Flightcell

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ALWAYS CONNECTED

Flightcell International Ltd

DZMx Operator's Manual

Firmware Version: 2.17.0

Flightcell DZMx Operator's Manual

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Section 1 Operator's Manual

The Flightcell DZMx provides global voice, data communications and aircraft tracking. This manual is designed to help users learn how to use their DZMx, from basic to more advanced features. The DZMx Installation Manual provides the instructions for the initial set up and configuration of a DZMx.

Overview of DZMx Functions

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

Voice calling and Data

» The DZMx provides a global phone service, enabling calls to virtually any phone in the world.
» The DZMx is interfaced to the aircraft audio system, providing all crew connected to the audio system with access to the available phone networks.
» A cabin phone may also be installed for passengers' use.
» Calls are dialled from the DZMx keypad, or by using the phone directory or speed dial keys to retrieve and call stored phone numbers.
» Other parties can call the aircraft by dialling the aircraft's satellite or cell phone numbers.
» Connect to the Iridium or 3G/4G cellular networks to provide a data connection via the DZMx Ethernet port.

Two-way messaging

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

Aircraft tracking

The DZMx can send periodic position reports automatically and manually triggered position reports to one of a number of tracking service providers. Additionally, the DZMx can be configured to send position reports that mark specific events, including:

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

DZMx Keypad References

The following table outlines the DZMx keypad buttons and how they are referenced throughout the manual. This will be a handy page to return to when unsure which button is being referenced.

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

Section 2 Operator Interface
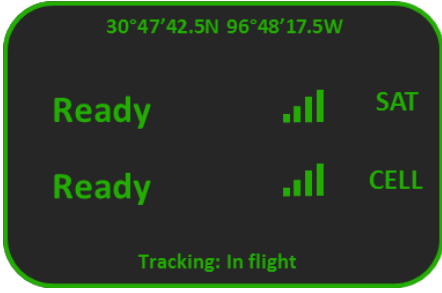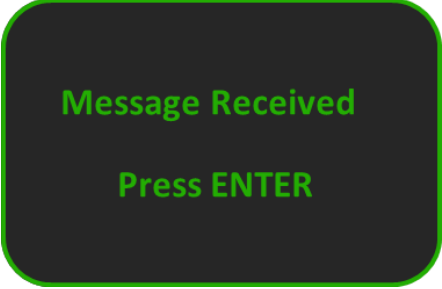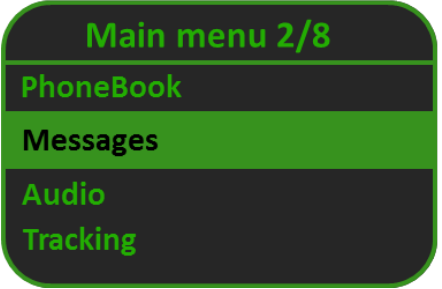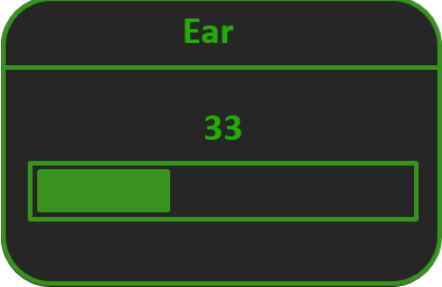
This manual contains several sections to help guide you through the DZMx operation and settings. The display and user interface consists of:

LCD Display

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

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

Understanding the Main Screen

During normal operation, the DZMx LCD display shows the Main Screen. This displays:

» On the top line: The current GPS information, which can be changed in the GPS settings (see "Global Positioning System (GPS)" on page 12).

» In the centre of the display, modem information:

    » Modems installed in each position in the DZMx

    » Status of each of the installed modems; this changes depending on the operation currently being performed

   » Signal strength (up to five bars); if the phone doesn't have a connection, it shows 📵 .

» Above the "modem information", additional information on:

    » Messaging activity, including number of queued messages

    » Phone number or name of the other party to an active phone call.

» On the bottom line, information for:

    » Tracking status (messages and events)

    » A.R.M status.

    » Distress/Emergency status
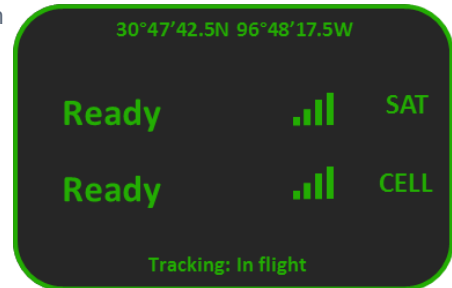
DZMx Menus

The DZMx has an extensive menu system providing access to a range of functions, settings and diagnostic information.

The menu system provides access to user level settings, such as tracking timers, basic audio configuration, GPS display options and phone book management.

