# Flightcell

ALWAYS CONNECTED

Flightcell International Ltd

# DZMx Operator Manual

Firmware Version: 3.2x

**Flightcell DZMx Operator Manual**

MAN_DZ4_002

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# Table of Contents

# Section 1: Introduction

The Flightcell DZMx provides voice and data communications and aircraft tracking. The purpose of this manual is to help users operate their DZMx and do basic configuration. Refer to the DZMx Installation Manual for the initial set up and detailed configuration information.

## Overview of DZMx Functions

The Flightcell DZMx is a powerful communications system that uses the Iridium satellite and/or 3G/4G terrestrial cellular networks to provide:

### Voice Calling and Data

» The DZMx provides a global phone service, enabling calls to virtually any phone in the world.
» The DZMx interfaces to the aircraft intercom system, connecting crew audio to the available phone networks.
» Calls are dialled from the DZMx keypad, from a computer using DZMx Connect or from a smart device using the DZMx Connect app. A phone directory or keypad speed dial keys are used to retrieve and call stored phone numbers.
» Other parties call the aircraft by dialling the aircraft's satellite or cell phone numbers.
» Data connections are provided to connected devices over satellite and cellular networks, providing access to email and the internet (cellular networks only).
» Data is accessed via the DZMx Ether port of wirelessly via DZMx WiFi.

### Two-Way Messaging

» SMS text messages can be sent to the DZMx over either the satellite or cellular networks.
» SMS/SBD messages can also be sent to the DZMx over the Iridium network from an Iridium web application or any email program.
» Messages from the DZMx's message library can be sent either to another satellite phone or cell phone, or to your tracking service provider.

### Aircraft Tracking

The DZMx automatically sends periodic position reports to one of many tracking service providers. Manual positions may also be triggered by the user. Additionally, the DZMx can be configured to send position reports that mark specific events, including:

» Start-up
» Engine start and stop
» Take-off and landing
» Course change
» Manual position
» Emergency mayday
» Automated Rescue Monitoring (A.R.M.)
» Firefighting events
» Other special purpose events

# Section 2: DZMx Connect

DZMx Connect is a browser utility that is used to configure and operate the DZMx. An app version is available from the Apple App Store and Google Play for use on smart devices over DZMx WiFi. DZMx It is recommended that DZMx Connect is used to alter DZMx configuration settings, as it is quicker and more intuitive interface than using the DZMx keypad and display.

## Setup

There are three ways to use DZMx Connect:

### Hardwired Computer Connection

1. Connect a computer to the DZMx Ethernet port.

2. Power up the DZMx and wait for it to fully initialise.

3. 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.

### Wireless Laptop Connection

1. Power up the DZMx and wait for it to fully initialise.

2. Check that WiFi is enabled.

3. 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:

   a. Press and hold the keypad MODE button until "Enabling WiFi is displayed on the display. WiFi can also be disabled with a subsequent press of the MODE button.

   b. Using the DZMx keypad, navigate to: MENU>>Hardware Config>>Wireless and Networks>>WiFi Enable and select Yes.

   c. Connect a PC or laptop to the DZMx via an Ethernet cable.  Type 192.168.4.1 into a web browser and navigate to Connectivity>>WiFi and toggle the switch to ON.

4. 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

1. Configure the smart device to connect to:
   » Default SSID: DZMx WiFi
   » Default password: flightcell (all lower case)

2. 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.

3. 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

Permission levels allow users of the DZMx system to have more in-depth control of how best to configure their product. Two different levels of roles, with individually configurable passwords are available in DZMx Connect. These roles and default passwords are:

| Role | Default Password |
|---|---|
| Installer | <installers only> |
| Administrator | 2580 |

The installer role can edit all DZMx settings and hardware options. The administrator role has access to all application features and configuration but is unable to access hardware configurations. There is no Operator password by default, however if you have Administrator or Installer access you can revert back to the original Operator status using default password: 1234.

**Note:** Passwords can be changed by the Installer and the Administrator in "Settings".

# Section 3: Physical Interfaces

This section explains physical interfaces that are available to the user; interfaces such as the keypad, the display and the menu options.

## DZMx Keypad References

The following table outlines the DZMx keypad buttons and how they 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 |

The DZMx is installed with an inbuilt LCD display to show timely and important information to users. The LCD can show several different views:

## LCD Display

| | | |
|---|---|---|
| The Main Screen | 30°47'42.5N 96°48'17.5W<br><br>**Ready** .ıll SAT<br><br>**Ready** .ıll CELL<br><br>Tracking: In flight | After the DZMx has booted and initialised, the display will show the main screen. This shows:<br>» GPS information (at the top of the screen).<br>» Phone networks designated for the two soft keys A and B.<br>» Network connection status and strength for the installed modem(s).<br>» Other status messages (at the bottom of the screen). |
| Pop-up Screens | **Message Received**<br><br>**Press ENTER** | Pop-up screens are used to announce events such as incoming calls and messages. Some pop-ups will be accompanied by an audible alert (e.g. for an incoming call or text message) or warning (e.g. if Automated Rescue Monitoring remains active after landing).<br><br>Most Pop-up screens will have a time-out and will automatically disappear, but all can be cleared from the display at any time by pressing the ENTER key. |
| Menu and List Screens | **Main menu 2/8**<br>**PhoneBook**<br>**Messages**<br>**Audio**<br>**Tracking** | Displays available menu options or a list of items, e.g. received messages or phone book entries. The currently selected item will be highlighted. The user can navigate the list using UP and DOWN and select the item bey pressing ENTER.<br><br>Next to the title of the list will appear two numbers, the first is the index of the current item selected, the second is the total number of items in the list. |
| Settings Adjustment Screens | **Ear**<br><br>**33** | Displays the current value when adjusting or viewing settings such as audio volumes or backlight brightness.<br><br>The slider bar shows the setting as a percentage of the maximum available value and can be adjusted using LEFT and RIGHT. Changes can be confirmed by using ENTER, or aborted by using BACK or END. |
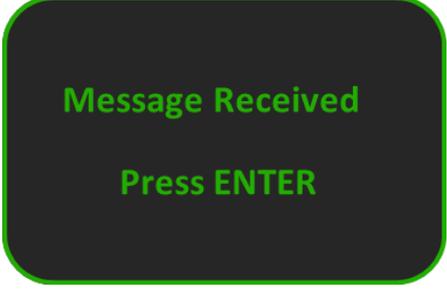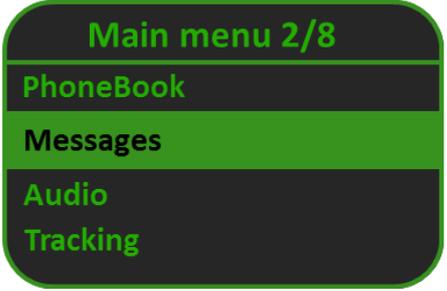
## Understanding the Main Screen

During normal operation, the DZMx LCD display shows the Main Screen. This information is presented:

» On the top line, the current GPS information which can be changed. See the Global Positioning System (GPS) section for details.
» In the Center of the display, modem information:
  » Modems installed in each position in the DZMx.
  » Status of each of the installed modems. The status changes, depending on the operation being performed.
  » Signal strength (up to five bars); if the phone doesn't have a connection, it shows
» Above the "modem information", additional information on:
  » Messaging activity, including number of queued messages.
  » Phone number or name of the other party to an active phone call.

» On the bottom line, information for:
  » Tracking status (messages and events)
  » A.R.M status. Distress
  » Emergency status

# DZMx Menus

The DZMx has an extensive menu system providing access to a range of functions, settings and diagnostic information. It provides access to user level settings, such as tracking timers, basic audio configuration, GPS display options and phone book management.

Settings used to configure the DZMx for a specific operation or application are normally hidden from the user and an installer password is required to access and change them.

