Flightcell DZM

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

Global communications over the

> Iridium satellite network

> Cellular network

GPS flight following

Audio/MP3 integration

Operation Manual (English Commercial Model)

Registered in U.S. Patent and Trademark Office

1 VERSION HISTORY (ENGLISH COMMERCIAL MANUAL)

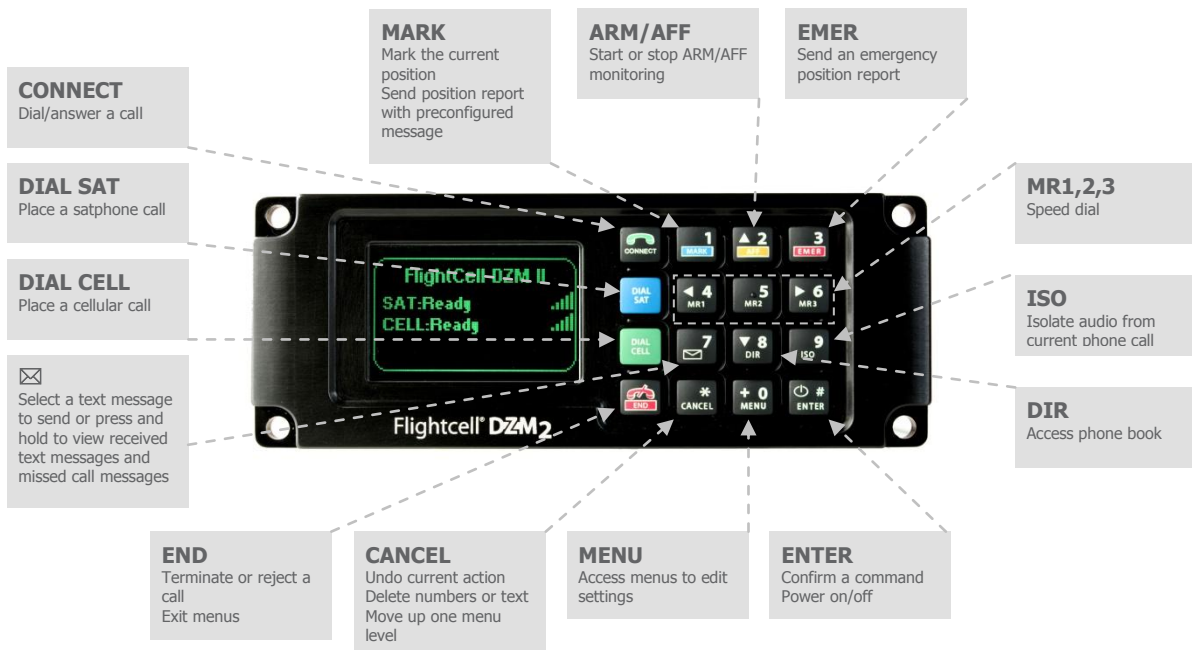| Version	Date	Author	Firmware Version	Change Note Number	Description
V1.0	14 May 2009	A. Whitlock	3.00	N/A	Document created
V1.2	18 Aug 2010	J. Mace / A. Whitlock	3.105	FCN0100	Cabin phone functionality updated Messaging functionality updated Altitude alarm functionality removed Sat/Cell destinations updated Updated for other menu changes Screenshot & minor edit updates
V3.108	26 Nov 2010	J Mace/ H. Twissell/ F. Twissell	3.108	FCN0134	Updated for menu changes
V3.108b	20 Jan 2010	J Mace	3.108	FCN0152	Updated for new TracPlus SBD delivery addresses
V4.002	3 Feb 2011	J Mace/H Twissell	4.002	FCN0155	Updated for changes to message queuing functions.
V4.003	2 May 2011	H Twissell	4.003	FCN0187	Addition of new text message reply functionality from 'Messages' menu and change of functionality of 'Mark with Message', 'Pick from List', 'Select by Number' and Envelope key. Addition of new Master/Remote DZM functionality and associated menus. Addition of new separate LCD backlight and keypad backlight settings, and new day and night operating modes. Added Cabin phone audio settings to menus. Added prompt for SIM PIN if phone is SIM locked.
V4.005	10 May 2011	H Twissell J Mace	4.005	FCN0196	Addition of new tracking lock setting and manual power off setting.
V4.007	18 July 2011	H Twissell J Mace	4.007	FCN0201	Installer Password moved to bottom of Setup Menu. Tracking and Queue status line explanation has been extended. Addition of new NMEA feed Menu Option. Screenshot corrections.
V4.011	23 Jan 2012	H Twissell	4.011	FCN0297	Addition of External Inputs Diagnostics screen. Addition of new variable backlight calibration. Addition of new missed call notification Addition of call annunciation on Output 1 on the DZM3 Addition of dialling option from received message view Updated menu layout diagram.

V5.0	5th April 2012	J Mace	4.013	FCN0328	Applied paragraph numbering
					Addition of squat switch functionality
					Reordered and reformatted document
V6.0	10th June 2012	J Mace H Twissell	4.014	FCN0358	Addition of new function providing for transmission of preconfigured messages to tracking system and receipt of messages sent from tracking system
V6.1	9th January 2013	J Mace H Twissell	4.019	FCN0442	New Cell and Sat status and network information added to main screen and phone/modem diagnostics.
					New Hovering tracking event added
					New Geofence Mode feature added
					Flight mode feature now available for cell modem
					New warning tones and ringing tone enable settings added.
V6.2	17 April 2013	J Mace	4.020	FCN0480	Added instructions for configuration of DZM with connected DZM Remote Head.
V6.3	4 April 2016	J Mace H Twissell	4.028	FCN0689	Added details for configuration of DZM3 output to activate an annunciator light, and additional annunciator options.
					Added instructions for configuring DZM2 or DZM3 to manually select operating cell band on connected cellular modem.

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3 YOUR FLIGHTCELL DZM AT A GLANCE

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Mark the current position
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4 ABOUT THIS MANUAL

This manual describes how to operate your Flightcell DZM. In most cases the instructions will apply to both DZM models (the DZM2 with external sat phone cradle and DZM3 with embedded satellite transceiver), so for simplicity both are referred to as DZM.

In any cases where different instructions apply to each of the two models, the instructions will refer specifically to the DZM2 or DZM3.

5 GETTING TO KNOW YOUR FLIGHTCELL DZM

Learn how to:

Switch your Flightcell DZM on and off

Understand the Main Screen information

Use the Flightcell DZM keypad

Use the Flightcell DZM menu

5.1 Switching the DZM on and off

Switching the DZM on:

By default, the DZM will automatically switch on when the power supply is connected.

If the DZM does not switch on automatically, press **ENTER** once to switch on manually.

The DZM will take a few seconds to switch on and boot up, then it will display the **Main Screen**.

Switching the DZM off manually:

The DZM will automatically switch off when power supply is disconnected, i.e. when the aircraft is powered down.

To turn the DZM off manually when aircraft power is still on, Press and hold **ENTER** until the progress bar on the LCD display screen reaches the end.
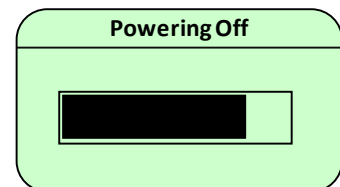
Refer to "Setting Auto Power On" on page 91 for further information about 'Auto Power On'.

5.2 Understanding information on the DZM's display

The LCD display screen on the DZM, during normal operation will display the Main Screen. This screen shows the current GPS position on the top line, the status of each of the attached configured devices in the centre of the screen, and tracking status line at the bottom.
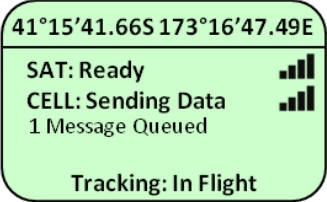
The bars to the right of each device show the current signal strength. An additional information line will appear below the device status text depending on the operation being performed. The information line may display additional information, such as who is calling, why a call has terminated, and message queue information.

5.2.1 Icon indications

Three icons display across the top of the LCD above the current GPS position line. These are used to indicate DZM status and error information.

The antenna icon ⅄ is used to indicate the status of the GPS signal lock, regardless of the tracking setup or whether tracking is enabled. When the DZM has a valid GPS signal lock, the antenna icon is displayed. The antenna icon will disappear whenever there is no GPS lock. Position reports cannot be generated if there is no GPS signal lock.

The Computer icon ▭ is used to indicate that the DZM is configured as a Master when using two DZMs in a Master/Remote configuration.

The Warning icon ⚠ is only used when a DZM is configured as either a Master or a Remote DZM. It is used to indicate communication failure with the other connected DZM.

5.2.2 Device and Signal status

At power-up, the DZM will try and establish a GPS lock. Also, depending on your configuration, it will initialise communication with all externally connected devices. Most commonly, these would be your Sat phone cradle, Sat phone and Cell modem, but the DZM may also be configured to connect to other devices such as another DZM, a POTS phone, a dialer, an Iridium fax adapter etc.
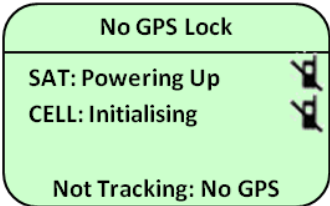
5.2.2.1 Device Icons

Satellite phone and cell modem activity indicators are displayed on the right of the Main Screen.

▪▃▅ is displayed when the phone is powered on and ready for use. The number of vertical bars shows the signal strength, with four bars showing maximum signal.

✘ is displayed when a call cannot be made via this device. It may indicate that the phone or modem is either offline (no device connected or detected), disabled (ie in flight mode), is not registered on the network due to no signal or low signal, or the DZM is still initialising the device.

5.2.2.2 Device Connection Status

The phone or modem status will change as the DZM establishes a connection with the devices:

Powering Up is displayed when the DZM is waiting to connect to the satellite phone or tranceiver.

Initialising is displayed when the DZM has established a connection to the external device and is in the process of initialising the device.

No Phone is displayed when there is either no satellite phone in the phone cradle (DZM2 only) or the phone or modem is powered off. If after a minute or two the DZM has not established a connection with the Sat Phone, the DZM will display a warning screen and beep advising that the device is not responding and to check it is in cradle/connected as an alert to the pilot before takeoff.

Unreg or No SIM is displayed if there is no SIM card in the connected satellite phone (DZM2) or embedded modem (DZM3). This status is also displayed if the SIM is present, but is unregistered. If the SIM is locked, blocked or requires a PIN, the DZM will notify the user here with the appropriate status.

Low Signal is displayed when the connected device reports a poor signal strength to the DZM. A low signal may cause the DZM to use the alternative device for tracking if configured to do so. The device is still available for incoming and outgoing calls, but be aware it is possible that the call may be dropped due to there being a poor signal.

Ready is displayed when the phone or modem is powered on, has been successfully initialised by the DZM, is registered on the network and is reporting a good signal strength but it is not in use.

Disabled is displayed as the Cell modem status if the device has been put into Flight Mode. In this state the modem cannot be used for calls or messages.

Searching is displayed when the sat device or cell modem is looking for a network.

Ready (Roaming) is displayed when the cell modem is registered on a network but this is not its home network.

Not Registered is displayed when the sat device or cell modem is not registered on a network and is no longer searching.

Denied Service is displayed when the network operator has denied service.

Network Error is displayed when the sat device or cell modem is not registered on the network and there is no signal (indicating there may be an antenna problem).

SMS Only or **SMS Only (Roam)** or **Emg Calls Only** is displayed (Flightcell 3G modem only) when service on the cellular network is restricted.

5.2.2.3   Device Status During a Call

While you are making a phone call, the Main Screen will show you which device is currently being used for the call and also who you are calling, or being called by. If the other party is listed in the DZM's phone book, then the information line will display their name. Refer to "Making and answering calls" on page 20 for further information about making and receiving calls.

```
41°15'41.66S 173°16'47.49E
SAT: Ready              ..ıll
CELL: On Call          ..ıll
Joe Bloggs

       Tracking: In Flight
```

The phone or modem statuses will change as the DZM establishes a connection with the other party:

Calling... is displayed when the DZM has dialed the number but a connection has not yet been established.

On Call is displayed when the DZM has established a connection and the other party has accepted the call.

Incoming Call will flash on the DZM display and an audible ringing tone will sound over the audio system if there is an incoming call.

Disconnecting is displayed when a phone call is terminated at either end of the call or the phone or modem loses the connection.
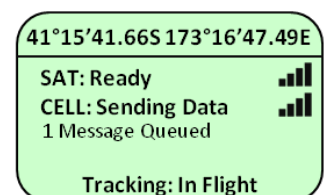
>>Phone Isolated is displayed on the information line when the audio from the satellite and cell modem is isolated (muted).

Refer to "Isolating (muting) phones" on page 48 for further information about muting phones.

```
       Flightcell DZM

SAT: On Call           ..ıll
     >>  Phone Isolated


Not Tracking: On Ground
```
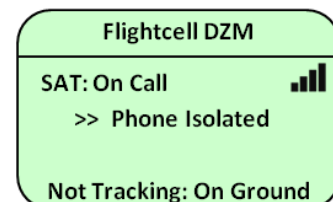
5.2.3 Tracking, messages and queue status

The DZM can be configured to send tracking messages (position reports) periodically, or manually, to your tracking provider. It can also be configured to send a position report associated with particular events, such as takeoffs and landings. The status line at the bottom of the Main Screen will display whether the DZM is currently tracking. The Main Screen will also display how many messages are queued, waiting to be sent.

```
41°15'41.66S 173°16'47.49E
SAT: Ready              ..ıll
CELL: Sending Data     ..ıll
1 Message Queued

       Tracking: In Flight
```

The phone or modem status will change to **Sending Data...** when an SMS or SBD message is being transmitted.

SMS failed! or **SBD Failed!** is displayed on the information line if transmission has failed, usually because of a
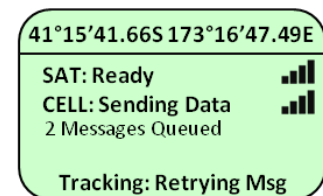
low signal; in this case the DZM will attempt to resend the message.

SMS Sent or **SBD sent** is displayed on the information line when an SMS or SBD message has been successfully transmitted.

In order to for periodic tracking to work correctly, the DZM must have a valid GPS lock, tracking must be enabled and the DZM must be correctly configured with the tracking gateway email address and phone number of your tracking provider. There are many settings available to allow you to customise your tracking setup. Read the Configuring GPS Tracking section on page 54 for more details.

5.2.4 The Tracking Status line

The bottom status line will show if the DZM is currently tracking and also if the DZM has detected if the aircraft is currently flying or on the ground. If the aircraft is travelling in an area that is experiencing poor signal, the bottom line will display if messages are being queued or retried. The bottom line is also used to indicate ARM (Automated Rescue Monitoring) and Emergency tracking modes.

```
41°15'41.66S 173°16'47.49E
SAT: Ready                  .ıll
CELL: Sending Data          .ıll
     2 Messages Queued

   Tracking: Retrying Msg
```

Tracking: Retrying Msg is displayed if there is a loss of signal during the sending of a position report. The DZM will retry on the same or a different modem device, depending on how the tracking settings are configured.

Tracking: Queuing is displayed if there are more than two messages in the message queue. This indicates poor cell and/or Iridium signal strength and 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 no messages have been transmitted successfully due to poor signal strength for quite some time and now the queue is full. Any new position reports created will remove the oldest one 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 signal lock.

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

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

No Tracking: On Ground is displayed when the DZM 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 DZM is configured to send tracking data whilst on the ground (see page 75 for further information).

Tracking: Takeoff and **Tracking: Landed** is displayed after the DZM has sent takeoff and landing reports, if the DZM is configured to record these events.
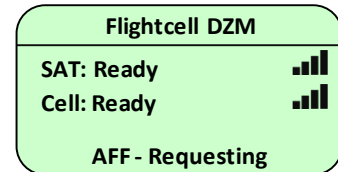
Tracking: Hovering is displayed if hovering messages are enabled and the aircraft is flying at less than 15 knots.

Engine Start and **Engine Stop** is displayed after the DZM has sent engine start and stop repots, if the DZM 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 DZM detects that the aircraft is within the geofence radius (see page 84 for how to configure Geofence Suspend mode).

See Management of the Message Queue on page 63 for more details on message priorities and how messages are queued and retried.

Automated Rescue Monitoring (ARM, previously called AFF, for – Automated Flight Following) status information is displayed on the 'Main Screen' when **ARM/AFF** is activated.

```
┌─────────────────────────────┐
│      Flightcell DZM         │
│                             │
│  SAT: Ready           ▂▄▆█  │
│  Cell: Ready          ▂▄▆█  │
│                             │
│      AFF - Requesting       │
└─────────────────────────────┘
```

AFF – Requesting is displayed when **ARM/AFF** is activated and confirmation of **ARM/AFF** operation is requested from the receiving server.

AFF – Active is displayed when the receiving server confirms **ARM/AFF** has been activated.

The tracking status will also be displayed if the DZM has been setup up to detect takeoff/landing, in which case the display will show **AFF Active: In Flight** or **AFF Active: On Ground** and **AFF Active: Takeoff** and **AFF Active: Landed** for ten seconds after each takeoff and landing.

AFF – Cancelling is displayed when **ARM/AFF** is deactivated and confirmation of **ARM/AFF** termination is being requested from the receiving server.

AFF – Terminated is displayed briefly when the receiving server confirms **ARM/AFF** has been deactivated.

No Response. Retry? is displayed when **ARM/AFF** operation or termination confirmation has not been received after several attempts. Press **ENTER** to keep re-trying.

No AFF Server Response! Is displayed to advise that confirmation of **ARM/AFF** activation or deactivation has not been received. No further automated attempts are made.

Refer to "Using Automated Rescue Monitoring (**ARM/AFF**)" on page 43 for further information about **ARM/AFF**.

When in Distress (Emergency) mode, **Emergency Mode!** will flash at the bottom of the Main Screen to indicate emergency messages are being transmitted to the tracking provider every minute.

```
┌─────────────────────────────┐
│      Flightcell DZM         │
│                             │
│  SAT: Ready           ▂▄▆█  │
│  Cell: Ready          ▂▄▆█  │
│                             │
│      Emergency  Mode!       │
└─────────────────────────────┘
```

Refer to "Sending an emergency distress signal" on page 30 for further information about Distress (Emergency) mode.
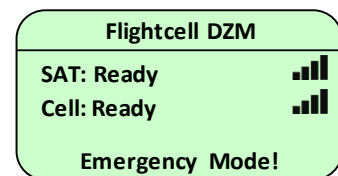
5.3 The DZM keypad

The keypad on the DZM English Commercial model has various functions, as described below. Refer to the page number in brackets for further information about the key function.
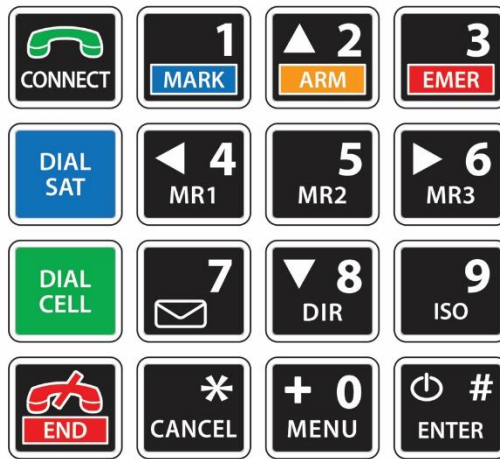
When the 'Main Screen' is displayed, the keys have the following functions:

	CONNECT key	Press to call a phone number that has been entered (page 20); Press to call a quick dial number than has been selected (page 21); Press to call a phonebook number that has been selected (page 22); Press to answer an incoming call (page 24). Press to call the cabin phone, if installed (page 31) Press to transfer an active call to the cabin phone (page 27)
	MARK key	Press to send current position reports for a point of interest (page 30). When on a phone call, Press and hold this key to activate this function. Press and hold to send a current position report with an attached text message or message code (page 32).
	ARM/AFF key	Press to start and stop Automated Rescue Monitoring (labelled Automated Flight Following - AFF – on earlier models) (page 43).
	EMERGENCY key	Press and hold to start and stop emergency distress messages (page 30).
	DIAL SAT key	Press to manually dial a phone number via the satellite phone (page 20), or press to call a quick dial number (page 21) or to call a number from the phonebook (page 22).
	DIAL CELL key	Press to manually dial a phone number via the cell modem (page 20), or press to call a quick dial number (page 21) or to call a number from the phonebook (page 22). Press and hold this key to disable or re-enable the cell modem for calls and messages (see page 51 for more information on disabling the cell modem).

	END key	Press to end a phone call (page 20) or to reject an incoming call;
	MR1 key	Press to select the first phone number number in the DZM phone book (page 21).
	MR2 key	Press to select the second phone number in the DZM phone book (page 21).
	MR3 key	Press to select the third phone number in the DZM phone book (page 21).
	MESSAGES key	Press to display a list of preconfigured messages that can be sent to other phones (page 33). Press and hold to view received messages (page 35).
	DIRECTORY key	Press to display the DZM's phonebook (page 22). When on a phone call, Press and hold this key to activate this function.
	ISOLATE key	Press to isolate (mute) audio between the DZM and the satellite or cell modem (page 48. When on a phone call, Press and hold this key to activate this function.
	CANCEL key	Press to delete numbers shown on the display, undo the last action or return to previous screen.
	MENU key	Press to open the menu system. Press and hold this key to initiate geofence suspend tracking mode and recentre the geofence suspend region. When on a phone call, Press and hold this key to open the menu system.
	ENTER/POWER	Press, or Press and hold, to switch the DZM on or off, respectively (page 8)

When the 'Menu Screen' is displayed, the following key functions are available:

	ARROW keys	Press the up and down arrow keys to navigate through the menu options Press the left and right arrow keys to increase or decrease DZM settings (e.g. volume or level setting)
	MENU list quick keys	Press the 3 key to move directly to the first item in a menu list Press the 9 key to move directly to the last item in a menu list

	ENTER key	Press to select a menu item (page 18); Press to save modified settings for a selected menu item.
	CANCEL key	Press to delete numbers shown on the display, undo last action, cancel any unsaved settings and return to previous screen.
	END key	Press to exit the menu system, undo last action and return to the 'Main Screen'.

When dialing calls, the following key functions are available:

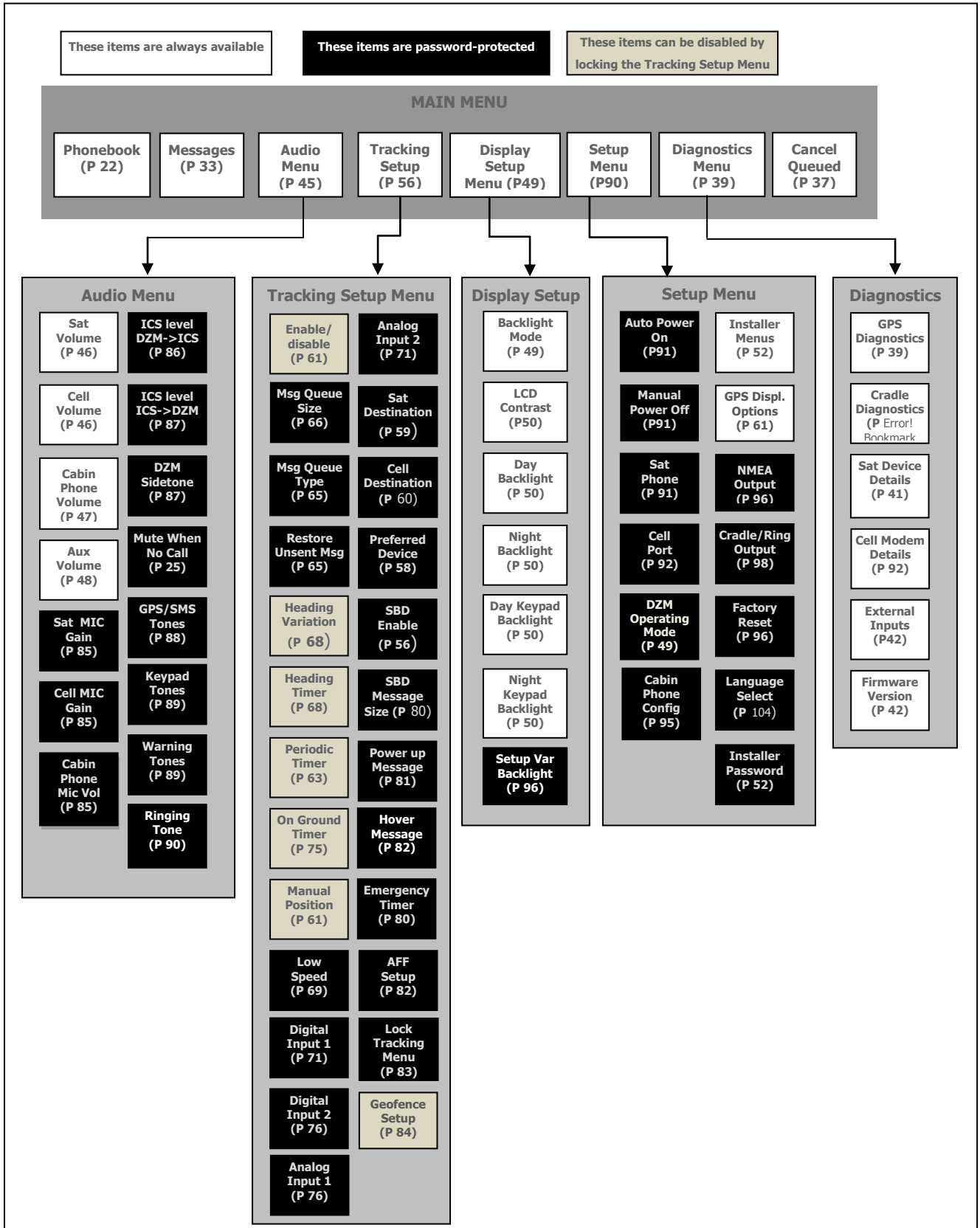|	**+** key	Press and hold for the international dialing prefix "+" (for GSM and Iridium networks only) (page 20).
	NUMBER keys	Press the 0 to 9 digit keys to dial a phone number.
	CONNECT key	Press to call a phone number that has been entered (page 20); Press to call a quick dial number than has been selected (page 21); Press to call a phonebook directory number that has been selected (page 22); Press to answer an incoming call (page 24).
	DIAL SAT key	Press to select the satellite phone when dialling a call.
	DIAL CELL key	Press to select the cell modem when dialling a call.
	ENTER key	Press to dial a phone number that has been entered.
	END key	Press to end a call (page 20).
	* key	Use to enter * symbol during a call when touch-tone dialling is required (page 24).
	# key	Use to enter # symbol during a call when touch-tone dialling is required (page 23).