A number of settings are used to configure the DZMx for a specific operation or application; these are normally hidden from the user and an installer password is required to access and change them.
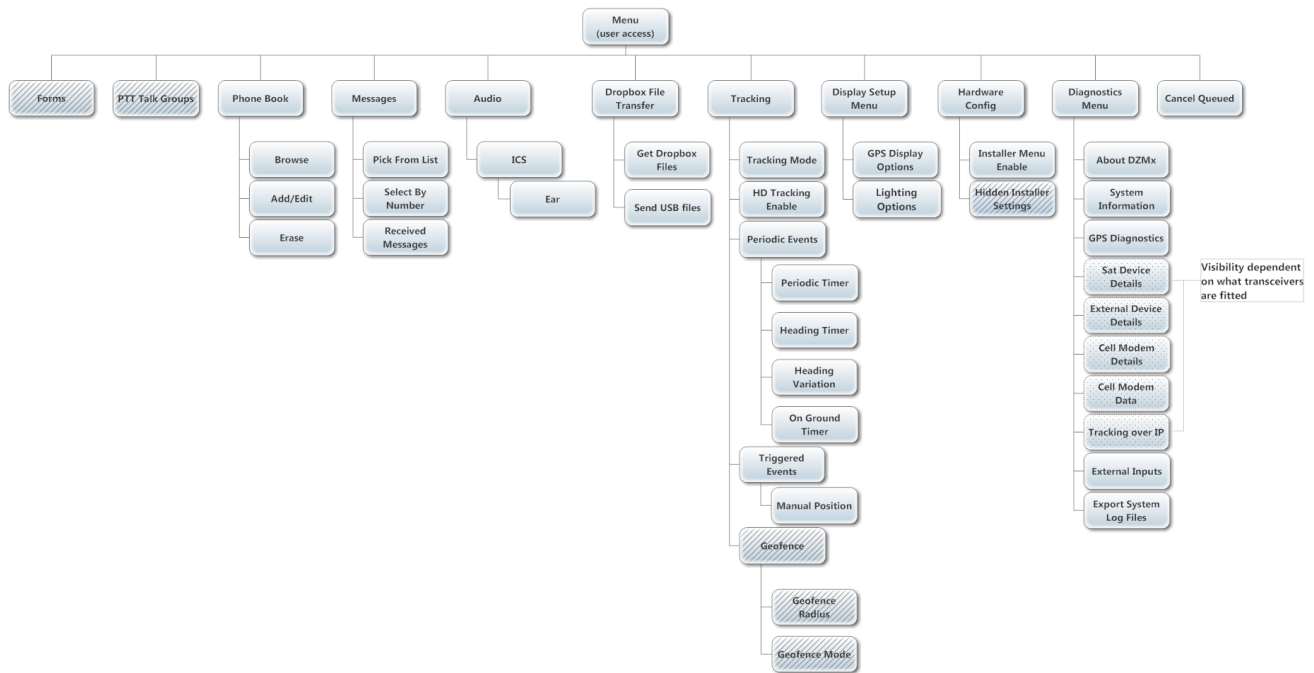
Navigating the Menus

The DZMx keypad is used to access the menu system:

» Press MENU. If the DZMx is on a phone call, press and hold MENU for 2 seconds to access the menus

» Use UP and DOWN to navigate between menu options

» Press ENTER to select the highlighted item

» Press BACK to cancel a setting change and to move back up a menu level

» Press ENTER to confirm a setting change

» Press END to cancel a setting change and exit the menu system.

Status Messages

The DZMx has four status message regions on the main display for GPS, the modems, queued messages and tracking. For information on the GPS status line, including configuration, see "Global Positioning System (GPS)" on page 12. The modem status lines are used for reporting to the user various messages including network status and call/messaging activity.

```
      30°47'42.5N 96°48'17.5W

  2 Queued
  Ready           ▃▅▆█     SAT

  Ready           ▃▅▆█     CELL

           Tracking: In flight
```
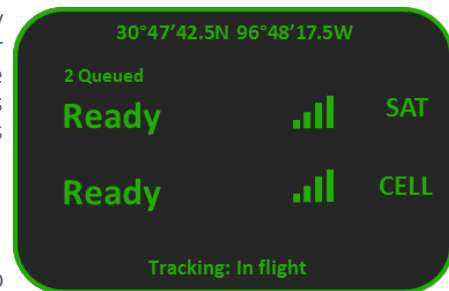
Network Status Messages

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

- » **Initialising:** The modem has established a connection to the modem and is in the process of initialising the device
- » **Ready:** The modem is powered on, successfully initialised, registered on the network, and is reporting a good signal strength
- » **Searching:** The modem is searching for a good signal
- » **Disabled:** Flightmode has been activated. The modem is disabled until flightmode is deactivated, see "Cellular Flightmode" on page 28
- » **Online:** Modem Data connection has been established
- » **Going Online:** The modem is establishing a data connection.

Error Messages

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

- » **SIM Error:** Either no SIM is inserted, or is not registered with the network provider.
- » **SIM PIN Required:** The SIM card is locked and requires a PIN
- » **Not Inserted:** The DZMx cradle is reporting there is no phone in the cradle (external cradles only)
- » **Not Responding:** The modem is not responding to the DZMx. Occurs when the modem is not configured correctly.

