcell (all lower case)
 - » Open the DZMx Connect app (available from Apple App Store and Google Play). The initial screen is a discovery screen and the DZMx should be discovered automatically. The DISCOVER button is only required if the process needs to be repeated.
If the DZMx IP address has been manually configured, it will be necessary to enter this IP address in the browser address bar. After the first use of a custom IP address, the app will remember the address in the **Stored Devices** list.
 - » Click on the discovered DZMx unit to open navigation and settings options.
- [Click here](#) to watch a short video explaining the DZMx Connect app capabilities.

Permission levels

Installers should select the Installer option. The default password is 2468.

Configuring using the DZMx User Interface

Accessing the Installer Menu

On power up, only the limited range of operational settings that may need to be adjusted by the crew will be available on the menus, with the remainder password protected.

To access the password-protected installer menu on the DZMx:

- » Go to **MENU>Hardware Config>Installer Menu Enable**
- » Enter the password and press **ENTER**.

The default installer password is 2468.

Changing the Installer Password

The installer password can be changed as required:

















- » On the DZMx UI, go to **MENU>Hardware Config>Change Installer Passwd**
- » In DZMx Connect, go to **Settings>Preferences>Access management**.



Note: It is important to record the password. If the password is forgotten, it will be necessary to reset the DZMx to factory settings before the password protected functions can be used again.

DZMx Keypad References

Most keys on the DZMx keypad have more than one function. The following table outlines how the DZMx keys are referenced throughout the manual.

Icon	Manual Reference	Icon	Manual Reference
	CALL		5, SPD2
	END		6, RIGHT, SPD3
	A		7, MSG
	B		8, DOWN, DIR
	1, MARK		9, MODE
	2, UP, A.R.M., ALERT		0, +, MENU
	3, EMER		*, BACK
	4, LEFT, SPD1		#, ENTER, POWER

Audio Installation and Configuration

The DZMx supports the following audio services:

- » Telephony over the Iridium and cellular networks (depending on the modems installed in the DZMx)
- » Iridium PTT, a Push-to-Talk service using the Iridium network to provide one-to-many PTT calling
- » Telephony over a mobile phone connected to the DZMx Bluetooth service.

Connection to the Aircraft Audio System

Audio from the above services is connected into the aircraft audio system (ICS) to enable aircrew, mission crew or passengers to use these connections.

The DZMx can be connected to the aircraft audio system or ICS in several ways, depending on the aircraft configuration and type of operation.

It is recommended that audio from the DZMx is connected to spare radio positions on the ICS if possible.

Modem connections to the ICS are configured in **DZMx Connect>Settings>Audio>Modems**.

Single or Dual ICS Connections

The DZMx supports one or two connections to the audio panel/ICS, ICS1 and ICS2.

The dual ICS connections may be used to allow the DZMx to be connected to two different audio panels on the aircraft, or to allow different audio connections to be used simultaneously.

Mirroring audio on dual ICS connections

If the DZMx has connections to two audio panels but it is desirable to have the same audio mirrored to both, select **Mirror Audio to ICS2**.

Providing for modems to be connected to separate ICS connections

The two ICS connections may be used to allow the DZMx modems or connected Bluetooth device to connect to separate ICS channels, allowing separate calls to occur on the separate respective ICS channels.

Typically, this is used where ICS1 and ICS2 are connected to different audio positions on the ICS.

Each of the modems and Bluetooth device may be allocated to either ICS1 or ICS2.

Dual Calling

The DZMx can make two calls simultaneously, either

- » If the two ICS connections are wired, separate calls on ICS1 and ICS2
- » If only ICS1 is wired to the audio system, two calls on the single ICS channel.

Call Priority

A modem which has been given priority will automatically mute all other calls when it makes or receives a call. When a priority call has ended, it automatically unmutes any other call. This can be particularly useful if a call on a modem is vital to vehicle aircraft operations. By default, call priority is off, however it can be enabled using the "Call Priority" setting for each modem in **DZMx Connect>Settings>Audio>Modems**. This option can be found in the settings under the audio section. This setting is particularly useful for simultaneous calls on a single ICS channel.

Audio from the DZMx to the ICS

Audio from the DZMx is connected direct to the ICS input, and its levels adjusted using the DZMx audio menu (see next page).

Audio from the ICS to the DZMx (microphone installation)

The DZMx can be installed in aircraft 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. Refer to www.flightcell.com/resources for wiring diagrams for the microphone connections.

Low Impedance Microphones

When installing the DZMx with an ICS that uses low impedance mics, the DZMx must be connected to a line level Radio/Comms port. If a line-level port is not available and the DZMx is to be connected direct to the mic line, then a tactical radio adaptor will be needed to match impedances. Options include the NAT AA34-300, Jupiter JA34-001 or PS Engineering 200-002-0002.

High Impedance Microphones

There are several options for connecting the DZMx into an audio panel/ICS with high impedance microphones. The way in which the DZMx is connected 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 DZMx on a hot mic connection, rather than PTT (keyed). The DZMx will typically be installed in one of the following ways:

Connecting Directly to a Headset Microphone Line

The MIC lines are spliced to one or more headset microphone inputs on the audio panel. As these microphone inputs have mic bias provided by the audio panel, the DZMx should have mic bias disabled.

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

If only the pilot is to use the DZMx, its MIC TO DZMx 1 HI/LO lines are connected only to the pilot's microphone line.

If both pilot and co-pilot are to use the DZMx, the MIC lines are connected to the pilot microphone line and the MIC lines are connected to the co-pilot microphone line.

If more than two microphones need to have access to the DZMx, an external switch is required to select the active microphone input.

Connecting to a Cell Phone Port on the Audio Panel

The DZMx MIC line can be connected to the cell phone port on the audio panel.

Connecting to a Spare Radio Position on the Audio Panel

On aircraft with separate audio control panels at each crew position, this option enables crew to use the DZMx and connected phones individually on demand. In this case it may be necessary to provide mic bias.

Configuring Microphone Bias

In some aircraft with high impedance headsets, where the mic line is connected direct to the DZMx, it is necessary to provide bias power to energise the headset microphone.

To activate mic bias power to the MIC line, activate either in **MENU>Audio>ICS>Mic Bias** or **DZMx Connect>Settings>Audio>ICS1** or **ICS2**.

Configuring Side Tone

Side tone is normally provided by the aircraft audio panel or ICS, but in some installations may not be available. Side tone can be supplied by the DZMx if required. This can be configured in **MENU>Audio>ICS>Mic Bias** or **DZMx Connect>Settings>Audio>ICS1** or **ICS2**.

Select **Off** to disable, **When on Call** to enable only during a call, or **Always On** to leave active all the time.

Configuring Notification Tones

Notification tones are used to notify the crew of specific events. Notification tones can be enabled or disabled in the audio menu. Notification tones include:

- » Keypad tones
- » Message queue full, which sounds when the tracking message queue is full
- » Warnings, which notify when there is an issue; in this case a popup will show the details of the issue
- » Incoming or Outgoing Bluetooth call.

Adjusting Audio Volume

Audio levels can be adjusted using DZMx Connect or the DZMx menus, however as there is a short lag when using the DZMx Connect, it is recommended that audio levels are adjusted using the DZMx menus.

To adjust audio volumes from the DZMx to the ICS (EAR):

- » Set up a call to another party over the satellite or cellular link as appropriate. Press **MENU>Audio>ICS>Ear**
- » Use **LEFT** and **RIGHT** to adjust audio volume to the preferred level.

To adjust audio volumes from the ICS to the DZMx (MIC):

- » Set up a call to another party over the satellite or cellular link as appropriate. Press **MENU>Audio>ICS>Mic**
- » Use **LEFT** and **RIGHT** to adjust audio volume to the preferred level.

Iridium Push-To-Talk (PTT)

Iridium PTT is a licensed feature. If you wish to use Iridium PTT, you must subscribe to the PTT service through your Iridium service Provider, and purchase a licence from Flightcell (by contacting orders@flightcell.com).

To enable and configure your DZMx for PTT, go to **DZMx Connect>Settings>Modem>Internal Sat modems**.