## Navigating the Menus

The keypad is used to access the menu system on the DZMx display:

1. Press MENU. If the DZMx is on a phone call, press and hold MENU for 2 seconds to access the menus Use UP and DOWN to navigate between menu options.
2. Press ENTER to select the highlighted item.
3. Press BACK to cancel a setting change and to move back up a menu level.
4. Press ENTER to confirm a setting change.
5. Press END to cancel a setting change and exit the menu system.
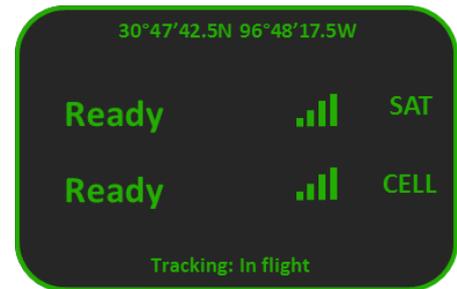
# Status Messages

The DZMx has four status message regions on the main display for GPS, the modems, queued messages and tracking. For information on the GPS status line, including configuration, see the Global Positioning System (GPS) section. The modem status lines are used for reporting to the user various messages including network status and call/messaging activity.

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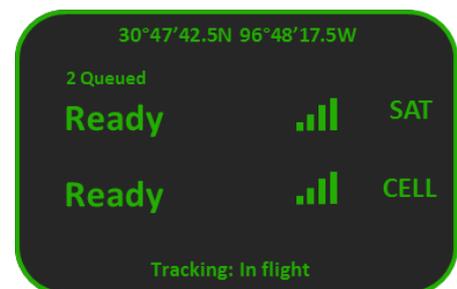
## Network Status Messages

The modem status message will change as the DZMx powers up and establishes a connection to the network:

» **Initialising**: The modem has established a connection to the modem and is in the process of initialising the device.

» **Ready**: The modem is powered on, successfully initialised, registered on the network, and is reporting a good signal strength.

» **Searching**: The modem is searching for a good signal.

» **Disabled**: Flightmode has been activated. The modem is disabled until flightmode is deactivated, see the Cellular Flightmode section for details.

» **Going Online**: The modem is establishing a data connection.

» **Online**: Modem Data connection has been established.

## Error Messages

The modem status lines will show error messages if the DZMx is unable to connect to the network for the following reasons:

» **SIM Error**: Either no SIM is inserted, or is not registered with the network provider.

» **SIM PIN Required**: The SIM card is locked and requires a PIN.

» **Not Inserted**: The DZMx cradle is reporting there is no phone in the cradle (external cradles only).

» **Not Responding**: The modem is not responding to the DZMx.  Occurs when the modem is not configured correctly.

## Calling Status

While you are making a phone call, the modem status lines will show you which device is currently being used for the call, and on the line above, who you are calling, or being called by. If the other party is listed in the DZMx's phone book, then the information line will display their name.

The phone or modem status message changes as the DZMx establishes a connection with the other party:

» **Calling**: The DZMx has dialled the number but a connection has not yet been established On Call: The DZMx has established a connection and the other party has accepted the call.

» **Incoming Call**: flashed on the DZMx display, an audible ringing tone will sound over the audio system and the call annunciator light (if installed) will flash if there is an incoming call.

» **Call Queued**: The DZMx has queued the call, and will start the call when the modem is next free

» **Disconnecting**: The phone call has been terminated at either end of the call or the modem loses the connection.

## Messaging Status

The modem status messages will briefly show the status of the transmitted messages:

» **Receiving SMS**: An SMS is being received.

» **Sending Data**: An SMS or SBD message is being transmitted.

» **SMS Failed! or SBD Failed!**: Transmission has failed, usually because of a low signal.  The DZMx will attempt to resend the message.

» **SMS Sent or SBD Sent**: An SMS or SBD message has been successfully transmitted.

The line above the messaging status will show the number of messages in the message queue that have not been transmitted.

## Data Status

The modem status messages will show the status of the data connections:

» **Going Online**: The modem is connecting to the network for data.

» **Online**: The modem has a data connection to the network.

## Tracking Status

The tracking status line on the bottom of the display will show aircraft and tracking status:

» **Tracking: Queuing** is displayed if there are more than two messages in the message queue.  This indicates poor cellular and/or Iridium signal strength or that position reports are not being sent or are being sent at a slower rate than they are being queued.

» **Tracking: Queue Full!** is displayed if messages have not been transmitted for quite some time due to poor signal strength and now the queue is full.  Any new position reports will be added to the queue and the oldest one removed from the queue.

» **Not Tracking: No GPS** is displayed when the GPS does not have a fix.  Position reports will not be generated if there is no GPS fix.

» **Not Tracking: Disabled** is displayed when tracking has been disabled.

» **Not Tracking: Suspended** is displayed when tracking has been suspended.

» **Not Tracking: On Ground** is displayed when the DZMx is configured to only send tracking data when the aircraft is in the air.

» **Tracking: On Ground** is displayed when the aircraft is on the ground and the DZMx is configured to send on-ground position reports.

» **Tracking: Inflight** is displayed when aircraft is tracking and currently in a flight.

» **Tracking: Takeoff** and **Tracking: Landed** is displayed after the DZMx has sent take-off and landing reports, if the DZMx is configured to record these events.

» **Tracking: Hovering** is displayed if DZMx detects the flight speed has dropped below the hover speed threshold.

» **Engine Start** and **Engine Stop** is displayed after the DZMx has sent engine start and stop reports, if the DZMx is configured to record these events.

» **Geofence Active: nn NM** is displayed if Geofence Suspend mode has been activated. nn is the distance, in nautical miles, of the aircraft from the centre of the geofence area. Tracking will be suspended for as long as the DZMx detects that the aircraft is within the geofence radius (see the Geofence Suspend Mode section for details of how to configure the Geofence application settings).

## PTT Status

The modem status messages will show the status of the PTT modem:

» **PTT: Initialising** is displayed when the modem is switching from normal satellite mode to PTT mode.

» **PTT: Registering** is displayed when modem is registering with the network.

» **PTT: (no tg)** is displayed when the user has not specified a talkgroup for the modem PTT: Requesting is displayed the user is requesting to talk.

» **PTT: RX** is displayed when someone else is talking on the current talkgroup PTT: TX is displayed when the DZMx is able to talk on the current talkgroup

» **PTT: "Talkgroup Name"** is displayed when "Talkgroup Name" is the selected talkgroup and has been successfully joined.

Additional status messages can also be generated when using Emergency and Distress Mode, or Automated Rescue Monitoring (A.R.M.).

## 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. 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 lighting control input. External lighting is only available if the DZMx has been connected to the cockpit dimmer control. See Flightcell DZMx Installation and Configuration manual for external lighting installation options.

## Switching Backlight Modes

To switch modes between Day, Night and External backlighting:

1. Press and hold the "*" key on the DZMx or remote head for 2 seconds
2. Scroll to Backlight Mode
3. Use LEFT and RIGHT to change the setting
4. 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:

1. Press and hold the "*" key for 2 seconds.
2. Select the Day or Night setting as above.
3. Scroll down to **Display Brightness** or **Keypad Brightness**.
4. Use LEFT and RIGHT to decrease/increase the brightness.
5. 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. To change the minimum brightness options for the external lighting on the DZMx or remote head:

1. Press and hold the "*" key for 2 seconds.
2. Scroll to **Advanced** and press ENTER.
3. Scroll to **Ext Lighting Config Low** and press ENTER.
4. Set the dimmer control to the minimum position.
5. Adjust the keypad and display minimum brightness using LEFT and RIGHT to match cockpit lighting levels.
6. Scroll to **Input Calib**. then press ENTER.
7. 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:

1. Press and hold the "*" key for 2 seconds.
2. Scroll to Advanced and press ENTER.
3. Scroll to Ext Lighting Config High and press ENTER.
4. Set the dimmer control to the maximum position.
5. Adjust the keypad and display maximum brightness using LEFT and RIGHT to match cockpit lighting levels.
6. Scroll to **Input Calib**. then press ENTER.
7. Press END to save the setting and exit the menu.

> **Note:** While the lighting control input is reduced below the "minimum position", the brightness levels will switch to "Day" brightness.