Calling Status

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

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

- » **Calling:** The DZMx has dialled the number but a connection has not yet been established
- » **On Call:** The DZMx has established a connection and the other party has accepted the call
- » **Incoming Call:** flashed on the DZMx display, an audible ringing tone will sound over the audio system and the call annunciator light (if installed) will flash if there is an incoming call
- » **Call Queued:** The DZMx has queued the call, and will start the call when the modem is next free
- » **Disconnecting:** The phone call has been terminated at either end of the call or the modem loses the connection.

Messaging Status

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

- » **Receiving SMS:** An SMS is being received
- » **Sending Data:** An SMS or SBD message is being transmitted
- » **SMS Failed!** or **SBD Failed!:** Transmission has failed, usually because of a low signal. The DZMx will attempt to resend the message
- » **SMS Sent** or **SBD Sent:** An SMS or SBD message has been successfully transmitted.

The line above the messaging status will show the number of untransmitted messages in the message queue.

Data Status

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

- » **Going Online:** The modem is connecting to the network for data
- » **Online:** The modem has a data connection to the network.

Tracking Status

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

- » **Tracking: Queuing** is displayed if there are more than two messages in the message queue. This indicates poor cellular and/or Iridium signal strength or that position reports are not being sent or are being sent at a slower rate than they are being queued
- » **Tracking: Queue Full!** is displayed if messages have not been transmitted for quite some time due to poor signal strength and now the queue is full. Any new position reports will be added to the queue and the oldest one removed from the queue
- » **Not Tracking: No GPS** is displayed when the GPS does not have a fix. Position reports will not be generated if there is no GPS fix
- » **Not Tracking: Disabled** is displayed when tracking has been disabled
- » **Not Tracking: Suspended** is displayed when tracking has been suspended
- » **Not Tracking: On Ground** is displayed when the DZMx is configured to only send tracking data when the aircraft is in the air
- » **Tracking: On Ground** is displayed when the aircraft is on the ground and the DZMx is configured to send on-ground position reports
- » **Tracking: Inflight** is displayed when aircraft is tracking and currently in a flight
- » **Tracking: Takeoff** and **Tracking: Landed** is displayed after the DZMx has sent take-off and landing reports, if the DZMx is configured to record these events
- » **Tracking: Hovering** is displayed if DZMx detects the flight speed has dropped below the hover speed threshold
- » **Engine Start** and **Engine Stop** is displayed after the DZMx has sent engine start and stop reports, if the DZMx is configured to record these events
- » **Geofence Active: nn NM** is displayed if Geofence Suspend mode has been activated. nn is the distance , in nautical miles, of the aircraft from the centre of the geofence area. Tracking will be suspended for as long as the DZMx detects that the aircraft is within the geofence radius (see the Flightcell DZMx Installation and Configuration manual for details of how to configure the DZMx Geofence settings).

PTT Status

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

- » **PTT: Initialising** is displayed when the modem is switching from normal satellite mode to PTT mode.
- » **PTT: Registering** is displayed when modem is registering with the network
- » **PTT: (no tg)** is displayed when the user has not specified a talkgroup for the modem
- » **PTT: Requesting** is displayed the user is requesting to talk
- » **PTT: RX** is displayed when someone else is talking on the current talkgroup
- » **PTT: TX** is displayed when the DZMx is able to talk on the current talkgroup
- » **PTT: "Talkgroup Name"** is displayed when "Talkgroup Name" is the selected talkgroup and has been successfully joined.

Additional status messages can also be generated when using "Emergency and Distress Mode" on page 34, or "Automated Rescue Monitoring (A.R.M.)" on page 31.

Backlighting

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

External lighting provides the user with the ability to dim or brighten the display by adjusting the lighting control input. External lighting is only available if the DZMx has been connected to the cockpit dimmer control. See Flightcell DZMx Installation and Configuration manual for external lighting installation options.

Switching Backlight Modes

To switch modes between Day, Night and External backlighting:

» Press and hold the "*" key on the DZMx or remote head for 2 seconds
» Scroll to **Backlight Mode**
» Use LEFT and RIGHT to change the setting
» Press END to exit the menu.

Altering Backlight Brightness Levels

Day and Night Modes

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

» Press and hold the "*" key for 2 seconds
» Select the Day or Night setting as above
» Scroll down to **Display Brightness** or **Keypad Brightness**
» Use LEFT and RIGHT to decrease/increase the brightness
» Press END to save the setting and exit the menu.

External Lighting Mode

The minimum and maximum brightness levels can be set individually for both the DZMx and any remote heads. To change the minimum brightness options for the external lighting on the DZMx or remote head:

» Press and hold the "*" key for 2 seconds
» Scroll to **Advanced** and press ENTER
» Scroll to **Ext Lighting Config Low** and press ENTER
» Set the dimmer control to the minimum position
» Adjust the keypad and display minimum brightness using LEFT and RIGHT to match cockpit lighting levels
» Scroll to **Input Calib.** then press ENTER
» Press END to save the settings and exit the menu.