5.4 Using the Flightcell DZM menu

The menu system is used to access and configure a wide range of DZM settings.

The DZM menu tree is shown below. Refer to the page numbers shown for more detailed information.

Refer to "Using the Installer Menu to protect advanced settings" on page 52 for further information about how critical settings are password-protected.

| These items are always available | These items are password-protected | These items can be disabled by locking the Tracking Setup Menu |

MAIN MENU

| Phonebook (P 22) | Messages (P 33) | Audio Menu (P 45) | Tracking Setup (P 56) | Display Setup Menu (P49) | Setup Menu (P90) | Diagnostics Menu (P 39) | Cancel Queued (P 37) |

Audio Menu

Sat Volume (P 46)	ICS level DZM->ICS (P 86)
Cell Volume (P 46)	ICS level ICS->DZM (P 87)
Cabin Phone Volume (P 47)	DZM Sidetone (P 87)
Aux Volume (P 48)	Mute When No Call (P 25)
Sat MIC Gain (P 85)	GPS/SMS Tones (P 88)
Cell MIC Gain (P 85)	Keypad Tones (P 89)
Cabin Phone Mic Vol (P 85)	Warning Tones (P 89)
	Ringing Tone (P 90)

Tracking Setup Menu

Enable/ disable (P 61)	Analog Input 2 (P 71)
Msg Queue Size (P 66)	Sat Destination (P 59)
Msg Queue Type (P 65)	Cell Destination (P 60)
Restore Unsent Msg (P 65)	Preferred Device (P 58)
Heading Variation (P 68)	SBD Enable (P 56)
Heading Timer (P 68)	SBD Message Size (P 80)
Periodic Timer (P 63)	Power up Message (P 81)
On Ground Timer (P 75)	Hover Message (P 82)
Manual Position (P 61)	Emergency Timer (P 80)
Low Speed (P 69)	AFF Setup (P 82)
Digital Input 1 (P 71)	Lock Tracking Menu (P 83)
Digital Input 2 (P 76)	Geofence Setup (P 84)
Analog Input 1 (P 76)	

Display Setup

| Backlight Mode (P 49) |
| LCD Contrast (P50) |
| Day Backlight (P 50) |
| Night Backlight (P 50) |
| Day Keypad Backlight (P 50) |
| Night Keypad Backlight (P 50) |
| Setup Var Backlight (P 96) |

Setup Menu

Auto Power On (P91)	Installer Menus (P 52)
Manual Power Off (P91)	GPS Displ. Options (P 61)
Sat Phone (P 91)	NMEA Output (P 96)
Cell Port (P 92)	Cradle/Ring Output (P 98)
DZM Operating Mode (P 49)	Factory Reset (P 96)
Cabin Phone Config (P 95)	Language Select (P 104)
	Installer Password (P 52)

Diagnostics

| GPS Diagnostics (P 39) |
| Cradle Diagnostics (P Error! Bookmark |
| Sat Device Details (P 41) |
| Cell Modem Details (P 92) |
| External Inputs (P42) |
| Firmware Version (P 42) |

5.4.1 Opening the DZM menu

Press **MENU** to enter the menu system.

When in the menu system, the DZM will automatically return to the 'Main Screen' after 30 seconds unless another key is pressed.

```
          Main Menu
PhoneBook
Messages
Audio Menu
```
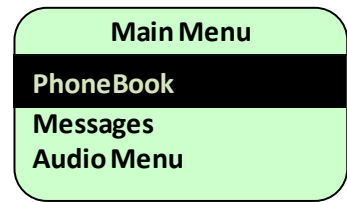
5.4.2 Navigating the menu

In the menu system, press the **UP** or **DOWN** arrow keys to move up and down the menu options.

Press the **EMERGENCY** quick key to move directly to the first item in the menu list.

Press **ISOLATE** to move directly to the last item in the menu list.

5.4.3 Selecting a menu option

Press **ENTER** to select a highlighted menu option.

```
          Main Menu
PhoneBook
Messages
Audio Menu
```

5.4.4 Returning to the previous screen

Press **CANCEL** to deselect a menu option and return to the previous screen (up one level in the menus).Altering a menu setting

Press the **RIGHT** arrow key to increase a setting (e.g. a volume or level setting).
Press the **LEFT** arrow key to decrease a setting (e.g. a volume or level setting).

```
        Sat Volume
            10
```
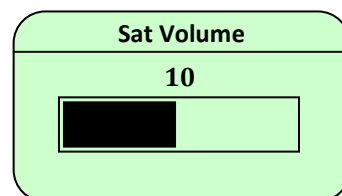
5.4.5 Saving a menu setting

Press **ENTER** to save modified settings for a selected menu item.

5.4.6 Cancelling a menu setting

If a menu setting has not been saved:

Press **CANCEL** to cancel the change and return to the previous screen.

or press **END** to cancel the change and exit the menu system.

5.4.7 Exiting the menu system

Press **END** to exit the menu system and return to the 'Main Screen'.

When in the menu system, the DZM will automatically return to the Main Screen after 30 seconds unless another key is pressed.

5.4.7 Exiting the menu system

6 FLIGHTCELL DZM OPERATORS' GUIDE

Learn how to:

Use DZM functions that are commonly required by the pilot during flight.

Refer to "DZM advanced setup guide" on page 52 for further information about how to configure advanced DZM settings.

6.1 Phone calling

6.1.1 Making a call using manual dial

STEP 1 - Selecting to make a call using the satellite phone or cell modem:

From the 'Main Screen', press one of the following keys:

Press **DIAL SAT** to manually dial a call from the satellite phone.

or press **DIAL CELL** to manually dial a call from the cell modem.

The Enter Number screen will display.

```
Enter Number
```
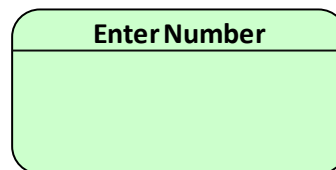
STEP 2 - Entering the phone number:

Press and hold **MENU** to enter the international dialling prefix "+" (GSM and Iridium networks)
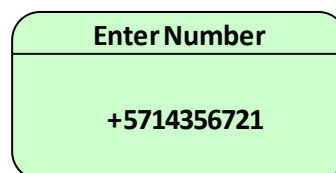
or press the "**0**" key where the "0" number is required.

Use the **0** to **9** keys to enter the remaining digits in the phone number.

Press **CANCEL** to backspace if necessary.

The phone number entered will be displayed.

If the phone number is in the DZM phonebook, the display will show the name and number to be called.
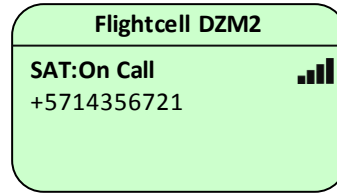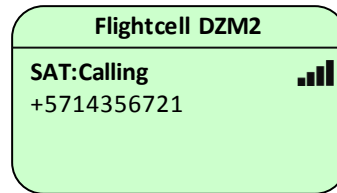
```
Enter Number

+5714356721
```

Step 3. Dialling the number

Press **CONNECT** to dial the number. phone status on the 'Main Screen' displays **Calling**. When the call is connected phone status displays **On Call**.

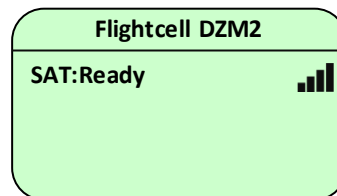It may take up to 30 seconds for the satellite phone call to connect.

If the call is cancelled before connection, phone status shows **Disconnecting** before returning to **Ready**.

```
┌─────────────────────────┐
│    Flightcell DZM2      │
│ SAT:Calling        ▄▆█  │
│ +5714356721             │
│                         │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│    Flightcell DZM2      │
│ SAT:On Call        ▄▆█  │
│ +5714356721             │
│                         │
└─────────────────────────┘
```

STEP 4 - Terminating the call:

Press **END** to terminate a call at any time. phone status returns to **Ready**.

The call will also be terminated if the party at the other end of the call hangs up.

```
┌─────────────────────────┐
│    Flightcell DZM2      │
│ SAT:Ready        ▄▆█    │
│                         │
│                         │
└─────────────────────────┘
```
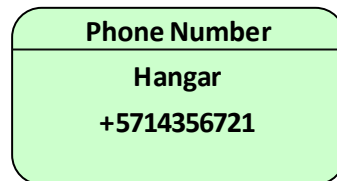
6.1.2 Making a call using quick dial

The DZM has three Memory Recall (quick dial) keys which access the first three numbers in its phone directory.

STEP 1 – Select the number to be dialled:

Press the **MR1, MR2** or **MR3** quick dial key.

The name and/or number for that key will display. "NO NUMBER" is displayed if the memory recall key entry is blank.

```
┌─────────────────────────┐
│     Phone Number        │
│        Hangar           │
│     +5714356721         │
│                         │
└─────────────────────────┘
```
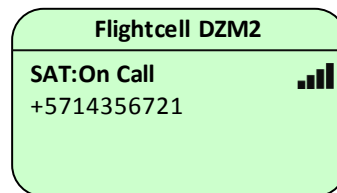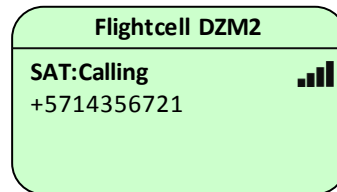
STEP 2 – Select the satellite phone or cell modem:

Press **DIAL SAT** to make the call on the satellite phone.

or press **DIAL CELL** to make the call on the cell modem.

```
┌─────────────────────────┐
│    Flightcell DZM2      │
│ SAT:Calling        ▄▆█  │
│ +5714356721             │
│                         │
└─────────────────────────┘
```

phone status on the 'Main Screen' displays **Calling**. When the call is connected phone status displays **On Call**.

It may take up to 30 seconds for the satellite phone call to connect.
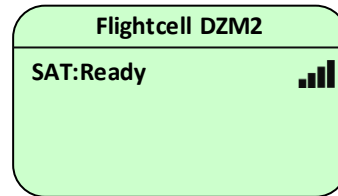
If the call is cancelled before connection, phone status displays **Disconnecting** before returning to **Ready**.

```
┌─────────────────────────┐
│    Flightcell DZM2      │
│ SAT:On Call        ▄▆█  │
│ +5714356721             │
│                         │
└─────────────────────────┘
```

STEP 4 - Terminating the call:

Press **END** to terminate a call at any time. phone status returns to **Ready**.

The call will also be terminated if the party at the other end hangs up.

```
┌─────────────────────────────┐
│      Flightcell DZM2        │
│                             │
│  SAT:Ready            ▂▄▆█  │
│                             │
└─────────────────────────────┘
```

6.1.3 Making a call using the DZM phonebook

The DZM can store up to 50 phone numbers in its phonebook.

The phonebook is managed using the DZM Manager Utility. Details of the DZM Manager Utility are provided in a separate manual available on the support page on the Flightcell website.

STEP 1 - Selecting the number from the phonebook:

Press **DIRECTORY** to open the 'Browse' screen .

Press the **UP** or **DOWN** arrow keys to navigate through the phonebook to the desired entry.

To display the phone number, press **ENTER** to show the entry, or skip this step to dial the entry immediately.

This phonebook screen will show the name of the contact for each phonebook entry. If no name is recorded it will show the phone number only.

```
┌─────────────────────────────┐
│          Browse             │
│  1. Hangar                  │
│  2. Control Tower           │
│  3. Empty  Entry            │
│                             │
└─────────────────────────────┘
```

```
┌─────────────────────────────┐
│       Phone Number          │
│         Hangar              │
│       +5714356721           │
│                             │
└─────────────────────────────┘
```
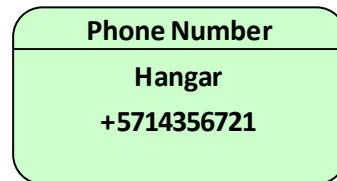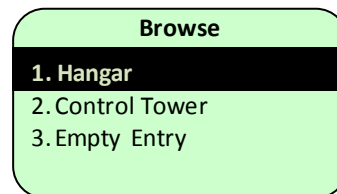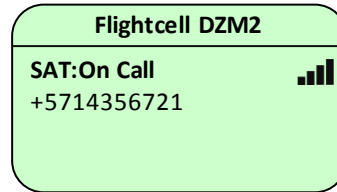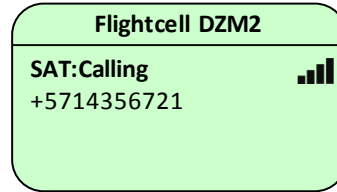
STEP 2 – Dialling the number:

Press **DIAL SAT** to make the call on the satellite phone.

<u>or</u> press **DIAL CELL** to make the call on the cell modem.

phone status on the 'Main Screen' displays **Calling**. When the call is connected phone status displays **On Call**.

It may take up to 30 seconds for the satellite phone call to connect.

If the call is cancelled before connection, phone status displays **Disconnecting** before returning to **Ready**.

```
  Flightcell DZM2
 SAT:Calling          ▁▃▅▇
 +5714356721
```

```
  Flightcell DZM2
 SAT:On Call          ▁▃▅▇
 +5714356721
```

STEP 3 - Terminating the call:

Press **END** to terminate a call at any time. phone status returns to **Ready**.

The call will also be terminated if the party at the other end hangs up.

```
  Flightcell DZM2
 SAT:Ready            ▁▃▅▇
```
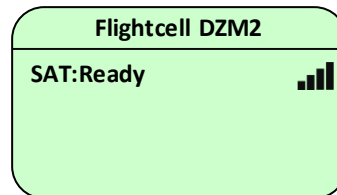
6.1.4 Redialling the last called number

Redialling the last called number:

Press **DIAL SAT** or **DIAL CELL**; the last dialled number will display

Press **ENTER** to make the call.

6.1.5 Answering an incoming call

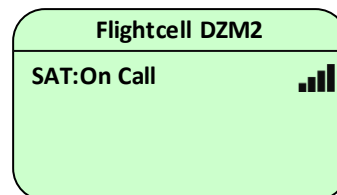The DZM can receive incoming calls on either the satellite phone or cell modem.

STEP 1 - Incoming call detected:

When the DZM detects an incoming call, the LCD screen flashes an alert message and an alert tone sounds over the audio connection to the aircraft audio system. If the call is coming in via the cell modem, then the caller ID, if known, is also indicated by the modem. In this case it is possible to identify the caller's number and it will be displayed in the Incoming Call screen. If the caller's number matches a number the in the phone book, then the caller's name will be displayed instead.

```
┌──────────────────────────┐
│                          │
│       Incoming Call       │
│                          │
└──────────────────────────┘
```
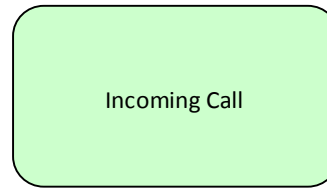
STEP 2 - Answering the call:

Press **CONNECT** to answer the incoming call. phone status displays **On Call**.

```
┌──────────────────────────┐
│      Flightcell DZM2      │
│ SAT:On Call          ▂▄▆█ │
│                          │
│                          │
└──────────────────────────┘
```

STEP 3 – Rejecting or terminating the call:

Press **END** to terminate a call at any time or to reject the call. phone status returns to **Ready**.

The call will also be terminated if the party at the other end hangs up.

```
┌──────────────────────────┐
│      Flightcell DZM2      │
│ SAT:Ready            ▂▄▆█ │
│                          │
│                          │
└──────────────────────────┘
```
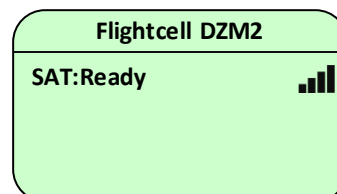
6.1.6 Using touch-tone dialling (DTMF) during a call

Dual-tone multi-frequency (DTMF) signalling, commonly known as touch-tone dialling, uses key tones to signal to automated operator services and some PABX systems. Common examples of the use of DTMF signalling are when selecting from call centre menus, using phone banking, etc.

When on a call, 'DTMF' is shown on the top line of the display. This indicates that DTMF signalling is available.

When on a call, the number keys and the ***** and **#** keys on your DZM may be used to send DTMF tones as required.

6.1.7 Using other DZM keypad functions when on a call

When on a phone call you need to Press and hold THE **MARK**, **ARM/AFF**, **EMERGENCY**, **MESSAGE**, **DIRECTORY**, **ISOLATE** and **MENU** keys to use their quick key functions.

## 6.1.8 Muting DZM audio when not on a call

Audio from the DZM to ICS may be automatically muted when the DZM is not on a call to minimize unwanted noise from the satellite phone or cell modem.

Muting audio from DZM to ICS:

From the 'Audio Menu', use the arrow keys to navigate to Mute When No Call'.

Press **ENTER** to select. The 'Mute When No Call' screen is displayed.

Use the arrow keys to select **Off** or **On,** then press **ENTER** to confirm the setting.

```
        Audio Menu
  Mute When No Call
  GPS/MSG Tones
  Keypad Tones
```

```
     Mute When No Call
  Off
  On
```
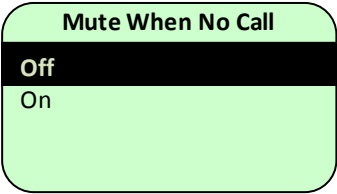
6.1.9 Missed call notification

If an incoming call goes unanswered, the details of the call will be saved as a missed call notification message and the DZM will display an alert message. The missed call message will appear in the list of received SMS messages (see page 35 for details on viewing received messages). if caller ID is available for the caller's number, the missed call notification message will display the number, or if that number is in the DZM phonebook, the message will display the caller's name.

The caller's identity will not always be displayed:

Some callers may not have caller ID enabled for their number

Iridium do not currently provide caller ID, so the identity of incoming calls to the Sat device cannot be identified.

In these cases, '?' is shown in the message, along with the time of the call.

STEP 1 - Incoming call detected:

When the DZM detects an incoming call, the LCD screen flashes an alert message and an alert tone sounds over the audio connection to the aircraft audio system.

```
    Incoming Call
     Joe Bloggs
```

STEP 2 – Missed incoming call detected:

If the call goes unanswered and the caller hangs up, the LCD screen flashes an alert . This will stay on the screen until the user presses **ENTER** or **END**. If the user presses **END** , then the notification message is removed and the main screen is displayed. If the user presses **ENTER** , then the missed call message will be displayed. While viewing the missed call message, the user will then have the option of calling back the caller or sending them a message. See page 35 for information on viewing and responding to Missed Call messages.

6.1.10 Using the optional cabin phone

The DZM has a SLIC (Subscriber Line Interface Connection). This enables installation of a standard phone in the cabin for passenger use. This is useful on aircraft with low noise levels in the cabin where passengers or crew do not usually use a headset.

If installed, a cabin phone can be used to:

Make a call to any local or international phone number

Talk to the aircraft's flight crew

Hold a three way call between a passenger, the flight crew and any phone number.

If a passenger is on a call, the flight crew cannot hear the call unless they are conferenced in to the call.

If the DZM is in use by the pilots, the passengers hear a "Busy" tone if they pick up the cabin phone.

6.1.10.1 Making an outgoing call from the cabin phone

STEP 1 – Select the satellite phone or cell modem:

Press the 9 key to make the call using the satellite phone.

or press the 8 key to make the call using the cell modem.

STEP 2 – Dialling the destination phone number:

For a satellite phone call, use the dialling prefix "00" followed by the phone number (e.g. to dial a number in the United States, dial *00 - 1 – area code – phone number*).

For a cell modem call, dial the call in the same way as you would from a normal telephone in the country in which you are flying (e.g. *0011* for an international call).

STEP 3 – Terminating the call:

Press END on the phone handset.

6.1.10.2 Answering an incoming call on the cabin phone

STEP 1 - Answering an incoming call from the cabin phone handset:

Press TALK on the phone handset.

STEP 2 – Terminating the call:

Press the END key on the phone handset.

6.1.10.3 Transferring a call from the cabin to the flight deck

Press the FLASH key on the phone handset (this is often the same as the TALK key). The DZM on the flight deck will flash '**Three-party Call**' at the bottom of the screen and ring to announce the incoming call. When answered at the flight deck, the cabin phone participant can either have a three-way conference call or hang up to complete transfer of the call.

6.1.10.4 Transferring a call from the flight deck to the cabin phone:

Press **CONNECT** on the DZM. The cabin phone will ring.

When the cabin phone is answered (by pressing the **TALK** key), the flight deck participant can either have a three-way conference call or hang up to complete transfer of the call.

6.1.10.5 Calling the cabin phone from the flight deck

Press **CONNECT** on the DZM. The cabin phone will ring and the DZM LCD screen shows that an intercom call is in progress.

Press the TALK key on the cabin phone handset to take the call.

STEP 3 – Terminating the call:

Press **END** on the DZM keypad

or the END key on the cabin phone handset.

6.1.10.6 Calling the flight deck from the cabin phone

Press the **1** key on the cabin phone handset. '**Passenger Intercom**' will flash along the bottom of the DZM LCD screen and the DZM will ring.
Press t **CONNECT** on the DZM to take the call.

To end the call, press **END** on the DZM keypad

or the END key on the cabin phone handset.

6.1.10.7 Terminating a call on the cabin phone in an emergency

If the flight crew need to use the DZM to make a call, but the cabin phone is in use, the cabin phone call may be terminated from the flight deck by pressing **END** on the DZM keypad.

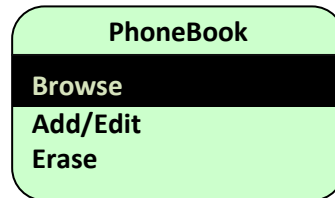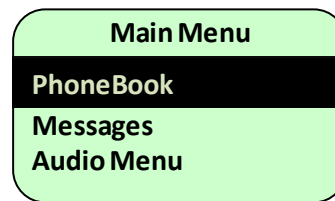## 6.1.11   Adding, editing or deleting entries from the DZM phonebook

Phonebook entries can be added, edited or deleted.

The most efficient way to edit the phonebook is using the DZM Manager utility. The DZM Manager software and manual can be downloaded from the support page on the Flightcell website.

To manually edit the phonebook, follow the instructions below.

Press **MENU** then **ENTER** to select Phonebook.

Main Menu
PhoneBook
Messages
Audio Menu

The PhoneBook menu will display.

PhoneBook
Browse
Add/Edit
Erase

Scroll down to Add/Edit and press **ENTER**. The Add/Edit screen will display.

Add/Edit
1. Headquarters
2. Hospital
3. Engineering
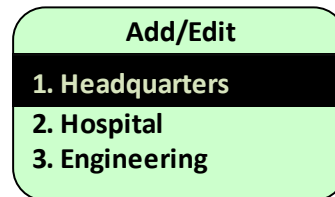
6.1.11.1 Adding a new number to the phonebook

Scroll down the list of phone entries to an empty entry. Press **ENTER** again. The 'Number Edit' screen will display.

Number Edit
Enter Number
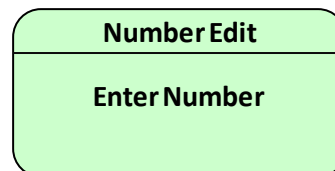
Enter the number using the numbered keys on the DZM keypad. Press and hold the + key for the international dialling prefix '+'.

Press **ENTER** to save.
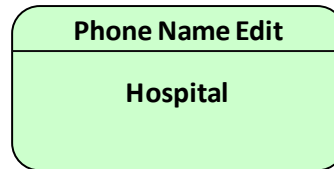
Number Edit
+57146683214
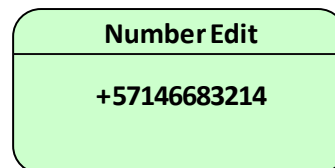
The 'Phone Name Edit' screen will display. Use the **RIGHT** arrow key to move right one character.
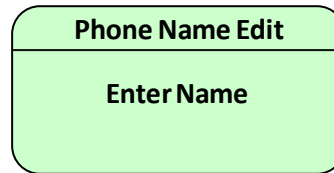
Use the **UP** and **DOWN** arrow keys to scroll up through the available characters. Use the **RIGHT** arrow key to move to the next character.
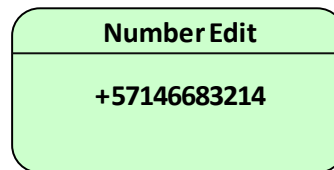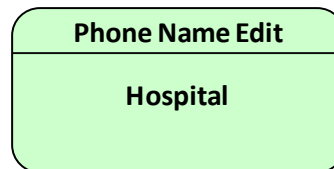
Use **CANCEL** to backspace.