If you wish to have the DZMx start up in PTT mode, activate **Start PTT on Boot**.

If the PTT talkgroups are changed by your Iridium Service Provider, it is recommended to update talkgroups by going to **MENU>PTT Talk Groups>Refresh Talk Groups**.

Configuring the PTT Input

PTT calls can be triggered from the DZMx keypad, but it is preferable to use a PTT switch connected to a DZMx Input.

See "Configuring Inputs" on page 35 for designating and calibrating the PTT input.



Note: The Call Priority setting can be useful for automatically muting a PTT call when making a call on another modem. See "Call Priority" on page 20 for more information.

Modem Configuration

The DZMx can be configured with up to three internal modems and one external modem or satellite phone.

Cellular Modems

The following cellular modems may be installed in the DZMx:

- » A 4G (LTE) modem
- » A 450 MHz modem.

Different countries or geographic areas use different cellular bands, due to international and national radio frequency licensing agreements.

In Revision 3 DZMx, the cell modem supports most of the bands to for all countries in the world.

In Revision 4 DZMx, four different modem versions used for different geographic regions. The four modem options are:

- » Europe
- » Asia/Pacific and South America (APAC)
- » Americas and Band 14 (North America, including the US Public Safety Band, band 14)
- » Japan.

Note that there is considerable overlap in the bands offered by the different modem versions, so some modems can be used in more than one geographic area, with some reduction in the bands available.

When ordering the DZMx, it is essential that the version with the correct regional modem is ordered. Please contact tech@flightcell.com for more information on the appropriate modem (and therefore DZMx version) for your operational area.

Iridium Modems

The following satellite modems may be installed in the DZMx:

- » One or two internal Flightcell Iridium 9523 modems
- » An Iridium 9603 modem (used for Short Burst Data only).

External Modems and Phones

One external modem or satellite phone can be connected to the DZMx via its RS232 serial port:

- » A Flightcell Iridium Modem
- » An Iridium handset installed in a Flightcell Iridium Phone Cradle; these may be:
 - » Iridium 9555
 - » Iridium Extreme.

The modem and the phone handsets provide the same functions (except for Iridium PTT) as the internal Iridium modem, providing phone calling, messaging and data. These functions are all controlled by the DZMx, so it is not necessary to use the phone keypad.

The external Iridium devices do not support Iridium PTT; this can only be provided by an internal Iridium 9523 modem.

Activating Modems

Your DZMx will normally be configured for the installed internal modems prior to shipment.

You may need to configure the DZMx for an external device such as an Iridium modem or Iridium phone and cradle, if installed.

The DZMx can be configured for the installed and external modem options in **DZMx Connect > Settings>Hardware**.

You will need to check the detailed configuration for each modem and external device to ensure they are correctly configured for your operation.

SIM Cards

A SIM card is required for a DZMx cellular modem.

A SIM cards must be installed in the DZMx for an internal Iridium 9523 if it is to be used for phone calling and SMS messaging. A SIM card is not required for the Iridium 9523 modem if it is to be used only for Iridium PTT or for Iridium SBD.

A SIM card is not required for an Iridium 9603 (SBD only) modem.

The DZMx uses standard SIM cards, rather than the micro and nano versions.

SIM Slot Designation

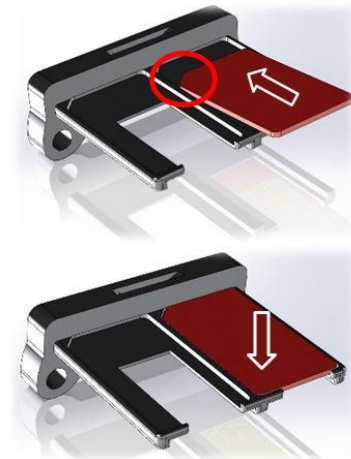
SIM card slots are allocated as follows:

- » SIM 1 is allocated to the modem (Iridium or cell) in internal slot 4
- » SIM 2 is allocated to the modem (Iridium or cell) in internal slot 5.

Installing SIM cards

SIM cards are installed in the SIM card tray inserted in the back of the DZMx. To install SIM cards:

- » Undo the screws securing the SIM card tray and remove the tray
- » Preferably place the tray on the edge of a hard surface such as a table or book
- » Position the SIM card with the bevelled corner (circled in drawing) forward and contacts downward, then slide the front edge into the recess in the front of the tray
- » Tilt the card downward until it clicks into the groove in the tray
- » Insert the tray into the slot on the back of the DZMx and secure in place with the two cap screws.



Note: Ensure that the SIM cards are in the correct slots, as they may be permanently damaged if incorrectly installed.

AT&T SIM Cards

Not all AT&T SIM cards are compatible with non-AT&T devices. For troubleshooting with AT&T SIM cards, visit the AT&T troubleshooting website [here](#).

Iridium SIM cards supplied with your DZMx

DZMx with Iridium modems are shipped with an unregistered Iridium SIM installed, unless otherwise requested. This can be registered to your Iridium Service Provider's account when you are ready to activate your Iridium service.

To transfer the SIM card to your ISP, please contact Flightcell International at orders@flightcell.com, advising the serial number of your DZMx and the name of your ISP.

Configuring Modems

The DZMx is configured prior to shipment with default settings for the installed modems. However, you may need to check and modify these settings.

This is done in **DZMx Connect>Settings>Modems**.

Configure which modems are used to transmit tracking data

By default, tracking messages are enabled for all modems. If more than one Iridium device or more than one cell modem is installed, only one of each should be activated for tracking.

If the internal Iridium 9523 modem is used for Iridium PTT, then the other Iridium modem (9523 or 9603) or external Iridium device should be configured for tracking.

Configure Iridium or cellular voice calling capability

By default, voice calling is enabled for all modems, except for the Iridium 9603 modem, which is used for SBD messaging only, and the 450 MHz cellular modem, which is for data only.

Configure Iridium SBD Transmission

If your Iridium modem has been provisioned to send SBD messages to your chosen tracking provider, then ensure SBD transmission is enabled for your Iridium device. If you do not wish your device to send SBD messages, then disable SBD transmission.

Configure the Iridium Service Centre

Most Iridium accounts use the standard Iridium Service Centre for handling SMS messages. However, some Iridium Service Providers use different SSNs (e.g. Telstra and Pivotal in Australian; DISA for US military).

If **(No SMS)** is displayed next to the Iridium modem's status message on the DZMx display, the service centre number is incorrectly set. The service centre number can be selected in **DZMx Connect>Settings>Modem**, or in **MENU>Hardware Config>Modem Config**.

Configure the cellular APN

It is necessary to set the APN (Access Point Name) for the cellular modems to allow the modem to use cellular data services. You will need to determine the APN for your cellular provider. This is often (but not always) **Internet**.

Enable or disable data

Use this setting to enable or disable data services for the selected modem.

Data Roaming

If a cell modem is operated outside its home country, it is usually necessary to activate data roaming to allow use of local cellular services.

Disabling Cell Modems

In some cases, it may be a requirement to disable cell modems for operational or regulatory reasons.

The DZMx may be configured so that:

- » Cell modems are always enabled
- » Cell modems can be disabled via softkey - the modem can be disabled manually on the DZMx, using a long press on the A or B softkey allocated to that modem
- » Cell modems are automatically disabled when the aircraft is in flight.

When a cell modem is disabled, all transmit and receive functions are completely disabled.

These settings can be changed in **DZMx Connect>Settings>Modem>Cell modems**



Note: When set to automatically disable in flight, the manual disable/enable key can override the automatic option until the next take-off or landing.

Backlighting

The DZMx and DZMx Remote Head have a backlit keypad and LCD display. Backlight levels are adjusted separately for the DZMx and remote head.

Backlighting Options

The DZMx can support variable lighting controlled from the aircraft dimmer control. Aircraft without dimmer controls can manually set the brightness to Day and Night levels. Day backlight is set at maximum brightness on both keypad and display. Night backlight can be adjusted separately for the keypad and LCD display.

External lighting provides the user with the ability to dim or brighten the display by adjusting the cockpit dimmer control. External lighting is only available if the DZMx has been installed with external lighting wiring.