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

» Press and hold the "*" key for 2 seconds
» Scroll to **Advanced** and press ENTER
» Scroll to **Ext Lighting Config High** and press ENTER
» Set the dimmer control to the maximum position

» Adjust the keypad and display maximum brightness using LEFT and RIGHT to match cockpit lighting levels
» Scroll to **Input Calib.** then press ENTER
» Press END to save the setting and exit the menu.

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

Global Positioning System (GPS)

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

» **Off:** no information shown
» **dddmm.mmmm:** the aircraft's position is shown in degrees and minutes (to 4 decimal points)
» **ddmmss:** the aircraft's position is shown in degrees, minutes and seconds
» **Speed and Heading:** the aircraft's speed and heading is shown in knots and degrees relative to true north (rather than magnetic north)
» **Clock:** the current time and date is shown.

Setting the GPS Display

To set the GPS display:

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

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

Section 3 Phone Calls

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

Initiating a Call

Dialling a Phone Number

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

Calling a number in the phone book

» Press DIR to display the phone book
» Scroll through the phone book to the required contact using UP and DOWN
» Press A or B to select the modem and initiate the call
» Press END to terminate the call at any time.

Calling using Speed Dial

The speed dial keys are automatically linked to the first three numbers in the phonebook, respectively.

» Press SPD1, SPD2 or SPD3 as appropriate, then the contact name and number will be displayed
» Press A or B to select the modem and initiate the call
» Press END to terminate the call at any time.

Redialling the last called number

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

Calling the sender of a text message

» Open the message so it is displayed on the screen (see for how to access received messages)
» Press A or B to select the modem and initiate the call.

Answering a Call

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

» Press CALL to answer an incoming call, or press END to reject the call

» Press END at any time to hang up .

Extra Call Features

Touch tone dialling (DTMF) during a call

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

Simultaneous Calls

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

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

To hang up an individual call:

» Press END, a pop-up will display **Press A or B to hang up a call**.

» Press A or B to hang up the individual call.

Using other DZMx Features during a call

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

Missed Calls

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

» Opening the message so it is displayed on the screen (see "Incoming Messages" on page 17 for how to access received messages)

» Press A or B to select the modem and initiate the call.

Audio Settings

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

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

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

Adjusting DZMx Audio Levels

To adjust incoming audio level:

1. Press MENU then navigate to **Audio**>>**ICS**>>**Ear**; the DZMx will display the setting.
2. Use LEFT or RIGHT to adjust the audio level.
3. Press ENTER to confirm the setting change and return the audio menu.
4. Press BACK to abort the change and return to the audio menu.
5. If **ICS2** is enabled; Repeat for **Audio**>>**ICS2**>>**Ear**.

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

Section 4 PTT Calling

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

Switching To PTT Mode

To switch to PTT mode on your satellite device:

» Press and hold the A or B button attached to the satellite device
» **PTT Initialising** will display on the display
» After initialisation, you will be able to join a PTT Talkgroup or start a PTT call.

Joining a Talkgroup

To join or switch to an alternate talkgroup:

» Press MENU to enter the main menu.
» Select **PTT Talkgroups** from the top of the menu
» Scroll to the required Talkgroup and press ENTER to join it
» **Optionally**: Press CALL to make it the Default Talkgroup. This talkgroup will be automatically joined on startup

A PTT call can be started if the selected Talkgroup is active and has no other participants currently talking. You are able to talk for up to 30 seconds before the call will hang up. The PTT modem will automatically listen to any other talkers in the talkgroup. They can be temporarily silenced by pressing END. Pressing END will also end your own call.

PTT Calling with External Button

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

» Press and hold the button to start transmitting
» Release the button to stop transmitting.

PTT Calling with DZMx Keypad

If using the DZMx keypad to call using PTT:

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

Note: In order to use PTT, the DZMx needs to be a PTT-supported unit.

Section 5 DZMx Messaging

Incoming Messages

Viewing an incoming message

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

Viewing messages in the Inbox

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

To read messages saved in the inbox:

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

Missed Call Notifications

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

Sending Messages to the DZMx

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

By email:

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

From the Iridium website:

- » Go to the Iridium website at **http://messaging.iridium.com/**.
- » Enter the satellite phone number of the DZMx
- » Fill in the subject line
- » Fill in the message
- » Click Send Message.

Outgoing Messages

The DZMx has powerful text messaging capabilities. Text messages can be sent and received over cellular and satellite networks using any of the installed and connected modems. The DZMx has a 50-entry library of pre-configured messages. Only these preconfigured messages can be sent, as there is currently no method for manually entering a message from the main DZMx screen.

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

Sending Messages from the DZMx

Using a number from the DZMx Phonebook

» Press MSG, scroll to the required message and press ENTER to open the message
» Press the speed dial keys SPD1, SPD2 or SPD3 or press DIR and scroll to the number, then press ENTER
» Press A or B to send via the selected network.