Press **ENTER** to save and return to the phone list. Press **END** to exit to the 'Main Screen'.

```
┌──────────────────────────┐
│      Phone Name Edit      │
├──────────────────────────┤
│                          │
│       Enter Name         │
│                          │
└──────────────────────────┘
```

```
┌──────────────────────────┐
│      Phone Name Edit      │
├──────────────────────────┤
│                          │
│        Hospital          │
│                          │
└──────────────────────────┘
```

6.1.11.2 Editing a phonebook entry

Scroll down the list of phone entries to find the number to be edited. Press **ENTER** again. The 'Number Edit' screen will display.

Use the **LEFT** arrow key to backspace.

Enter numbers using the number keys on the DZM keypad.

Press and hold the + key for the international dialling prefix '+'.

Press **ENTER** to save.

```
┌──────────────────────────┐
│       Number Edit         │
├──────────────────────────┤
│                          │
│     +57146683214         │
│                          │
└──────────────────────────┘
```

The Phone Name Edit screen will display. Use **CANCEL** to backspace or the **RIGHT** arrow key to add a character.

Use the **UP** and **DOWN** arrow keys to scroll through the available characters.

Press **ENTER** to save and return to the phone list. Press **END** to exit to the 'Main Screen'.

```
┌──────────────────────────┐
│      Phone Name Edit      │
├──────────────────────────┤
│                          │
│        Hospital          │
│                          │
└──────────────────────────┘
```

6.1.11.3 Erasing a phonebook entry

Press **MENU** then press **ENTER** to select Phonebook. The PhoneBook menu will display.

Scroll down to 'Erase' and press **ENTER** . The Erase screen will display.

Scroll down the list of phone entries to find the entry to be erased. Press **ENTER** again to erase the entry. Phone Number Deleted will be displayed.

Press **END** to exit to the 'Main Screen'.

6.2 Sending position reports and distress messages

6.2.1 Sending distress messages

In emergency, a distress message may be transmitted from the DZM. In distress mode, the DZM transmits position reports with a distress tag attached at programmed time intervals. The receiving server identifies the distress signal and automatically raises an alarm, alerting nominated parties by text message, page or email.

> **NOTE!** An appropriately configured receiving server is required to receive distress signals and alert nominated parties.

Refer to "Configuring the DZM to transmit regular position reports" on page 67 for further information about setting the time interval for distress messaging.

STEP 1 - Transmitting distress messages:

From the 'Main Screen', Press and hold **EMERGENCY** to start sending distress messages. **Emergency mode!** flashes at the bottom of the LCD 'Main Screen' when in emergency (distress) mode.

STEP 2 - Switching emergency distress signal off:

From the 'Main Screen', Press and hold **EMERGENCY** to return to normal mode.

The DZM will send a message to the receiving server indicating that distress mode has been deliberately deactivated.

6.2.2 Using GPS tracking

The DZM can transmit position reports to a recipient destination (typically a tracking provider) using a satellite phone (DZM2) or satellite modem (DZM3) and/or a cell modem. The operator may manually transmit position reports, or configure the DZM to transmit automatically based on certain selected parameters.

Refer to "Configuring GPS tracking" on page 54 for information on configuration of your DZM and tracking service to provide for transmission of GPS.

> **NOTE!** GPS tracking is not a comprehensive surveillance and alert system. Refer to "Using Automated Rescue Monitoring (ARM/AFF)" on page 43 for further information about automated surveillance and alerting.

6.2.2.1 Automatically transmitting a position report

The DZM can be configured to automatically send a range of routine position reports. These are:

Aircraft power up

Engine start and stop

Takeoff and landing

At specified time intervals

When aircraft heading changes

In emergency situations.

NOTE! The DZM requires a valid GPS lock in order to automatically transmit position reports. Refer to "Using GPS antenna diagnostics" on page 39 for further information on GPS lock.

Refer to "Configuring GPS tracking" on page 54 for further information about configuring settings to enable automatic transmission of position report.

6.2.2.2 Manually transmitting your current position

Your current position may be manually transmitted at any time by pressing **MARK**. Your current position may also be sent with a preconfigured message or message code attached, if configured to do so, by pressing and holding **MARK**.

Manual Position reporting must be configured via the tracking menu in order to enable and configure the **MARK** button. Refer to "Enabling and disabling manual GPS tracking" on page 62 for further information about enabling and disabling various manual modes.

From the 'Main Screen', press and release **MARK** to send your current position only to your tracking provider.

The display shows "Message Queued", then "Sending Data" followed by "SBD Sent" or "SMS Sent", before returning to the 'Main Screen'.

Message Queued
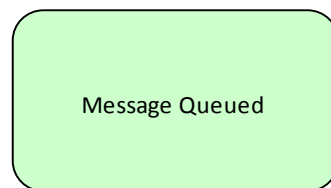
6.2.2.3 Sending a position report with an attached preconfigured message

A position report can be sent with a preconfigured message attached. Preconfigured messages are stored in the DZM's message library. The Manual Position setting must be configured as 'Pos with Text Msg' to configure the Mark button to transmit a position report with a text message attached. Refer page 61 for further information about enabling and disabling various manual position sending modes.

From the 'Main Screen', Press and hold the **MARK** key until the message list is displayed.

Scroll down to the required message and press **ENTER** to review the message, then **ENTER** again to transmit the message.

The display will show "Message Queued", then "Sending Data" followed by "SBD Sent" or "SMS Sent", on the 'Main Screen'.

Note, using this method, the position report is recorded at the time the tracking message is queued, just after the text message to send has been selected, not when **MARK** is first pressed.

If a preconfigured message is selected from the message list, and the message is longer than 88 characters, then the position report will still be sent with the selected text message, but the text message part will be truncated to 88 characters.

> **Pick From List**
> 1. **Returning to base**
> 2. Accident located
> 3. Returning to hospital
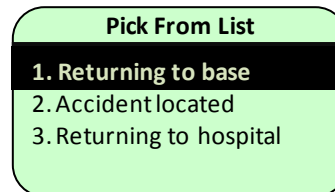
6.2.2.4 Sending message codes attached to manual position reports

Message codes are used by some tracking providers or users to designate specific preconfigured messages. Message codes may be attached to manual position reports using the **MARK** key. The Manual Position setting must be configured as 'Pos with Token' to configure the Mark button to transmit your position report with a message code attached. Refer to page 62 for further information about enabling and disabling various manual position sending modes.

From the 'Main Screen', Press and hold **MARK** .

"Enter Number" is displayed.

Enter the message code to be sent with the position report. The value must be between 1 and 127.

> **Send Message**
>
> **Enter Number**
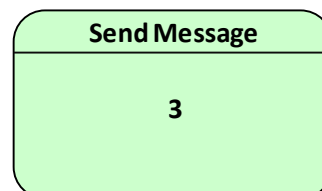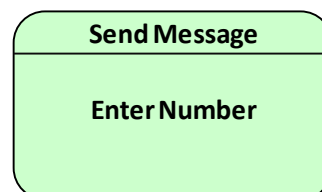
> **Send Message**
>
> **3**

Press **ENTER** to send the position report with the attached message code. The 'Message Queued' screen is displayed, before returning to the 'Main Screen'.

or press **CANCEL** to cancel message selection.

Note, using this method, the position report is recorded at the time the tracking message is queued, just after **ENTER** is pressed, not when **MARK** is first pressed.

> Message Queued
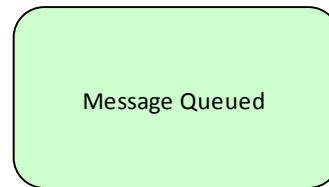
6.2.3 Sending and receiving plain text SMS messages

The DZM can transmit preconfigured messages as a plain text SMS message. Preconfigured messages can be sent

To a phone number in the DZM phonebook directory.

To a manually entered Iridium satellite phone number or cell phone number.

In reply to received text message.

Text messages may also be transmitted and received using a laptop computer connected to the DZM.

Preconfigured messages are loaded on the DZM using the Flightcell DZM Manager Utility. Details of the DZM Manager utility are provided in a separate manual provided with your DZM or available from the support page on the Flightcell website.

6.2.4 Sending plain text messages

6.2.4.1 Sending messages to numbers in the DZM phonebook

Preconfigured messages can be sent to valid cell phone numbers or Iridium satellite phone numbers stored in the DZM phonebook. Text messages cannot be sent to an email address.

NOTE! Some cell networks do not support transmission of text messages to or from the Iridium network. It is recommended that you test this capability with your cell phone service.

From the 'Main Screen', press **DIRECTORY** . The phonebook list will display.

Using the arrow keys, navigate to the required phone number. Alternatively, press **MR1**, **MR2** or **MR3** to display one of the first three numbers in the phone book.

Press **ENTER** to select the destination number.

Press **MESSAGES** , then scroll down to the selected preconfigured message.

Press **ENTER** to select an display the message.

Press **DIAL CELL** or **DIAL SAT** to send the message via the cellular or satellite network (respectively).

A message **Plain Text Message Queued** will display briefly to confirm the message has been queued for transmission.

6.2.4.2 Sending messages from the Messages Menu

To send a message using the 'Messages' menu:

Press **MENU** to enter the menu system. The 'Main Menu' is displayed.

Using the arrow keys, navigate to 'Messages'.

Press **ENTER** to select. The 'Messages' sub-menu is displayed.

```
Main Menu
PhoneBook
Messages
Audio Menu
```

Using the arrow keys, navigate to the option required then press **ENTER** to select:

- **Pick From List** allows you to browse the message list

- **Select By Number** allows you to enter the index number of the required message.

```
Messages
Pick From List
Select By Number
Received Messages
```

Using the arrow keys, navigate to the message (from the 'Pick From List' screen) or enter message number (from the 'Select By Number' screen) required.

Press **ENTER** to display the message.

```
Send Message
Returning to base
```

The user now has a choice of how to select the destination number:

- **Sending to a number in the phonebook**: Press **DIRECTORY** to show the phone book and scroll to the selected recipient. Press **ENTER** to display phone book entry. Now press either **ENTER** (if there is only one device connected), or **DAIL CELL** or **DIAL SAT** to choose the method of delivery.

```
Pick From List
1. Returning to base
2. Accident located
3. Returning to hospital
```

- **Sending to a quick-dial number**: press one of the quick-dial keys then press either **ENTER** (if there is only one device connected), or **DIAL CELL** or **DIAL SAT** to choose the method of delivery.

- **Sending to a manually entered number**: select the method of delivery first by pressing **DIAL CELL** or **DIAL SAT**, then type in the number. Press **ENTER** to send the text message.

```
Plain Text
Message Queued
```

or press **CANCEL** to cancel message selection.

'Plain Text Message Queued' is displayed, before returning to the 'Main Screen'.

Note: If a plain text message cannot be transmitted for some reason after 15 minutes (due to an invalid phone number or low signal strength), then the text message will be removed from the message queue, the DZM will beep, and '**Message Lost Failed to Send Text Message'** pop-up will be displayed.
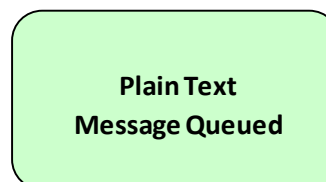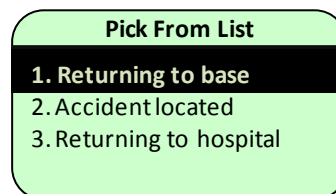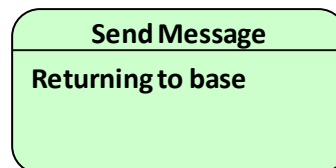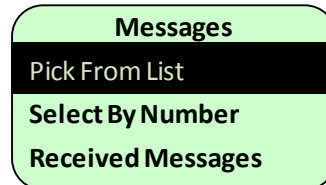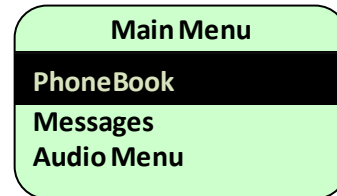
6.2.5 Viewing received messages

6.2.5.1 Viewing an incoming text message

When a new text message is received:

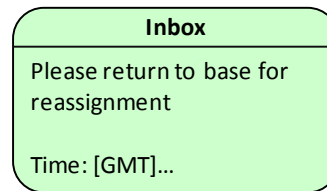"**Message Received**" or "**Missed Call"** flashes on the LCD
screen of the DZM.

Press **ENTER** to view the message.

If the message has been sent from a tracking system, "Tracking
System Msg" will display in the screen header.

For all other messages, "Inbox" will display in the screen header.

Press **END** to return to the 'Main Screen'.

> **Inbox**
>
> Please return to base for
> reassignment
>
> Time: [GMT]...

6.2.5.2 Viewing received messages

The last 30 text messages received will remain in the 'Received Messages' memory. The most recent message will
have the lowest message number.

Messages in the list that start with the text '**msg@**' are messages from your tracking provider.

The oldest message will be replaced when the next new message is received. Messages cannot be deleted
manually.

STEP 1 - Accessing the Received Messages screen:

From the 'Main Screen', Press and hold **MESSAGES** .

<u>or</u> press **MENU** to enter the menu system. The 'Main Menu' is
displayed.

Using the arrow keys, navigate to **Messages**, press Enter and
scroll down to 'Received Messages'.

Press **ENTER** to select. The 'Received Messages' screen is
displayed.

> **Received messages**
>
> **1. Please return to base**
> **2. Divert to hospital**
> **3. Call headquarters for**
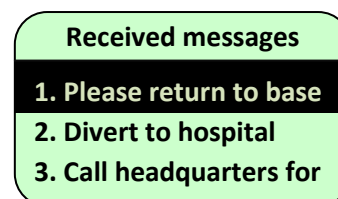
STEP 2 - Viewing received messages:

From the 'Received Messages' screen, use the arrow keys to scroll down to the required message.

Press **ENTER** to select. The message is displayed.

Use the **UP** and **DOWN** arrow keys as required to view the whole message.

Press **CANCEL** to return to the 'Received Messages' screen.

Press **END** to return to the main screen.

> **Inbox**
>
> Please return to base for reassignment
>
> Time: [GMT]…
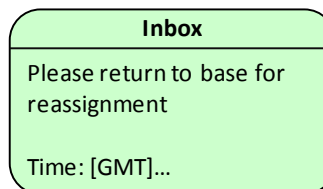
6.2.6 Replying to a message

6.2.6.1 Replying to a received message with a plain text preconfigured message

Preconfigured plain text messages can be sent in response to a received message or a missed call message where the caller phone number is known. This will apply to most, but not all, messages and calls from cell phones, but not to messages or calls from Iridium phones (as Iridium does not currently support caller ID).

While viewing the text of a received message, or while highlighting a particular received message in the received message list, press **MESSAGES**. This will display the list of preconfigured messages. Scroll down to highlight the chosen message to send in response.

Press **ENTER** to select.

Press **DIAL CELL** or **DIAL SAT** to send the message via the cellular or satellite network (respectively).

A message **Plain Text Message Queued** will display briefly to confirm the message has been queued for transmission.

6.2.6.2 Replying to a tracking system message with a position report and a preconfigured message

Preconfigured text messages can be sent in response to messages received from your tracking system. Note that a response to a tracking system message will be in the form of a position report + text message, not as a plain text message. This is the same type of message that will be sent from the DZM when the Mark key is configured to send a "Pos with Text Msg".

Tracking system messages can be identified by the words "Tracking System Msg" in the screen header when the message is open. When viewing the Received Messages list, tracking system messages can be identified by having the prefix "msg@" followed by the tracking system domain name. This prefix is removed for clarity when the message is opened, but then the screen header will indicate the message type. The message format of the reply to the tracking system will be a position report + text message. This is the same type of message that will be sent from the DZM when the Mark key is configured to send a "Pos with Text Msg".

While viewing the text of a tracking system message, or while highlighting a tracking system message in the received message list, press the **MESSAGES** key. This will display the list of preconfigured messages. Scroll down to highlight the chosen message to send in response.

Press **ENTER** to select.

Press **ENTER** to send the selected message to the tracking system.

A message "Message Queued" will display briefly to confirm the message has been queued for transmission, then "Sending Data" followed by "SBD Sent" or "SMS Sent", before returning to the 'Main Screen'.

6.2.7 Calling the sender of a received message or a missed call message

It is possible to make a call from the received message screen to call the sender of a received message, or in response to a missed call message where the caller ID is known.

While viewing the text of a received message or missed call message, press **DIAL CELL** or **DIAL SAT** to call the sender of the message via the cellular or satellite network (respectively).

Note that if the message contains a number that is recognised within the DZM phonebook, then the number in the phonebook is used in preference the number stored within the received message/missed call message. The phonebook number is used in preference because the number stored in a missed call message is unlikely to contain an international dialling prefix when received via the cell modem, so using the phonebook number will allow you the option to call back the caller via the SAT or CELL device.

6.2.8 Cancelling unsent messages

A queue of unsent messages may build up due to low satellite network coverage levels, or because a lot of messages were generated in a short time. Unsent messages may be cancelled from the queue if required.Cancelling unsent messages queue:The number of queued messages is displayed on the 'Main Screen'

Press **MENU** to enter the menu system. The 'Main Menu' is displayed.

Using the arrow keys, navigate to 'Cancel Queued'.

Press **ENTER** to select. 'Message Queue Deleted' is displayed, confirming the queue has been deleted, before returning to the 'Main Screen'. All tracking and plain text messages in the queue will be deleted.

```
┌─────────────────────────┐
│     Flightcell DZM      │
│                         │
│  SAT: Ready        ▄▆█  │
│  5 Queued Messages      │
│                         │
│   Tracking: Retrying Msg│
└─────────────────────────┘
```

```
┌─────────────────────────┐
│       Main Menu         │
│  Setup Menu             │
│  Diagnostics Menu       │
│ ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ │
│  Cancel Queued          │
│                         │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│                         │
│                         │
│     Message Queue       │
│        Deleted          │
│                         │
│                         │
└─────────────────────────┘
```
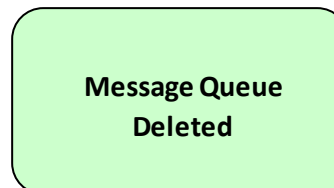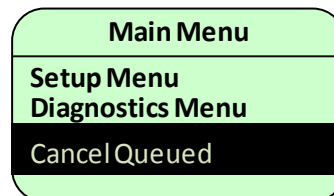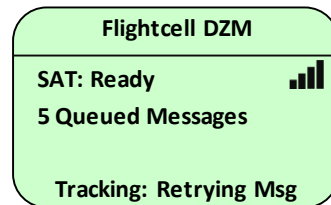
6.2.9 Sending text messages to a Flightcell DZM

SMS text messages can be sent to an aircraft or vehicle equipped with a DZM. Messages may be sent using the different methods outlined below.

Incoming text messages will display on the DZM LCD screen when received. If a computer with Flightcell SMS Console software is connected to the DZM, the incoming text message will also display on the computer screen.

Sending an SMS text message from another Iridium satellite phone:

SMS text messages may be sent from an Iridium satellite phone in the usual manner.

Sending an SMS text message from the Iridium website:

Iridium provides a quick utility for sending SMS text messages via their website.

Using an internet browser, go to the Iridium website at **http://www.iridium.com**.

From the top-right of the page, click on 'Send a Satellite Message'. The 'Send a Satellite Message' window is displayed.

Enter the destination phone number of the Iridium satellite phone in the 'To' field.

Enter your message in the 'Message' field.

Click 'Send Message'. The message will be sent.

Sending an SMS text message from a cell phone:

SMS text messages may be sent from most cell phones.

NOTE! Some cellular networks may not send messages to Iridium phones. It is suggested that you send a test transmission to determine whether this service is available on your cellular network.

Sending an SMS text message from an email program:

SMS text messages may be sent from any email program (e.g. Microsoft Outlook) in the usual manner.

Use the destination phone number in the 'To' field of the email (e.g. 8816XXXXXXX@msg.iridium.com).

6.3 Using Diagnostic Tools

6.3.1 Using GPS Diagnostics

Use the DZM GPS diagnostics function to view information about GPS antenna and signal quality.

Viewing GPS diagnostics information:

From the 'Main Menu', use the arrow keys to navigate to 'Diagnostics Menu'.

Press **ENTER** to select. The 'Diagnostics Menu' is displayed.

Use the arrow keys to navigate to 'GPS Diagnostics'.

Press **ENTER** to select. The 'GPS Diagnostics' screen is displayed, showing GPS status, signal to noise ratio and satellite information.

Press **CANCEL** to return to the 'Diagnostics Menu'.

or press **END** to return to the 'Main Screen'.

```
        Diagnostics Menu
   GPS Diagnostics
   Cradle Diagnostics
   Sat Device Details
```

```
        GPS Diagnostics
   GPS Lock
   SNR: 42dB/Hz
   13 Satellites Detected
```
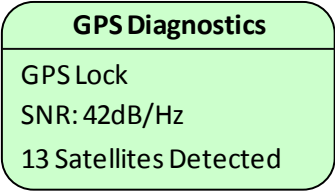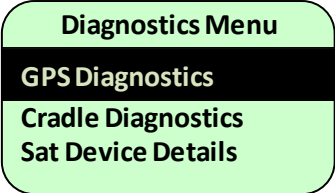
What does the antenna diagnostics information show?

GPS status information is shown on line one of the display.

GPS Lock is displayed when there is a good GPS signal providing positioning information;

Waiting For Lock is displayed after the DZM has been re-powered and is calculating, or waiting for sufficient signal before providing position information. Even under good conditions, it may take up to 2 minutes to acquire a GPS lock (or 15 minutes the first time the DZM is used in a different hemisphere).

Signal to noise ratio (SNR) shows on line two of the display in numerical and graphical form. This provides the average strength of the five best incoming satellite signals (or an average of all visible satellites if there are fewer than five).

Normal SNR value is around 40db/Hz. A minimum of 30db/Hz is usually required to obtain a GPS lock.

Low values can be due to weak signals from satellites which can be caused by some sort of physical obstruction. Low values can also be caused by excessive electrical noise being imposed on a strong signal, such other radio transmitters, radar etc.

It is possible that the SNR may be high but a GPS lock cannot be achieved. This may be due to a low number of visible satellites (a minimum of 4 satellites is required) or satellites not in suitable locations to acquire a GPS lock (i.e. they may all be in one area of the sky and so effective triangulation is not possible).

Number of satellites currently visible shows on line three of the display.

Satellites Used is displayed when you have a GPS lock. The greater number of satellites being used to calculate your position, the more accurate the position.

Satellites Detected is displayed when the DZM is attempting to acquire a GPS lock. This defines how many satellite signals are being received.

It can take up to three minutes to obtain a GPS lock if the DZM has not been used for some time. If the GPS diagnostics screen shows no satellites after some time, there may be an antenna connection fault.

The Antenna icon Y will be displayed at the top of the LCD when the DZM has a GPS lock. The icon will not display if there is no GPS lock. This indication is given no matter what menu or pop-up is currently being displayed and will even be displayed if tracking has been disabled.

6.3.2 Using cradle diagnostics

Cradle diagnostics provide information on the satellite phone cradle (in a DZM2 installation) for diagnostic purposes.

Viewing cradle diagnostics information:

From the 'Main Menu', use the arrow keys to navigate to 'Diagnostics Menu'.

Press **ENTER** to select. The 'Diagnostics Menu' is displayed.

Use the arrow keys to navigate to 'Cradle Diagnostics'.

Press **ENTER** to select. The 'Cradle Diagnostics' screen is displayed.

Press **CANCEL** to return to the 'Diagnostics Menu'.

or press **END** to return to the 'Main Screen'.

```
        Main Menu
Diagnostics Menu
Cancel Queued


```

```
      Diagnostics Menu

GPS Diagnostics
Cradle Diagnostics
Sat Device Details
```
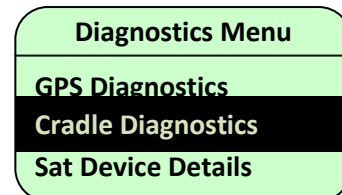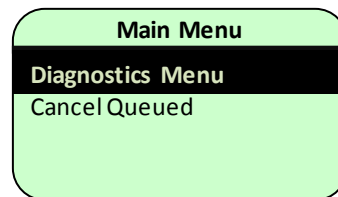
What information does the Cradle Diagnostics show?

Phone Detected indicates if the DZM detects a sat phone in the cradle. if this shows Not Detected, it means either the phone is turned off, there is no phone in the cradle, or there is a wiring fault.

Model will indicate if which model of Iridium phone is detected.

Firmware indicates the firmware version installed on the cradle

DSR and **RTS** indicate status of the serial port flow control lines
Digital Audio indicates the following options: if **Yes**, then the cradle is capable of sending and receiving digital audio to/from the satellite phone; if **No**, the cradle isn't capable; if **Active**, the cradle and phone are capable and digital audio between the phone and cradle is enabled.

6.3.3 Using Sat Device or Cell Modem Details

Sat Device Details and Cell Modem Details provide information on the satellite device or cell modem for diagnostic purposes.

Viewing sat device or cell modem information:

From the 'Main Menu', use the arrow keys to navigate to 'Diagnostics Menu'.

Press **ENTER** to select. The 'Diagnostics Menu' is displayed.

Use the arrow keys to navigate to 'Sat Device Details' or 'Cell Modem Details'.

Press **ENTER** to select. The diagnostics screen is displayed.

Press **CANCEL** to return to the 'Diagnostics Menu'. or press **END** to return to the 'Main Screen'.
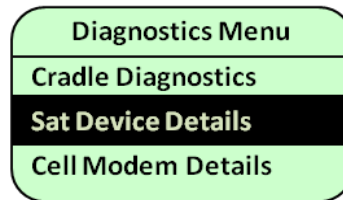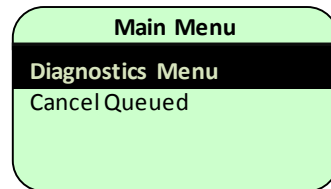
What information does Sat Phone Details show?

The first line provides a description of the status of the satellite phone installation:

SAT: <device status> (<signal strength>)

The signal strength as reported by the Sat device is shown in brackets after the device status. See Device Connection Status on page 10 for more details on device status values.