## Global Positioning System (GPS)

The 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.
» **dddmm.mmmm**: the aircraft's position is shown in degrees and minutes (to 4 decimal points).
» **ddmmss**: the aircraft's position is shown in degrees, minutes and seconds.
» **Speed and Heading**: the aircraft's speed and heading is shown in knots and degrees relative to true north (rather than magnetic north).
» **Clock**: the current time and date is shown.

## Setting the GPS Display

To set the GPS display:

1. Press MENU then navigate to Display Setup Menu>>GPS Display Options.
2. Press ENTER to select and use UP or DOWN to the required GPS display option.
3. Press ENTER to save the setting or BACK to abort and return to the Display Setup Menu.

> **Note:** The GPS will display **No GPS Lock**, if the DZMx is unable to connect to the GPS network.

# Section 4: Phone Calls

The DZMx allows users to initiate phone calls over the Iridium and cellular networks, providing global call coverage.  Phone calls can be made directly from the DZMx or remote heads. The DZMx provides the user with flexibility in choosing how to make their calls. This section describes the various options available for making calls from the DZMx or remote heads.

## Initiating a Call

### Dialling a Phone Number
1.   Select the modem to be used for the call by pressing A or B to display the Enter Phone Number screen.
2.   Enter the number using the "0" to "9" keys. For international calls requiring the dialling prefix "+", press and hold "0".  Press BACK to delete the last digit entered.
3.   Press CALL or ENTER to initiate the call.
4.   Press END to terminate the call at any time.

### Calling a Number in the Phone Book
1.   Press DIR to display the phone book.
2.   Scroll through the phone book to the required contact using UP and DOWN.
3.   Press A or B to select the modem and initiate the call.
4.   Press END to terminate the call at any time.

### Calling using Speed Dial
1.   The speed dial keys are automatically linked to the first three numbers in the phonebook, respectively.
2.   Press SPD1, SPD2 or SPD3 as appropriate, then the contact name and number will be displayed.
3.   Press A or B to select the modem and initiate the call.
4.   Press END to terminate the call at any time.

### Redialling the last called number
1.   Select the modem to be used for the call by pressing A or B to display the **Enter Phone Number** screen.
2.   Instead of entering a number, just press CALL; the contact name (if in the phone book) and number of the last number dialled will be displayed.
3.   Press CALL or ENTER to initiate the call.
4.   Press END to terminate the call at any time.

### Calling the Sender of a Text Message
1.   Open the message so it is displayed on the screen (see Incoming Messages for how to access received messages).
2.   Press A or B to select the modem and initiate the call.

## Answering a Call

When the DZMx detects an incoming call, and the pilot is not already in a call, an **"Incoming Call"** pop-up will flash on the DZMx. If caller ID is supported by the network, the caller's phone number, or name, if the number matches any in the phone book, will also be displayed.

1.   Press CALL to answer an incoming call or press END to reject the call.
2.   Press END at any time to hang up.

## Extra Call Features

### Call Forwarding
Incoming cellular voice calls can be redirected to a telephone number when the aircraft is powered down or when there is no cellular network connection.

To configure and enable call forwarding from the DZMx keypad:

1.   Select MENU.
2.   Scroll and select **Call Forwarding**.
3.   Select **Enter Number** and manually enter the telephone number, then press ENTER. Information will be sent to the cellular service provider and **"Updating Call Forward Information Over Cell Network"** will be displayed temporarily, followed by **"Call Forward Number Updated"**.

4. Alternatively, under the **Call Forwarding** menu, choose **Select From PhoneBook** and select an existing contact number.
5. Under the **Call Forwarding** menu select **Call Forward Enable** and select **Yes**. **"Updating Call Forward Information Over Cell Network"** will be displayed temporarily.

> **Note:** A cellular connection must be available when configuring and enabling call forwarding.

Dual cellular modem configurations have the option to configure a call forwarding number for each modem.

When configuring and enabling call forwarding using DZMx Connect, navigate to: **Settings>>Modem>>Modem1 and/or Modem2**.

## Touch Tone Dialling (DTMF) During a Call
When calling through a switchboard or call centre, you may be asked to press various keys. This is called touch-tone or DTMF dialling. The DZMx provides touch tone dialling when in a call. Simply press the 0 to 9 or * or # keys when prompted during a call.

## Simultaneous Calls
DZMx installations with more than one modem can make two calls simultaneously. Making and receiving the first call works the same way as described above. However, to make the second call, a long press is required to use the speed dial, phonebook or menu keys.

> **Note:** While on two calls, both parties can hear you, but they are unable to hear each other.

To hang up an individual call:

1. Press END, a pop-up will display **"Press A or B to hang up a call"**.
2. Press A or B to hang up the individual call.

## Using Other DZMx Features During a Call
To use the MARK, A.R.M., EMER, MSG, or MENU keys during a call, press and hold the applicable key for 2 seconds to override DTMF dialling on that key. To adjust the audio while on a call while viewing the main screen, press and hold either the LEFT or RIGHT key to display the Ear audio setting adjustment screen.

## Missed Calls
If a call is missed, a pop-up will flash on the main screen indicating a missed call. Additionally, a missed call message will be added to the received message list with details on the caller and which modem the caller dialled. The missed call can be returned by:

1. Opening the message so it is displayed on the screen (see Incoming Messages for how to access received messages).
2. Press A or B to select the modem and initiate the call.

## Audio Settings
Only the level of audio from the DZMx to the ICS (ear volume) can be adjusted by the user. An installer will have access to more audio settings (keypad beep volume, mic volume, warning tone volume) within the menu system and via the DZMx Connect utility program.

If the audio settings are set up correctly, the pilot will only need to adjust the ear volume for changes in the following:

- » Incoming call volume levels.
- » Switching headsets.
- » Ambient noise conditions.

## Adjusting DZMx Audio Levels
To adjust incoming audio level:

1. Press MENU then navigate to **Audio>>ICS>>Ear**; the DZMx will display the setting.
2. Use LEFT or RIGHT to adjust the audio level.
3. Press ENTER to confirm the setting change and return the audio menu.
4. Press BACK to abort the change and return to the audio menu.

5.   If ICS2 is enabled; Repeat for **Audio**>>**ICS2**>>**Ear**.

> **Note:** As a short-cut from the main screen, press and hold either the LEFT or RIGHT key while in a call to display the setting adjustment screen.

# Section 5: PTT Calling

The DZMx allows users to use Iridium's Push-to-Talk service, providing global call coverage.  PTT calls can be made directly from the DZMx or remote heads.  The DZMx can be switched between phone mode and PTT mode as required.

> **Note:** DZMx PTT is a paid optional extra.  If PTT functionality and menu options are not available, please contact Flightcell International Ltd or your vendor.

## Switching to PTT Mode

1. To switch to PTT mode on your satellite device:
2. Press and hold the A or B button attached to the satellite device.
3. **"PTT Initialising"** will display on the display.
4. After initialisation, you will be able to join a PTT Talk-group or start a PTT call.

> **Note:**  The DZMx can be configured to have PTT initialise automatically on startup.  This makes PTT the default mode for frequent users.  Configuration information is in the DZMx Installation Manual.

## Joining a Talk-Group

To join or switch to an alternate Talk-group:

1. Press MENU to enter the main menu.
2. Select **PTT Talk-groups** from the top of the menu.
3. Scroll to the required Talk-group and press ENTER to join it.

**Optionally**: Press CALL to make it the Default Talk-group. This talk-group will be automatically joined on startup

A PTT call can be started if the selected Talk-group is active and has no other participants currently talking. Maximum talk time is 40 seconds before the call will hang up. The PTT modem will automatically listen to other talkers in the talk-group.  Other talkers can be temporarily silenced by pressing END. Pressing END will also end a local DZMx call.

## PTT Calling with External Button

If the DZMx is externally wired to the pilots' PTT button (see Installation Manual for wiring options):

1. Press and hold the button to start transmitting.
2. Release the button to stop transmitting.

## PTT Calling with DZMx Keypad

If using the DZMx keypad to call using PTT:

1. Press and release the Iridium modem key (A or B) to start transmitting.
2. Press END at any time to stop transmitting.