Using an number NOT in the DZMx Phonebook

» Press MSG, scroll to the required message and press ENTER to open the message
» Press A or B to select the network
» When prompted, enter the destination phone number, then press ENTER to send the message.

Replying to a Message

» Open the received message, then press MSG to open the message library
» Scroll to the message to be sent in reply, and press A or B to send the message via the selected network.

Cancelling unsent messages

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

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

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

Section 6 Phone Book

Phone book entries can be added, edited or deleted by either using the DZMx menu system or through the DZMx Manager. DZMx Manager provides a quick and simple interface for importing contacts into the DZMx. It is recommended that DZMx Manager is used for making large changes to the phone book.

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

Adding a New Contact

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

Editing an Existing Contact

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

Deleting an Existing Contact

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

Section 7 DZMx Data

Both the cellular and satellite modems are capable of providing data connections (See Installer manual for further details). The DZMx can provide the data service to a connected PC or laptop via the DZMx Ethernet port. The DZMx operates as an internet router. When a PC or laptop is plugged into the DZMx's Ethernet port, the DZMx will allocate an IP address in the range 192.168.4.xxx, and you will then be connected to the internet.

Cellular Data

When the DZMx is successfully connected to the cellular data service, the DZMx status line for the modem will display "*Online*". See "Status Messages" on page 7 for more details on the DZMx display and status lines.

Satellite Data

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

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

Multiple Data Connections

Automatic data routing is not yet supported in software, therefore it is recommended to not turn on both data connections simultaneously. If the Cell and Sat data are both turned on then the connection used will be the last one turned on (not the fastest or cheapest connection). This applies to both control from the Data Manager and the normal User Interface.

Section 8 G.P.S. Tracking

The DZMx can send position reports to a tracking system using the Iridium and/or cellular network. The DZMx has several configurable periodic tracking timers and triggered tracking events. These generate automatic position reports at appropriate intervals, or when triggered (e.g. a takeoff or landing report). The user can also manually trigger a position report using MARK. Changes in the tracking status of the DZMx are displayed on the bottom line of the DZMx display and remote heads, see "Status Messages" on page 7 for further information.

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

» A valid GPS lock
» Tracking must be enabled
» The DZMx must be correctly configured according to the tracking provider's specifications.

Please see the DZMx Installation Manual for details on how to configure your DZMx tracking system.

Automatic Position Reports

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

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

Manual Position Reports

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

To send a manual position

» Press MARK
» The DZMx will display **Position Marked**
» A tracking message will be added to the outgoing message queue.

To send a manual position report with a message attached

» Press and hold MARK until the message library opens
» Scroll down to the message to be sent
» Press ENTER to display the message then press ENTER to send; the DZMx will display Position marked and a tracking message will be added to the outgoing message queue.

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

Enabling Tracking

» Press MENU then scroll to **Tracking**>>**Tracking Mode**

» Scroll to **On** as required and press ENTER.

Suspending or Disabling Tracking

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

» Press MENU then scroll to **Tracking**>>**Tracking Mode**

» Scroll to **Suspend** or **Disable** as required and press ENTER.

Adjusting Tracking Settings

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

Periodic and HD Tracking Timers

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

» **HD Tracking**: A 15 second delay between tracking reports

» **Periodic Tracking**: Configurable to be anywhere between a 1 to 60 minute delay between tracking reports.

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

Four periodic timer settings can be adjusted by the user:

» **Periodic Timer**: The delay between scheduled tracking reports during flight. The minimum interval is 1 minute

» **Heading Timer**: Position reports are sent more frequently when the aircraft is changing heading

» **Heading Variation**: Configures the change (in degrees) by which the aircraft's heading must vary in order to trigger a course change position report.

» **On Ground Timer**: The tracking interval on the ground. On Ground tracking can be disabled.

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

To change the settings of the periodic timer settings:

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

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

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

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

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

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

Tracking Intervals Summary

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

Tracking network	Flight state	HD tracking available	Tracking frequency
Cell SMS, Satellite SBD + SMS	All	No	From 1 to 60 minutes
Tracking-over-IP (Cell data)	On Ground	HD tracking suspended	From 1 to 60 minutes
Tracking-over-IP (Cell data)	Hovering	Yes	60 seconds
Tracking-over-IP (Cell data)	In Flight	Yes	15 seconds