Digital Audio shows if digital audio is available and active (see page **Error! Bookmark not defined.**)

CSQF means the phone has recent enough firmware to use CSQF command to acquire the signal strength

Firmware is the Iridium firmware version installed on the phone or modem.

IMEI is the IMEI number of the phone or Iridium modem; this is used when setting up the satellite phone account and tracking system (page 54).

What information does Cell Modem Details show?

The header on the screen shows the cell modem model for which the DZM is configured.

The next line provides a description of the status of the satellite phone connection plus a measure of raw signal strength:

CELL: <device status> (<signal strength>)

The signal strength as reported by the Cell modem is shown in brackets after the device status. See Device Connection Status on page 10 for a the list of device status values.

Network shows the network to which the cell modem is currently connected

Band: For the Xtend modem, this is the currently configured cellular band (e.g. I,III,IV). (3G) will appear if currently registered on a 3G network, bands indicate configured bands, not currently registered bands;

For the Flightcell 3G modem, the current band in use will be shown, e.g. WCDMA800 (3G) .

If the cell port is currently configured for a Flightcell FC3GM, then the Cell Modem Details page will also show:

Firmware: The cell modem's current firmware version.

IMEI: The IMEI number of the cell modem.

6.3.4 Checking the DZM digital and analog inputs

The DZM has two digital and two analog inputs, the behaviour of which can be configured via appropriate tracking menu options (see page 69 for further details). In order to test the connections to the DZM, the raw states of these inputs can be viewed via this diagnostics screen. The digital inputs show a simple high/low state and the analog inputs show the raw ADC reading.

To configure the DZM external inputs as squat or collective inputs to indicate aircraft 'in flight'/'landed' status and trigger the appropriate position reports, see page 69.

To configure the DZM external inputs to trigger engine start/stop position reports, see page 76. To configure the DZM external inputs to trigger distress messages see page 78.

To view the external input diagnostic information:

From the 'Diagnostics Menu', use the arrow keys to navigate to 'External Inputs'.

Press **ENTER** to select. The 'External Inputs' screen will display the current state of the digital and analog inputs information. The information will update once a second.

```
Diagnostics Menu
Cell Modem Details
External Inputs
Firmware Version
```

```
External Inputs
Digital Input 1: high
Digital Input 2: low
Analog Input 1: 80
Analog Input 2: 0
```
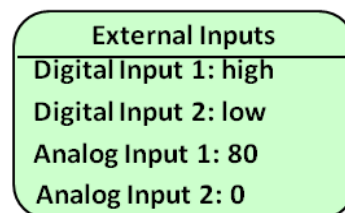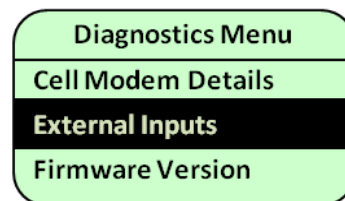
6.3.5 Identifying firmware version and serial number

The DZM firmware version and serial number may be identified.

Viewing firmware version and serial number: From the 'Diagnostics Menu, use the arrow keys to navigate to 'Firmware Version'.

Press **ENTER** to select. The 'Firmware Version' screen is displayed, the firmware version, firmware release and DZM serial number information.

```
Diagnostics Menu
Cell Modem Details
External Inputs
Firmware Version
```

```
Firmware Version
4.014 pG cA cb:0 RELEASE
Flightcell DZM2 Civil build
E09111961
```
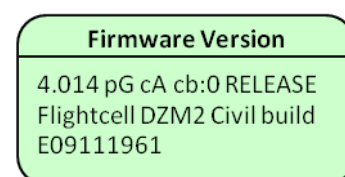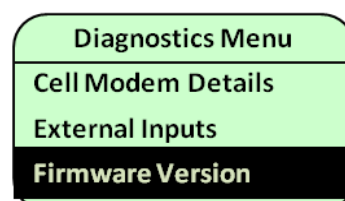
6.3.6 Using automated rescue monitoring (ARM/AFF)

In addition to GPS flight tracking, the DZM also has Automated Rescue Monitoring (ARM, also known as Automated Flight Following, AFF) capabilities. Used in conjunction with an appropriately configured receiving server and compatible computer mapping system, **ARM/AFF** provides automatic surveillance over an aircraft or vehicle's mission. Registering the start and end of a flight mission, **ARM/AFF** monitors position reports and automatically raises alerts if no position data is received from the aircraft for a specified time period (set on the receiving server).

Refer to "Enabling and disabling Automated Rescue Monitoring (**ARM/AFF**)" on page 82 for further information about enabling **ARM/AFF** for use in your aircraft.

This **ARM/AFF** feature is only available with some mapping systems, for example TracWatch, Automated Monitoring Service by TracPlus. Please contact your mapping service provider about availability of the **ARM/AFF** service on their network and to register for this service.

A manual distress signal may be sent from the aircraft or vehicle even when **ARM/AFF** is switched off. Refer to "Sending an emergency distress signal" on page 30 for further information about sending a distress signal.

Using **ARM/AFF** does not affect GPS tracking configuration and all position transmissions will be sent as normal. Refer to "Using GPS tracking" on page 30 for further information about using GPS tracking.

6.3.7 Registering ARM/AFF start and end points

Automated Rescue Monitoring (**ARM/AFF**) must be activated and deactivated at the start and end of the flight mission.

To operate, the **ARM/AFF** function must be enabled for use. Refer to "Enabling and disabling Automated Rescue Monitoring (**ARM/AFF**)" on page 82 for further information on how to do this. By default the **ARM/AFF** function is enabled unless it has been manually overridden.

STEP 1 - Registering **ARM/AFF** start point at commencement of flight:

From the 'Main Screen', press the **ARM/AFF** quick key. A message is immediately sent to the receiving server.

AFF – Requesting is displayed at the bottom of the screen when **ARM/AFF** has been turned on and confirmation of **ARM/AFF** operation is being requested from the receiving server.

AFF - Active is displayed when the receiving server confirms **ARM/AFF** is activated.

No Response. Retry? is displayed when **ARM/AFF** operation confirmation has not been received after several attempts.

Press **ENTER** to re-try.

```
┌─────────────────────────┐
│    Flightcell DZM2       │
├─────────────────────────┤
│ SAT:Ready          ▪▪▪▪  │
│                          │
│                          │
│ AFF - Requesting         │
└─────────────────────────┘
```
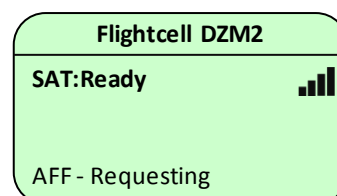
No AFF Server Response! is displayed to advise **ARM/AFF** operation confirmation has not been received. No further automated attempts are made. if this message is received, **ARM/AFF** has NOT been activated.

From the 'Main Screen', press the **ARM/AFF** quick key. A message is immediately sent to the receiving server.

```
╭─────────────────────────────╮
│      Flightcell DZM2        │
├─────────────────────────────┤
│ SAT:Ready              ▂▄▆█  │
│                             │
│                             │
│ AFF - Cancelling            │
╰─────────────────────────────╯
```

AFF - Cancelling is displayed at the bottom of the screen when a request to terminate an **ARM/AFF** session has been sent but not acknowledged.

AFF - Terminated is displayed when the receiving server confirms **ARM/AFF** has been terminated.

No Response. Retry? is displayed when **ARM/AFF** termination confirmation has not been received after several attempts.

Press **ENTER** to re-try.

No AFF Server Response! is displayed to confirm **ARM/AFF** termination confirmation has not been received. No further automated attempts are made.

NOTE! It is essential to register the **ARM/AFF** end point at termination of flight otherwise an emergency alert will be raised when the DZM is powered off (i.e. when the aircraft is switched off).

If an aircraft has landed and **ARM/AFF** has not been terminated, a reminder tone sounds over the audio system as a reminder to the pilot.

NOTE! If the bottom line of the display continues to show **AFF – Cancelling** or **No AFF Server Response!**, it's recommended that you make a radio or phone call to the appropriate personnel to advise completion of your mission.
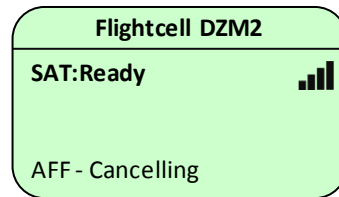
6.4 Adjusting audio settings

Various audio settings may be adjusted for the DZM and connected devices. These are shown in the diagram below and further described in the following sub-sections.

Refer to "Configuring advanced audio settings" on page 85 for further information about configuring advanced audio settings.
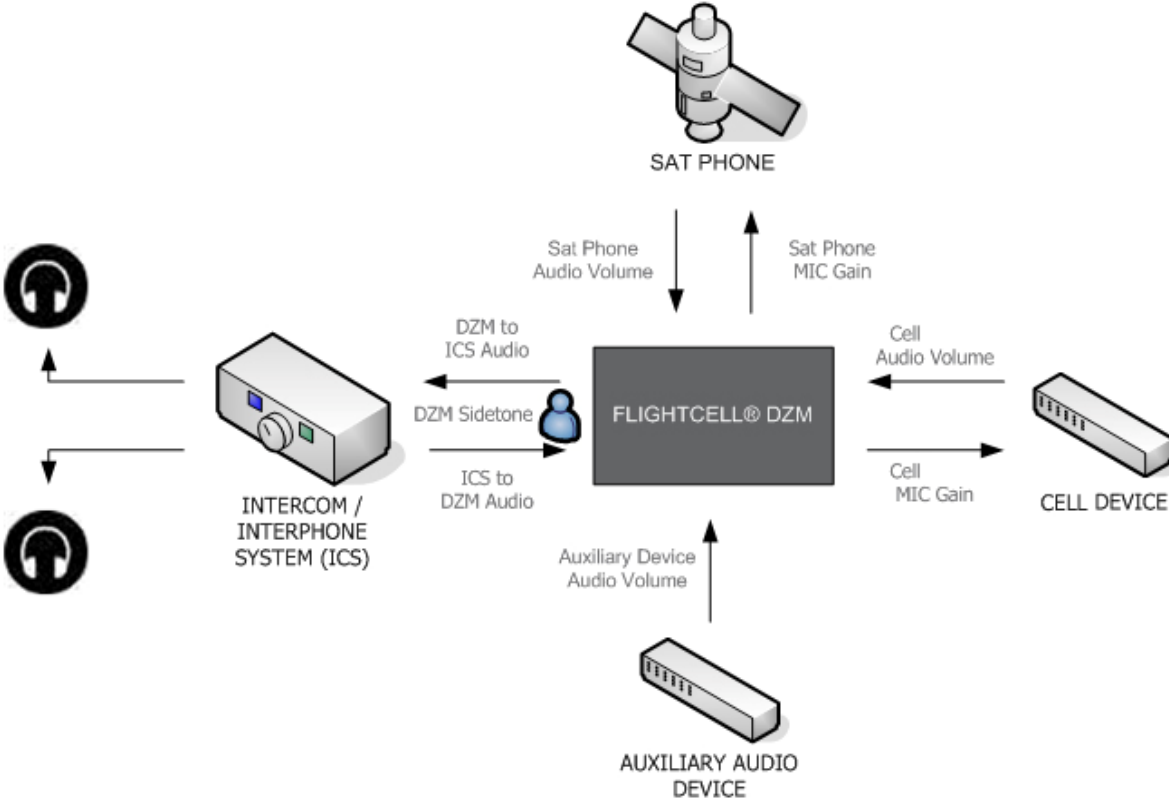
6.4.1 Accessing the Audio Menu

Audio settings are configured using the 'Audio Menu'.

Accessing the Audio Menu:

Press **MENU** to enter the menu system. The 'Main Menu' is displayed.

Using the arrow keys, navigate to 'Audio Menu'.

Press **ENTER** to select. The 'Audio Menu' is displayed.

6.4.2 Setting satellite phone audio volume

Satellite phone audio is audio from the satellite phone to the DZM. Audio from the satellite phone can be adjusted on the DZM. The level on the satellite phone itself is automatically set to mid-position by the DZM and should not be adjusted by the user.

Altering the satellite phone audio volume on the DZM:

From the 'Audio Menu', use the arrow keys to navigate to 'Sat Volume'.

Press **ENTER** to select. The 'Sat Volume' screen is displayed.

Press the **RIGHT** arrow key to increase the volume.

or press the **LEFT** arrow key to decrease the volume.

0 is the lowest volume. 100 is the highest volume. 10 is the default volume.

Press **ENTER** to save. You are returned to the 'Audio Menu'
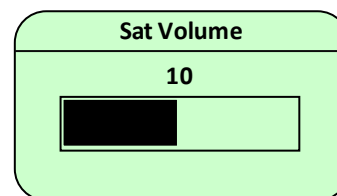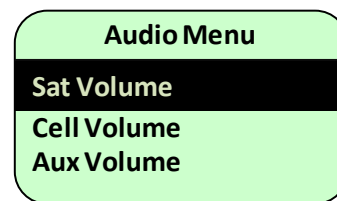
6.4.3 Setting cell modem audio volume

Cell audio is sound from the cell modem being received into the DZM. Audio from the cell modem may be adjusted on the DZM.

Altering cell modem audio volume on the DZM:

From the 'Audio Menu', use the arrow keys to navigate to 'Cell Volume'.

Press **ENTER** to select. The 'Cell Volume' screen is displayed.

Press the **UP** arrow key to increase the cell modem volume

or press the **DOWN** arrow key to decrease the cell modem volume.

0 is the lowest volume. 100 is the highest volume. 50 is the default volume

Press **ENTER** to save. You are returned to the 'Audio Menu'.
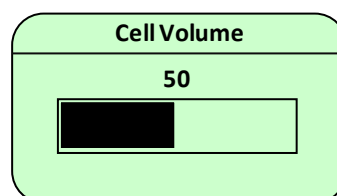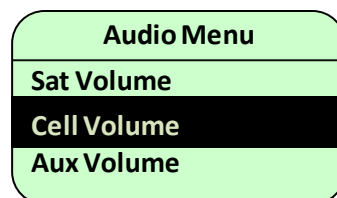
6.4.4 Setting cabin phone audio volume

This menu option will only appear in the Audio Menu if the Cabin Phone Installation Type on the Cabin Phone Configuration menu is set to 'Dialler/Cabin Phone'. Cabin Phone audio is sound from the Cabin POTS phone or dialler being received into the DZM. Audio from the cabin phone may be adjusted on the DZM.

Altering Cabin Phone audio volume on the DZM:

From the 'Audio Menu', use the arrow keys to navigate to 'Cabin Phone Vol'.

Press **ENTER** to select. The 'Cabin Phone Vol' screen is displayed.

Press the **UP** arrow key to increase the volume

or press the **DOWN** arrow key to decrease the volume.

0 is the lowest volume. 100 is the highest volume.

Press **ENTER** to save. You are returned to the 'Audio Menu'.

Audio Menu
Cell Volume
Cabin Phone Volume
Aux Volume

Cabin Phone Vol
50
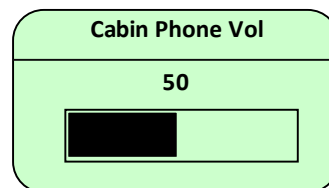
6.4.5 Setting auxiliary device audio volume

External audio devices (e.g. music players) may be connected to the aircraft or vehicle's intercom/interphone system (ICS) via the DZM2. (This facility is not available on the DZM3)..

This is dependent on provision being made for the connection of an external audio device by your engineers.

Altering the auxiliary volume:

From the 'Audio Menu', use the arrow keys to navigate to 'Aux Volume'.

Press **ENTER** to select. The 'Aux Volume' screen is displayed.

Press the **UP** arrow key to increase the auxiliary volume

or press the **DOWN** arrow key to decrease the auxiliary volume.

0 is the lowest volume. 100 is the highest volume. 22 is the default.

Press **ENTER** to save. You are returned to the 'Audio Menu'

Audio Menu
Aux Volume
Sat Mic Volume
Cell Mic Volume

Aux Volume
22
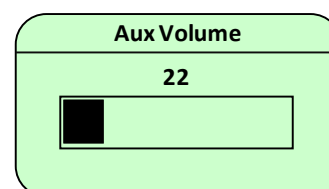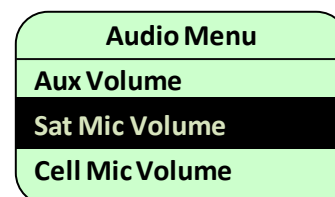
6.4.6 Isolating (muting) phones

Mute the audio between the DZM and connected cell modem and satellite phone using the Isolate Phones function.

When isolated, there is no audio output to the phones and incoming audio volume from the phones is muted.

Keypad tones (if enabled) and incoming audio from auxiliary audio devices are still audible.

Refer to "Switching keypad tones on and off" on page 88 for further information about keypad tones.

Refer to "Setting auxiliary device audio volume" on page 48 for further information about auxiliary audio devices.

STEP 1 - Isolating (muting) phones:

When in the 'Main Screen', press **ISOLATE** . **Phone Isolated** is displayed on the 'Main Screen' when phones are isolated.

When on a phone call you need to Press and hold **ISOLATE** to isolate phones.

> **Flightcell DZM2**
>
> SAT:Ready   ▂▃▄▅
> \>\>Phone Isolated
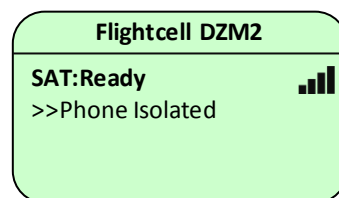
STEP 2 - Reinstating full phone audio:

From the 'Main Screen', press **ISOLATE** to reinstate full phone audio.

When on a phone call you need to Press and hold **ISOLATE** to reinstate phone audio.

6.5 Configuring keypad and display illumination

This section describes how common DZM settings may be configured using the 'Display Setup Menu' and the 'Setup menu'.

Refer to "Configuring other DZM advanced setup features" on page 90 for further information about configuring other advanced setup features.

6.5.1 Accessing the Display Setup Menu

To Access the Display Setup Menu:

Press **MENU** to enter the menu system. The 'Main Menu' is displayed.

Using the arrow keys, navigate to 'Display Setup Menu'.

Press **ENTER** to select. The 'Display Setup Menu' is displayed.
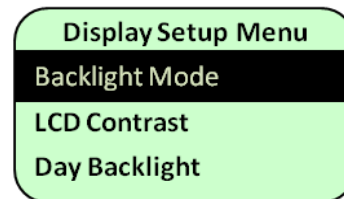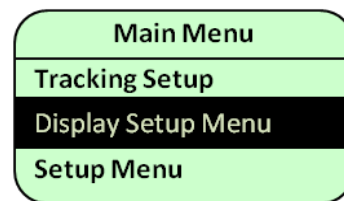
6.5.2 Setting LCD and keypad backlight mode

The DZM LCD display backlight brightness and the keypad backlight brightness may be adjusted. The backlight levels used depend upon the Backlight Mode setting. When the Backlight Mode is set to Day or Night mode, then the brightness levels used are the values set in the Day Backlight and Day Keypad Backlight or Night Backlight and Night Keypad Backlight settings.

If the Backlight Mode is set to use an external signal from the aircraft's instrument light control, then the brightness level will be dependent upon the value of the DC or AC input from an external source.

The DZM supports 0-5VAC and 0-28VDC external control signals.

From the 'Setup Menu', use the arrow keys to navigate to 'Backlight Mode.

Press **ENTER** to select. The 'Backlight Mode screen is displayed.

Using the arrow keys, navigate to the mode required (e.g. Day Mode).

The external options may be used when the DZM is connected to aircraft dimmer control. Alternatively, use the Day and Night options to set backlight brightness levels.

Press **ENTER** to save. You are returned to the 'Display Setup Menu'.

Scroll down the menu to see additional settings…..
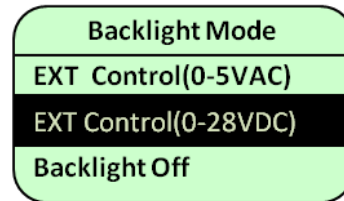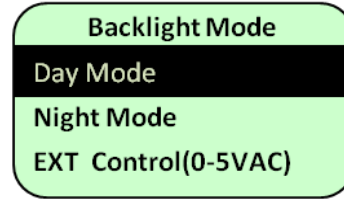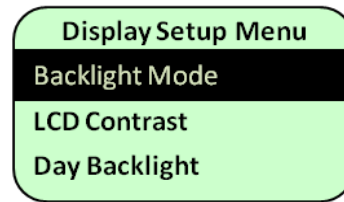
6.5.3 Setting LCD contrast

DZM LCD display contrast may be adjusted.

Setting LCD contrast:

From the 'Display Setup Menu', use the arrow keys to navigate to 'LCD Contrast'.

Press **ENTER** to select. The 'LCD Contrast' screen is displayed.

Press the **UP** arrow key to increase the contrast level.

or press the **DOWN** arrow key to decrease the contrast level.

0 is the lowest level. 100 is the highest level

Press **ENTER** to save. You are returned to the 'Display Setup Menu'.
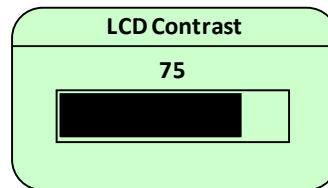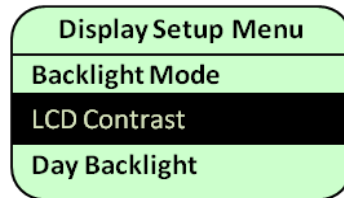
6.5.4 Setting LCD and Keypad day and night backlight brightness levels

The DZM LCD display backlight and keypad backlight levels may be customized. There are separate settings for both day and night mode for LCD and Keypad brightness levels (i.e. four settings). Which brightness levels are used is dependent upon the backlight mode setting.

Changing the Backlight Brightness Settings:

From the 'Setup Menu', use the arrow keys to navigate to 'Day Backlight', 'Night Backlight', 'Day Keypad Backlight' or 'Night Keypad B/light'.

Press **ENTER** to select the appropriate brightness setting. The 'Backlight' screen is displayed.

Press the **UP** arrow key to increase the brightness level.

or press the **DOWN** arrow key to decrease the brightness level.
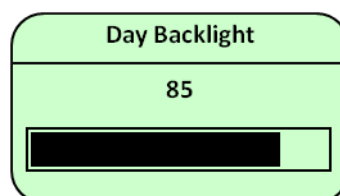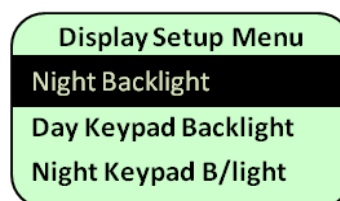
0 is the lowest level. 100 is the highest level. If you are changing a brightness setting that is being used by the current brightness mode (e.g. Day Backlight when mode is set to Day mode), then as you change the setting you will see the LCD or Keypad brightness change as you use the left and right arrow keys. If you are changing a setting that is not being used by the current mode (e.g. Night Backlight when the mode is set to Day mode), then you will not see any effect until you change the brightness mode to use that setting.

Press **ENTER** to save. You are returned to the 'Display Setup Menu'.

6.6 Disabling the cell modem (Flight Mode)

In some cases, the cell modem is only installed for use on the ground, and it is necessary to disable the modem when the aircraft is flying.

To disable the cell modem to put it into Flight Mode, Press and hold **DIAL CELL**. The Cell status will show 'Disabled' while this mode is in effect. All cellular messaging and calling options will be disabled until the cell modem is enabled again.

To enable the modem again, Press and hold **DIAL CELL**. In order to use the enable/disable function on the **DIAL CELL** key, this feature must be enabled via the Cell Flight Mode Fn setting under the Cell Port setup. See page 94 for further details on how to setup the cell modem.

7 FLIGHTCELL DZM ADVANCED SETUP GUIDE

Learn how to:

Configure advanced DZM settings not commonly requiring change by the pilot during flight

Configure your Iridium satellite transceiver

Configure your tracking service

Refer to "DZM operator's guide" on page 20 for further information about common DZM functions used by the pilot during flight.

7.1 Accessing restricted menus

Some DZM settings should only be altered by an authorized person. Protected settings can only be accessed when a security password has been entered.

Refer to "Updating Installer Menus password" on page 104 for further information about the Installer Password.

Refer to the "Menu Overview" on page 17 to see which settings are password protected.
Protected settings can be accessed by entering a password in the Installer Menus menu option

Using a password to access restricted menus :

Press **MENU** to enter the menu system. The 'Main Menu' is displayed.

Using the arrow keys, navigate to 'Setup Menu'.

Press **ENTER** to select. The 'Setup Menu' is displayed.

From the 'Setup Menu', use the arrow keys to navigate to 'Installer Menus'.

Press **ENTER** to select. The 'Installer Menus' screen is displayed.

Enter the Installer Password. The default password is 2468. Press **ENTER** to enter the password.

Refer to "Updating Installer Menus password" on page 104 for further information about the changing the password.

"Pin Invalid" will display when the incorrect password is entered.

If the correct password is entered, then the DZM will simply exit the menu system and return to the Main Screen. All Menus will now display additional installer options.

Password security is reset when the DZM is powered off.
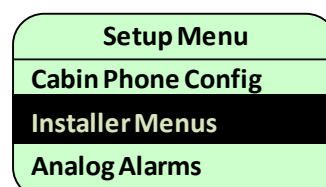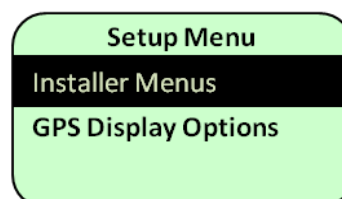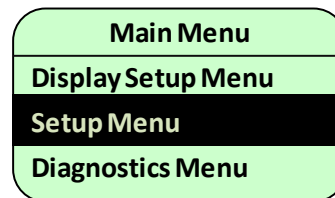
7.2 Configuring your Iridium satellite phone

If you have a DZM2 with satellite phone, this section describes how to carry out initial configuration of your phone handset.