A separate dimmer control can be used for each DZMx and remote head. The DZMx uses General Purpose Input 5 for the dimmer control input. The remote head uses the Lighting Control Input (pin 10) for its external lighting input.

Backlighting can only be adjusted on the DZMx control head and remote head.

Switching Backlight Modes

To switch modes between Day, Night and External Backlighting:

- » Press and hold the * key for 2 seconds

- » Scroll to Backlight Mode
- » Use **LEFT** and **RIGHT** to change the setting. Press **END** to exit the menu.

Altering Backlight Brightness Levels

Day and Night Modes

Backlight settings can be adjusted separately for the keypad and LCD display. To configure backlight settings on the DZMx or a remote head for Day and Night modes:

Press and hold the * key for 2 seconds and then release. Select the Day or Night setting as above

- » Scroll down to Display Brightness or Keypad Brightness
- » Use **LEFT** and **RIGHT** to decrease/increase the brightness
- » Press **END** to save the setting and exit the menu.

External Lighting Mode

The minimum and maximum brightness levels can be set individually for both the DZMx and any remote heads. The external lighting has two modes, which is determined by the way you set the **Ext Lighting Calib Low** point. The external lighting options are:

Option 1: External lighting input controls night lighting and toggles Day/Night mode. This requires setting the 'Low calib' point to a level higher than the lowest input voltage (typically where a 'detent' switch). Turning the input below the 'detent' position switches the brightness to Day mode.

Option 2: External lighting input controls night lighting only (no Day/Night mode switch). This requires setting the 'Low calib' point at the minimum input voltage.

To change the brightness options for the external lighting on the DZMx or remote head:

Press and hold the "" key for 2 seconds

- » Scroll to **Advanced** and press **ENTER**
- » Scroll to Ext Lighting Config Low and press **ENTER**
- » Set the dimmer control to the minimum position
- » Adjust the keypad and display minimum brightness using **LEFT** and **RIGHT** to match cockpit lighting levels
- » Scroll to **Input Calib.** then press **ENTER**
- » Press **END** to save the settings and exit the menu.

To change the maximum brightness options for the external lighting on the DZMx or remote head: Press and hold the "" key for 2 seconds

- » Scroll to **Advanced** and press **ENTER**
- » Scroll to Ext Lighting Config High and press **ENTER**
- » Set the cockpit dimmer control to the maximum position
- » Adjust the keypad and display maximum brightness using **LEFT** and **RIGHT** to match cockpit lighting levels
- » Scroll to **Input Calib.** then press **ENTER**
- » Press **END** to save the setting and exit the menu.

Checking Input Range

The **Input Calib.** options in the maximum and minimum brightness shows the raw input values, which update each time **ENTER** is pressed. These values need to be checked during installation to ensure that the hardware is functioning correctly. The following requirements are necessary for proper set-up of the external lighting:

The minimum position needs to have a smaller value than the maximum position. There should be a minimum difference of 50 for the DZMx display.

A remote head will typically have a difference of around 900.



Note: It is recommended that the lighting control input should vary between 0V and 28V between minimum lighting and maximum lighting respectively.

DZMx WiFi

The DZMx can be supplied with optional integrated WiFi components (designated by a W at the end of the product's part and dash number e.g.: DZP_04-xxxW in Revision 3, DZP_04-xxx-xxW in Revision 4).

DZMx Wi-Fi is a licensed application; purchase of a Wi-Fi licence is required to activate the Wi-Fi service on the DZMx (see DZM Applications and Licences on page 41).

DZMx Wi-Fi allows the DZMx to act as an access point to connected devices, enabling the DZMx to be used to:

- » Route DZMx data connections to connected devices, including
 - » PCs
 - » Tablets and smartphones
 - » Medical or other specialised devices
- » Provide WPA2 encryption security to wireless devices.

Starting WiFi

If the DZMx is WiFi capable and the Wi-Fi licence has been activated, the WiFi service is active by default.

It is possible to toggle WiFi on and off from the front panel using a long press on the **MODE** key.

When WiFi is enabled, a wireless icon will  appear at the top right of the screen on the front panel.

If it is necessary to disable WiFi so it cannot be overridden by the flight crew, the MODE key function can be disabled in **DZMx Connect>Settings>Main Screen Options>Mode Button Function**.

WiFi Settings

WiFi settings can be configured using in **DZMx Connect>Connectivity >WiFi**.

The following settings can be modified:

- » SSID
- » Passkey
- » WLAN channel
- » WiFi DHCP Server settings

DZMx Bluetooth™

DZMx Bluetooth is a built-in option that works with any DZMx that has a DZP_004-xxxW or DZP_04-xxx-xxW part and dash number.

DZMx Bluetooth is a licensed application; purchase of a Wi-Fi or Bluetooth licence is required to activate Bluetooth on the DZMx (see DZM Applications and Licences on page 41).


DZMx Bluetooth provides the ability to pair a mobile device, such as mobile phone or tablet, to the aircraft ICS/headset. This is very similar to hands-free operation in a motor vehicle.

Functionality includes:

- » Making and receiving calls on a mobile device and talk via the ICS and headset (as in a handsfree car kit)
- » Listening to streaming media on a headset from a mobile device.

If Bluetooth menu options are not available, this functionality will need to be purchased and then activated with a software key supplied by Flightcell International Ltd.

Enabling Bluetooth

Once Bluetooth is enabled, it is possible to toggle it on and off from the front panel using a long press on the **MODE** key. When Bluetooth is enabled, an  icon will appear at the top right of the screen on the front panel.

If it is necessary to disable Bluetooth so it cannot be overridden by the pilots, it can be disabled in the DZMx menus: **MENU > Hardware Config > Wireless and Networks > Bluetooth Enable**

Pairing

- » Check that the Bluetooth icon is showing on the DZMx display

- » Make the DZMx Bluetooth discoverable in either in **DZMx Connect > Connectivity>Bluetooth** or **MENU>Hardware Config>Wireless and Networks**
- » Enable Bluetooth on the mobile device settings and select the 'DZMx-Bluetooth' device
- » A pairing notification message with a confirmation code will appear on both the DZMx and the mobile device. Ensure they are the same number
- » Press **ENTER**, then select 'Pair' on the mobile device.

Connecting paired Bluetooth devices

The DZMx may be configured to require devices to be connected manually each time, or automatically connect the last connected device.

This can be configured in **DZMx Connect>Connectivity>Bluetooth** or **MENU>Hardware Config>Wireless and Networks**.



Note: The auto-connect functionality may vary according to mobile devices and the level of support provided by their operating systems. A high degree of variability is present across Android devices in particular. They may need to be connected manually.

Hands Free Calling

The DZMx supports a Bluetooth audio hands free profile called HFP. If a Bluetooth device is connected in this mode and pairing has been successful, the DZMx will display a mobile phone icon in the top left corner of its display (see 'Pairing' above). If a user receives or initiates a call on the paired mobile device, the audio will be routed to/from the ICS/Headset.

Media Streaming

The DZMx supports a Bluetooth audio streaming protocol called A2DP. If a Bluetooth device is connected and pairing has been successful, the DZMx will display a musical icon in the top left corner of its display (see 'Pairing' above). When the user starts audio playing on the connected mobile device it will be audible through the ICS/Headset.

IMPORTANT NOTE RELATING TO DZMx BLUETOOTH MODEM: To comply with FCC requirements, the BT800 must not be co-located or operating in conjunction with any other antenna or transmitter.

Federal Communication Commission Interference Statement

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 of the following measures:

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

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

DZMx Tracking

The DZMx has an embedded GPS, which provides precise information on position, heading, altitude and speed. This information can be sent to a tracking provider to enable the aircraft to be monitored and its movements tracked. To use the DZMx's tracking capability, it is necessary to enter a contract with a tracking service to receive, process and display tracking information. The DZMx must then be configured to work with that tracking service.

The DZMx cannot provide continuous tracking due to the constraints of the networks used but can transmit position reports at regular pre-programmed intervals.

As well as periodic position reports, the DZMx can be configured to automatically send event reports - these are position reports with an event code attached.