Section 9 DZMx Applications

Flightcell provides DZMx users with additional software support with their DZMx. The DZMx currently supports the following applications:
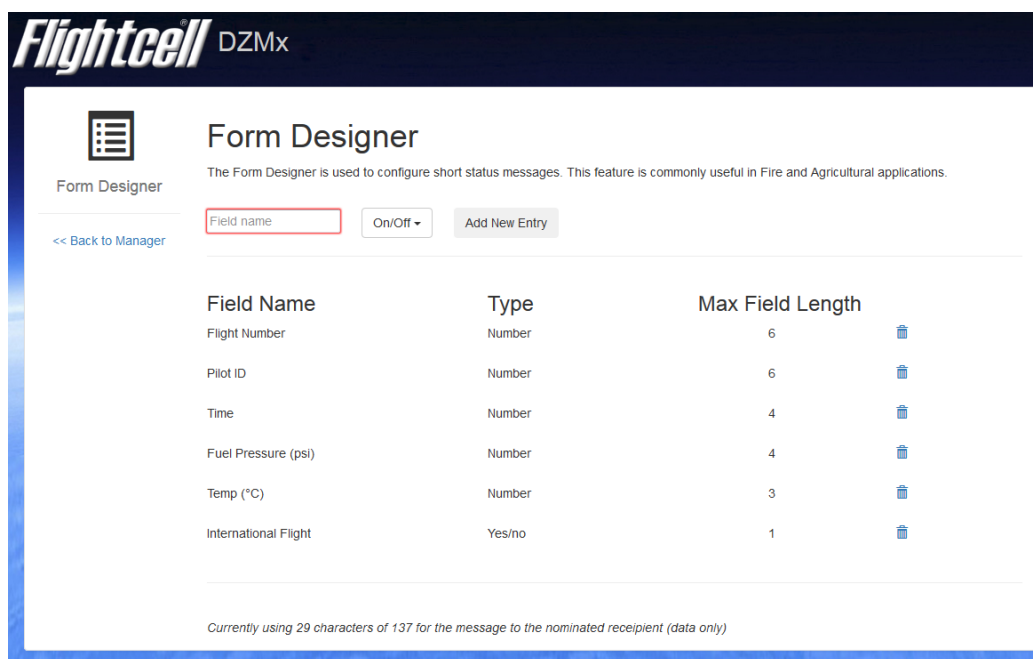
- » "Automated Rescue Monitoring (A.R.M.)" on page 31 (also known as A.F.F.)
- » "Emergency and Distress Mode" on page 34
- » "Cellular Flightmode" on page 28
- » "Forms" on the next page
- » "Dropbox File Transfer" on page 35
- » "Cabin Phone" on page 29
- » Geofence
- » Firefighting App
- » Airline App
- » Agriculture App.

For enquiries about upcoming applications or to request new applications, contact Flightcell (see "Contact Details" on page 40).

Forms

What is Forms?

Forms is a powerful feature developed to aid operators with analysing flight trends. Users can create custom fields for the form using the DZMx Manager, which can be filled in by an operator at specified intervals or events. An example of a typical form is:

Form Designer example in the DZMx Manager

Forms Settings

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

- » Tracking Provider
- » Custom email address
- » Custom phone number

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

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

The configurable settings for Forms are:

- » **Send To Tracking Provider:** Send completed forms to the configured Tracking Provider (see Installation Manual).
- » **Send To Recipient:** Send completed forms to a configurable recipient. Using email, SMS or SBD.
- » **Recipient Destination:** Recipient destination address (email address or phone number).
- » **Form Prompt Config:** Select an event which will prompt the operator to complete a new form.

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

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

Creating Forms

Forms Designer in the DZMx Manager is used to create forms. This utility allows users to create custom fields, using the following supported field types:

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

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

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

> **Note:** The Forms Designer will warn you when the limit for your configured Forms settings has been reached.

Adding a Field

Fields can be added using the Form Designer:

1. Enter a field name into the first text box (E.g. "Flight Number")
2. Select a field type
3. Add a field length (only valid for the Number type)
4. Click **Add New Entry**.

Deleting a Field

Fields can be deleted by pressing the delete button, 🗑, located to the right of the field. The Form Designer will pop-up a box to confirm the deletion of the field.

Reordering Field Layout

Fields can be reordered using the "Drag & Drop" feature. Simply click and hold on a field and drag it to the desired position on the form.

Completing a Form

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

» Press MODE from the main screen, this will take you to the **Form Entry** menu.

» Fill in the fields. Navigating the menu with UP and DOWN. Not all fields are required to be filled in.

» Select **Form Complete** to finish the form and send it to the required destinations.

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

Retrieving Form History

The DZMx stores the latest 50 records. These forms can be downloaded using the **Export Form Data** button on the DZMx Manager (located on the main screen), or exported onto a USB stick using the DZMx main menu:

» Ensure a USB stick is plugged into the DZMx USB Port.

» Press MENU then select **Forms**.

» Select **Export Form History**. This will save a copy of the Form history to the USB stick.

Cellular Flightmode

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

Toggling Flightmode

To turn Flightmode on or off:

» Press and hold the relevant modem button, A or B.

» If starting Flightmode, a status message will show saying **Disabled**.

» If stopping Flightmode, a status message will show **Searching**, until a good signal is obtained.

Cabin Phone

A corded or cordless phone may be installed in the cabin and connected to the DZMx to provide passengers with access to the DZMx Iridium satellite phone and/or cell phone connections. Calls are private to the connected party (cockpit or cabin) unless a three-way call is established. If the DZMx has two modems (e.g. one Iridium and one cellular, or two Iridium), the cockpit and cabin may each use a modem to make simultaneous calls.