7.2.1 Overriding satellite phone antenna lock

Some early versions of the Iridium satellite phone will not work unless the antenna is locked in the 10 o'clock or 2 o'clock position. If you receive an antenna alert when the satellite phone handset is installed in the Iridium phone cradle, you will need to override this antenna lock.

Overriding the antenna lock:

Enter the code ***#92#** into the satellite phone. "ANTENNA ALERT OFF" is displayed.

Power the satellite phone off and re-start for the override code to take effect. Once the satellite phone has been powered-on again it will not require the antenna to be rotated.

For the 9505 satellite phone, the override code operates in handsets operating firmware version LAC0307. For the 9505A satellite phone, the override code operates in handsets operating firmware versions LAC0307, ISO5004 or ISO6004. Enter the code ***#91#** to identify the firmware version of your Iridium satellite phone handset.

Refer to "Configuring GPS tracking" on page 56 for further information about important settings that need to be configured before Position reports will be transmitted.

7.2.2 Disabling the satellite phone's power-on PIN request

Iridium SIMs are typically shipped configured so that a PIN is required at power-on. This facility should be disabled.

On power up, the DZM will attempt to configure the SAT device and will detect if the SIM is locked. If a PIN is required, the DZM will display a SIM PIN prompt screen. The operator can then enter the PIN and press Enter to unlock the SIM. If the PIN entered is correct, then the initialisation of the SAT device will continue and the SIM lock will be disabled so that subsequent power cycles will not require the user to enter the PIN again.

If using a DZM2, the SIM PIN can also be entered and the SIM lock disabled via the menus on the itself. Note that if the incorrect PIN is entered three times, the SIM will be permanently disabled and must be replaced!

7.3 Configuring GPS tracking

In order to use your DZM to track your aircraft, you need to configure both the DZM and the tracking service.

The DZM tracking system can be configured to suit the type of aircraft and operational requirements.

7.3.1 Configuring your tracking service and DZM

Refer to "Using GPS tracking" on page 30 for further information about using GPS tracking during flight.

Refer to "Enabling messaging modes" on page 56 for further information about SBD and SMS messaging.

TASK 1 - Set up your tracking service

Notify your tracking service provider of:

The **serial number** of your DZM. Refer to "Identifying firmware version and serial number" on page 42 for further information about how to identify the serial number of your DZM.

The **IMEI** (International Mobile Equipment Identity) of your satellite phone handset. This is a unique 16 digit number located on a sticker under the Iridium battery

Request from your tracking service provider:

The **satellite phone SMS destination address**

The **satellite phone SBD destination address**

The **cellular SMS destination address**

Refer to "Finding messaging destination addresses" on page 59 for messaging destination addresses for some known tracking providers.

TASK 2 - Set up your satellite network service

If you will be using SBD messaging to transmit position reports:

Notify your satellite network service provider of the **IMEI** of your satellite transceiver. If you have a DZM2 with an Iridium phone handset, this is a 16 digit number located on a sticker under the Iridium battery. If you have a DZM3, the IMEI is printed on the top of the DZM3.

Notify your satellite network service provider of the **satellite phone SBD destination address**. This should be provided by your tracking service provider or refer to "Finding messaging destination addresses" on page 59.

You will also need to agree a contract for the SBD service with your satellite network service provider.

If you will be using Iridium SMS messaging to transmit position reports:

Check your satellite network service provider supports SMS messaging

If you will only be using SMS messaging, you should also contract a bulk SMS message plan with your satellite network service provider to obtain discounted prices for SMS messages.

If you are only using SMS messaging on an occasional basis, it may not be necessary to contract a bulk SMS plan.

TASK 3 - Setting up your cellular network service

If you will be using a cellular modem to transmit position reports:

Notify your cellular service provider of the **phone number** of your cellular modem

You will also need to contract a bulk SMS message plan with your cellular network provider

TASK 4 - Set up your Iridium satellite phone handset

If you will be using an Iridium 9505 satellite phone to transmit position reports (this step is not necessary for a 9505A, 9555 or 9575 phone):

Check that the **satellite phone service centre number** has been loaded into your satellite phone handset. Refer to "Configuring your Iridium satellite phone" on page 53 for further information about configuring the satellite phone service centre number.

Ensure the **antenna override** is activated on your satellite phone handset. Refer to "Overriding satellite phone antenna lock" on page 53 for further information about how to override the antenna lock.

TASK 5 - Set up your DZM:

Ensure the satellite phone is connected	If the DZM display does not show a status line **SAT:**..., then it must be configured for a satellite transceiver (see page 92).
Set **satellite messaging destination**	To send data over the satellite network, the destination address must be specified (page 59).
Set **cellular modem type**	To send audio or data over the cellular network, the type of cellular modem connected to the DZM must be specified (page 93).
Set **cellular messaging destination**	To send data over the cellular network, the recipient destination must be specified (page 60).
Set **preferred messaging device** or disabling unnecessary devices	Where both satellite and cellular devices are configured, you may specify a preferred device to be used by the DZM (page 58).
Set **messaging mode**	Position reports may be transmitted using different messaging modes. A messaging mode needs to be configured to send Position reports (page 56).
Set **message size**	When transmitting position reports using SBD messaging mode, the level of details included within each message may be defined (page 80).

By connecting your DZM to a laptop computer running DZM Manager utility, these settings may be very quickly and easily configured. The DZM Manager utility and manual can be loaded from the support page on the Flightcell website.

> ⚠ The following GPS settings have a dramatic effect on the way your Flightcell DZM operates. Adjust GPS settings only with extreme caution.

7.3.2 Accessing the Tracking Setup Menu

Tracking settings are configured using the 'Tracking Menu' on your DZM or by connecting your DZM to a laptop computer running DZM Manager utility software.
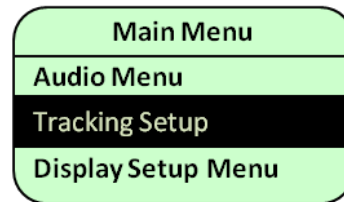
Accessing the Tracking Setup menu:

From the 'Main Screen', press **MENU** to enter the menu system. The 'Main Menu' is displayed.

Using the arrow keys, navigate to 'Tracking Setup'.

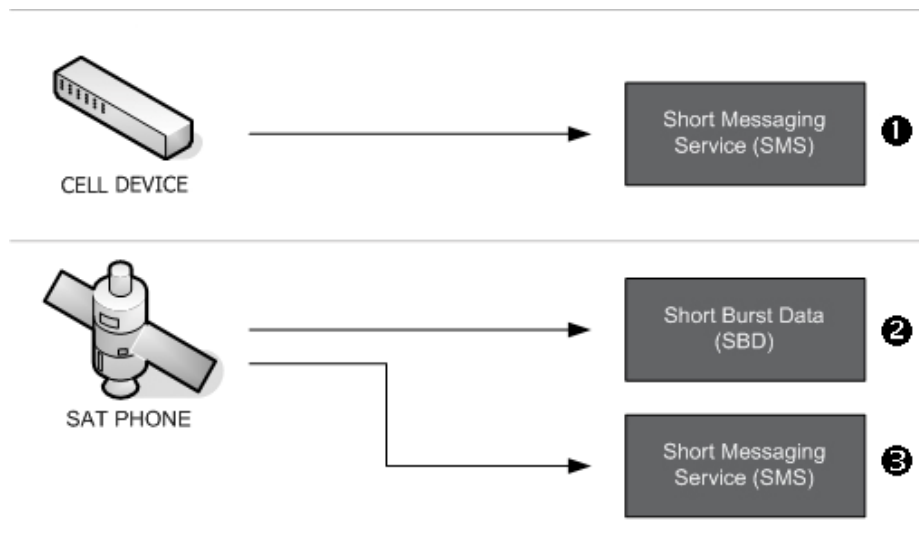Press **ENTER** to select. The 'Tracking Setup' sub-menu' is displayed.

If the Tracking Setup Menu is not visible, then this is because the installer setting 'Lock Tracking Menu' has been enabled to prevent unwanted user modification of the tracking settings. If this is the case, then the installer password must be entered via the Setup Menu to enable access to this menu. See the section on locking the Tracking Setup menu on page 83 for details on how to make the Tracking Menu only accessible to installers, or to change the setting to make the Tracking Setup Menu available to an ordinary user.

7.3.3 Enabling messaging modes

To transmit position reports using a satellite phone, messaging modes need to be configured. The diagram below shows the different messaging modes available on the DZM, listed in order of ascending cost.

Your Iridium satellite phone can use 2 different transmission modes to send data; Short Burst Data (SBD) and Short Message System (SMS). SBD is the default mode as it is usually clearer, faster and more economic than SMS. However, if you are only flying a small number of hours, SMS may be more economic.

Please confirm the most cost effective mode for your operation with your network service provider.

Setting up transmission via the satellite network:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'SBD Enable'.

Press **ENTER** to select. The 'SBD Enable' screen is displayed.

Using the arrow keys, navigate to the mode required (e.g. 'On').

Press **ENTER** to save. You are returned to the 'Setup Menu'.

SBD transmission cannot take place when the Iridium satellite phone is being used for a voice call. However, the DZM is configured to automatically revert to SMS transmission mode when a voice call is in progress.

If SBD transmission is disabled, all position data sent via your satellite phone will be transmitted by SMS.

Tracking Setup
Preferred Device
SBD Enable
SBD Message Size

SBD Enable
On
Off
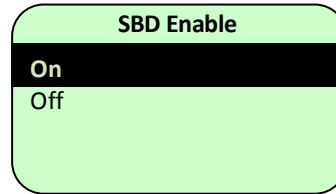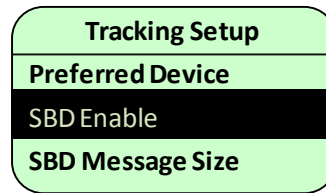
7.3.4 Setting preferred messaging device

The DZM transmits position report and custom flight information using SMS over the cellular network, or SMS or SBD messaging over the satellite phone network. Messages are queued and transmitted using a device with adequate signal strength. If both the satellite and cellular networks have adequate signal strength, the DZM will use the specified preferred device.

A minimum of three bars must be shown on the signal strength indicator on the 'Main Screen' for the DZM to attempt to transmit an SMS message via the cellular network.

The satellite phone activity indicator on the 'Main Screen' must be showing as active (▪▪▋) for the DZM to attempt to transmit a message via the preferred network.

Refer to "Configuring GPS tracking" on page 54 for further information about important settings that need to be configured before Position reports will be transmitted.

Refer to "Enabling messaging modes" on page 56 for further information about SBD and SMS messaging.

Specifying the preferred messaging device:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Preferred Device'.

Press **ENTER** to select. The 'Preferred Device' screen is displayed.

Using the arrow keys, navigate to the preferred device required (e.g. 'Sat Phone').

Press **ENTER** to save. You are returned to the 'Setup Menu'.

Tracking Setup
Cell Destination
Preferred Device
SBD Enable

Preferred Device
Sat Phone
Cell Phone
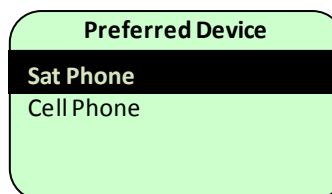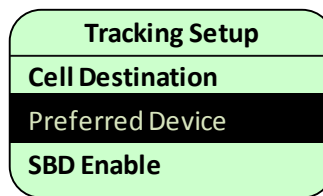
7.3.5 Configuring destination addresses for position report transmissions

7.3.5.1 Finding messaging destination addresses

The messaging destination addresses for some commonly known tracking providers are listed below. If your tracking service provider is not listed here, contact your provider directly to request the appropriate messaging destination addresses.

Tracking Provider	Cellular Network	Satellite Network	
	SMS Destination	**Iridium SMS Destination**	**Iridium SBD Destination**
Guardian Mobility	Not available	fc@bo.gways1.com	tcp.gways1.com:9100
TracPlus	New Zealand Telecom: - 027 5078043 Australia: - +61 427 767958	in@dzm.daestra.com	202.191.51.6:11001 202.191.51.158:11002
Flight Explorer (using SatCom Direct 3PDI)	Not available	fc@fdfmail.com	63.144.240.225:10800

7.3.5.2 Checking or editing satellite messaging destination

The recipient destination for position reports sent over the satellite network must be specified. This is critical to the delivery of tracking, mapping and other data to appropriate parties. Messages are usually sent to a central ground data server, which follows preconfigured rules to distribute any received data appropriately.

The satellite messaging destination can be set using the DZM Manager Utility. It can also be set or changed on the DZM, as specified below.

The DZM Manager utility and manual can be downloaded from the support page on the Flightcell website.

Your Iridium satellite phone can use 2 different transmission modes to send data; Short Burst Data (SBD) and Short Message System (SMS). Only the recipient destination for SMS messages may be specified from the DZM. Contact your satellite network service provider to configure the recipient destination for SBD messages.

Checking satellite phone messaging destination (SMS only):

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Sat Destination'.

Press **ENTER** to select. The 'Sat Destination' screen is displayed.

Use the arrow keys to enter the destination email address or phone number.

> Use the **UP** arrow key to scroll up letters, numbers and other characters in ascending order.
>
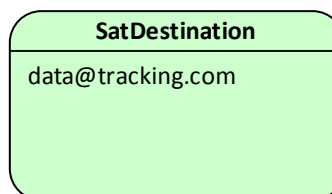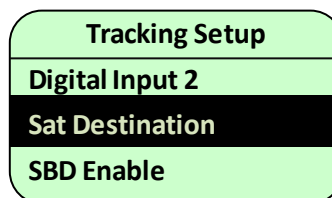> Use the **DOWN** arrow key to scroll down letters, numbers and other characters in descending order.
>
> Use the **RIGHT** arrow key to accept the last character and begin entering the next character.
>
> Use the **LEFT** arrow key to delete the last character when required.

The maximum length of specified email address is 21 characters. Email addresses are not case sensitive so may be entered using uppercase letters.

Press **ENTER** to save.

```
┌─────────────────────────┐
│     Tracking Setup      │
├─────────────────────────┤
│ Digital Input 2         │
│ Sat Destination         │
│ SBD Enable              │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│     SatDestination      │
├─────────────────────────┤
│ data@tracking.com       │
│                         │
│                         │
└─────────────────────────┘
```

7.3.5.3 Checking or editing cellular messaging destination

If the cellular network is used for sending position reports, the recipient destination must be specified. This is critical to the delivery of tracking, mapping and other data to appropriate parties. Messages are usually sent to a central ground data server, which follows preconfigured rules to distribute any received data appropriately.

The cellular messaging destination is set using the Cell Destination menu option on the DZM, as described below, or using the Flightcell DZM Manager utility. Details of the DZM Manager utility are provided in a separate manual.

The DZM currently supports WaveCom Xtend and Flightcell 3G cell modems. Cellular messages may be sent to other phones supported by the network provider. For users who have a cellular connection with Vodafone New Zealand, cellular messages may also be sent to an email address.

Specifying cellular messaging destination:

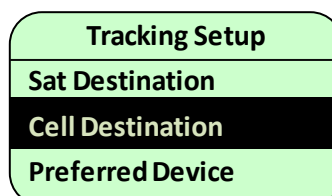From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Cell Destination'.

Press **ENTER** to select. The 'Cell Destination' screen is displayed.

Use the number keys to enter the destination phone number.
Press and hold the + key to enter the international dialling prefix.

Use **CANCEL** to delete the last digit in the number.

Press **ENTER** to save the phone number.

```
┌─────────────────────────┐
│     Tracking Setup      │
├─────────────────────────┤
│ Sat Destination         │
│ Cell Destination        │
│ Preferred Device        │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│     Cell Destination    │
├─────────────────────────┤
│ 0276717300              │
│                         │
│                         │
└─────────────────────────┘
```
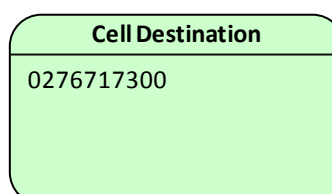
7.3.5.4 Setting SBD destination address

SBD destination address is normally configured on the Iridium server by your tracking service provider, not on the DZM or Iridium transceiver.

If you are using a service provider other than your normal tracking provider to supply the SBD service, they must be notified of your tracking provider's SBD address.

7.3.6 Setting GPS display options

You may set your current position report to display at all times at the top of the DZM 'Main Screen'. By default, onscreen position report is switched off unless manually overridden.

Setting GPS display options:

> From the 'Tracking Setup' menu, use the arrow keys to navigate to 'GPS Display Options'.
>
> Press **ENTER** to select. The 'GPS Display Options' screen is displayed.
>
> Using the arrow keys, navigate to the GPS display option required:
>
> > **Off** switches onscreen position report display off.
> >
> > **dddmm.mmmm** sets onscreen position report display to degrees and minutes (to 4 decimal points).
> >
> > **dd°mm'ss.s"** sets onscreen position report display to degrees, minutes and seconds.
> >
> > **Speed and Heading** sets onscreen position report display to knots and degrees relative to true north (rather than magnetic north) format.
>
> "No GPS Lock" is displayed on the 'Main Screen' if the DZM does not have a valid GPS lock.
>
> > Press **ENTER** to save.

Setup Menu
Installer Menus
GPS Display Options

GPS Display Options
Off
ddmm.mmmm
Dd"mm'ss.s'
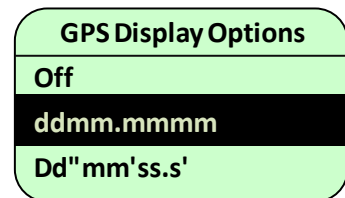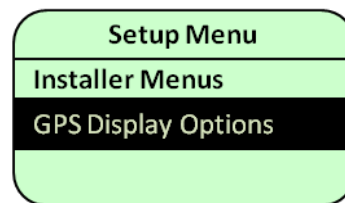
7.3.7 Enabling and configuring manual GPS reports

Using the DZM, your current position report may be manually transmitted to your tracking provider.

Refer to "Configuring GPS tracking" on page 54 for further information about important settings that need to be configured before Position reports will be transmitted.

Refer to "Manually transmitting your current position" on page 31 for further information about how to send manual position reports.

Enabling manual transmission of position report:

From the 'Tracking Setup' menu, use the arrow keys to navigate to Manual Position.

Press **ENTER** to select. The 'Manual Position' screen is displayed.

Tracking Setup
On Ground Timer
Manual Position
Low Speed
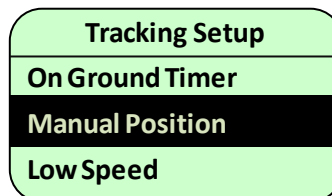
Using the arrow keys, navigate to the manual sending mode required:

Pos with Text Msg means that a preconfigured message may be sent with the position report

Pos with Token means that message codes may be sent with the position report.

Position Only means only the position report is transmitted when the **MARK** key is pressed.

Disabled disables manual position reporting on the DZM.

Manual Position
Pos with Text Msg
Pos with Token
Position Only
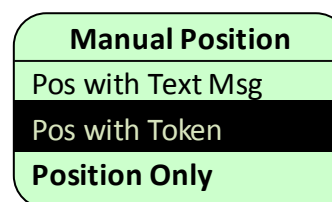
7.3.8 Enabling, disabling and suspending automated GPS tracking

You may define whether or not automated GPS tracking may be used on the aircraft or vehicle. By default, GPS tracking is enabled unless manually overridden.

Refer to "Configuring GPS tracking" on page 54 for further information about important settings that need to be configured before Position reports will be transmitted.

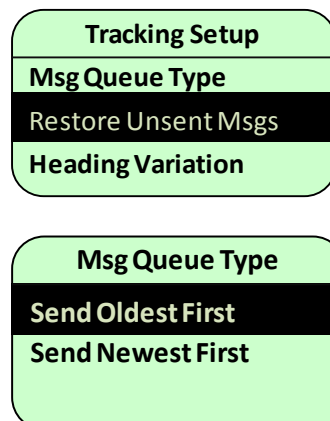Enabling, disabling or suspending GPS tracking:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Enable/Disable'.

Press **ENTER** to select. The 'Enable/Disable' screen is displayed.

Using the arrow keys, navigate to the GPS tracking setting required:

Tracking On enables GPS tracking to be used.

Tracking Suspend disables GPS tracking for the current flight only. GPS will automatically be re-enabled when the DZM is next powered up.

Tracking Off disables GPS tracking until it is manually re-enabled.

Press **ENTER** to save.

```
┌─────────────────────────┐
│   Tracking Setup Menu    │
├─────────────────────────┤
│   Enable/Disable         │
│   Msg Queue Size         │
│   Msg Queue Type         │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│      Enable/Disable      │
├─────────────────────────┤
│   Tracking On            │
│   Tracking Suspend       │
│   Tracking Off           │
└─────────────────────────┘
```
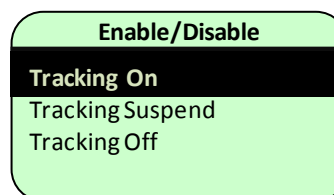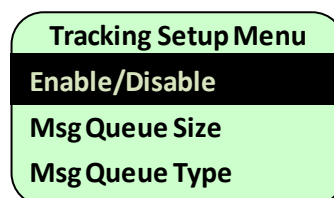
7.3.9 Managing the message queue

7.3.9.1 Configuring message queuing to store messages when the network is unavailable

The DZM's smart tracking system is designed to ensure that position reports are successfully delivered even if network coverage is interrupted. This may happen, for example, if the aircraft is flying amongst mountains and cannot maintain continuous contact with the cellular or satellite networks.

All messages are placed in a queue when they are created. The DZM will then attempt to send any queued messages:

If a cellular modem is selected as the primary device for sending messages, the DZM will first attempt to transmit over the cell network.

If the cellular network is unavailable, it will then revert to Iridium.

If SBD is activated as the primary means of sending messages via the Iridium network, the DZM will transmit by SBD.

If the Iridium phone is in use for a voice call (and hence SBD is not available) the DZM will send the message by SMS.

If the message cannot be transmitted by Iridium (for example when the signal is temporarily lost), the DZM will alternate between attempting to send via the cell modem and the Iridium phone until the message is

successfully sent. When all methods of transmission are unavailable, unsent messages will remain in the queue and will be sent when contact with the cell or Iridium network is regained.

The DZM can be configured to either delete or retain unsent messages when the aircraft is powered up; in the latter case these messages will be added to the message queue when the aircraft is next powered up and will be sent as soon as cell or satellite network coverage is available. This is valuable when the DZM position reports are used for flight time monitoring or track monitoring.

7.3.9.2   Message priority

Different message types are given different priorities:

Manual position reports are high priority

Standard position reports are normal priority

Text messages are low priority.

Queued messages are sent according to this priority order.

If the number of queued messages exceeds the configured queue length, then the oldest standard position report is deleted as new messages are added.

If a text message is queued but cannot be sent, it will expire after 15 minutes and will be removed from the queue. The DZM will beep three times and display the popup 'Message Lost / Failed to Send / Text Message'. If an unsent position report is removed from the queue due to the message queue overflowing, then the DZM will beep once (if GPS tones switched on) and display a message. 'Message Queued / by Overwriting / Oldest Message'.

7.3.9.3   Cancelling queued messages

Queued messages may be deleted if it is no longer necessary for them to be transmitted. See page 37 for more details on how to cancel queued messages.

7.3.9.4 Configuring the DZM to send queued messages when the aircraft restarts

The DZM can be configured so that queued messages that remain unsent when the aircraft powers down are transmitted when the aircraft restarts.

NOTE! Messages can only be restored within 24 hours of the time when they were created.

Configuring the DZM to send queued messages when the aircraft restarts:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Restore Unsent Messages'.

Press **ENTER** to select. The 'Restore Unsent Messages' screen is displayed.

Use the **UP** or **DOWN** arrow keys to select On or Off.

Press **ENTER** to confirm selection.

```
  Tracking Setup
Msg Queue Type
Restore Unsent Msgs
Heading Variation
```

```
  Restore Unsent Msgs
On
Off
```
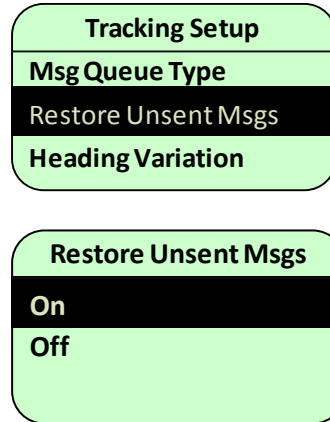
7.3.9.5 Setting the order in which queued messages are transmitted

The DZM can be configured to send the oldest queued message first, or the newest queued message first. The queuing method chosen should be appropriate for the tracking provider. Not all tracking providers can accommodate position reports being sent out of order, in which case, 'oldest message first' should be selected. Using the 'newest message first' method ensures that the most recently created position reports will be sent immediately. Any queued messages will then be sent and cleared from the queue until a more recent position report is created.

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Msg Queue Type'.

Press **ENTER** to select. The 'Msg Queue Type' screen is displayed.

Press **ENTER** to select. The 'Msg Queue Type' screen is displayed.

Use the **UP** or **DOWN** arrow keys to select the preferred option.

Press **ENTER** to confirm selection.

```
  Tracking Setup
Msg Queue Type
Restore Unsent Msgs
Heading Variation
```

```
  Msg Queue Type
Send Oldest First
Send Newest First
```

7.3.9.6 Setting the size of the message queue

The maximum number of messages that may be stored in the DZM message queue can be configured from 1 to 50 if using the 'Send Newest First' setting, or 1 - 20 if using the 'Send Oldest First' setting.