Tracking settings can be configured using either the DZMx tracking menu or using DZMx Connect.



Note: Most of the menu settings will not be visible unless the user has unlocked the Installer Menu.

Changing Tracking Modes

Tracking can be disabled (until re-enabled) or suspended (for the current flight only). To suspend or disable tracking:

- » Go to **MENU>Tracking>Tracking Mode**, select one of the following options
 - » **Suspend:** Suspends tracking until the DZMx is next powered on
 - » **Off:** Turns tracking off until it is manually enabled
 - » **On:** Turns tracking on until it is disabled or suspended.

Locking the Tracking Menu

By default, some tracking settings are unlocked and can be altered by the crew to change the main tracking timers.

To completely lock the tracking menu, go to **MENU > Tracking>Lock Tracking Menu** or **DZMx Connect>Settings>Tracking>General**.

The Tracking Menu will be hidden from view when DZMx is next restarted.



Note: The tracking menu can also be locked or unlocked using DZMx Connect.

Configuring the DZMx tracking system

Configuring DZMx GPS

The default setting for the GPS receiver in the DZMx provides for a maximum operating altitude of 12,000 meters and a maximum ground speed of 310m/s (603 knots, or 1116 km/hr).

For high speed or high-altitude operations, change the GPS setting in **DZMx Connect>Settings>Preferences>GPS:**

Setting	Max (m)	Max Horizontal (m/s; knots; km/hr)	Max Vertical (m/s; knots; km/hr)
General Purpose	12,000	310; 603; 1116	50; 97; 180
High Altitude	50,000	250; 486; 900	100; 184; 360
High Speed	50,000	500; 972; 1800	100; 184; 360

GPS Display Options

GPS information is displayed on the top line of the DZMx screen and can be varied to meet your needs. The current available options for the display line are:

- » **Off:** no information shown
- » **Speed and Heading:** the aircraft's speed and heading are shown in knots and degrees relative to true north (rather than magnetic north)
- » **Clock:** the current time and date is shown in UTC (not local) time
- » **TTAF:** Total Time Airframe
- » **DFT:** Daily Flight Time
- » **Trip:** Current trip time.

To set the GPS display, go to **MENU > Display Setup Menu>GPS Display Options** or **DZMx Connect>Settings>Preferences>Top Line Options**

Tracking Providers

Flightcell does not provide a tracking service but works with a number of tracking service providers who support DZMx data. Contact Flightcell for information on available tracking service providers or refer to the list of providers on our website (<http://www.flightcell.com/tracking/tracking-providers>).

If you have a preferred tracking provider who is not currently supported by Flightcell, please contact us at info@flightcell.com. We are always prepared to support additional providers.

Setting up the Tracking Service Provider

Before your tracking service provider can configure your tracking account, you may need to provide them with the following information:

- » **DZMx Serial Number:** Used to identify your aircraft when data is sent to a tracking provider. You can find your serial number in one of three places:
 - » On the DZMx packaging
 - » On the serial number label on back plate of the DZMx
 - » Pressing **MENU>Diagnostics Menu>About DZMx**
- » **Iridium IMEI (International Mobile Equipment Identity):** A unique 16-digit number. Located on the back plate label of the DZMx or under the battery of the (optional) Iridium External Device. This can also be found by pressing **MENU>Diagnostics Menu>Sat Device Details**.
- » **Iridium Phone Number:** DZMx systems will usually be delivered with an unlocked SIM Card installed. Your tracking provider should be able to activate an account for this SIM Card.
 - » The phone number for the SIM card can be found in the back of the starter guide included with your DZMx shipment.
 - » If there is no SIM card installed - then your tracking service provider will be able to send you an activated card.
 - » Alternatively you may already have an Iridium phone number on a phone to be connected via a cradle
- » **Cellular Phone Number:** If you have a cell modem installed.

Tracking Transmission

The DZMx can send position reports over:

- » The cellular network: Using an IP data connection.
- » The Iridium network: Using the Short Burst Data service (SBD) or SMS.

If you wish to enable a particular modem for tracking, ensure the "Use For Tracking" modem setting is enabled and additionally, the "SBD Enable" modem settings is enabled for any Iridium modems to be used for sending tracking data.

See "Modem Configuration" on page 24 for further details.

Preferred Transmission Mode

The DZMx can prioritise the available networks used for sending tracking messages. This is particularly useful to allow you to prioritise the cheapest transmission method, enabling least cost tracking while allowing the DZMx to fall back to the alternate network if there is no coverage on the preferred network.

DZMx also allows tracking messages to be sent from modem while the other is in use for calls/data..

To set the preferred transmission mode:

Go to **DZMx Connect>Settings>Tracking>Transmission** or **MENU>Tracking > Transmission Options > Preferred device**

Select one of the following:

- » **Try Sat First:** to use the Iridium satellite network if available; if messages aren't transmitted over Iridium, the DZMx will then send them over the cellular network
- » **Try Cell First:** to use the cellular network if available; if messages can't be transmitted over cellular (for example if the aircraft is out of cell coverage), the DZMx will then send them over the Iridium satellite network
- » **Sat Only:** to only use the Iridium network; tracking messages will be queued if this modem has no signal or is unavailable
- » **Cell Only:** to only use the cell network; tracking messages will be queued if this modem has no signal or is unavailable.



Note: During a satellite call, SBD will be unavailable. Therefore, the satellite modem will default to using Iridium SMS for tracking, until the call has ended, ensuring tracking is uninterrupted.

Configuring DZMx Tracking Destinations

Once the Tracking Service Provider has your account set up, the DZMx can be configured to send tracking messages to your selected providers. The destination gateways for Iridium and cellular networks need to be configured for each tracking service, they will provide you with the destination addresses. The following tracking gateways can be used with the DZMx:

- » **Iridium SBD:** Destination addresses are configured by your tracking service provider on the Iridium service [SPNet](#).
- » **Iridium SMS:** Configure in **DZMx Connect>Settings>Tracking>Transmission**
- » **Cellular Tracking over IP:** Enter the IP address and port number in **DZMx Connect>Settings>Tracking>Transmission**.



Note: If a method of transmission is not supported by your tracking provider, leave the destination address setting for that transmission method blank.

Configuring Tracking over IP using Cellular Data

If supported by your tracking provider, the DZMx can be configured to send tracking messages via the cellular data connection to an IP address when a data connection is available.

Configure the following settings in DZMx Connect:

- » Configure in **DZMx Connect>Settings>Modem**
 - » **APN** for your cellular network: this can be obtained from your cellular service provider or from their website. The normal default APN is **Internet**
 - » **Enable Data:** This setting must be set to **On**. There must be a data connection active in order to send tracking messages to an IP port.
- » Configure in **DZMx Connect>Settings>Tracking>Transmission**
 - » **IP address:** Your tracking provider will advise you what IP address setting to use. An example is: *123.123.5.6*
 - » **IP port:** Your tracking provider will advise you what IP port number to use. An example is: *12021*
 - » **IP Timeout Profile:** There are three possible settings; Short, Medium (default) and Long. The IP timeout configures the delay used to wait on the connection to the IP gateway from the tracking provider when attempting to send the messages. The shorter the delay, the faster the tracking system will fall back onto another network service to send tracking messages if

transmission over IP fails. Setting this to Long will make the system more resilient when the connection is poor, and maximise the use of tracking over IP, but messages could take longer to send.

Configuring Periodic Events

The DZMx can be configured to send position reports at designated intervals, which depend on aircraft activity. The following events or timers can be configured individually:

- » **Periodic Timer:** The time, in minutes, between sending automated position reports while in flight (15 seconds for HD tracking)
- » **On Ground Timer:** The time, in minutes, between sending automated position reports while on the ground (not in flight)
- » **Taxiing Timer:** The time, in minutes, between sending automated position reports while taxiing
- » **Hover Timer:** The time, in minutes, between sending automated position reports while hovering. Hover events will replace the periodic events when they are due to be sent. Hovering can only be reported for a helicopter which has a collective or weight on wheels switch to detect take-off and landing. The hover timer cannot be enabled if using speed only.
- » **Heading Timer:** The minimum time, in minutes, between position reports when the aircraft is changing heading.