# Section 6: Messaging

Text messages can be sent and received over cellular and satellite networks using any of the installed and connected modems. The DZMx has a 50-entry library of pre-configured messages that can be sent using the DZMx keypad. Use DZMx Connect to craft custom messages.

> **Note:** Messages in the DZMx message library can only be entered or edited using DZMx Connect.

## Incoming Messages

### Viewing an Incoming Message
When a message is received on the DZMx, a pop-up window announces **"Message received"**. To open the message, press CALL or ENTER. Scroll through the message using UP and DOWN. The bottom lines of the message show the sender and the time the message was sent.

### Viewing Messages in the Inbox
Received messages are stored in the DZMx inbox.  The inbox will hold up to 30 messages. Once full, the oldest message will be deleted each time a new message is received.

To read messages saved in the inbox:

1. Either press and hold MSG until the message list is displayed or alternatively, using the menus, press MENU then scroll to **Messages**>>**Received Messages**.
2. The received message list will show the first few words of the received message; use UP and DOWN to scroll to the message to be read.
3. Press ENTER to view the entire message, then UP and DOWN to scroll through the message.
4. Press BACK to return to the message list.
5. Press END to exit the menu system and return to the main screen.

### Missed Call Notifications
Missed calls notifications will be added to the received message list. This message will contain details on the missed call, including the call date, caller ID and the modem the call originated from. A message can be sent to the caller, see Replying to a Message.

### Sending Messages to the DZMx
SMS text messages can be sent to the DZMx in several ways. From any cell phone or satellite phone, send the message to the DZMx's cell or satellite phone number. Messages can also be sent via Iridium's online services:

#### By Email
Address the email to 8816xxxxxxx@msg.iridium.com (where 8816xxxxxx is the Iridium phone number for the DZMx).

#### From the Iridium Website
1. Go to the Iridium website at http://messaging.iridium.com/.
2. Enter the satellite phone number of the DZMx.
3. Fill in the subject line.
4. Fill in the message.
5. Click Send Message.

## Outgoing Messages

### Using a Number from the DZMx Phonebook.
1. Press MSG, scroll to the required message and press ENTER to open the message.
2. Press the speed dial keys SPD1, SPD2 or SPD3 or press DIR and scroll to the number, then press ENTER.
3. Press A or B to send via the selected network.

### Using a Number NOT in the DZMx Phonebook
1. Press MSG, scroll to the required message and press ENTER to open the message'.
2. Press A or B to select the network'.
3. When prompted, enter the destination phone number, then press ENTER to send the message. For international calls requiring the dialling prefix "+" press and hold "0".

## Replying to a Message
1. Open the received message, then press MSG to open the message library.
2. Scroll to the message to be sent in reply, and press A or B to send the message via the selected network.

## Cancelling Unsent Messages
If for any reason you wish to remove all unsent messages (including position reports) from the outgoing message queue:

1. Press MENU and scroll to **Cancel Queued** and then press ENTER.
2. A pop-up message will be displayed showing **'Message Queue Deleted'**.

This command will remove all messages, both tracking and text messages, from the queue.

# Section 7: Phone Book

Phone book entries can be added, edited or deleted by either using the DZMx keypad or through the DZMx Connect utility program. DZMx Connect is a quick and simple interface for importing contacts into the DZMx. It is recommended that DZMx Connect is used for making wholesale changes to the phone book.

> **Note:** The phone book is only able to store a maximum of 50 contacts.

## Adding a New Contact

1. Press MENU then navigate to **PhoneBook**>>**Add/Edit**; the phone book will be displayed.
2. Scroll down to an empty contact and press ENTER; the DZMx will display **"Enter number"**.
3. Enter the number using the full international dialling string including country code and area code (e.g. +6435458659); press and hold the "0" key to get the "+" prefix.
4. Press ENTER; the DZMx will display **"Enter name"**.
5. Use UP and DOWN to scroll through the letters of the alphabet to the required letter, press RIGHT to move to the next character or BACK to backspace the last digit.
6. When the name has been entered, press ENTER to save the new contact.

## Editing an Existing Contact

1. Press MENU then navigate to **PhoneBook**>>**Add/Edit**; the phone book will be displayed.
2. Scroll down to the contact to be altered and press ENTER; the DZMx will display the phone number.
3. Edit the number using the BACK key and the number keys.
4. After the number has been edited, press ENTER; the DZMx will then display the contact name.
5. Use the BACK key to remove characters from the name. The UP and DOWN keys are used to scroll through the letters of the alphabet to the required letter. Press RIGHT to move to the next character.
6. When the name has been entered, press ENTER to save the contact.

## Deleting an Existing Contact

1. Press MENU then navigate to **PhoneBook**>>**Erase**; the phone book will be displayed.
2. Use UP and DOWN to scroll to the contact to be deleted.
3. Press ENTER to delete the selected contact.

# Section 8: Data

Both the cellular and satellite modems can provide data connections (See Installer manual for further details). The DZMx can provide access to the internet for a connected PC, laptop, or Windows tablet. It does this via the DZMx Ethernet port.  The DZMx operates as an internet router. When a PC or laptop is plugged into the DZMx's Ethernet port, the DZMx will allocate an IP address in the range 192.168.4.xxx.

## Cellular Data

When the DZMx is successfully connected to the cellular data service, the DZMx status line for the modem will display **"Online"**. See Status Messages for more details on the DZMx display and status lines.

## Satellite Data

To start/stop the satellite data connection, press and hold the corresponding modem key, A or B. The modem will display **"Going Online"**. When the data has successfully connected, the modem will display **"Data Online"**.

> **Note:** The DZMx must be configured using DZMx Connect to be able to activate cellular or Iridium data.  See the Flightcell DZMx Installation Manual for further details.

## Multiple Data Connections

Automatic data routing is not yet supported in software so turning on both data connections simultaneously is not recommended. If the Cell and Sat data are both turned on, the connection used will be the last one turned on, which may or may not be the fastest or most economical connection. This applies to both control from DZMx Connect and the physical user interface.

# Section 9: GPS Tracking

The DZMx can send position reports to a tracking system using the Iridium and/or cellular network.  The DZMx has several configurable periodic tracking timers and triggered tracking events. These generate automatic position reports at appropriate intervals, or when triggered (e.g. a take-off or landing report). The user can also manually trigger a position report using MARK. Changes in the tracking status of the DZMx are displayed on the bottom line of the DZMx display and remote heads, see Status Messages for further information.

In order to for periodic tracking to work correctly, the DZMx must have:

- » A valid GPS lock, and
- » Tracking must be enabled, and
- » The DZMx must be correctly configured according to the tracking provider's specifications. Refer to the DZMx Installation Manual for details on how to configure DZMx tracking.

## Automatic Position Reports
The DZMx can be configured to automatically send a range of routine position reports. These are:

- » Aircraft power up – triggered when power supplied to the DZMx.
- » Engine start and stop – triggered by an external input from the engine. Take-off and landing – triggered by aircraft speed and/or an extra input. Periodic events – triggered at regular intervals.
- » Aircraft heading changes – based on change in heading and time since last message sent.

## Manual Position Reports
Position reports are usually sent automatically, but manual position reports may also be sent to mark a point of interest.  You can send a position only, or a position with preconfigured message attached.  The aircraft position and time are taken from the time and location when MARK is pressed, so this feature can be used to mark a point of interest on your tracking system.

### To Send a Manual Position

1. Press MARK.
2. The DZMx will display **'Position Marked'** and a tracking message will be added to the outgoing message queue.

### To Send a Manual Position Report with a Message Attached
1. Press and hold MARK until the message library opens
2. Scroll down to the message to be sent
3. Press ENTER to display the message then press ENTER to send; the DZMx will display Position marked and a tracking message will be added to the outgoing message queue.

> **Note:** To send messages attached to position reports, this feature must be enabled in the DZMx configuration menus.

## Enabling Tracking
1. Press MENU then scroll to **Tracking**>>**Tracking Mode**
2. Scroll to **On** as required and press ENTER.

## Suspending or Disabling Tracking
Automatic tracking reports may be suspended temporarily, for example when an aircraft is working for a period at a known location, or disabled. If suspended, tracking is disabled for the current flight only, and will be automatically re-enabled when the DZMx is next powered up. If disabled, tracking will remain off until re- enabled.