Setting the size of the message queue:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Msg Queue Size'.

Press **ENTER** to select. The 'Msg Queue Size' screen is displayed.

Tracking Setup
Enable/Disable
Msg Queue Size
Msg Queue Type
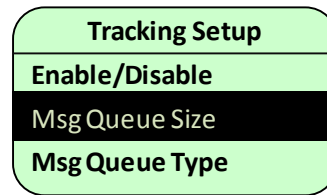
Press the **RIGHT** arrow key to increase the queue size,

or press the **LEFT** arrow key to decrease the queue size.

Press **ENTER** to select and save. You are returned to the 'Tracking Setup' sub-menu.

Msg Queue Size
15
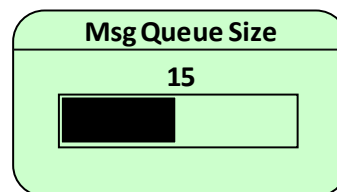
7.3.10　Configuring automatic position transmission during flight

7.3.10.1 Configuring the DZM to transmit regular position reports

The DZM can be set to automatically transmit the current position report to your tracking provider at specified time intervals during a flight. Position reports can also be transmitted at intervals when the aircraft is on the ground – see page 75 for further details.

Enabling automated transmission of Position reports based on periodic time interval:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Periodic Timer'.

Press **ENTER** to select. The 'Periodic Timer' screen is displayed.

Press the **RIGHT** <u>or</u> the **LEFT** arrow key to increase or decrease the automated time interval.

The 'Periodic Timer' may be set between 0 to 60 minutes. The default is 4 minutes. To disable automatic position report, decrease the time interval to 0. This will default to 'Disabled'. When disabled, the DZM will not automatically transmit Position reports.

Press **ENTER** to save. You are returned to the 'Tracking Setup' sub-menu.

Automatic position report occurs the defined number of minutes after the last position report. If the last transmission was sent using manual transmission, the next automated transmission will occur the defined number of minutes after the manual transmission was sent.

```
      Tracking Setup
   Heading Timer
   Periodic Timer
   On Ground Timer
```

```
      Periodic Timer
            4
   [█            ]
```
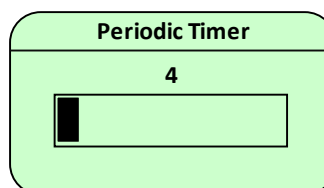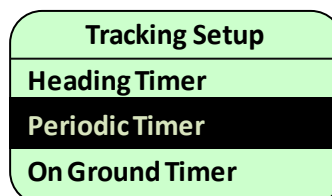
7.3.10.2 Configuring DZM position reporting when the aircraft is changing course

The DZM can be set to automatically transmit more frequent position reports to your tracking provider whenever the aircraft turns or changes heading. Two settings are configured to enable this feature:

Heading Variation

Heading Timer

'Heading Variation' is the change (in degrees) by which the aircraft's heading must vary in order to trigger an automated course change position report. For example, if the 'Heading Variation' is set to 10 degrees, any heading changes less than 10 degrees will not generate an automated position report.

Setting Heading Variation:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Heading Variation'.

Press **ENTER** to select. The 'Heading Variation' screen is displayed.

Press the **RIGHT** arrow key to increase the heading variation angle.

or press the **LEFT** arrow key to decrease the heading variation angle.

Heading Variation may be set between 2 and 90 degrees. The default is 10 degrees.

Press **ENTER** to select and save. You are returned to the 'Tracking Setup' sub-menu.

Tracking Setup
Restore Unsent Msgs
Heading Variation
Heading Timer

Heading Variation
10
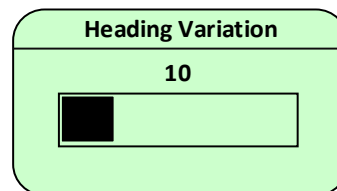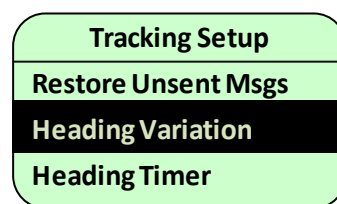
The 'Heading Timer' defines how soon after each heading change the next position report transmission will be automatically transmitted. For example, an aircraft that is circling is constantly changing heading, so the time period between automated position reports may be defined using the 'Heading Timer'.

Setting the Heading Timer:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Heading Timer'.

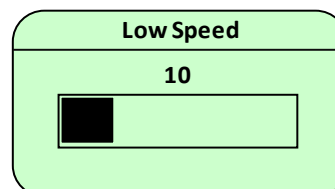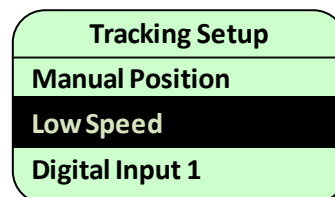Press **ENTER** to select. The 'Heading Timer' screen is displayed.

Press the **UP** arrow key to increase the automated heading variation time interval, <u>or</u> press the **DOWN** arrow key to decrease the automated heading variation time interval.

The 'Heading Timer' may be set between 0 to 60 minutes. The default is 2 minutes. To disable automatic heading change position report, decrease the heading variation time interval to 0. This will default to 'Disabled'. When disabled, the DZM will not automatically transmit Position reports on heading change.

Press **ENTER** to select and save. You are returned to the 'Tracking Setup' sub-menu.

Tracking Setup
Heading Variation
Heading Timer
Periodic Timer

Heading Timer
2
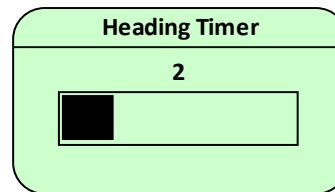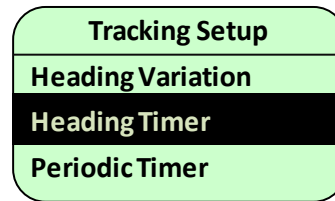
7.3.11   Configuring the DZM to report takeoff and landing

The DZM can be configured to send takeoff and landing event reports at the start and end (respectively) of each flight.

The simplest approach is to use aircraft speed to trigger takeoff 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 takeoff and landing reports when hovering.

Ideally, helicopters would use a connection to a collective switch or squat (also known as a wheels on ground or weight on wheels) switch to activate these reports.

Note: Manual position reports will be transmitted regardless of 'Collective Switch' settings. This allows positions to be marked while on the ground or hovering in a helicopter.

7.3.11.1 Reporting takeoff and landing based on aircraft speed

A speed threshold can be used to trigger takeoff and landing reports.

When aircraft speed increases above this threshold it transmits a take-off position report. When aircraft speed drops below this threshold it transmits a landing position report.

If this method is used for helicopters, the 'Low Speed' setting should be set as low as possible to ensure automated position reports continue to occur when there are small changes in speed while hovering. However, it is recommended that the DZM 'Collective Switch' or 'Squat Switch' functions are used to trigger helicopter take-off and landing reports.

Note: Regular position reports will not be sent when the aircraft's ground speed is less than the specified 'Low Speed' limit, unless the DZM is configured to send position reports when the aircraft is still on the ground (page 75).

Setting the Low Speed Limit:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Low Speed'.

Press **ENTER** to select. The 'Low Speed' screen is displayed.

Press the **RIGHT** arrow key to increase the low speed limit.

<u>or</u> press the **LEFT** arrow key to decrease the low speed limit.

The 'Low Speed' limit may be set between 5 and 100 knots. The default is 10 knots. To disable, decrease the 'Low Speed' setting to 0. This will default to 'Disabled'. When disabled, the DZM will transmit Position reports even when stationary and will not register take-off and landings.

If the 'Collective Switch' is used to trigger take-off and landing information, the 'Low Speed' setting will be automatically set and cannot be disabled.

Press **ENTER** to save. You are returned to the 'Tracking Setup' sub-menu.

```
┌─────────────────────────┐
│     Tracking Setup      │
├─────────────────────────┤
│ Manual Position         │
│ Low Speed               │
│ Digital Input 1         │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│       Low Speed         │
│          10             │
│ ┌───┬─────────────────┐ │
│ │███│                 │ │
│ └───┴─────────────────┘ │
└─────────────────────────┘
```

7.3.11.2 Reporting takeoff and landing using collective switch information

If the DZM is configured to use the collective switch function, then a combination of collective switch state and speed is used to determine if the helicopter is in the air. The 'Low Speed' setting will be automatically set at 5 knots and cannot be disabled.

The DZM's collective switch configuration is set based on the position of the switch (open or closed) when the helicopter is on the ground.

The collective switch function can be implemented on either Digital Input 1 or Analog Input 2.

Note! Before you start it is useful to determine the current status of each of the external inputs.

Go to External Inputs on the Diagnostics Menu. This shows the current status of the digital and analog inputs. See page 42 for more information on using the Diagnostics Menu to check the status of the external inputs.

> Digital Input High will indicate the switch is open (or the circuit is not connected)
>
> Digital Input Low will indicate that the switch is closed
>
> Analog Input will indicate the voltage on the analog circuit as a percentage of 28 volts.

Note! The analog inputs provide for maximum and minimum voltage thresholds to be set. These thresholds can be found in the sub-menu for each analog input.

These are shown as percentages of the maximum voltage 28V.

The voltage value on the input must fall above the upper threshold, or below the lower threshold, for the relevant reading to be taken. Default values for the maximum and minimum thresholds are 70 and 10, respectively, but may be adjusted if necessary..

STEP 1 – Configuring the DZM for a collective switch:

> From the 'Tracking Setup' menu, use the arrow keys to navigate to the selected input – Digital Input 1 or Analog Input 2.
>
> Press **ENTER** to select. The input submenu is displayed.
>
> Using the arrow keys, navigate to 'Input Designation' and press **ENTER** to select.
>
> Using the arrow keys, navigate to 'Collective Switch' and press **ENTER** to select.

Tracking Setup
Digital Input 1
Digital Input 2
Analog Input 1

Digital Input 1
Input Designation
Input Configuration

| Input Designation |
|---|
| **Collective Switch** |
| **Squat Switch** |
| **Emergency Button** |
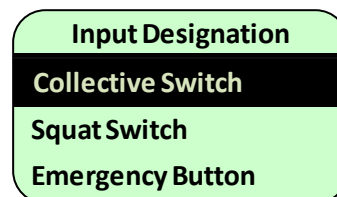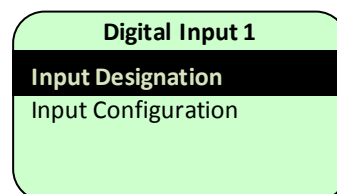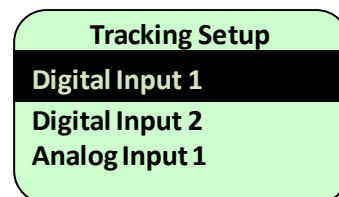
STEP 2 – Checking the existing collective switch configuration

The display will now show what the DZM interprets as the position of the collective.

If this is incorrect (e.g. if the display says Collective State **UP** when the collective is actually down) it will be necessary to change the collective switch configuration, as follows:

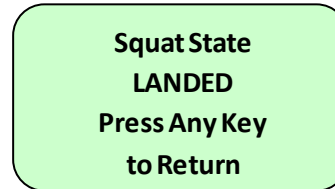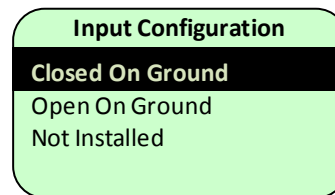Use the arrow keys to navigate to 'Input Configuration' and press **ENTER** to select.

> Collective State
> UP
> Press Any Key
> To Return

> **Digital Input 1**
> Input Designation
> **Input Configuration**
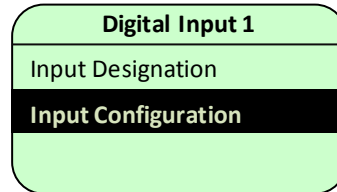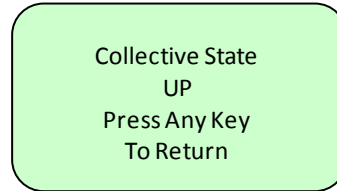
STEP 3 – Changing the collective switch configuration

If using Digital Input 1:

Using the arrow keys, navigate to the collective switch mode required.

> Select **Closed on Ground** if the collective switch is closed when the helicopter is on the ground.[1]

> Select **Open on Ground** if the collective switch is open when the helicopter is on the ground. This is the most common configuration of a collective switch.

> **Input Configuration**
> **Closed On Ground**
> Open On Ground
> Not Installed

> Collective State
> UP
> Press Any Key
> To Return
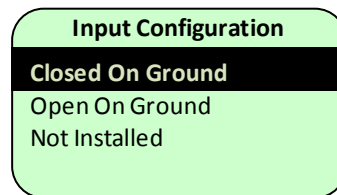
If using Analogue Input 2:

Using the arrow keys, navigate to the collective switch mode required.

> Select **Low on Ground** if the collective switch circuit provides a low voltage when the helicopter is on the ground.

> Select H**igh on Ground** if the collective switch circuit provides a high voltage when the helicopter is on the ground.

> Select **Not Installed** if the DZM is not connected to a collective switch.

Press **ENTER** to select. The display will show the current collective position.

---
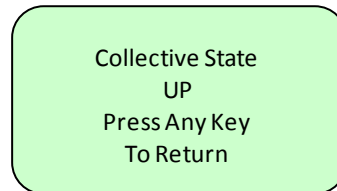
1 The digital input threshold is ~1.0V, i.e. the input must drop below 1V for the DZM to register a "Closed" event.

7.3.11.3 Reporting takeoff and landing using squat switch information

The DZM's squat switch configuration is set based on the position of the switch (open or closed) when the aircraft is on the ground.

The squat switch function can be implemented on either Digital Input 1 or Analog Input 2.

Note! Before you start it is useful to determine the current status of each of the external inputs.

Go to External Inputs on the Diagnostics Menu. This shows the current status of the digital and analog inputs. See page 42 for more information on using the Diagnostics Menu to check the status of the external inputs.

Digital Input High will indicate the switch is open (or the circuit is not connected)

Digital Input Low will indicate that the switch is closed

Analog Input will indicate the voltage on the analog circuit as a percentage of 28 volts.

STEP 1 – Configuring the DZM for a squat switch:

Tracking Setup
Digital Input 1
Digital Input 2
Analog Input 1

From the 'Tracking Setup' menu, use the arrow keys to navigate to the selected input – Digital Input 1 or Analog Input 2.

Press **ENTER** to select. The input submenu is displayed.

Digital Input 1
Input Designation
Input Configuration

Using the arrow keys, navigate to 'Input Designation' and press **ENTER** to select.

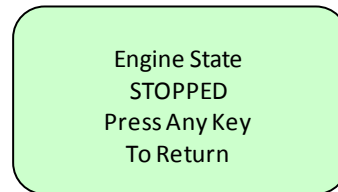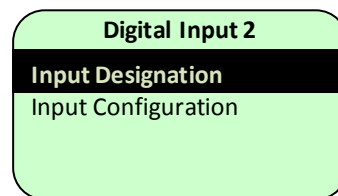Using the arrow keys, navigate to 'Squat Switch' and press **ENTER** to select.

Input Designation
Collective Switch
Squat Switch
Emergency Button
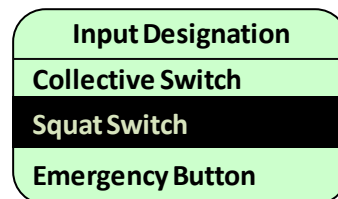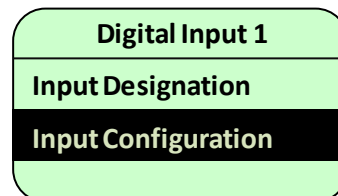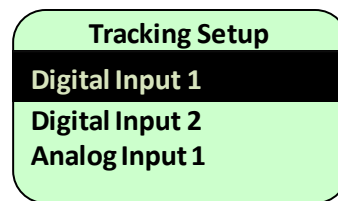
STEP 2 – Checking the existing squat switch configuration

The display will now show what the DZM interprets as the status of the aircraft.

If this is incorrect (e.g. if the display says Squat State AIRBORNE when the aircraft is on the ground) it will be necessary to change the squat switch configuration, as follows:

Use the arrow keys to navigate to 'Input Configuration' and press **ENTER** to select.

```
┌──────────────────────┐
│     Squat State      │
│      AIRBORNE        │
│    Press Any Key     │
│      to Return       │
└──────────────────────┘
```

```
┌──────────────────────┐
│   Digital Input 1    │
├──────────────────────┤
│  Input Designation   │
│ Input Configuration  │
│                      │
└──────────────────────┘
```
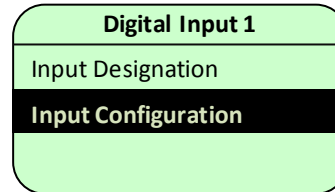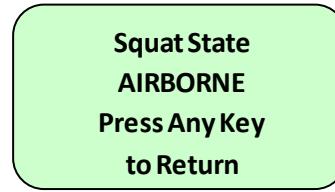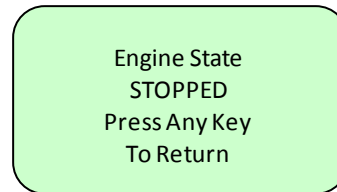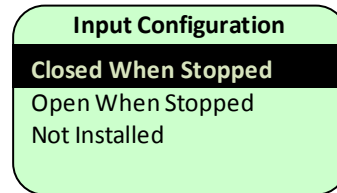
STEP 3 – Changing the squat switch configuration

If using Digital Input 1:

Using the arrow keys, navigate to the squat switch mode required.

Select **Closed on Ground** if the squat switch is closed when the helicopter is on the ground.[2]

Select **Open on Ground** if the squat switch is open when the helicopter is on the ground.

```
┌──────────────────────┐
│  Input Configuration │
├──────────────────────┤
│  Closed On Ground    │
│  Open On Ground      │
│  Not Installed       │
└──────────────────────┘
```

```
┌──────────────────────┐
│     Squat State      │
│       LANDED         │
│    Press Any Key     │
│      to Return       │
└──────────────────────┘
```

If using Analog Input 2:

Using the arrow keys, navigate to the squat switch mode required.

Select **Low on Ground** if the squat switch circuit provides a low voltage when the helicopter is on the ground.

Select **High on Ground** if the squat switch circuit provides a high voltage when the helicopter is on the ground.

Select **Not Installed** if the DZM is not connected to a squat switch.

Press **ENTER** to select. The display will show the current squat switch position.

---

[2] The digital input threshold is 1.0V, i.e. the input must drop below 1V for the DZM to register a "Closed" event.

7.3.12   Enabling position reporting while the aircraft is on the ground

If the DZM is configured to send takeoff and landing reports, standard periodic position reports will only be sent when the aircraft is airborne.

In some cases, operators may wish to send periodic position reports while the aircraft is powered on but still on the ground.

Enabling automated transmission of Position reports when the aircraft is on the ground:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'On Ground Periodic.

Press **ENTER** to select. The 'On Ground Periodic screen is displayed.

Press the **RIGHT** arrow key to increase the time interval.

or press the **LEFT** arrow key to decrease the time interval.

The 'On Ground Periodic Timer' may be set between 0 and 60 minutes. The default is disabled.

To disable automatic position report, decrease the time interval to 0. This will default to 'Disabled'. When disabled, the DZM will not automatically transmit Position reports while the aircraft is on the ground.

Press **ENTER** to save. You are returned to the 'Tracking Setup' sub-menu.

Tracking Setup
Periodic Timer
On Ground Periodic
Manual Position

On Ground Periodic
5
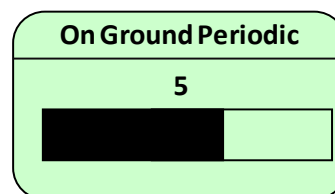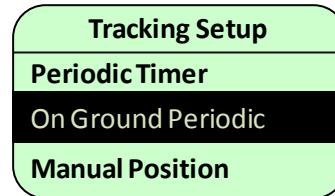
7.3.13 Enabling engine start and stop reports

The DZM can be configured to send an automatic position report when the engine starts and stops. This function can be implemented on either Digital Input 2 or Analog Input 1, connected to the aircraft oil pressure warning light pressure switch.

STEP 1 – Configuring the DZM for an oil pressure switch:

From the 'Tracking Setup' menu, use the arrow keys to navigate to the appropriate input.

Press **ENTER** to select. The input submenu is displayed.

Using the arrow keys, navigate to 'Input Designation' and press **ENTER** to select.

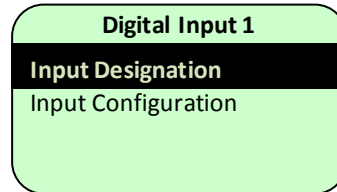Using the arrow keys, navigate to 'Oil Pressure Switch' and press **ENTER** to select.

```
┌──────────────────────┐
│   Tracking Setup      │
│ Digital Input 1       │
│ Digital Input 2       │
│ Analog Input 1        │
└──────────────────────┘
```

```
┌──────────────────────┐
│   Digital Input 2     │
│ Input Designation     │
│ Input Configuration   │
└──────────────────────┘
```

```
┌──────────────────────┐
│   Input Designation   │
│ Oil Pressure Switch   │
│ Input Disabled        │
└──────────────────────┘
```

The display will now show what the DZM interprets as engine status. If the engine status is incorrectly shown (e.g. the display shows that he engine is running when it is actually stopped) the configuration will need to be changed.

```
┌──────────────────────┐
│                       │
│    Engine State       │
│     STOPPED           │
│   Press Any Key       │
│    To Return          │
└──────────────────────┘
```

STEP 2 – Changing the existing oil pressure switch configuration

Press **CANCEL** to return to the input submenu.

Using the arrow keys to navigate to 'Input Configuration' and press **ENTER** to select.

```
┌──────────────────────┐
│   Digital Input 1     │
│ Input Designation     │
│ Input Configuration   │
└──────────────────────┘
```
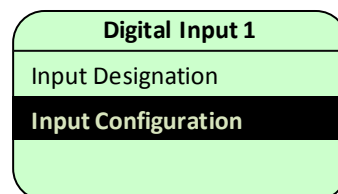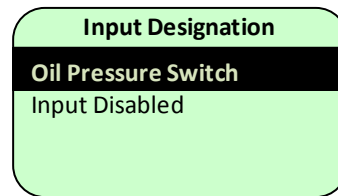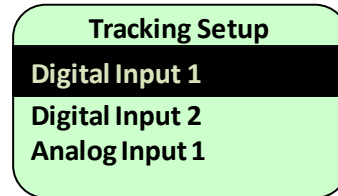
STEP 3 – Changing the oil pressure switch configuration

Digital Input 2:

Using the arrow keys, navigate to the oil pressure switch mode required.

> Select **Closed When Stopped** if the oil pressure switch is closed when the aircraft engine is stopped.[3]

> Select **Open When Stopped** if the oil pressure switch is open when the aircraft engine is stopped.

```
┌─────────────────────────┐
│   Input Configuration   │
├─────────────────────────┤
│ Closed When Stopped     │
│ Open When Stopped       │
│ Not Installed           │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│                         │
│      Engine State       │
│        STOPPED          │
│     Press Any Key       │
│       To Return         │
└─────────────────────────┘
```

Analog Input 1:

Using the arrow keys, navigate to the oil pressure switch mode required.

> Select **Low When Stopped** if the oil pressure switch circuit provides a low voltage when the aircraft engine is stopped.

> Select **High When Stopped** if the oil pressure switch circuit provides a high voltage when the aircraft engine is stopped.

> Select **Not Installed** if the DZM is not connected to an oil pressure switch.

Press **ENTER** to select. The display will show the current oil pressure switch state.

---

[3] The digital input threshold is 1.0V, i.e. the input must drop below 1V for the DZM to register a "Closed" event.

7.3.14   Configuring an emergency button

A distress switch can be installed in the aircraft cockpit (for example, on the cyclic in a helicopter), and interfaced to the DZM to enable the DZM's distress function to be activated quickly in an emergency.

STEP 1 – Configuring the DZM for a distress button:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Digital Input 1'.

Press the **ENTER** to select. The 'Digital Input 1' screen is displayed.

Using the arrow keys, navigate to 'Input Designation' and press **ENTER** to select.

Using the arrow keys, navigate to 'Distress button' and press **ENTER** to select.

Tracking Setup
Low Speed
Digital Input 1
Digital Input 2

Digital Input 1
Input Designation
Input Configuration

Input Designation
Collective Switch
Emergency Button
Input Disabled
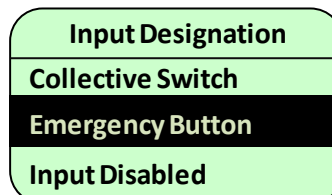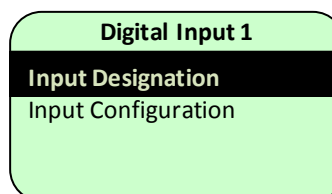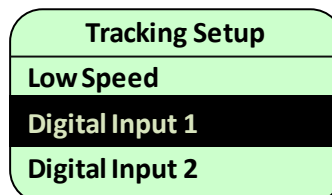
STEP 2 – Checking the distress button configuration

The display will now show what the DZM interprets as the state of the distress button.

If this is incorrect (e.g. if the display says Button State Pressed when the button is actually not pressed) it will be necessary to change the distress button configuration, as follows:

Use the arrow keys to navigate to 'Input Configuration' and press **ENTER** to select.

> Button State
> NOT PRESSED
> Press Any Key
> To Return

> **Digital Input 1**
> **Input Designation**
> Input Configuration

STEP 3 – Changing the distress button configuration

Using the arrow keys, navigate to the emergency switch mode required.

Select **Normally Closed** if the emergency button switch is closed when the button is not pressed.[4]

Select **Normally Open** if the emergency button switch is open when the button is not pressed. This is the most common configuration of an distress button switch.