To change the interval for the selected timer:

- » Go to **DZMx Connect>Settings>Tracking** or **MENU>Tracking>Periodic Events >Timer** as appropriate
- » Use **LEFT** and **RIGHT** to vary the timer interval (shown in minutes)
- » Press **ENTER** to save the setting.



Note: Any timer can be disabled by setting its interval to zero.

Enabling HD Tracking

While tracking interval over Iridium is set in minutes, with tracking over cellular IP, the interval can be reduced to 15 seconds (High Definition Tracking).

To enable or disable HD Tracking:

Go to **DZMx Connect>Settings>Tracking>General** and select one of the following options:

- » **On:** Enables HD tracking, thus allowing up to 1 tracking message to be sent every 15 seconds by the DZMx while a data connection is available.
- » **Off:** Turns HD tracking off, reverts to the periodic tracking interval as set-up in "[Periodic Events](#)".

Configuring the Heading Timer

If the **Heading Timer** is configured, a position report will be sent as soon as a specified change in heading occurs. To set the heading variation that triggers a heading change report, go to **DZMx Connect>Settings>Tracking>Periodic**.



Note: The heading timer only specifies a minimum delay between heading events.

Triggered Events

Manual reports

The **MARK** key can be configured to send a variety of manual position reports:

- » Long press of **MARK** key
 - » **A position report only**, to the tracking service, or
 - » **Position with text message:** When **MARK** is held for 2 seconds, it opens a list of pre-programmed text messages that can be sent with the manual position report.
- » Short press of the **MARK** key
 - » **A position report only**, to the tracking service, or

- » **A mission mark** - this prompts the user to press one of the coloured keys on the DZMx, then the mission number; this is sent to the tracking service, or
- » **Mark and text contacts** - send a position and message (from the DZMx message library) to one or more SMS recipients and optionally the tracking service. The recipients for each message are designated individually by editing entries in the DZMx phonebook.

These options are configured in **DZMx Connect>Settings>General**.



Note: These options are not supported by all tracking service providers. Check with your service provider before activating these options.

Power Up

To send a position report when aircraft power is supplied to the DZMx.



Note: It is recommended that the DZMx be connected to the primary power bus on the aircraft so that the power up message is created when the aircraft is first powered on.

Take-off and Landing Events

The DZMx can be configured to send take-off and landing event reports at the start and end of each flight leg. The simplest approach is to use aircraft speed to trigger take-off and landing reports. This is ideal for fixed wing aircraft. However, while this approach can be used for helicopters, it is not ideal as it can result in false take-off and landing reports when hovering.

For helicopters, it is recommended that a collective switch or squat switch (also known as a “wheels on ground” or “weight on wheels” switch) be used to activate these reports. See page 35 for instructions on how to configure a collective or squat switch.

To configure the DZMx for take-off and landing events using aircraft speed, go to **DZMx Connect>Settings>Triggered** and set a speed just below take-off speed for the aircraft, and a landing speed just below the aircraft’s landing speed.

Engine Start and Stop Events

The DZMx can be configured to send an event report when the engine starts and stops. Typically this is triggered by the transmission oil pressure warning light circuit. Refer to page 35 for instructions on how to configure the oil pressure switch.

MessageQueue

The DZMx sends position reports and other messages to the selected networks as soon as they are created. Occasionally, the DZMx may lose network connection, which will cause messages to be stored in a message queue until a network connection is restored.

The behaviour of this queue can be configured in **DZMx Connect>Settings>Tacking>Queue**

- » Queue size can be set up to store up to 20 messages
- » Either send the newest messages first, or the oldest messages first
- » Restore unsent messages; unsent messages in the queue are retained in DZMx memory when it is powered down and sent when the DZMx is started up again.



Note: Once this message queue limit is reached, the oldest messages will begin to be deleted from the queue.



Note: Some tracking providers are unable to cope with tracking messages that are out-of-order, so it may be required to use the **Send Oldest First** setting.



Note: Messages older than 24 hours will not be restored.

Automated Rescue Monitoring

A.R.M. (also known as Automated Flight Following, or AFF) is an optional automated flight monitoring system. When A.R.M. is activated, your tracking service monitors position reports from the aircraft and raises an alert when reports are overdue by a specified period, or (optionally) if the aircraft is stationary for a specified period.

Enabling A.R.M. allows for the feature to be activated when the A.R.M. key is pressed. To enable the A.R.M. function, press **MENU>Tracking>ARM Enable** and select **On**.

Not all Flightcell tracking providers support A.R.M. before activating A.R.M., contact your tracking service provider to determine if they support this function.



Note: A.R.M. can only be configured with tracking providers who support this application. See "Tracking Providers" on page 32 for more information on A.R.M. support.

Alert Mode

Alert Mode allows users to send special alert messages in specific circumstances (e.g. Under Fire).

The Alert mode setting can only be found in **DZMx Connect>Settings>Tracking>Automated Rescue Monitoring**. When enabled, it is activated via a long press on the **A.R.M.** key.



Note: A.R.M. and Alert mode cannot be enabled at the same time.

Geofence Suspend Mode

The Geofence Suspend application allows operators to suspend tracking while the aircraft remains within a set geographical radius. This enables position reports to be suppressed while the aircraft is operating in a localised area, e.g. during crop dusting or airwork operations.

Moving outside the geofence perimeter will cause geofence mode to be cancelled and normal tracking to resume. Whilst within the perimeter, periodic tracking is suspended and depending on how geofence suspend mode is configured, triggered events, such as take-offs and landings, can also be suspended.

Setting the Geofence Mode

Geofence radius is set in **DZMx Connect>settings>Tracking>Geofence>Geofence Radius** or **MENU>Tracking>Geofence>Geofence Radius**.

Geofence Mode is configured in **DZMx Connect>settings>Tracking>Geofence>Geofence mode** or **MENU>Tracking>Geofence>Geofence Mode**.

- » Select: **Disabled** to disable the Geofence application. This will remove the geofence function from the **MENU** key.
- » Select: **Without Events** mode to suspend all tracking messages, except emergency, forms, ETM1000 and manual mark messages.
- » Select: **With Events** mode to suspend periodic and course change tracking messages as above, but all triggered events will still be transmitted.
- » Select: **Events on Cell Only** mode to operate as per **With Events** mode but with the additional cost-saving feature to only send event messages via cell modem. Triggered event messages will be queued if the cell modem has no signal until the cell modem obtains a connection to the cell network, or the aircraft flies out of the geofence perimeter.

Refer to the DZMx Operators' Manual for details of how to activate a geofence.

DZMx Inputs and Outputs

The DZMx has General Purpose Inputs/Outputs (GPIO) which can be configured to trigger alerts or tracking messages during operation, or to signify some event. The DZMx has five inputs and two outputs. Another seven inputs can be installed with the optional Input Expansion Card (IEC).

DZMx Inputs

The DZMx general purpose inputs (GPIs) can be used to indicate some event or state on the aircraft.

Uses include:

- » Indicating an event, including, but not limited to:
 - » Engine start
 - » Take-off
 - » Release of water from a fire fighting tank
 - » Indicating a level, such as the amount of water in a fire fighting tank
- » Triggering an action on the DZMx, such as triggering an Iridium Push-to-Talk (PTT) transmission.

A standard DZMx has five inputs, with another seven inputs available on the optional DZMx Input Expansion Card (IEC). An input may be used for a range of functions:

- » To trigger an event report; connect to a
 - » **Collective switch** or **Weight on Wheels** (Weight on Ground) **switch** to generate take-off tracking messages
 - » **Oil pressure switch**: To generate engine start and stop messages.
 - » **Cockpit lighting control** to control DZMx brightness externally from the dimmer control (only available on input 5, see "Backlighting" on page 25)
 - » **Rotor brake light** to trigger a Rotor Brake On/Off report
 - » **Winch control** to trigger winch out/in report
 - » Custom key to trigger a **Mark** report (see page 32)
- » **To trigger an action**; connect to a
 - » **PTT button** to start/stop a PTT transmission (see "Iridium Push-To-Talk" on page 22)
 - » **Custom button** to cancel DZMx audio alerts
 - » **Custom button** to turn on or off Wi-Fi and Bluetooth.