1. Press MENU then scroll to Tracking>>Tracking Mode
2. Scroll to Suspend or Disable as required and press ENTER.

## Geofence Suspend Mode

The Geofence suspend application allows operators to suspend tracking while the aircraft remains within a geographical radius. 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 suspended. See Geofence Suspend Mode for more details on how to enable and configure this application.

Geofence suspend mode can be activated, re-centred and cancelled via a single key press:

1. Press and hold MENU to activate.
2. The DZMx screen will momentarily display that tracking is now suspended and will also state the suspend radius.  The geofence radius will be centred at your current position and the suspend radius set will be set to the Geofence Radius setting.
3. When inside the geofence perimeter, press and hold MENU to access the Geofence Options menu to re-centre or to deactivate geofence suspend mode.

## Adjusting Tracking Settings

The DZMx tracking timers and operation of the mark button can be configured using the DZMx menu system or via DZMx Connect.  The tracking system can also be disabled or suspended if required.

### Periodic and HD Tracking Timers

The time delay between sending tracking reports can be varied to suit operational requirements (see Tracking Intervals Summary for more information):

   » **HD Tracking**: A 15 second delay between tracking reports
   » **Periodic Tracking**: Configurable to be anywhere between a 1 to 60-minute delay between tracking reports.

An automatic position report will be created at the specified number of minutes after the last position report. For example, if the last tracking position report was triggered by a take-off event, this will effectively reset the tracking timer and the next automated transmission will occur the specified number of minutes after the last transmission was sent.

Four periodic timer settings can be adjusted by the user:

   » **Periodic Timer**: The delay between scheduled tracking reports during flight.  The minimum interval is 1 minute
   » **Heading Timer**: Position reports are sent more frequently when the aircraft is changing heading.
   » **Heading Variation**: Configures the change (in degrees) by which the aircraft's heading must vary in order to trigger a course change position report.
   » **On Ground Timer**: The tracking interval on the ground.  On Ground tracking can be disabled.

> **Note:** HD tracking requires Tracking over IP (cell data) to be enabled.  Please refer to the Installation manual for further configuration details.

To change the settings of the periodic timer settings:

Press MENU and scroll to **Tracking**>>**Periodic Events** and select the appropriate setting from the menu; the DZMx will display a slider indicating the current settings value.

Use LEFT or RIGHT to adjust the tracking timer or heading angle.

Press ENTER to confirm the setting change and return the Tracking menu.

Press BACK to abort the setting change and return to the Tracking menu or END to exit the menu system.

> **Note:** The Periodic Timer setting must have a higher value than the heading timer.

> **Note:** On Ground tracking can disabled by reducing the "On Ground Timer" setting to Disabled by moving the slider to the very left.

## Tracking Intervals Summary

Whenever HD Tracking is enabled, it becomes effective whenever Tracking-over-IP is operational. The resulting tracking frequency also depends on the current Flight State as follows:

| Tracking Network | Flight State | HD Tracking Available | Tracking Frequency |
|---|---|---|---|
| Cell SMS, Satellite SBD + SMS | All | No | From 1 to 60 minutes |
| Tracking-over-IP (Cell data) | On ground | HD tracking suspended | From 1 to 60 minutes |
| Tracking-over-IP (Cell data) | Hovering | Yes | 60 seconds |
| Tracking-over-IP (Cell data) | In Flight | Yes | 15 seconds |

# Section 10: WiFi

DZMx WiFi is a built-in option that works with any DZMx that has a DZP_04-xxxW part and dash number.  It provides an onboard hotspot and hub for smart devices and connected equipment (such as medical monitors) aboard the aircraft.  WiFi also allows the user to use DZMx Connect to operate and configure the DZMx.

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

## WiFi Setup & Operation

1. Power up the DZMx and wait for it to fully initialise.
2. Ensure the DZMx is running version 3.x.x firmware. To check the version, use the keypad to navigate to: **Menu**>>**Diagnostics Menu**>>**About DZMx**.
3. Check that WiFi is enabled. Look for a radiating WiFi icon   located at the top right-hand side of the DZMx display. If the WiFi icon is not present, WiFi can be checked and enabled in one of three ways:
   a. Press and hold the keypad MODE button until **"Enabling WiFi"** is displayed on the display.  WiFi can also be disabled with a subsequent press of the MODE button.
   b. Using the DZMx keypad, navigate to **Menu**>>**Hardware Config**>>**Wireless and Networks/WiFi Enable** and select **Yes**.
   c. Connect a PC or laptop to the DZMx via an Ethernet cable. Type 192.168.4.1 into a web browser and navigate to **Connectivity**>>**Wi-Fi**. Toggle the switch to **On**.
4. To use the free DZMx Connect app on a mobile device, download it from the Apple App Store or from Google Play. The DZMx Connect app lets you manage contacts, initiate telephone calls, send and receive text & SBD messages, and configure the DZMx.
5. Configure the mobile device or the connected device (e.g. medical monitor) to connect to:
   a. **Default SSID**: DZMx WiFi
   b. **Default password**: flightcell (all lower case)

## Discovery using DZMx Connect app

1. Open the DZMx Connect app. 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.
2. Click on the discovered DZMx unit to open navigate and settings options.
3. Click here to watch a short video explaining the DZMx Connect app capabilities.

# Section 11: Bluetooth™

DZMx Bluetooth is a built-in option that works with any DZMx that has a DZP_04-xxxW part and dash number.  It provides the ability to pair a mobile device, such as mobile phone or tablet, to the aircraft ICS/headset.  The user can make and take calls on the mobile device and talk via the intercom system.  This is very similar to hands-free operation in a motor vehicle.

Functionality includes:

- » Receive calls from mobile device on headset
- » Make calls from a mobile device and use headset
- » Listen to streaming media on 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.

## Bluetooth Setup & Operation

1. Power up the DZMx and wait for it to fully initialise.
2. Ensure the DZMx is running version 3.x.x firmware.  To check the version, use the keypad to navigate to: **Menu>>Diagnostics Menu>>About DZMx**.
3. Check that DZMx Bluetooth is enabled.  When it is enabled this icon ⁑ will appear in the top right-hand side of the DZMx display.  It can be enabled in one of three ways:
   a. Using the DZMx keypad, navigate to: "**Menu>>Hardware Config>>Wireless and Networks/Bluetooth Enable** and select "Yes".
   b. Connect a PC or laptop to the DZMx via an Ethernet cable. Type 192.168.4.1 into a web browser and navigate to: "**Connectivity/Bluetooth**".  Toggle the **On** switch to **On**.
   c. Using the DZMx Connect app on a mobile device, navigate to **Connectivity>>Bluetooth**. Toggle the **On** switch to **On**. NOTE: This can only be done if the DZMx is WiFi capable and WiFi has been set up and enabled.

Make the DZMx discoverable (this is a temporary setting), so the mobile device can see it and pair with it.  When discoverable, this icon ⅰ] will appear in the top right-hand side of the DZMx display.

The DZMx can be made discoverable in one of three ways:

Using the DZMx keypad, navigate to: **Menu>>Hardware Config>>Wireless and Networks/Bluetooth Discoverable** and select **Yes**.

Connect a PC or laptop to the DZMx via an Ethernet cable. Type 192.168.4.1. into a web browser and navigate to: **Connectivity>>Bluetooth**. Toggle the **Discoverable** switch to **On**.

Using the DZMx Connect app on a mobile device, navigate to **Connectivity>>Bluetooth**. Toggle the **Discoverable** switch to **On**. This can only be done if the DZMx is WiFi capable and WiFi has been set up and enabled.

## Pairing

1. Check that both of these icons are displayed on the DZMx display: ⁑ⅰ]
2. Enable Bluetooth on the mobile device settings and select the **DZMx-Bluetooth** device.
3. A pairing notification message with a confirmation code will appear on both the DZMx and the mobile device.  Ensure they are the same number.
4. Press ENTER on the DZMx keypad, then select **Pair** on the mobile device.
5. When pairing is successful, icons will appear in the top left-hand side of the DZMx display. When the note icon ♪ is displayed, media can be streamed (e.g.  music) from the mobile device to the DZMx and it can be heard over the ICS. When the mobile phone icon ▯ is displayed, a mobile device can be used "hands free" over the ICS.