Select **Not Installed** if an distress button is not installed.

Press to select. The display will show the current state of the distress button.

> **Input Configuration**
> **Normally Closed**
> **Normally Open**
> **Not Installed**

> Button State
> NOT PRESSED
> Press Any Key
> To Return

---
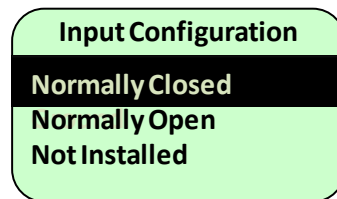
[4] The digital input threshold is 1.0V, i.e. the input must drop below 1V for the DZM to register a "Closed" event.

7.3.15 Setting the message size

When transmitting position report over the satellite network using Short Burst Data (SBD), you may specify the level of detail included within each message.

The DZM sends full position reports at programmed intervals. Between position reports it also records intermediate positions (known as breadcrumbs) that provide additional tracking information. Breadcrumbs may also be included as part of each normal position report.

SBD message size options:

The following SBD message size options are available:

Minimum Information – The current position report plus the previous 2 breadcrumbs will be transmitted.

Maximum Information – The current position report plus the previous 3 breadcrumbs will be transmitted.

By selecting 'Minimum Information' you should only be charged for the 30 byte minimum message charge by your satellite network provider. By selecting 'Maximum Information', each message will be approximately 32 bytes so will cost around 10% more to transmit.

Specifying SBD message size:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'SBD Message Size'.

Press **ENTER** to select. The 'SBD Message Size' screen is displayed.

Using the arrow keys, navigate to the mode required (e.g. 'Minimum' or 'Maximum').

Press **ENTER** to save. You are returned to the 'Setup Menu'.

Tracking Setup
Preferred Device
SBD Enable
SBD Message Size

SBD Message Size
Minimum
Maximum
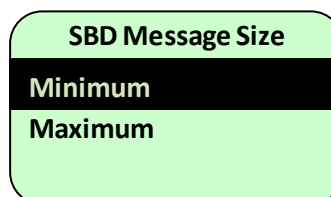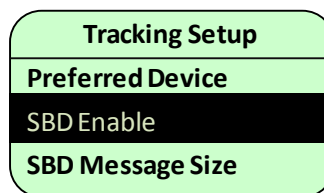
7.3.16　Sending GPS location upon power up

When power up messaging is enabled, the DZM will send the current GPS location of the aircraft as soon as it powers up and a GPS lock is obtained. If power up messaging is switched off, position reports will not begin until engine start or take-off.

Following the initial power up message being transmitted, tracking report transmission (depending on the GPS tracking settings confirmed on your DZM) will not commence until the aircraft starts moving, unless tracking on the ground is enabled (page 75).

The DZM records the time of power up, but only transmits the position once a GPS lock is obtained. Therefore, transmission may be delayed, but the time recorded in the power up message will accurately record when the aircraft was powered up.

Switching power up messaging on or off:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Power up Message'.

Press **ENTER** to select. The 'Power up Message' screen is displayed.

Using the arrow keys, select **Off** or **On**. Press **ENTER** to save. You are returned to the 'Tracking Setup' menu.
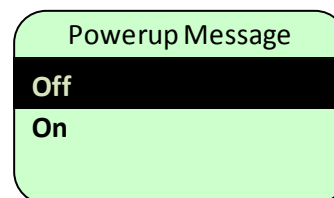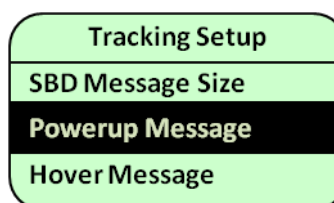
7.3.17   Configuring the Hover message

Certain tracking providers support the Hover position report message from the DZM. When this feature is enabled on the DZM, and if the aircraft is flying slower than 15 knots, position reports will be transmitted with a Hovering event code instead of a Regular event code at the periodic tracking timer interval. Additionally, when the hover message is enabled, Course Change events will be disabled if the aircraft is flying slower than 15 knots. Course Change events will be enabled automatically when the aircraft is flying faster than 15 knots.

Breadcrumbs may also be included as part of each hovering position report.

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Hover Message' menu option.

Press **ENTER** to select.

Using the arrow keys, select **On** or **Off**.

Press **ENTER** to save

<u>or</u> press **MENU** or **CANCEL** to abort the change
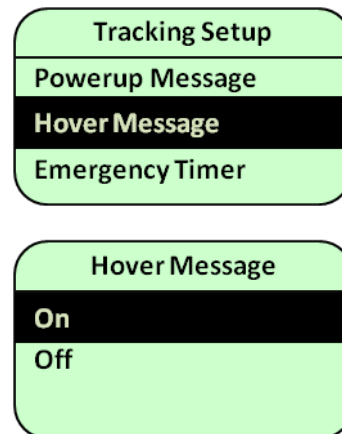
7.3.18   Setting time interval for distress messaging

You may define the time interval that distress (emergency) messages are transmitted by the DZM.

Setting the emergency timer:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Emergency Timer'.

Press **ENTER** to select. The 'Emergency Timer' screen is displayed.

Press the **RIGHT** arrow key to increase the time interval.

<u>or</u> press the LEFT arrow key to decrease the time interval.

The minimum time interval for the 'Emergency Timer' is 60 seconds.

Press **ENTER** to save. You are returned to the 'Tracking Setup' sub-menu.
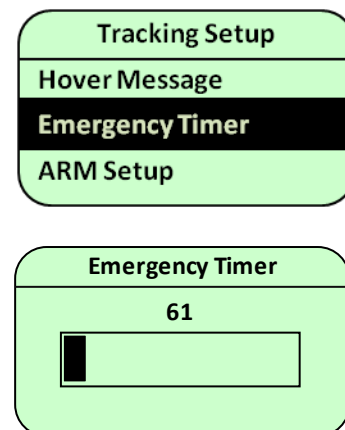
Refer to "Sending an emergency distress signal" on page 30 for further information about sending emergency distress and under fire alert signals.

7.3.19 Enabling and disabling Automated Rescue Monitoring (ARM/AFF)

You may define whether or not the Automated Rescue Monitoring (ARM/AFF) function may be used on the aircraft or vehicle. By default the ARM/AFF function is disabled.

Enabling and disabling ARM/AFF use:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'ARM Settings'.

Press **ENTER** to select. The 'ARM Settings' screen is displayed.

Using the arrow keys, select **On** or **Off**.

Press **ENTER** to save

<u>or</u> press **MENU** or **CANCEL** to abort the change
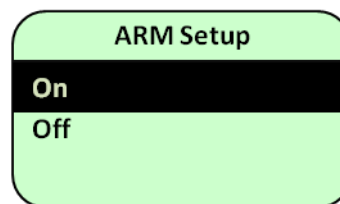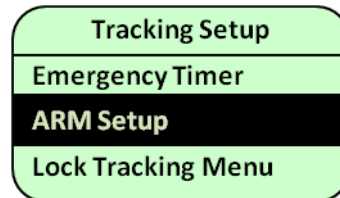
7.3.20 Locking the Tracking Setup Menu

It is desirable in some cases to make the tracking options more secure to prevent tampering by normal users. It is possible to remove the Tracking Setup menu completely from the main menu by configuring the Lock Tracking Menu setting. If the Lock Tracking Menu setting is enabled, then only installers will be able to view the Tracking Setup menu. You must first enable the installer menus. See page 52 for details.

Accessing the Lock Tracking Menu:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Lock Tracking Menu.

Press **ENTER** to select. The 'Lock Tracking Menu' screen is displayed.

Using the arrow keys, select **On** or **Off**.

Press **ENTER** to save

<u>or</u> press **MENU** or **CANCEL** keys to abort the change

NOTE! The DZM will need to be powered off and powered on again before the Tracking Menu is hidden.
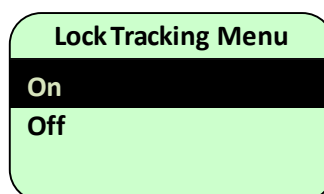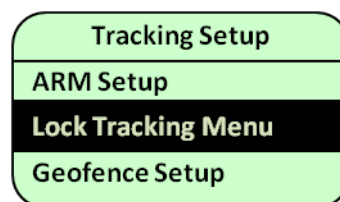
7.3.21 Geofence Suspend Setup

The geofence suspend feature allows you to temporarily suspend tracking within a specified area. The radius of this area is set up using this menu. The Radius setting specifies the geofence area radius in nautical miles (1NM = 1.852km).

The Geofence Mode setting determines the behaviour of the DZM whilst the aircraft is within the geofence area. The Geofence Mode setting can be configured to suspend all tracking messages (without events), or to suspend only periodic messages (with events) and allow events such as takeoff, landing, engine on, engine off, to still be reported whilst geofence suspend mode is active.

Geofence suspend mode is activated from the main screen by pressing and holding the **+** key. Once activated, the geofence area will be centered on the current position and normal tracking will be suspended whilst the aircraft remains within the geofence area. When the aircraft moves outside the geofence area, periodic tracking will resume automatically.

Note that once the aircraft has moved outside the geofence area, moving back within the geofence area will not automatically reactivate the geofence suspend mode. Geofence suspend mode can be reactivated by pressing and holding the + key.

The geofence area can be recentered by holding the + key while the aircraft is still within the geofence area.

7.3.21.1 Setting up geofence mode:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Geofence Setup'.

Press **ENTER** to select. The 'Geofence Setup' screen will be displayed.

Now select 'Geofence Mode' from the menu and press **ENTER** to modify the 'Geofence Mode' setting.

Using the arrow keys, modify the 'Geofence Mode' setting.

Press **ENTER** to save

or press **MENU** or **CANCEL** to abort the change
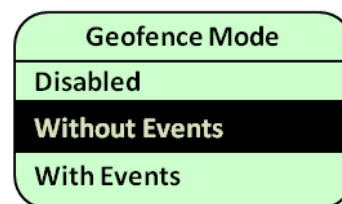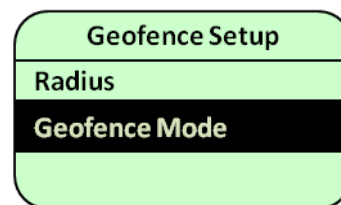
7.3.21.2 Setting up the geofence suspend radius:

From the 'Tracking Setup' menu, use the arrow keys to navigate to 'Geofence Setup'.

Press **ENTER** to select. The 'Geofence Setup' screen will be displayed.

Now press **ENTER** to modify the 'Radius' setting. The 'Radius' slider screen will be displayed.

Using the arrow keys, modify the radius setting.

Press **ENTER** to save

<u>or</u> press **MENU** or **CANCEL** to abort the change
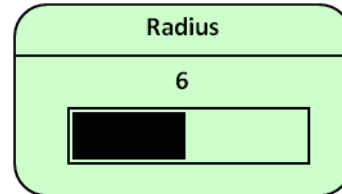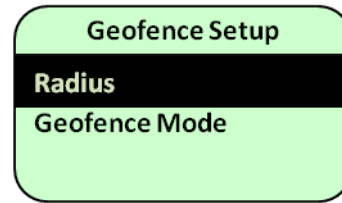
7.4 Configuring advanced audio settings

Various advanced audio settings may be adjusted for the DZM and connected devices. These are described in the following sub-sections.

Refer to "Controlling audio settings" on page 45 for further information about controlling basic audio settings during flight.

7.4.1 Setting satellite phone, cell modem and Cabin Phone MIC gain

Satellite, Cell and Cabin phone MIC gain is audio from the DZM going out to the connected phone or device. The phone MIC gain may be adjusted on the DZM.

> ⚠ The following MIC gain settings have a dramatic effect on the way your Flightcell DZM operates. Adjust MIC gain settings only with extreme caution.

Altering phone MIC gain on the DZM:

From the 'Audio Menu', use the arrow keys to navigate to the appropriate MIC gain setting.

Press **ENTER** to select. The MIC Gain screen is displayed.

Press the **RIGHT** arrow key to increase phone MIC gain.

<u>or</u> press the **LEFT** arrow key to decrease the MIC gain.

0 is the lowest volume. 100 is the highest volume.

Press **ENTER** to save. You are returned to the 'Audio Menu'.
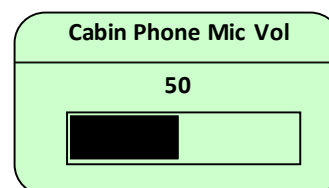
7.4.2 Setting DZM to ICS audio level

The audio level from the DZM being received into the intercom/interphone system (ICS) may be adjusted on the DZM.

> ⚠ The following ICS audio settings have a dramatic effect on the way your Flightcell DZM operates. Adjust ICS audio settings only with extreme caution.

Altering the DZM to ICS audio level on the DZM:

From the 'Audio Menu', use the arrow keys to navigate to 'ICS Level DZM --> ICS'.

Press **ENTER** o select. The 'ICS Level DZM --> ICS' screen is displayed.

Press the RIGHT arrow key to increase the audio level.

or press the LEFT arrow key to decrease the audio level.

0 is the lowest volume. 100 is the highest volume. 16 is the default volume.

Press **ENTER** to save. You are returned to the 'Audio Menu'.

Audio Menu
Cell Mic Gain
ICS Level DZM>ICS
ICS Level ICS>DZM

ICS Level DZM → ICS
16
▮
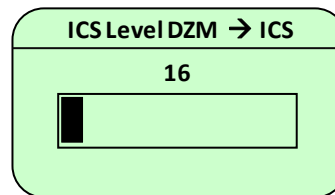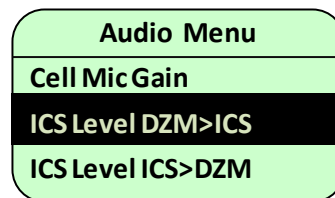
7.4.3 Setting ICS to DZM audio level

The audio level from the intercom/interphone system (ICS) going out to the DZM may be adjusted on the DZM.

⚠ The following ICS audio settings have a dramatic effect on the way your Flightcell DZM operates. Adjust ICS audio settings only with extreme caution.

Altering the ICS to DZM audio level on the DZM:

From the 'Audio Menu', use the arrow keys to navigate to 'ICS Level ICS --> DZM'.

Press **ENTER** to select. The 'ICS Level ICS --> DZM' screen is displayed.

Press the **RIGHT** arrow key to increase the audio level.

or press the **LEFT** arrow key to decrease the audio level.

0 is the lowest volume. 100 is the highest volume. 50 is the default volume.

Press **ENTER** to save. You are returned to the 'Audio Menu'.

Audio Menu
Cell Mic Gain
ICS Level DZM>ICS
ICS Level ICS>DZM

ICS Level ICS → DZM
50
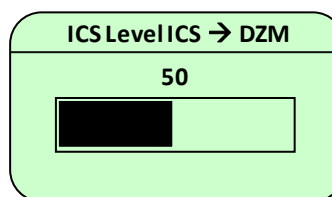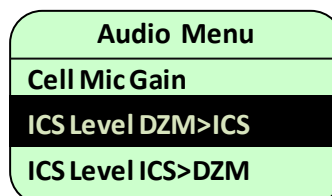
7.4.4 Setting DZM sidetone

When users wear a headset, they can hear their own voice in their headphones. The audio from their microphone is amplified and sent to the headphones. This is called sidetone. Sidetone is usually (but not always) provided by the audio panel or intercom/interphone (ICS).

Some installation configurations may require the DZM to provide sidetone. The DZM sidetone setting is used to enable or disable the DZM's sidetone. When ICS sidetone is 'On', audio received from the ICS into the DZM is passed back out to the ICS. It is recommended that ICS sidetone be activated where no sidetone is provided by an ICS, or if there is no ICS.
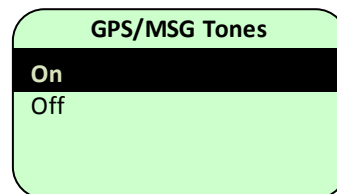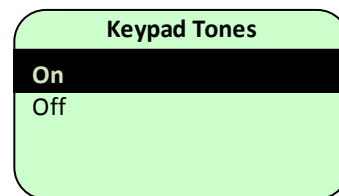
Switching DZM sidetone on or off:

From the 'Audio Menu', use the arrow keys to navigate to 'DZM Sidetone'.

Press **ENTER** to select. The 'DZM Sidetone' screen is displayed. Use the arrow keys to navigate to the DZM sidetone option required:

Off disables sidetone

When On Call provides sidetone only when the DZM is on an active call

Always On always provides sidetone

Press **ENTER** to select and save. The 'Audio Menu' is displayed.

The DZM sidetone is set to 'Always On' by default. This may cause excessive noise in some systems, so if sidetone is provided by the aircraft ICS during calls, it should be switched to 'Off'.

```
        Audio Menu
ICS Level DZM>ICS
DZM Sidetone
Mute When No Call
```

```
        DZM Sidetone
Off
When On Call
Always On
```
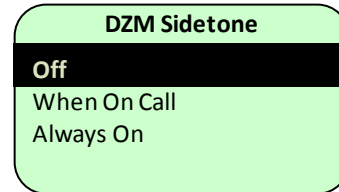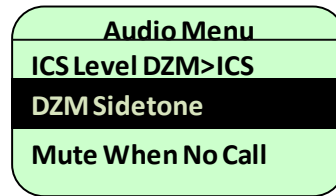
7.4.5 Switching GPS/MSG confirm tones on and off

The DZM can sound tones when position reports or messages are transmitted. These tones may be switched on or off as required.

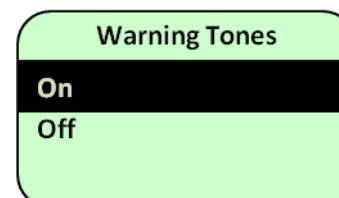Switching GPS/MSG confirm tones on and off:

From the 'Audio Menu', use the arrow keys to navigate to 'GPS/MSG Tones'.

Press **ENTER** to select. The 'GPS/MSG Tones' screen is displayed.

Use the arrow keys to select **Off** or **On**.

Press **ENTER** to save. You are returned to the 'Audio Menu'.

```
        Audio Menu
Mute When No Call
GPS/SMS Tones
Keypad Tones
```

```
        GPS/MSG Tones
On
Off
```

7.4.6 Switching keypad tones on and off

DZM keypad tones may be switched on or off as required. Keypad tones are the sounds that are emitted when keys on the DZM are pressed.

Turning keypad tones on and off:

From the 'Audio Menu, use the arrow keys to navigate to 'Keypad Tones'.

Press **ENTER** to select. The 'Keypad Tones' screen is displayed.

Use the arrow keys to select Off or On.

Press **ENTER** to save. You are returned to the 'Audio Menu'.

 is displayed

7.4.7 Switching Warning tones on and off

The DZM also sounds a number of other tones to denote specific events. These include

An incoming SMS message

A missed call

A message overwritten due to filling up the message queue

ARM still enabled on landing.

These types of events are categorised as warning tones.

Turning warning tones on and off:

From the 'Audio Menu, use the arrow keys to navigate to 'Warning Tones'.

Press **ENTER** to select. The 'Warning Tones' screen is displayed.

Use the arrow keys to select Off or On.

Press **ENTER** to save. You are returned to the 'Audio Menu'.

7.4.8 Switching the Ringing tone on and off

The DZM will normally emit a ringing tone when there is an incoming call. It is possible to disable this tone if, for example, your installation is using the cradle output for a ringing indication instead.

Turning the ringing tone on and off:

From the 'Audio Menu, use the arrow keys to navigate to 'Ringing Tone'.

Press **ENTER** to select. The 'Ringing Tone' screen is displayed.

Use the arrow keys to select Off or On.

Press **ENTER** to save. You are returned to the 'Audio Menu'.
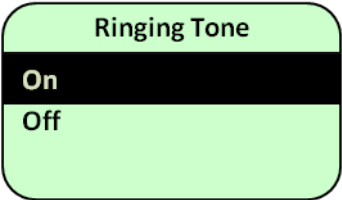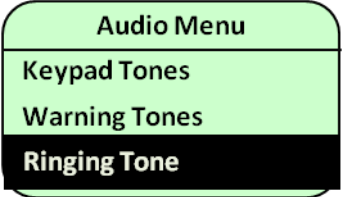
7.5 Configuring other Flightcell DZM advanced setup features

This section describes how more advanced DZM settings may be configured using the 'Setup Menu'.

Refer to "Using DZM common setup features" on page 49 for further information about configuring common setup features using the 'Setup Menu'.

7.5.1 Configuring power settings

7.5.1.1 Setting Auto Power On

When Auto Power On is switched on, the DZM switches on automatically when aircraft power is switched on.

The default setting for Auto Power On is 'On'.

Switching Auto Power on or off:

> From the 'Setup Menu', use the arrow keys to navigate to 'Auto Power On'.
>
> Press **ENTER** to select. The 'Auto Power On' screen is displayed.
>
> Using the arrow keys, navigate to the auto power mode required (e.g. 'On').
>
> Press **ENTER** to save. You are returned to the 'Setup Menu'.

Setup Menu
Auto Power On
Sat Phone
Cell Port
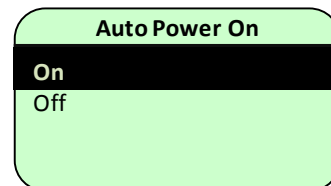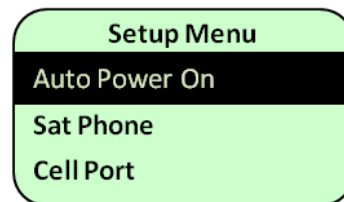
Auto Power On
On
Off

7.5.1.2 Disabling Manual Power Off

When Manual Power Off is switched off, the user will not be able to power down the DZM via the keypad.

The default setting for Manual Power Off is 'On'.

Switching Manual Power Off on or off:

> From the 'Setup Menu', use the arrow keys to navigate to 'Manual Power Off'.
>
> Press **ENTER** to select. The 'Manual Power Off' screen is displayed.
>
> Using the arrow keys, navigate to the mode required (e.g. 'On').
>
> Press **ENTER** to save. You are returned to the 'Setup Menu'.

Setup Menu
Auto Power On
Manual Power Off
Sat Phone

Manual Power Off
On
Off
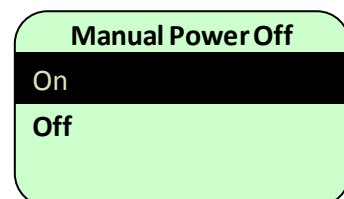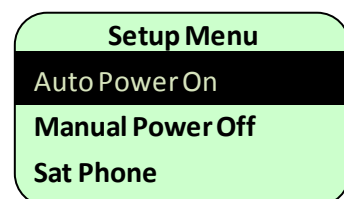
7.5.2 Configuring the DZM's transceivers

7.5.2.1 Configuring for a satellite transceiver

The DZM2 currently supports three models of Iridium phone and two models of Iridium modem:

Motorola 9505, Iridium 9505A or Iridium 9555 phones

Iridium 9522A or Iridium 9522B modems.

The DZM3 has an embedded 9522B modem.

The DZM automatically detects the phone or modem type and configures the appropriate settings for each phone.

The DZM2 currently supports Iridium 9505 and 9505A satellite phones with the latest firmware releases. For the 9505 model phone, the latest firmware version is LAC0307. For the 9505A model phone, firmware versions LAC0307, ISO5004 or ISO6004 may be operated. For the 9555 model phone, firmware version HT10001 or later is required.

To check the firmware version of 9505 and 9505A model phones: type ***#91#** into the phone. To check firmware version on the 9555 model phone: select **Menu** using the soft key, scroll down the menus and select **Setup**, then scroll down and select **Phone Information.** The firmware version is displayed.

Specifying satellite phone connection (or no satellite connection):

From the 'Setup Menu', use the arrow keys to navigate to 'Sat Phone'.

Press **ENTER** to select. The 'Sat Phone' screen is displayed.

Using the arrow keys, navigate to the connection option required (e.g. 'Not Connected' or 'Connected').

If the DZM is not connected to a supported satellite phone, select **Not Connected**.

Press **ENTER** to save. You are returned to the 'Setup Menu'.
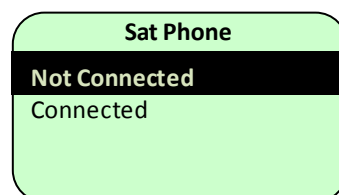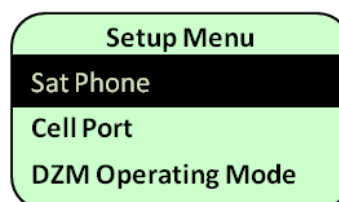
7.5.2.2 Configuring the DZM for a cell modem

To send audio and data over the cellular network, the type of cell modem connected to the DZM must be specified. The DZM currently supports Wavecom Xtend and Flightcell 3G cell modems. These cell modems can be supplied by Flightcell International.

The DZM cell modem port can also be configured to support an Iridium Fax adapter. To connect an Iridium Fax Adapter Device to the DZM, contact Flightcell International for details.

Specifying cell modem type (or no cellular connection):

From the 'Setup Menu', use the arrow keys to navigate to 'Cell Port'.

Press **ENTER** to select. The 'Cell Port' screen is displayed.

Select 'Connected Device' and press **ENTER** to select. The 'Connected Device' screen is displayed.

Using the arrow keys, navigate to the modem type connected (e.g. 'FC3G Modem').

If the DZM is not connected to a supported cell modem, select **No Data Connection**.

Press **ENTER** to save. You are returned to the 'Setup Menu'.