Additional applications can be activated on the DZMx which provides a large range of additional functions for the inputs. These include:

- » Airline Application
- » Firefighting Application (see details in the DZMx Firefighting Application Manual).

Wiring the inputs

The inputs can tolerate a voltage range of 0-28VDC, with an over/under voltage protection to ± 32 VDC. The inputs have two states, **Open** (high voltage) or **Closed** (low voltage). Refer to the Flightcell website at www.flightcell.com/resources for the wiring diagrams.

Two ground return pins are provided for the five primary GPIs (pin 3 and pin 17 of the primary connector); these are internally connected to power ground and aircraft chassis ground, so the aircraft chassis can be used as a ground return for these GPIs if required.

Input 5 can be configured as either a standard input (see "Configuring Inputs" below), or as a cockpit dimmer control for the DZMx keypad/LCD brightness (see "Backlighting" on page 27).

Configuring the inputs

These inputs can be set up on either the DZMx menus or using DZMx Connect. In practice, it is easier to set them up using the menus as the DZMx reports the status of the input in real time.

Inputs 1 to 5 can be used either as two-state or as variable inputs.

Events can only be triggered on inputs 6-12 (on the input expansion card) by pulling them to ground, as they are two-state inputs.



Note: If Input 5 is to be used for the cockpit dimmer control, it cannot be used for other functions

To set up the inputs:

- » Go to **DZMx Connect>Settings>Inputs** or **MENU>Hardware Config>Input Configuration**
- » Select the function that you want to assign to an input (e.g. Take-off Switch)
- » Select Input Designation, then select the input which has been wired for that function, or select **Not Installed**

If using the DZMx UI, a pop-up will now show the current state the DZMx reads from this input (e.g. **Up/Down, On/Off**)

If the state is wrong (e.g. DZMx reports “Collective is Up” when it is actually down), go to **Input Configuration** and change the selected condition.

Additional information on the input functions can be found in "Triggered Events" on page 32.



Note: Some specialised input functions will only appear in the Input Configuration menu if the application (e.g. airline, firefighting or PTT) is enabled.

DZMx Outputs

The DZMx has two outputs, which are switches that can be used to turn an electrical signal on or off. A typical use of an output is to energise a ring alert light on the aircraft panel.

Each output has two terminals, A and B. The output consists of an isolated switch, internal to the DZMx. When the output is active, the switch is closed (terminals A and B are connected). When output is inactive, the switch is open (terminals A and B are disconnected). The outputs can be configured to flash or simply turn on/off.

The events that can be configured to trigger the outputs on the DZMx are:

- » **Off Hook:** Turned on when the operator is dialling, or in a call
- » **Incoming Call:** Alerts the operator when there is an incoming call
- » **PTT Transmitting:** A device in the talk group is transmitting
- » **Received Msg:** Alerts the operator when a text message has been received or a call has been missed
- » **Power Indicator:** Alerts the operator when the DZMx is powered on.

To select the allocation of the outputs and the blink pattern, press **MENU>Hardware Config>Outputs Config** and select the appropriate setting

- » **Off Hook Output** > [Disabled | Output 1 | Output 2]
- » **Off Hook Mode** > [Off | Solid | Blink]
- » **Incoming Call Output** > [Disabled | Output 1 | Output 2]
- » **Incoming Call Mode** > [Off | Solid | Blink]
- » **PTT Transmitting Output** > [Disabled | Output 1 | Output 2]
- » **PTT Transmitting Mode** > [Off | Solid | Blink]
- » **Received Msg Output** > [Disabled | Output 1 | Output 2]
- » **Received Msg Mode** > [Off | Solid | Blink]
- » **Power Indicator Output** > [Disabled | Output 1 | Output 2]
- » **Power Indicator Mode** > [Off | Solid | Blink].

Configuring DZMx Data

DZMx data can provide access to the internet for a connected PC, laptop, or Windows tablet over a cellular data connection. These devices can connect to the DZMx via its Ethernet port or Wi-Fi connection.

Ethernet Configuration

It is recommended that the Flightcell USB/Ethernet module is installed to provide the necessary Ethernet connection. The DZMx requires the **Ethernet Configuration** to be set to **DHCP Server**, or **Static IP** address mode. When configured with a static IP address, or when configured in DHCP Server mode, the DZMx cellular data internet connection can be shared and is available via its Ethernet port. Configure connected network devices to use the DZMx IP address 192.168.4.1 as their default IP gateway.:

DHCP Server Mode Configuration

The DZMx can be set as a DHCP server, a DHCP client, or allocated a fixed IP address.

These can be selected in **DZMx Connect>Settings>Preferences>Local Network Settings**.

The DZMx operates as an internet router while in DHCP server mode. When a PC or laptop is plugged in using the DZMx's Ethernet port, the DZMx DHCP server will allocate the connected device an IP address in the range 192.168.4.xxx.



Note: Ensure that there are no other devices on the network are configured as a DHCP server when using this mode.

Static IP Address Mode Configuration

The DZMx can be assigned static IP settings, this includes a static IP address, a subnet mask, a default gateway (optional) and DNS settings (optional).

Static IP settings (IP address, Subnet Mask) are set in **DZMx Connect>Settings>Preferences>Local Network Settings**.

A static IP address may also be set in the DZMx UI:

- » Go to **MENU>Hardware Config>Wireless and Network>Static IP Configuration** then press **ENTER**.
- » Scroll to **Host IP Address** and then specify the DZMx Ethernet interface IP address e.g. 192.168.4.100, then press **ENTER**.
- » Scroll to **Subnet Mask** and then specify the subnet mask that matched the IP address (previous step) usually 255.255.255.0, then press **ENTER**.

Optional Gateway and DNS Configuration

Independently from the IP address mode, DNS server settings can be specified in order to use a specific DNS server. This will work with all 3 possible modes (DHCP client, server or Static IP address). This is optional as it overrides default settings provided by DHCP mode and is only required if internet connectivity is needed in static address mode.

Default Gateway: Specify which network gateway provides internet connectivity to the DZMx. This can be an internet default gateway.

(Optional) Scroll to **Hardware Config>Wireless and Networks>Static IP Configuration>Gateway IP address** in order to specify the default internet gateway the DZMx will use, in the case where the internet connectivity is coming from a specific IP gateway (contact your cell network provider for more information) i.e. 192.168.4.100, then press **ENTER**.

(Optional) To override the default DNS server configuration scroll to **Hardware Config>Wireless and Networks>DNS Configuration>DNS Server IP Address #1**, press **ENTER** and specify the IP address for the Primary DNS server, then press **ENTER**. Repeat this step for the Secondary. Scroll to **DNS Server Address #2** in order to specify the Secondary DNS server IP Address.

Applying the Specified Static IP Configuration

- » Press **MENU> Hardware Config > Wireless and Networks> Select IP Address Mode**
- » Scroll to **Static IP Address**, then press **ENTER**.

This will apply the specified static IP settings and optional settings, Default gateway and DNS. This process can take a few seconds.



Note: In order to check which IP address is in use for the Ethernet connection, using the Main Menu scroll to the **Diagnostic > About DZMx** Menu, then inspect the 3rd line **IP Address**

Configure Cellular Data

To enable or disable cellular data go to **DZMx Connect>Settings>Modems>Modem 2**.

- » Set **Enable Data** to allow cellular data to be used
- » Set **Data Roaming** to allow cellular data to be used outside the area coverage of your cellular data account,



Note: Data roaming can incur significant charges!

Set the APN. The APN setting must be configured in order to establish a data connection. The Access Point Name (APN) is the name of the setting your cellular modem uses to set up a connection to the gateway between your carrier's cellular network and the public Internet. The APN you need to specify will depend on the cellular network service provider. The APN is often published on the service provider's web site.

This setting is easier to enter via DZMx Connect, where you can type or paste in the APN, however it can also be entered from the DZMx UI:

Enabling and Disabling Satellite Data

Modify the satellite modem settings in **DZMx Connect>Settings>Modems>Internal Sat Modems** to enable and disable satellite data. This cannot be enabled from the DZMx keypad.