Apple devices select both phone audio and media audio automatically. Android devices select the settings icon on the paired device and select phone audio, media audio, or both.

## Connection

After pairing, the mobile device can be disconnected and re-connected using the mobile device's Bluetooth settings. When a device is paired, it is typical for the connection to be saved on the mobile device for future use.

Auto-connect functionality is available, allowing a user's mobile device automatically connects to the DZMx. This can be enabled in one of two ways:

>> **From the DZMx keypad** navigate to: **Menu>>Hardware>>Wireless>>Bluetooth Autoconnect**

>> **From DZMx Connect** navigate to: **Connectivity>>Bluetooth**

When enabled the DZMx will scan periodically for previously paired devices and attempt to automatically connect with the most recent device. If that device is not present, the next most recently connected device will be tried, and so on.

> **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.

## 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 for more information).

When the user starts audio playing on the connected mobile device it will be audible through the ICS/Headset.

## 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 for more information). If a user receives or initiates a call on the paired mobile device, the audio will be routed to/from the ICS/Headset.

# Section 12: Features

Flightcell provides DZMx users with additional software support with their DZMx. The DZMx currently supports the following features:

- » [Automated Rescue Monitoring (A.R.M.)](#)
- » [Emergency and Distress Mode](#)
- » [Alert Mode](#)
- » [Cellular Flightmode](#)
- » [Forms](#)
- » [Flight Timers](#)
- » [Dropbox File Transfer](#)
- » [Flight Data Recorder for Motion capture](#)
- » [SBD Document Transfer](#)
- » [Geofence Suspend Mode](#)
- » [Firefighting App](#)
- » [Flightcell Remote Assistance](#)
- » [OpenVPN (Virtual Private Network) Connection](#)

These applications are also available but not covered in this manual:

- » Airline App
- » Agriculture App

For enquiries about upcoming applications or to request new applications please contact Flightcell International Ltd.

## Automated Rescue Monitoring (A.R.M.)

A.R.M (also known as Automated Flight Following, or A.F.F.) is an optional automated flight monitoring system. When A.R.M. is activated, your tracking service provider 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.

The DZMx and your tracking service must be appropriately configured to use A.R.M. functions. Installation instructions for activating and configuring the A.R.M. service, are provided in Installation Manual.

> **Note:** A.R.M. is only supported by some tracking service providers.

### Activating A.R.M.

To activate A.R.M. before a flight commences:

1. Press and hold the A.R.M. key for 2 seconds then release. This will trigger the DZMx to send an A.R.M. activation request message to the tracking server. The DZMx will show **"A.R.M. Requesting"** on the status line of the display.
2. When the DZMx receives an acknowledgement from the tracking server, A.R.M. mode is considered active and the status display will show **"A.R.M. Active"**.

### Deactivating A.R.M.

To terminate A.R.M. at the end of a flight:

1. Press and hold the A.R.M. key for 2 seconds then release. This will trigger the DZMx to send an A.R.M. cancellation request message to the tracking server. The DZMx will show **"A.R.M. Cancelling"** on the status line of the display.
2. When the DZMx receives and acknowledgement from the tracking server, A.R.M. mode is considered terminated and the status display will show **"A.R.M. Terminated"** for a few seconds before returning to displaying the tracking status.

**Note:** If A.R.M. has been activated for a flight, it is essential to terminate A.R.M. at the end of the flight, otherwise the tracking system will send overdue alerts. If A.R.M. has not been terminated after landing, beeps will sound in your headset to remind you.

## Status Messages

Automated Rescue Monitoring status information is displayed on tracking status line when A.R.M. is active. Enabling and disabling A.R.M. mode causes the DZMx to send an activate or deactivate message to the tracking server followed by the DZMx receiving an acknowledgement. The status of this process is displayed on the status line:

» **A.R.M. Active** is displayed when the tracking server has responded and confirmed that A.R.M. is active; the current aircraft status is appended to this message

» **A.R.M. Terminated** is displayed briefly when the tracking server has responded confirming A.R.M. has been deactivated.

» **Requesting** is displayed when A.R.M. mode is activated by the user and indicates that confirmation of A.R.M. operation has been requested from the tracking server.

» **Cancelling** is displayed when A.R.M. mode has been disabled by the user and a termination acknowledgement has been requested from the tracking server.

» **No Response. Retry?** is displayed when A.R.M. mode activation or termination confirmation has not been received from the tracking server after several attempts; press ENTER to keep re-trying.

» **No Server Reply** is displayed to advise that confirmation of A.R.M. activation or deactivation has not been received. No further automated attempts are made.

# Emergency and Distress Mode

The DZMx allows users to activate an Emergency (distress) mode. When Emergency mode has been activated by the user, **"Emergency Mode!"** will flash in the tracking display line to indicate emergency messages are being transmitted to the tracking provider at programmed intervals. See [Status Messages](#) for more information on the DZMx display and status lines.

## Activating Emergency Mode

Distress messages may be sent from the DZMx in emergency. Your tracking provider will have a system for raising an alert or alarm when a distress message is received.

To send a distress message:

1. Press and hold EMER until the DZMx beeps and flashes DISTRESS queued.
2. The DZMx will display Position marked.
3. A tracking message will be added to the front of the outgoing message queue.
4. Distress messages will continue to be sent at pre-programmed intervals until distress mode is terminated.

To terminate distress mode, press and hold EMER until the DZMx beeps and Emergency Mode is no longer displayed on the DZMx display; the DZMx will transmit a message that emergency mode has been terminated.

# Alert Mode

The DZMx allows users to activate an "Alert" mode. When Alert mode has been activated by the user **"Distress Queued"** will be momentarily displayed and **"Emergency Mode!"** will flash in the tracking display line to indicate alert messages are being transmitted to the tracking provider at programmed intervals. See "Status Messages" for more information on the DZMx display and status lines.

## Activating Alert Mode

Alert messages may be sent from the DZMx in an emergency. Your tracking provider will have a system for raising an alert or alarm when an Alert message is received.

To send an Alert message:

1. Press and hold A.R.M. until the DZMx beeps and flashes Alert Queued!
2. A tracking message will be added to the front of the outgoing message queue.
3. Alert messages will continue to be sent at pre-programmed intervals (usually set at minute) until Alert mode is terminated.

To terminate Alert mode, press and hold A.R.M. until the DZMx beeps and Under Fire Mode! is no longer displayed on the DZMx display; the DZMx will NOT transmit a message that Alert mode has been terminated.

## Cellular Flightmode

The cellular modem can be set to Flightmode so that it does not transmit or operate in-flight. When Flightmode is enabled, the modem is put into a low-power state and cannot be used for incoming or outgoing calls, tracking, SMS or data.

### Toggling Flightmode

To turn Flightmode on or off:

1. Press and hold the relevant modem button, A or B.
2. If starting Flightmode, a status message will show saying Disabled.
3. If stopping Flightmode, a status message will show Searching, until a good signal is obtained.

## Forms

### What are Forms?

Forms is a feature developed to aid operators to collect data and analyse flight trends. Installers (with installer password access) can create custom fields for the form using DZMx Connect. The form is completed by an operator at specified intervals or after certain events.

### Forms Settings

The DZMx can be configured to send the completed forms to:

» Tracking Provider
» Custom email address
» Custom phone number

The settings for the Forms application can be found in DZMx Connect in the **Settings** section. Alternatively, Forms can be configured using the DZMx menu system.

> **Note:** The Forms option in the DZMx menu will only appear when a field has been added through the Form Designer.

The configurable settings for Forms are:

**Send to Tracking Provider**: Send completed forms to the configured Tracking Provider (see Installation Manual).

**Send to Recipient**: Send completed forms to a configurable recipient. Using email, SMS or SBD.

**Recipient Destination**: Recipient destination address (email address or phone number).

**Form Prompt Config**: Select an event which will prompt the operator to complete a new form

**Form Prompt Timer**: Time between triggering a new prompt to complete a new form. Between 0 (Disabled) and 1200 minutes.