The cabin phone can also be used with the DZMx as an intercom between cockpit and cabin. If the cabin phone is in use, the call status is shown on the bottom line of the DZMx display. The dialling method is similar to that on the DZMx keypad in that a modem must be selected first before dialling the phone number. If a cabin phone is connected, and is not already in a call, this will also ring when the DZMx receives a phonecall.

Making an internal call between the cabin phone and the pilot, or to transfer a call to the pilot, requires the use of either the 'hook/flash' or 'flash' key, or optionally programming one of the speed-dial buttons on the cabin handset to '701#'. The best method used will depend on your handset type.

Dialling a Phone Number

- » Pick up the handset and press the off hook button and wait until you hear the dial tone
- » Select the desired modem by pressing either "1" for modem A or "2" for modem B
- » Dial the phone number
- » Press # after dialling your number to initiate the call immediately, or wait a few seconds for the DZMx to recognise no further numbers will be entered, after which it will initiate the call automatically.
- » Hang up to end the call
- » If the modem selected is already in use (for example, by a pilot), then the passenger will hear an engaged tone. If the modem selected has no signal, is unavailable (not fitted or not in cradle), or the other party has hung up, then the passenger will hear a busy tone. In either case, they will need to hang up and try again later, or try again using another modem.

Note: If the Cabin Phone does not have a "+" key for international dialling, enter "00" instead.

Intercom Calls Between Cabin and Cockpit

Starting Intercom from the Cabin

- » Pick up the handset and press the off hook button and wait until you hear the dial tone.
- » Press 'hook flash', or the appropriate speed-dial key to initiate a call to the pilot. If the pilot is already busy on a call, then the passenger will hear an engaged tone. If the pilot is available, then a ring tone will be generated on the ICS until the pilot answers or until either party hangs up the call.
- » The call will be terminated if either the cabin phone goes on hook, or the pilot presses END.
- » If the pilot hangs up, the passenger will hear the busy tone through the handset.

Starting Intercom from the Cockpit

- » Press CALL to ring the Cabin phone.
- » The call will begin when the Cabin phone is picked up.
- » The call will be terminated when either END is pressed or the Cabin phone hangs up.

Transferring a Call to the Pilot

If the cabin phone is on a call using one of the modems, and the pilot is not busy on another call, it is possible to transfer the call to the pilot. During a call, the cabin phone can invite the pilot into a three-way call to initiate the call transfer, or once connected, maintain a three-way call between the cabin phone, modem and the pilot.

> » While on a call, the cabin phone can invite the pilot into the call by pressing 'flash'. If the pilot is available, then a ring tone will be generated on the ICS until the pilot answers or the pilot can reject the invite by pressing END.

> » Once the pilot has answered, a three-way call is established. The cabin phone party can choose to hang up at that point, or continue to have a three-way conversation.

> » Once a three-way call is established, if either the pilot or the cabin phone hang up, the call will turn into a standard two-party call between the remaining parties. If the party at the modem end hangs-up, the call is terminated.

Transferring a Call to the Cabin Phone

If the pilot is on a call using one of the modems, and the cabin phone is not busy on another call, it is possible to transfer the call to the cabin-phone.

> » While on a call, the pilot can invite the cabin phone into the call by pressing CALL. If the cabin phone is available, then the handset will ring until the cabin phone answers the call.

> » Once the passenger has answered, a three-way call is established. The pilot can choose to hang up at that point, or continue to have a three-way conversation.

Cabin Phone Status Messages

Cabin phone status messages will be displayed on the bottom status line on the DZMx. These status message could display the following:

> » **Cabin Phone: Off Hook** - The cabin phone has been picked up, and is out of its cradle
> » **Cabin Phone: Dialling** - The cabin phone is dialling through one of the modems
> » **Cabin Phone: In Call** - The cabin phone is currently in a call

Automated Rescue Monitoring (A.R.M.)

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

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

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

Activating A.R.M.

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

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

Deactivating A.R.M.

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

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

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

A.R.M. Status Messages

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

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

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

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

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

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

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

Alert Mode

The DZMx allows users to activate an "Alert" mode. When Alert mode has been activated by the user, ***Under Fire Mode!*** will flash in the tracking display line to indicate Alert messages are being transmitted to the tracking provider at programmed intervals. See "Status Messages" on page 7 for more information on the DZMx display and status lines.

Activating Alert Mode

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

To send an Alert message:

» Press and hold A.R.M. until the DZMx beeps and flashes ***Alert Queued!***

» A tracking message will be added to the front of the outgoing message queue

» Alert messages will continue to be sent at pre-programmed intervals (usually set at minute) until Alert mode is terminated

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

Emergency and Distress Mode

The DZMx allows users to activate an Emergency (distress) mode. When Emergency mode has been activated by the user, **Emergency Mode!** will flash in the tracking display line to indicate emergency messages are being transmitted to the tracking provider at programmed intervals. See "Status Messages" on page 7 for more information on the DZMx display and status lines.