DZMx Data Logging

The DZMx provides several data logging functions, described below:

DZMx Flight Data Recorder

The DZMx has an inbuilt flight data recording function that includes an inertial measurement unit and barometric pressure sensor. The output from these sensors is logged at one second intervals.

The following raw sensor data is logged:

- » Angular rotation in all 3 axes (radians per second, relative to the DZMx)
- » Acceleration in all 3 axes (G force, relative to the DZMx)

The inertial data is fused and logged to provide:

- » Airframe pitch (degrees)
- » Airframe roll (degrees)
- » Pressure (millibars)
- » Pressure altitude (reference to 1013.25 millibars)

Disclaimer

The Flight Data Recording system in the DZMx uses a six degree of freedom sensor fusion technique and thus all pitch and roll values output are a best estimate based on measured angular rate (prone to drift) and estimated gravity vector (which can be distorted by accelerations). This must not be used for navigational or control purposes.

Setting up the Flight Data Recorder

To correctly estimate the pitch and roll of the aircraft using the DZMx, the unit's rotational offset relative to the aircraft's primary axes is required. DZMx Connect provides an interface to set those parameters:

DZMx Connect>Flight>Flight Icon>Gear Icon.



Note: If the DZMx is installed not aligned with respect to any of the aircraft axes, data readings will be incorrect unless this step is performed at installation

Accessing DZMx Flight Data

This data can be accessed by the user in a number of ways:

- » Using DZMx Connect to view the data live.
- » Using DZMx Connect to download the data for a given flight - go to **DZMx Connect>Flight>Flight Icon>Folder Icon**
- » Using Flightcell International's DZMx API the data can be accessed and incorporated into a third-party application
- » Emailed automatically using the DZMx Email Outbox (see below).

Cellular Network Data Logging

The DZMx logs a number of network parameters for the cellular network, along with aircraft position, altitude, speed and heading.

GPS Data Logging

The DZMx logs GPS data at 1Hz intervals, including aircraft position, speed, heading and altitude, and GPS quality metrics.

Transmitting Log Data

The DZMx can automatically transmit log data using the DZMx Email Outbox feature (see following page).

Go to **DZMx Connect>Settings>Preferences>Login Email Reporting to:**

- » Specify which logs are transmitted
- » Activate automatic emailing of the logs.

DZMx Email Outbox

The DZMx can transmit data via email. To do this, the email outbox must be configured.

- » Go to **DZMx Connect>Settings>Preferences>Outgoing Email Account**
- » Enter the following settings; these can be for an existing email account, or you can set up an email account:
 - » SMTP server
 - » SMTP email login
 - » SMTP password
 - » SMTP port
 - » Email SMTP destination (the destination address for the log data).

Following is an example of these settings using a Gmail account for sending the data, and an in-house account as the destination:

Preferences: Outgoing Email Account Settings

Email Smtip Server
smtp.gmail.com

Email Smtip Login
myaircraft.data@gmail.com

Email Smtip Password
●●●●●●

Email Smtip Port (Min 0, Max 65535)
587

Email Smtip Destination
myaircraftlogs@mycompany.com

DONE

Recording and Transmitting Maintenance Data

The DZMx supports maintenance timers (also known as a Hobbs Meter). The DZMx can record and log the following:

- » Trip time
- » Daily Flight Time (DFT)
- » Total Airframe Flight Time (TTAF)
- » Engine starts
- » Landings.

This data can be displayed on the DZMx UI, sent to the tracking provider and sent by email to a nominated email address.

Prerequisites

- » For the maintenance data to be recorded and sent by email,
 - » The Outgoing Email Account Settings in **Email Outbox** must be set up (see above)
 - » The email address for the maintenance reports must be set up (see below)
- » For maintenance data to be included in landing and take-off messages, tracking must be enabled and either a take-off input must be configured, or a take-off speed must be configured.
- » For engine starts to be counted and visible in the Timer page, an oil pressure input must be configured.
- » For landings to be counted and visible on the Timer page, either a take-off input must be configured, or a take-off speed must be configured.

Configuring Maintenance Data

Go to **DZMx Connect>Preferences>Hobbs and Maintenance** to:

- » Specify whether landings and engine start data is sent,
- » Enter the destination email address for the maintenance report. Note that this can be a different email address to that set up in DZMx Outbox above.

Section 6: DZMx Applications

Flightcell has developed specialised applications on the DZMx to support specific types of operation.

DZMx Applications and Licences

Some DZMx applications require a licence to be activated. If the licence has been purchased with the DZMx, then the application will be activated before delivery. If the licence is required after delivery of the DZMx, the application licences can be installed using DZMx Connect.

To purchase an application licence, contact Flightcell at info@flightcell.com. We will send you a licence file. To load the licence file:

- » Open **DZMx Connect**, enter the installer password
- » Go to **About**; this will show a list of licences currently installed on the DZMx
- » Click on **Upload licence** and follow the prompts
- » Restart the DZMx.

DZMx Applications

These following licensed applications are described in this manual:

- » DZMx Wi-Fi - this application activates the Wi-Fi and Bluetooth services on the DZMx
- » DZMx Bluetooth - this application activates only the Bluetooth service on the DZMx
- » Iridium Push-To-Talk (PTT)

For information on the following applications, contact Flightcell International at info@flightcell.com for more details:

- » Firefighting application
- » Dropbox file transfer application
- » SBD m application
- » OpenVPN Virtual Private Network connection application
- » Airline application
- » Agriculture application
- » Loadcell application
- » Asset tracking application
- » Direction finder application

Section 7: Maintenance, Diagnostics and Support

Firmware Upgrades

Flightcell regularly releases firmware upgrades to provide new features, enhancements to existing features and bug fixes.

The duration of the upgrade will vary and is dependent on the previous firmware version installed. It will take between 5 and 40 minutes to complete. Power must be maintained to the DZMx at all times.

A firmware upgrade can be carried out in two ways:

- » Using DZMx USB port upgrade method:
- » Using DZMx Connect upgrade method:

Before commencing the upgrade:

Check the current DZMx firmware by going to **MENU>Diagnostics Menu>About DZMx**. This should show firmware platform 3.x.x. If the current firmware version is 2.x.x or 1.x.x, please contact the Flightcell technical support team - phone: +64 3 545 8651 or email: tech@flightcell.com.

If using the USB upgrade method, download the firmware directly from: www.flightcell.com/support/firmware and save it to a USB memory stick.

If using the DZMx Connect upgrade method, download the firmware directly from <https://www.flightcell.com/support/firmware> and save it to the PC or laptop hard drive.

Ensure the aircraft is on ground power or there is enough battery power to run the DZMx for at least 1 hour (DZMx draws approximately 1A at 28VDC).

To perform the upgrade:

Using the DZMx USB port:

Insert the USB memory stick into the DZMx USB port.

Go to **MENU>Hardware Config** and press **ENTER**.

If necessary, enable the DZMx extended menus using Installer Menu Enable, enter the installer password, then press **ENTER**.

Scroll down to **Firmware Upgrade** and press **ENTER**.

The upgrade will commence.

Follow the prompts on the DZMx display.

Using DZMx Connect:

- » Connect a laptop or PC to the DZMx via Ethernet or via Wi-Fi.
- » Open an internet browser and in the address/URL/location bar, enter the IP address: 192.168.4.1.
- » Discover the DZMx and Login as an installer using the installer password.
- » Select Upgrade and browse to the saved firmware file.
- » Select Upload and wait for the firmware file to upload to the DZMx. Once the file has been fully uploaded the upgrade process will start automatically.
- » After being redirected to the Discovery area, wait for the DZMx to fully reboot before re-discovering it. The display and keyboard may alternatively flash on and off during this period.
- » Login as an installer using the installer password.
- » Navigate to About and check that the new firmware version is displayed.

Diagnostics

The DZMx provides a range of diagnostic and other information on various aspects of the system.



Note: These files are not user-readable, however they should be forwarded to Flightcell International with a description of any problems.