> **Note:** If SBD is selected as the recipient type, the Recipient Destination will be ignored, and completed forms will be sent to all addresses configured in Iridium SPNet.

Forms are created with custom fields supporting the following field types:

» Number (with a length)
» On/Off
» Yes/No

Since the forms are designed to be sent via SMS, SBD or email, there is a fixed character limit on the size of the forms. Therefore, it is recommended to keep the field names as short as possible. Messages sent to Tracking Providers have different size limits than messages sent to Recipients. Size limits are:

| | Recipient Limit (characters) | Tracking Provider Limit (characters) |
|---|---|---|
| Email | 137 | 88 |
| SMS | 137 | 88 |
| SBD | 1940 | 1940 |

> **Note:** Installer privileges are required to create forms. Refer to the DZMx Installation Manual for details.

### Completing a Form

When a form requires completion, **"Form Entry Required"** will be displayed on the top of the DZMx main screen. To begin filling in the form field:

1. Press MODE from the main screen, this will take you to the Form Entry menu.
2. Fill in the fields. Navigating the menu with UP and DOWN. Not all fields are required to be filled in.
3. Select Form Complete to finish the form and send it to the required destinations.

Alternatively, a form can be completed at any time by selecting Forms>>Form Entry, from the DZMx menus.

## Flight Timers

The DZMx provides three flight timers, they are:

» Total Time Airframe Hours (TTAF) – also known as Hobbs Meter. This records all flight time in hours and tenths of hours. The user enters the aircraft airframe hours once on installation and this is incremented during every flight

» Daily Flight Timer (DFT). This is a continuous timer that records flight time in hours and tenths of hours. It has a reset function, so it can be reset daily or periodically to allow the user to measure a flight or sequence of flights.

» Trip Timer. This is an hour and minute timer that resets every flight. It can also be reset mid-flight to ascertain certain operations or flight legs.

```
              Timers
TTAF                840.4
DFT                 30.2
Trip                01:45
```
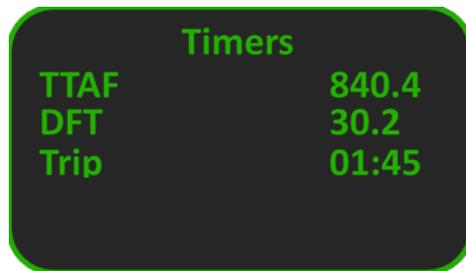
The DFT and the Trip Timer can be reset using the DZMx front panel or DZMx Connect. Refer to the DZMx Installation Manual for instructions on how to set the TTAF. NOTE: the TTAF reset is one-time only and it is important to set it correctly.

# Dropbox File Transfer

The DZMx provides the ability to upload and download files between a Dropbox folder (www.dropbox.com) and a memory stick inserted into the DZMx USB port.

## Configuration

Please refer to the Dropbox File Transfer section in the Installer Manual.

## Transferring files

Files can only be transferred if the cellular modem has a good signal and an active data connection. Ensure the cellular modem displays "Online" on the DZMx front panel display.

> **Note:** The DZMx will only list and copy up to a maximum of 20 files. Ensure old files are removed from the upload/download directories to avoid any conflicts or confusion.

> **Note:** The upload/download operation can take a few seconds to complete and the DZMx will wait for the operation to be completed before returning to the menu. The transfer will fail if the connection is lost during the transfer operation.

## Uploading Files to the Dropbox

Insert the USB stick containing the files into the DZMx USB port. The DZMx will check the USB's specified directory for the files to be uploaded:

### Uploading One File

1. Press MENU then navigate to **Dropbox File Transfer**>>**Send USB Files**>>**Select a File** to view the files on the USB stick.
2. Press MODE key to toggle the sorting of the file list between date order (most recent first) and alphabetical order.
3. Up to 20 files will appear in the file list. Use UP and DOWN to scroll to the file to upload. Press ENTER to upload the file to Dropbox.
4. Press BACK to return to the Upload USB Files menu.
5. Press END to exit the menu system and return to the main screen.

### Uploading All Files

Press MENU then navigate to **Dropbox File Transfer**>>**Send USB Files**>>**Send All Files** to upload all files from the USB stick to the specified Dropbox location.

## Viewing the Dropbox Directory

1. Press MENU then navigate to **Dropbox File Transfer**>>**Send USB Files**>>**View Files on Dropbox** to view files that are in the Dropbox directory.
2. Press MODE key to toggle the sorting of the file list between date order (most recent first) and alphabetical order.
3. Use UP and DOWN to view the files in the Dropbox directory.

## Downloading Files to USB stick

Insert the (preferably empty) memory stick into the USB slot. Ensure the files to download are located in the Dropbox directory that was specified in DZMx Connect.

### Downloading One File

1. Press MENU then navigate to **Dropbox File Transfer**>>**Get Dropbox Files**>>**Select a File** to view the files in the Dropbox directory.
2. Press MODE key to toggle the sorting of the file list between date order (most recent first) and alphabetical order.
3. Use UP and DOWN to scroll to the file to download. Press ENTER to download the file to the USB stick.
4. Press BACK to return to the Download Dropbox Files menu.
5. Press END to exit the menu system and return to the main screen.

### Downloading All Files

Press MENU then navigate to **Dropbox File Transfer**>>**Get Dropbox Files**>>**Get all files** to download all files from the Dropbox directory to the USB stick.

### Viewing the USB Directory

Press MENU then navigate to **Dropbox Transfer Menu**>>**Get Dropbox Files**>>**View Files on USB** to view all files that are on the USB stick.

Press MODE key to toggle the sorting of the file list between date order (most recent first) and alphabetical order.

Use UP and DOWN to view the files in the USB stick directory.

> **Note:** If the transfer operations causes the number of files in the Dropbox directory to exceed 20, some or all of the most recently copied files will not appear.

## Flight Data Recorder for Motion Capture

The DZMx has a built-in inertial measurement unit and barometric pressure sensor. The following information is available, along with timestamp:

1. Latitude
2. Longitude
3. Altitude
4. Speed
5. Heading
6. Satellites
7. Horizontal Dilution of Precision (HDOP)

The data from these sensors is logged on a SD card inside the DZMx at one-second intervals and the DZMx stores 20 flights worth of data. The data can be viewed live and downloaded using DZMx Connect or using Flightcell International's DZMx API. Flight data recording is enabled by default and it can be disabled upon request.

Refer to the DZMx Installation Manual for more information on the flight data recorder configuration and usage.

> **Note:** During installation the unit must be precisely orientated to the aircraft, in order to correctly estimate and record the pitch and roll of the aircraft.

## SBD Document Transfer

### Sending documents to the DZMx

It is possible to send plain text emails to the DZMx via satellite SBD. Received documents are viewed using DZMx Connect. This is useful for transmitting NOTAM, weather, and passenger information.

### Prerequisites

To use this feature, the DZMx must be registered with TracPlus. They will assign the unit a dedicated email address and ask for a list of nominated sender email addresses. Only nominated senders will be able to send plain text emails to the DZMx.

### Transmission

The text must be in the body of the email and it must be sent in plain text format. HTML formatted emails will be rejected. The email will be split by TracPlus into the required number of SBD messages and then transmitted via Iridium to the DZMx. The sender will receive an acknowledgement email saying that the document has been received by TracPlus and forwarded to the DZMx. This acknowledgement does not guarantee delivery to the DZMx, only that it has reached the Iridium gateway. If the DZMx is powered down when you send the email, Iridium will queue the message at the gateway and send it when the DZMx next comes online. The DZMx will reassemble the separate SBD messages back into a single message and it can be viewed using DZMx Connect.

### Viewing the Email

Received emails are viewed by selecting **SBD Inbox** from the Inbox area in DZMx Connect home page. The SBD Inbox page will display a list of up to 10 received emails. For each email, the SBD Inbox will show if the email is partial or complete, the originator, and the date and time sent. Clicking on an email will display the email text.  It is possible to read partially received emails that have not yet received all their SBD message parts. In marginal signal conditions, occasionally an SBD message will not be received by the DZMx. If an email does not receive all of its parts after a reasonable period of time, contact the sender and ask them to resend the email.