Activating Emergency Mode

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

To send a distress message:

» Press and hold EMER until the DZMx beeps and flashes **DISTRESS queued**

» The DZMx will display Position marked

» A tracking message will be added to the front of the outgoing message queue

» Distress messages will continue to be sent at pre-programmed intervals (usually set at minute) until distress mode is terminated

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

Dropbox File Transfer

The DZMx allows an operator to upload and download files between a specified Dropbox location and a memory stick inserted into the DZMx USB port.

Configuration

Hardware

The DZMx must be fitted with a cell modem and it must be configured and enabled to use data. See the DZMx Data section in the Installation manual for further details

Setting Configuration

The Dropbox settings can only be modified via the DZMx Manager. The following settings must be configured correctly via DZMx Manager before attempting to transfer your files via the DZMx menu.

Dropbox Token	Your Dropbox App token (a long sequence of characters) obtained from your Dropbox account.
Dropbox Directory	This is the directory path on Dropbox that will contain your uploaded files and files to download to your USB directory. If left blank, the root directory is assumed.
USB Directory	This is the directory path on your USB drive that will contain your downloaded files and files to upload to your Dropbox directory. If left blank, the root directory is assumed.

Obtaining your Dropbox Token

You must acquire an App token from your Dropbox account in order for the DZMx to have access to your Dropbox files and directories. To obtain your token:

» Navigate to **https://www.dropbox.com/developers/apps/create**.

» For question 1 - *Choose and API*, choose 'Dropbox API'.
» For question 2 - *Choose the type of access you need*, choose either of the options.
» For question 3 - *Name your app*, type in a unique name, such as 'DZMx'.
» Click on the Create app button at the bottom to take you to next configuration screen.

> **Note:** If 'App folder' is selected, your dropbox files will be uploaded and downloaded from www.dropbox.com/home/Apps/<app name> where <app name> is the name you typed into question 3. If you enter a sub-directory into your Dropbox Directory setting, then this directory will be created under the <app name> directory.

» On the second page, do not change any of the settings, simply click on the Generate button. This will ask Dropbox to create you a unique token; a long sequence of characters.

» Copy the token from this page, return to view the Dropbox settings on the DZMx Manager page and paste the token into your Dropbox Token setting. This will enable the DZMx to access your remote files and directories.

Transferring files

In order for files to be transferred, first ensure your cell modem status shows 'Online'. Files can only be transferred if the cell modem has a good signal and an active data connection.

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

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

Uploading your files to Dropbox

Insert your memory stick containing your files into the USB slot. The DZMx will look for the files to upload in the USB directory you specified via DZMx Manager:

Uploading One File

» Press MENU then navigate to **Dropbox Transfer Menu>>Send USB files>>Select a file** to view the files on the USB stick.

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

» Up to 20 files will appear in the file list. Use UP and DOWN to scroll to the file to upload.

» Press ENTER to upload the file to Dropbox.

» Press BACK to return to the Upload USB Files menu.

» Press END to exit the menu system and return to the main screen.

Uploading All Files

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

Viewing the Dropbox Directory

» Press MENU then navigate to **Dropbox Transfer Menu>>Send USB files>>View files on Dropbox** to view files that are in the Dropbox directory.

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

» Use UP and DOWN to view the files in the Dropbox directory.

> **Note:** If your transfer operations cause the number of files in the Dropbox directory to exceed 20 files, then it is possible you will not see some or all of your recently copied files.

Downloading your files to your USB stick

Insert your (preferably empty) memory stick into the USB slot. Ensure the files you wish to download are located in the Dropbox directory you specified via DZMx Manager.

Downloading One File

» Press MENU then navigate to **Dropbox Transfer Menu>>Get Dropbox Files>>Select a file** to view the files in the Dropbox directory.

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

» Use UP and DOWN to scroll to the file to download.

» Press ENTER to download the file to your USB stick.

» Press BACK to return to the Download Dropbox Files menu.

» Press END to exit the menu system and return to the main screen.

Downloading All Files

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

Viewing the USB Directory

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

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

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

> **Note:** If your transfer operations cause the number of files in the USB directory to exceed 20 files, then it is possible you will not see some or all of your recently copied files.

Contact Details

Mailing Address

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Warranty

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

The DZMx warranty covers Flightcell manufactured items only. Any ancillary items may be covered by individual manufacturer warranties. The warranty is void if any labels are removed or if it is determined that your DZMx has been:

» Connected to a power supply delivering more than 32 Volts

» Connected with reverse polarity

» Installed in direct contravention to the guidelines outlined in the Flightcell DZMx Installation and Configuration Manual

» Physically damaged, or a fault has occurred due to the product being used beyond what is considered normal use, causing unusual deterioration of the product.

If the product is deemed to be faulty or in need of repair, please complete a Returned Materials Authorization form on **www.flightcell.com/rma** or contact Flightcell International (see "Contact Details" on the previous page).