Real-Time Diagnostics

The DZMx diagnostic pages may enable you to resolve any configuration or other issues.

The following options in the **Diagnostics Menu** may be available:

- » **About DZMx:** Contains the DZMx serial number, firmware version, IP address, memory usage and whether a USB device is mounted
- » **System Information:** Contains the serial numbers for the fitted cards
- » **GPS Diagnostics:** Contains information on the GPS connection
- » **Sat Device Details:** Contains information on the IMEI and network status of the satellite device
- » **Cell Modem Details:** Contains information on the IMEI of the cellular device, and on the status and band used by the cellular modem
- » **Cell Modem Data:** Contains information on the cell data connection
- » **Ext Modem Details:** Contains information on an external modem or phone in a cradle
- » **Tracking over IP:** Contains diagnostic information on the tracking over IP function. Performs a check on the settings used to enable Tracking over IP as well as a real time test using the configured tracking provider gateway
- » **Local Network Info:** Contains diagnostics on the status of the Bluetooth and WiFi connections
- » **External Inputs:** Contains diagnostics on the current status of the DZMx General Purpose Inputs

The diagnostics menu also provides for the following functions:

- » **Export System Log Files:** Exports system log files for diagnostics and support (see below).


Exporting Diagnostic Log Files

The DZMx maintains diagnostic log files, capturing key information on system performance. This information can be exported to a memory stick installed in the DZMx USB socket.

To export log files to a memory stick:

- » Install a USB memory stick in the DZMx USB port
- » Press **MENU>Diagnostic Menu>Export System Log Files**
- » Remove the memory stick and extract the files on a PC.

Logfiles can also be downloaded in DZMx Connect.

- » Go to **About**, click on the  icon on the top right.
- » Click on **Device Logs**, then on **Download all**. A zip file containing the logfiles will be downloaded to your default download folder.

Flightcell Remote Assistance

Flightcell Remote Assistance Virtual Private Network (VPN) allows Flightcell support staff to remotely connect to a DZMx and help with diagnostics, using a secure encrypted connection. This requires either a cellular data connection or a wired Ethernet connection.

Initial Remote Assistance Setup

Remote Assistance must be set up on the DZMx before it can be used. This is a one-off configuration step and will never need to be repeated.

To set up a connection, request a password from Flightcell International Support (tech@flightcell.com). You will need to provide the serial number of the DZMx.

Go to **MENU>Remote Assistance >Setup Connection** and press **ENTER** or go to **DZMx Connect>Remote Access**

Enter the supplied password and press **ENTER**

If the setup was successful a "Configuration received ok" message will be displayed.



Note: If the DZMx connection has been set up previously, the **Setup a Connection** option will not be displayed and instead you will have three menu options: **Connect VPN**, **Reset Connection** and **Enable at Startup**. In this instance go direct to step 2 "Establish a VPN Connection".

Establishing a VPN Connection

This provides a secure connection between the DZMx and Flightcell support team. The support staff will receive a notification and they will be able to remotely access the DZMx.

The DZMx will operate normally throughout this process.

To establish a VPN connection, go to **MENU >Remote Assistance>Connect VPN**, then press **ENTER** or to **DZMx Connect>Remote Access** and click on **Connect**

If the connection is successful a "VPN connection online" message will be displayed.

If the connection is unsuccessful a "Error: VPN connection has failed" message will be displayed.



Note: An unsuccessful connection can occur when a data connection is unreliable, or the remote assistance server is unreachable.

Disconnect a VPN Connection

Once connected it is possible to disconnect it at any time. Disconnection would normally be done once Flightcell support has finished assisting and has given the 'all-clear'. The VPN connection can be disconnected on the DZMx UI or on DZMx Connect.

Once the OpenVPN settings are configured and saved, the VPN connection status can be accessed both from DZMx Connect and from the DZMx screen configuration Menu.

Other Menu Options

Reset Connection

This menu option resets and updates the Remote Assistance connection and you will typically be directed to do this by Flightcell Support.

Enable at Start-up

This menu option forces the DZMx to automatically establish a VPN Remote Assistance connection on start-up. This feature is useful for long-term monitoring and diagnosis.

Appendix 1. Connector kits provided with the DZMx and associated parts.

Description	Supplied with	Component Description	Qty/ Kit
CNK_00003 - Flightcell Cradle D38999 Connector Kit	Flightcell Iridium Phone Cradles with military connectors	CNC_00002 - TNC crimp plug, RG58	1
		CNC_00011 - D38999/26WD-35SN Straight plug	1
		CNC_00014 - M85049/38S-15A - D38999 Strain Relief Cradles	1
CNK_00004 - Flightcell Cradle D25 Connector Kit	Flightcell Iridium Phone Cradles with civilian connectors	CNC_00002 - TNC crimp plug, RG58	1
		CNC_00004 - DB25S M24308 Crimp and Poke Socket with Contacts (Female)	1
		CNC_00026 - Metal Back Shell for DB Size connectors Straight (25 way)	1
CNK_00005 - Dual Antenna BNC/TNC Connector Kit	Dual Iridium/GPS antennas	CNC_00001 - BNC crimp plug, RG58	1
		CNC_00002 - TNC crimp plug, RG58	1
CNK_00029 - Single Antenna TNC Connector Kit	Single Iridium antennas	CNC_00002 - TNC crimp plug, RG58	1
CNK_00030 - Flightcell DZM Remote Head Connector Kit	Flightcell DZMx remote head	CNC_00046 - Metal Back shell for DA Size connectors Straight (15 way)	1
		CNC_00048 - DA15S M24308 Crimp and Poke Socket with Contacts (Female)	1
CNK_00035 - Flightcell DZMx Civilian Connector Kit	Flightcell DZMx - all versions with standard (D-25) connectors	CNC_00004 - DB25S M24308 Crimp and Poke Socket with Contacts (Female)	1
		CNC_00050 - DB25P M24308 Crimp and Poke Plug with Contacts (Male)	1
		CNC_00026 - Metal Back Shell for DB Size connectors Straight (25 way)	2
		CNC_00002 - TNC crimp plug, RG58	2
		CNC_00001 - BNC crimp plug, RG58	1
		IDP_00013 - Flightcell USB/Ethernet Civilian Connector Box	1

		CNC_00023 - DE9S M24308 Crimp and Poke Socket with Contacts (Female)	1
		CNC_00027 - Metal Back shell for DE Size connectors Straight (9 way or 15 way HD)	1
CNK_00038 - Triple Antenna BNC/TNC/TNC Connector Kit			
		CNC_00001 - BNC crimp plug, RG58	1
		CNC_00002 - TNC crimp plug, RG58	2
CNK_00037 - Flightcell DZMx Military Connector Kit	Flightcell DZMx - all versions with military (D38999) connectors		
		CNC_00012 - D38999/26WE-35SN Straight plug	1
		CNC_00013 - M85049/38S-17W - D38999 Strain Relief DZM2	1
		CNC_00002 - TNC crimp plug, RG58	2
		CNC_00001 - BNC crimp plug, RG58	1
		IDP_00012 - Flightcell USB/Ethernet Military Connector Box	1
		CNC_00059 - D38999/26WB-35SN Straight plug	1
		CNC_00058 - M85049/38S-11A - D38999 Strain Relief B Shell	1
CNK_00039 - Flightcell Iridium Modem Connector Kit	Flightcell Iridium modem		
		CNC_00045 - DA15P M24308 Crimp and Poke Plug with Contacts (Male)	1
		CNC_00046 - Metal Back shell for DA Size connectors Straight (15 way)	1
		CNC_00002 - TNC crimp plug, RG58	1

Contact Details

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Warranty

Flightcell International Limited's quality products are proudly designed and manufactured to the highest standards in New Zealand. Your DZMx is warranted for one year from date of sale. Your warranty can be extended to five years if you have purchased the extended warranty and your DZMx is registered on our product registration system, <http://www.Flightcell.com/Register>.

The DZMx 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 DZMx 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 Flightcell DZMx Installation and Configuration 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 complete a Returned Materials Authorization form on www.Flightcell.com/RMA or contact Flightcell International (see "Contact Details" on the previous page).