Setup Menu
Sat Phone
Cell Port
DZM Operating Mode

Cell Port
Connected Device
Cell Flight Mode Fn
Sat Data Activation

Connected Device
No Data Connection
FC3GM Modem
Wavecom Modem
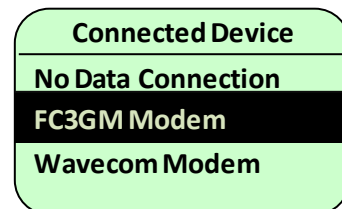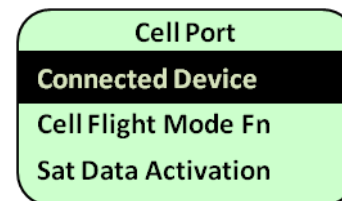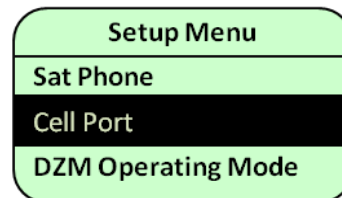
7.5.2.3 Selecting the frequency bands used by the cell modem

The Flightcell cell modem will automatically select the band on which it will operate. Typically it will select a 3G band if available, on the frequency provided by the contracted cell service provider, but drop down to GSM if 3G is not available.

Where dual 3G bands are available (e.g. 850MHz and 2100 MHz), it is sometimes the case in some areas that the modem will preferentially lock onto a particular band that has a poor signal and thus provides a poor connection, even when a more stable connection is available on the lower frequency band.

The DZM can be configured to restrict the modem to a preferred set of frequency bands in order to prevent the modem from locking onto a particular band. This feature can be configured using the **Network Bands** setting, which is only available via DZM Manager.

7.5.2.4 Cell modem Flight Mode

As part of the cell port setup, the DIAL CELL key can be configured to allow the operator to disable the cell modem for messages and calls (i.e. Flight Mode). Press and hold the Cell key to toggle the Cell Flight Mode function. Whilst Cell Flight Mode is active, cell status will display 'Disabled'. If the Cell Flight Mode feature is not required, set this setting to 'Disabled' (default setting). For non-master/remote configurations, set this setting to 'Enabled' . For master/remote configurations, this setting can allow you to configure whether the master, remote, or both units can activate the Cell Flight Mode function.

If using Cell Flight Mode, ensure that that the Preferred Device setting (via Tracking Menu) is not set to Cell Only, therwise, whilst the Cell modem is disabled, no tracking messages will be transmitted to the tracking provider.

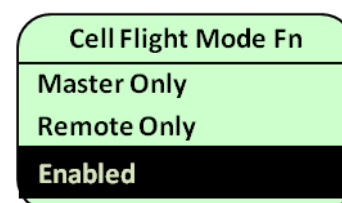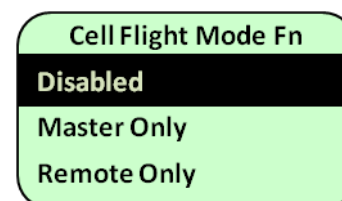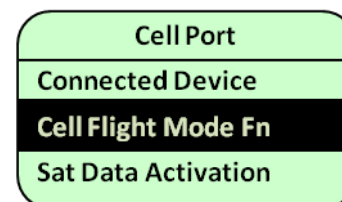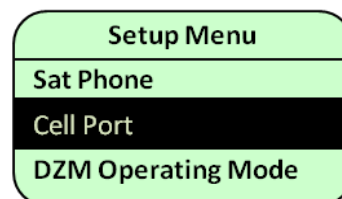Configuring the cell modem Flight Mode function:

From the 'Setup Menu', use the arrow keys to navigate to 'Cell Port'.

Press **ENTER** to select. The 'Cell Port' screen is displayed.

Select 'Cell Flight Mode Fn' and press **ENTER** to select. The 'Cell Flight Mode Fn' options screen will be displayed.

Using the arrow keys, navigate to the desired mode for the Cell key.

Press **ENTER** to save. You are returned to the 'Setup Menu'.

Setup Menu
Sat Phone
Cell Port
DZM Operating Mode

Cell Port
Connected Device
Cell Flight Mode Fn
Sat Data Activation

Cell Flight Mode Fn
Disabled
Master Only
Remote Only

Cell Flight Mode Fn
Master Only
Remote Only
Enabled

7.5.3 Configuring the cabin phone connection

The DZM has a SLIC (Subscriber Line Integrated Circuit) connection, which can be used for two functions:

To connect an optional corded or cordless phone handset in the passenger cabin of the aircraft

To connect a remote dialler in the cabin of the aircraft, allowing passengers connected to the ICS to dial a call on the DZM

In general, a telephone might be used where passengers would not normally wear a headset and/or where they might require the ability to make private calls. A dialler might be used where passengers/crew would normally wear a headset but might not be able to access the DZM itself to dial calls; in this case the calls would typically be audible by all personnel.

Setting the cabin phone connection:

From the 'Setup Menu', use the arrow keys to navigate to 'Cabin Phone Config'.
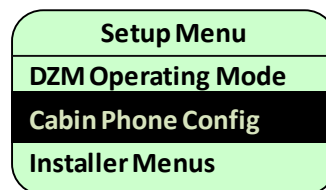
Press **ENTER** to select. The 'Cabin Phone Config' screen is displayed.

Using the arrow keys, navigate to the Installation Type menu option. Press **ENTER** to select. The 'Installation Type' screen is displayed.

Using the arrow keys, navigate to the cabin phone connection required (e.g. 'Not Connected', 'Dialler/Cabin Phone' or 'Dialler with ICS Audio').

Press **ENTER** to save. You are returned to the 'Main Screen'.

If 'Dialler/Cabin Phone' is selected, then additional Cabin Phone Volume and Mic Volume audio settings will now be available from the Audio Menu.

| **Setup Menu** |
| DZM Operating Mode |
| **Cabin Phone Config** |
| Installer Menus |

| **Cabin Phone Config** |
| Installation Type |
| **Line Cap Comp** |
| 2W Impedence Synth |

| **Cabin Phone Config** |
| Installation Type |
| Line Cap Comp |
| 2W Impedance Synth |
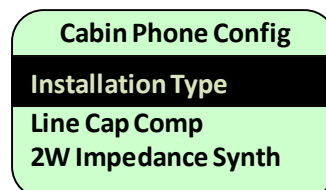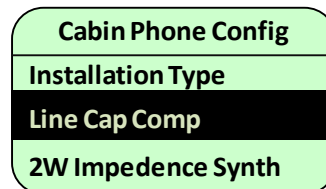
7.5.4 Setting up the variable backlight input

If the Backlight Mode setting (see page 49) is set to either 'EXT Control (0-5VAC)' or 'EXT Control (0-28VDC)', then the voltage level measured by the DZM on the variable backlight analog input will be used to determine the brightness. The analog input accepts voltages in the range 0 to 28V DC or 0-5V AC. It is possible to calibrate the brightness scale by calibrating a high and low brightness level for particular high and low input voltages. Once calibrated, the DZM will scale the brightness based on the two calibration levels.

Accessing the Variable Backlight calibration menu:

From the 'Display Setup Menu', use the arrow keys to navigate to 'Setup Var Backlight'.

Press **ENTER** to select. The 'Setup Var Backlight' menu is displayed.

Display Setup Menu
Day Keypad Backlight
Night Keypad B/light
Setup Var Backlight

Setup Var Backlight
Calibrate High Value
Calibrate Low Value
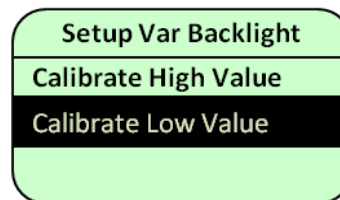
7.5.5 Calibrating the variable backlight values

The calibration settings define the low and high brightness calibration levels for two voltages applied to the variable backlight analog input.
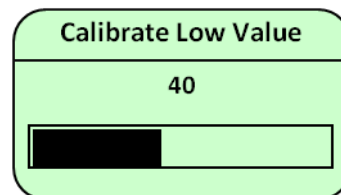
Setting the low brightness calibration value:

With the aircraft instrument backlighting set to a low level, vary the low brightness setting using the arrow keys until the DZM backlight level matches the brightness of the other aircraft instruments.

Press the**ENTER** to calibrate the low setting.

or press **CANCEL** to leave the current settings unchanged.

You are returned to the 'Setup Menu'.

Calibrate Low Value
40

Setting the high brightness calibration value:

With the aircraft instrument backlighting set to a high level, vary the high brightness setting until the DZM backlight level matches the brightness of the other aircraft instruments.

Press t**ENTER** to calibrate the high setting.

or press **CANCEL** to leave the current settings unchanged.

You are returned to the 'Setup Menu'.

Calibrate High Value
80
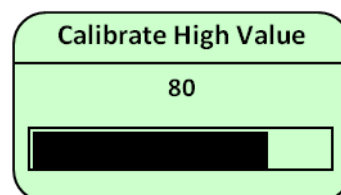
7.5.6 Configuring NMEA sentence streaming

The DZM can be configured to output a sub-set of NMEA sentences that it receives from its on-board GPS receiver to the setup com port.

Important Note: This com port is also used when upgrading the DZM, so NMEA Sentence Output must be disabled before attempting to upgrade the DZM.

The NMEA sentence output can be switched on and off via an option on the Setup Menu, and can also be switched on and off via an AT command on the port itself.

To configure the NMEA Sentence Output via the Setup menu:

From the 'Setup Menu', use the arrow keys to navigate to 'NMEA Output'.

Press **ENTER** to select. The 'On/Off' screen is displayed.

Select On or Off by using the arrow keys, then press **ENTER** to select,

<u>or</u> press **CANCEL** to leave the current settings unchanged.

You are returned to the 'Setup Menu'.
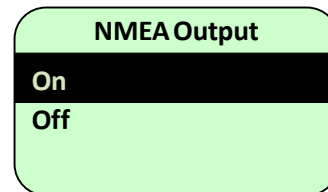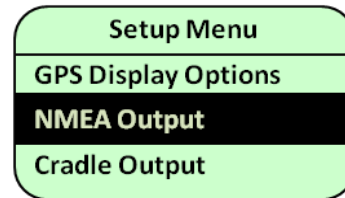
The commands to configure the NMEA Sentence Output via the com port are as follows:

Command	DZM Response
AT^NMEA=1	NMEA feed is ON OK
AT^NMEA=0	NMEA feed is OFF OK

While NMEA Sentence Output is enabled, the DZM will output updated NMEA sentence data every second. The following is an example of the three sentences sent by the DZM every second:

> **$GPRMC,020630.00,A,4115.69284,S,17316.79523,E,0.006,,130511,,,A*63**
> **$GPVTG,,T,,M,0.006,N,0.010,K,A*24**
> **$GPGGA,020630.00,4115.69284,S,17316.79523,E,1,08,1.39,8.1,M,15.6,M,,*46**

7.6 Providing ring, missed call, new message or off-hook alerts

7.6.1 Configuring alert notification via the cradle output or DZM3 output

Output 1 on a DZM3, or the output on a cradle connected to a DZM2, may be configured to activate an annunciator light to indicate a combination of off-hook, incoming call, in call, missed call/unread message.

7.6.1.1 Providing an alert on the cradle output

The output on the cradle is an open-collector output which pulls to ground when activated and open circuit when inactive. It can sink up to 100mA and is rated to +45V. This output is not protected against negative voltages (below GND potential) or inductive loads. Therefore if the output is used to drive a relay coil it is essential to fit a 'freewheel' diode across the relay.

7.6.1.2 Providing an alert on a DZM3 output

Output 1 on the DZM3 can be used to provide a ring alert on an incoming call. Output 1 is an isolated switch which is closed when the output is active. It has a maximum current rating of 500mA and a maximum voltage of 60VDC. The switch is bi-directional so the polarity of the applied signal can be decided on by the installer.

7.6.1.3 Configuring the alert output status on the DZM2 or DZM3

The output can be configured to indicate one or more of: an incoming call, off hook, in call, unread message and a missed call. This feature is configured via the Cradle Output (DZM2) or the Ring Output (output 1 DZM3) menu option in the DZM setup menus or using DZM Manager. For DZM3, if this setting is configured to anything other than Off, then Output 2 will also be driven active to indicate a missed call/unread message.

To configure the cradle output/DZM3 Output 1 via the Setup menu:

From the 'Setup Menu', use the arrow keys to navigate to 'Cradle Output' on a DZM2 or 'Ring Output' on a DZM3.

Press **ENTER** to select. The screen will display a list of options.

Select the appropriate option by using the arrow keys, then press **ENTER** to select,

<u>or</u> press **CANCEL** to leave the current settings unchanged.

You are returned to the 'Setup Menu'.

The following options are available:

Off

Flash on ring - flashes on an incoming call

Active on ring - active (steady on-state) on an incoming call

Active when off hook - active when in call or making a call

Active on ring/msgs - active on an incoming call or if there is an unread text message or missed call

Flash:Active on call - flashes on an incoming call, then remains active while in call.

Active ring/off hook – active on an incoming call or during a call.
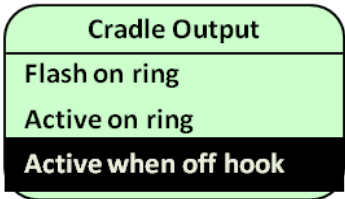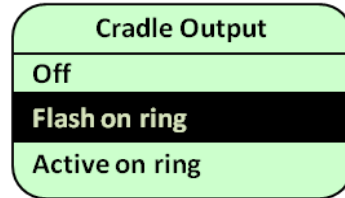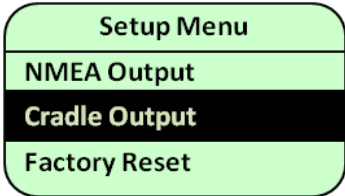
7.7 Configuring Master/Remote functionality using a Flightcell DZM and a DZM Remote Head

A DZM Remote Head can be installed to provide remote control of a DZM3 or DZM2. This Master/Remote configuration is useful for installations where it is necessary to operate the DZM system from two locations in the aircraft (e.g. the cockpit and the passenger cabin), or in certain installations where the access to the keypad of the DZM is not available.

The DZM2 or DZM3 must be configured using its menus or DZM Manager. No configuration is required on the remote head.

The DZM requires firmware 4.013 or later to operate the remote head.

7.7.1 Configuration of the DZM2 or DZM3

First, enable the installer menus. See page 52 for details.

Now select DZM Operating Mode from Setup menu and then select 'Master Unit Mode' on the DZM2 or DZM3, and press **ENTER** to save. You are returned to the 'Setup Menu'.

The remote head will immediately start to operate as a remote control for the DZM.
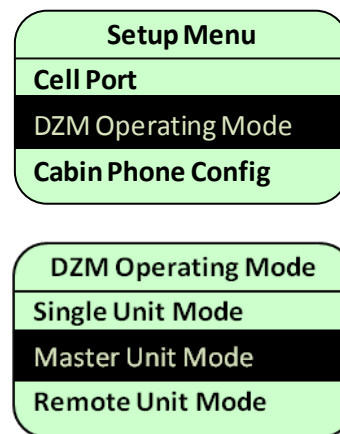
An icon ⟳ at the top of the DZM screen indicates that communication has been established between the DZM and the remote head.

The warning icon ⚠ at the top of the screen will illuminate if there is a communication failure with the remote head. If a communication failure occurs, the system will need to be restarted from the power bus.

7.7.2 Operation of the remote head

The remote head display will mirror everything shown on the DZM display, and vice versa.

All keypad and menu functions carried out on either the DZM or remote head will be given effect on the DZM, except that the DZM cannot be powered down using the power key on the remote head, and the DZM operating mode can't be changed from the remote head.

7.7.3 Master/Remote Display Settings

To enable display settings to be configured for both the DZM and remote head, the Display Setup Menu will display an extra level of settings when a remote head is connected.

To change the Master or Remote display settings, select Display Setup Menu from the Main menu then press **ENTER**. Select 'Master Setup' to change display settings on the master unit, or 'Remote Setup' to change display settings on the Remote unit. This menu can be accessed from either unit. If accessing from the Remote unit, select 'Remote Setup' then press **ENTER** and modify the display settings as appropriate.

See Accessing the Display Setup Menu on page 49 for details on how to configure the display settings.

Display Setup Menu
Master Setup
Remote Setup

Remote Setup
Backlight Mode
LCD Contrast
Day Backlight
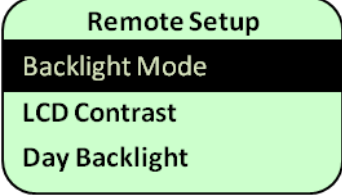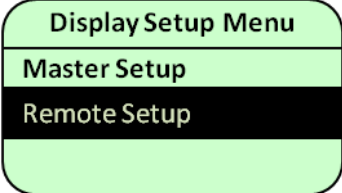
7.8 Configuring Master/Remote functionality using two Flightcell DZMs

In some aircraft, a second DZM2 has been installed to provide remote control of a DZM3 or DZM2. This mode of operation is configured in the DZM firmwareon both the Master and remote units.

7.8.1 System Requirements

- Two DZM units running identical DZM firmware versions 4.003 or later.

- The unit designated as the master unit can be a DZM3 or DZM2 with external satellite phone and Flightcell Cradle.

- GPS antenna connected to the master unit.

- Both units connected via their RS422 ports.

- No satellite phone, GPS connection or audio connection is required for the remote device.

- It is recommended that the PC port connection for both units is accessible to allow for upgrades and configuration.Master/Remote Configuration

7.8.2 Master/Remote Configuration

First, enable the installer menus. See page 52 for details.

Now select DZM Operating Mode from Setup menu and then select 'Master Unit Mode' on the master unit and 'Remote Unit Mode' on the Remote Unit then press **ENTER** to save. You are returned to the 'Setup Menu'. The units will immediately begin to operate in their selected mode.

Setup Menu
Cell Port
DZM Operating Mode
Cabin Phone Config

DZM Operating Mode
Single Unit Mode
Master Unit Mode
Remote Unit Mode
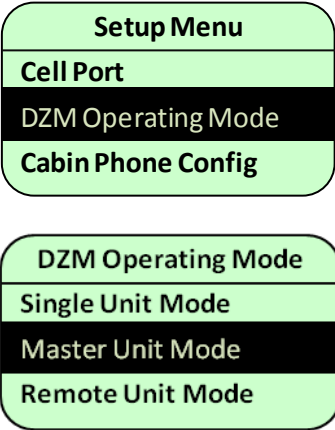
The Computer icon 🖥 is used to indicate that a DZM is configured as a Master when using two DZMs in a Master/Remote configuration.

7.8.3 Master/Remote Communication at Startup

When Master and Remote units first start up, they will establish contact with each other, check that they are running compatible versions of firmware and exchange settings. If for whatever reason a unit is not able to communicate with the other, then it will display a message:

```
No Comms with
Master Unit

Retrying....
```

This pop-up can be cleared by pressing any key. In the case of the Master unit, the screen will return to the Main screen and the DZM operate as normal, but will continue to try and establish comms with the Remote unit. In the case of the Remote unit, the screen will return to...

```
Remote Unit Mode

No Comms
```
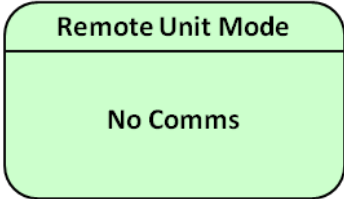
...and will continue to try and connect to the Master unit.

The Warning icon ⚠ at the top of the screen will also illuminate to indicate communication failure with the other connected DZM. This icon will remain lit while there is a comms error even after the user has acknowledged the No Comms pop-up message.

7.8.4 Remote Configuration Menu

While the Remote unit is in this 'no comms' state, a very limited menu will be available. When **MENU** is pressed, you will have to enter the Installer PIN number first before the DZM will display the Main Menu. From the Audio Menu, you can only switch the keypad tones on and off. From the Setup Menu, you can change the DZM Operating mode and change the Installer Password. From the Diagnostics Menu, you can only view the Firmware Version.   Note that the Installer password used when there is no comms is stored locally on the Remote unit, but the Master Installer PIN must be used to access installer menus when the Remote unit has established comms with the Master unit.

```
Main Menu
Audio Menu
Tracking Setup
Display Setup Menu
```
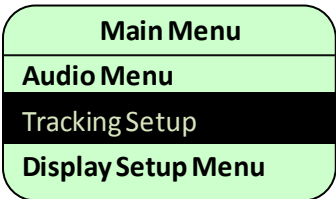
7.8.5 Master/Remote normal operation

When operating units in this mode, key presses from the Remote unit are transmitted to the Master unit and the Master unit will transmit display information and display settings to the Remote unit. In this way, the Remote can control the Master unit and the Remote unit will mirror exactly what is being displayed on the Master unit.

The only exception to this is when a Remote unit powers down via pressing and holding down the Power button. When the Remote is powered down via its own keypad, the key press is not transmitted to the Master unit, so the Master unit will remain operational and display a popup to announce that the Remote unit has just powered down.

If the Master unit is powered down via the Power button on the Master unit keypad, then the Remote unit is also powered down.

7.8.6 Master/Remote Display Settings

To enable display settings to be configured for both Master and Remote units, the Display Setup Menu will display an extra level of settings.

To change the Master or Remote display settings, select Display Setup Menu from the Main menu then press **ENTER** . Select 'Master Setup' to change display settings on the master unit, or 'Remote Setup' to change display settings on the Remote unit. This menu can be accessed from either unit. If accessing from the Remote unit, select 'Remote Setup' then press **ENTER** and modify the display settings as appropriate.

See Accessing the Display Setup Menu on page 49 for details on how to configure the display settings.

Display Setup Menu
Master Setup
Remote Setup

Remote Setup
Backlight Mode
LCD Contrast
Day Backlight
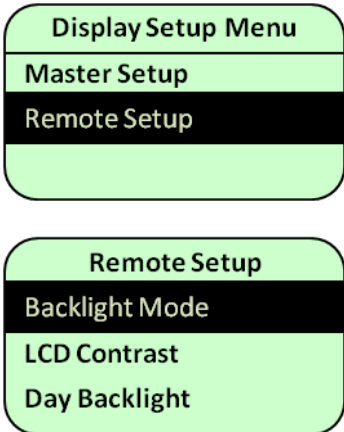
7.9 Selecting language preference

You may select the language that is displayed on the DZM LCD screen. The DZM currently supports English and Spanish.

Selecting language preference:

From the 'Setup Menu, use the arrow keys to navigate to 'Language Select'.

Press **ENTER** to select. The 'Language Select' screen is displayed.

Using the arrow keys, navigate to the language required (e.g. 'English').

Press **ENTER** to save. You are returned to the 'Setup Menu'.

Setup Menu
Factory Reset
Language Select
Installer Password

Language Select
English
Español
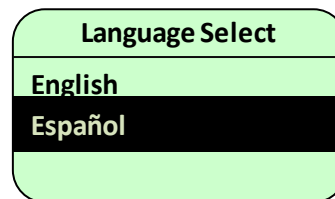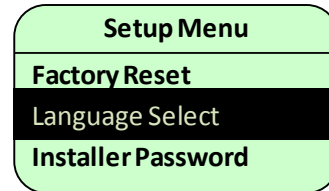
7.10 Updating Installer Menu password

Many DZM settings in the menus may only be viewed and edited by first entering the Installer Password.

Refer to the "Menu Overview" on page 17 to see which settings are protected by the Installer Menu.
Refer to "Using the Installer Menu to protect advanced settings" on page 52 for further information about using the Installer Menu.
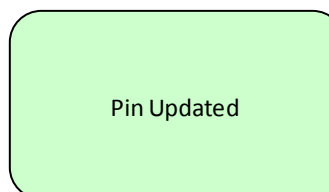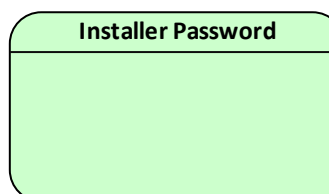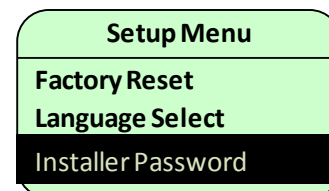
Updating the Installer password:

From the 'Setup Menu', use the arrow keys to navigate to 'Installer Password'.

Press **ENTER** to select. The 'Installer Password' screen is displayed.

Enter the new 4 digit password pin

Press **ENTER** to save. "Pin Updated" is displayed.

Setup Menu
Factory Reset
Language Select
Installer Password

Installer Password

Pin Updated

7.11 Restoring factory default settings

DZM factory default settings may be restored if required.

Restoring to factory default settings:

From the 'Setup Menu, use the arrow keys to navigate to 'Factory Reset'.

Press **ENTER** to select. The 'Factory Reset' screen is displayed.

Press **ENTER** to reset factory settings.

or press **CANCEL** to leave the current settings unchanged.

You are returned to the 'Setup Menu'.

Setup Menu
NMEA Output
Factory Reset
Language Select

Factory Reset
Press ENTER to reset to Factory Defaults
Any other key to exit
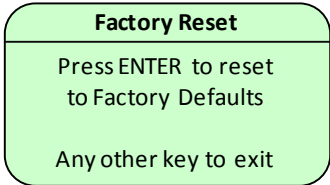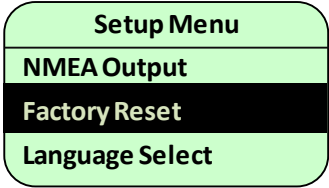
8 WARRANTY AND CONTACT DETAILS

8.1 Limited warranty for your Flightcell DZM

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

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

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

connected to a power supply delivering more than 32 Volts;

connected with reverse polarity;

installed in direct contravention to the guidelines outlined in the technical installation manual;

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

If the product is deemed to be faulty or in need of repair, please contact Flightcell International Ltd to obtain a Returned Materials Authorization.

8.2 Flightcell International contact details

Flightcell International Ltd

PO Box 1481

98 Vickerman Street

Nelson 7040

New Zealand

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Fax	+64 3 5488091
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9 USER NOTES