> **Note:** TracPlus is the only tracking provider that supports this application.

## Geofence Suspend Mode

The Geofence suspend application allows operators to suspend tracking while the aircraft remains within a geographical radius. 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 suspended.

### Setting the Geofence Mode

Press MENU then scroll to **Tracking**>>**Geofence**>>**Geofence Mode** then select the required mode of operation.

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.

> **Note:** Geofence suspend events, manually marked positions, form data transmissions, ETM1000 events and exceedences, and emergency messages are never suspended and will always be generated and transmitted according to the normal tracking rules.

### Setting Geofence Radius

When activated, the geofence perimeter is fixed to a radius as specified via this setting. The radius can be set between 1 and 10 nautical miles:

Press MENU then scroll to **Tracking**>>**Geofence**>>**Geofence Radius**

Use LEFT and RIGHT to adjust the radius to the preferred distance.

### Activating Geofence Suspend Mode

Geofence suspend mode can be activated via a single key press. Press and hold MENU to activate. The DZMx screen will momentarily display that tracking is now suspended and will also state the suspend radius. The geofence radius will be centred at your current position and the suspend radius set will be set to the Geofence Radius setting.

While inside the geofence perimeter, the main screen will display the distance from the centre of the geofence at the bottom of the main screen.

When geofence has been configured to use **Events on Cell Only** mode, the message queue size is increased to 100 if tracking over IP is available, but otherwise, the queue is increased to 40, in order to maximise the cost-saving benefits of tracking via cell modem. If the message queue reaches half full (50 or 20) due to no cell coverage, then the oldest message will be sent on whichever modem is available using the configured preferred network priority (ie, via satellite if available) to ensure the queue does not overflow. See the Installer manual for more details on how to configure the preferred device and message transmission options.

### Leaving the Geofence Perimeter

When the aircraft flies outside the geofence perimeter, the DZMx will beep and pop-up a screen to notify the operator that they have flown beyond the geofence perimeter. Once the DZMx has left the geofence perimeter, geofence mode is cancelled and normal tracking and queue rules are resumed. Any queued messages will be sent on whichever modem is available using the configured preferred network priority.

### How to Re-centre or Cancel Geofence Suspend Mode

While flying inside the geofence perimeter, it is possible to either re-centre the perimeter radius on the aircraft's current position or cancel geofence suspend mode and resume normal tracking operation. Both options are available from the **Geofence Options** menu.

- » If the DZMx is within a geofence perimeter, press and hold MENU until the Geofence Options menu appears.
- » Select either the Cancel or the Recentre option from the menu.
- » Re-centring the geofence will reset the geofence radius to centre on the current position and the DZMx will remain in geofence suspend mode.
- » Cancelling the geofence will cancel geofence suspend mode and the DZMx will resume normal tracking.


## Firefighting App

The firefighting application collects data from firefighting operations and sends real-time firefighting event and GPS position information to tracking providers and fire authorities. The Firefighting application can be configured using DZMx Connect or via the DZMx menus. When enabled, the DZMx will report fill events at the end of a fill, drop start events at the start of a drop, and drop end events when the tank is empty or the door/valve is closed.

The DZMx can be configured to use one or two separate water containers. The water containers can be configured as water tanks or buckets. See the Firefighting Mode section in the Installer manual for details on the different configuration options.

### Firefighting Application Options and Configurations

#### Measuring the Water Level

The DZMx can determine the volume of water on board via one of these three methods:

- » **Automatic Water Tank Controller (AWTC)**: The DZMx can be configured to interface to an AWTC which provides volume, flow selection, drop quantity, and drop signal information via a serial port connection.
- » **Fill Pump**: The DZMx input can be connected to a fill pump which will time how long the pump is running for. A separate flow rate setting will allow the DZMx to calculate the volume of water added on board.
- » **Fill Level or Bucket Load Cell** (variable voltage input): Inputs can be configured to measure a voltage level from a level gauge or load cell. The input must be calibrated to produce an accurate reading.

#### Adding Additive

The DZMx will report as much information about the additive as is supplied, based on the configuration of the inputs and settings. Drop Start and Drop End event messages will report that additive has been added.

#### Fill Event Reporting

The DZMx will report a Fill Event when water is brought on board or when a bucket is filled. How the unit detects that a fill has taken place, when the DZMx records the position of the fill event, and when the fill is reported will depend upon how the water level is being measured. The volume reported in a Fill Event message will be how much has been taken on board during the current fill event at this particular location. If there are several fill events before a drop, the volume reported in each fill event will add up to the total volume on board. The total volume on board will always be reported at the start of a drop in the Drop Start message.

#### Changing the Settings

See the Firefighting Mode section in the Installer Manual for full details on how to configure the Firefighting application. The only setting available to operators is to enable and disable the firefighting mode.

### Configuring Firefighting Mode

Firefighting Mode must be enabled in order to use the application, set other firefighting application settings, configure firefighting input settings and generate fire event reports. This section will outline the configuration procedure when using the DZMx menus.

### To enable/disable Firefighting mode
1. Press MENU then scroll to **Tracking**>>**Firefighting Options**>>**Firefighting Enable**
2. Select **Yes** or **No**.
3. When the setting has been selected, press ENTER to save.

### Calibrating the Bucket Load Cell input
If an operator changes to use a different type of bucket than originally fitted, then it will be necessary to recalibrate the DZMx for the weight of the new bucket to ensure that the volume of water reported in fill and drop messages is correct. See the Firefighting section in the Installer Manual for details on how to calibrate, or recalibrate, the DZMx load cell input.

# Flightcell Remote Assistance
Flightcell Remote Assistance allows Flightcell support staff to remotely connect to a DZMx and help diagnose it, using a secure encrypted VPN connection. This requires either a cellular data connection or a wired Ethernet connection and it can be done on the ground or in-flight. There are three steps involved:

1. Set up the connection to the Flightcell Remote Assistance VPN.
2. Establish a Remote Assistance connection
3. Disconnect the Remote Assistance Connection

## Setting up a Connection
Please refer to the Flightcell Remote Assistance section in Installer manual for further details.

## Establish a Remote Assistance Connection
This provides a secure connection between the DZMx and Flightcell support team using the Flightcell Remote Assistance VPN. The support staff will receive a notification and they will be able to remotely access the DZMx configuration. The DZMx will operate normally throughout this process.

To establish a connection using DZMx Connect, navigate to **Settings**>>**Remote Access** and select **Connect** using the toggle switch. Auto Connect on Startup can be selected if repeated sessions are required.

To establish a connection using the DZMx keypad:

Press the MENU key

Scroll to **Remote Assistance** and press ENTER

Ensure **Connect VPN** is highlighted, then press ENTER.

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 the Remote Assistance 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".

To disconnect using DZMx Connect, navigate to **Settings**>>**Remote Access** and de-select **Connect** using the toggle switch.

To disconnect the connection using the DZMx keypad:

Press the MENU key

Scroll to **Remote Assistance** and press ENTER

Ensure **Disconnect VPN** is highlighted and press ENTER Scroll to Yes and press ENTER

### Other Menu Options
Other Remote Assistance menu options include **Reset Connection**. Please refer to the Flightcell Remote Assistance section in Installer manual for further details.

**Enable at Startup** automatically establishes a VPN Remote Assistance connection on startup.

> **Note:** For the pre-requisite connection configuration, or for error and diagnostics, refer to the Flightcell Remote assistance section or the installer manual.

## OpenVPN (Virtual Private Network) Connection

The DZMx can connect to an existing OpenVPN.  A VPN is a network of devices connected together over one or more physical public networks, or one or more local private networks, which are connected to the internet.

The VPN provides private and secure (encrypted) communications, regardless of the under-lying nature of physical networks used to connect the devices together. It acts as if the network was one and only uniform physical private and secure network, such as local physical Ethernet network.

For configuration information refer to the DZMx Installation manual.

## Contact Details

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