Flightcell
Always Connected

Flightcell® DZMx Plus Specification
Revision 1.0

REVISIONS & APPROVAL

Revision	Effective Date	Approved By	Reasons for Change
1.0	27/05/2025	JJ Booyse	Initial Release HWD-457

CONTENTS

1 Introduction

The Flightcell DZMx Plus is a communication system that provides voice and data communications over the Iridium satellite and/or cellular networks.

The DZMx Plus can be built in different configurations to meet customer requirements. Options include different modems and special purpose circuit cards including ARINC 429, Ethernet and additional discrete inputs.

The DZMx Plus Transceiver Unit is designed to be installed in the Flightcell 2MCU DZMx Plus Tray, part number MEP_01-000.

2 Electrical Specifications

DZMX PLUS TRANCIEVER UNIT		
Part/Item	**Parameter**	**Value**
Power	Input Voltage	12-32VDC
	Power Supply Current	Up to 1.5A @28VDC
ICS to DZM Audio	Input Levels	20mVrms to 1.15Vrms, adjustable
		775mVrms to 1.15RMS nominal
	Input Impedance	600Ω
Microphone bias voltage		12V via 2.2kΩ
DZM to ICS Audio	Output levels	Up to 5Vrms, adjustable
		775mVRMS nominal
	Output Impedance	150Ω
GPS	Antenna bias voltage	5V
	Antenna current	Up to 100mA
	Sensitivity	-162dBm (with Flightcell Antenna)
	Time to first fix	26s
Wi-Fi	Tx power (dBm)	16
	Antenna gain (dBi)	2.0
	Total power (dBm)	18
	Total power (mW)	63.1
Bluetooth	Tx power (dBm)	10
	Antenna gain (dBi)	2.0
	Total power (dBm)	12.0
	Total power (mW)	15.9
Satellite Iridium	RF Frequency Range	1616 MHz to 1625.5 MHz
	Tx power (max)	7W
	Antenna gain (dBi)	3
	RF RX Sensitivity	-118 dBm
	Max Cable Loss	3 dB

	Antenna impedance	50 Ω
General Purpose Outputs	Levels (Vout)	0 to 32VDC
	Max Current (Iout)	500mA
General Purpose Inputs	Input Levels	0 to 28VDC with over/under voltage protection to +/- 32VDC
Data connection	Ethernet	2x Ethernet data interface 10/100 BASE T Front RJ45 ETH0 Secondary Ethernet ETH1 via the main connector (Interface to Flightcell Controllers)
	USB	2.0
USER INTERFACE		
Power switch	**Momentary action switch PWR on/off with backlight**	
LEDs	**Transceiver Status Indicator x3**	

SOFTWARE DEFINED RECIEVER	
RX Power	-5dBm +/-1dB
RX Power (RX amplifier disabled)	+10dBm +/-1dB
Operating frequency	1 MHz to 2 GHz

3 Mechanical Design

Metal work in the DZMx Plus is machined from 6061-T6 aluminium with an Oxsilan protective coating, and 6005-T6 folded sheetmetal which is powder coated. These finishes are to help maintain electrical conductivity between mechanical components and prevent corrosion.

The DZMx Plus is designed to be environmentally sealed to protect it from sand, dust and water to a level of IP54.

3.1 Enclosure

The DZMx Plus main enclusre is custom designed aluminium mix of folded sheet metal and machined parts, which is designed for strength and to maximise passive heat dissipation.

3.2 Front Panel

The Front Panel houses the interface connector, RF connectors, SIM cards for the internal modes, Power Switch, indicator LED's, and the Ethernet and USB connectors. The interface connector is an 62 High-Density D-Subminiture type male connector.

The RF connectors are BNC, TNC and SMA types.

3.3 Dimensions

Dimension	DZMx Plus
Length	239.60 mm
Width	58.00 mm
Height	188.00 mm

3.4 Mass

1.6 kg (depending on configuration)

4 Modems

The DZMx Plus supports up to three separate modems.

4.1 Iridium modem(s)

The following satellite modems may be installed in the DZMx Plus:

» One or two internal Flightcell Iridium 9523 modems

» An Iridium 9603 modem (used for Short Burst Data only).

4.2 Cellular Modem(s)

The following cellular modems may be installed in the DZMx Plus:

» A 4G (LTE) modem

» A 450 MHz modem.

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

Three different 4G modem versions are available for different geographic regions:

» EMEA (Europe, Middle East, Africa)

» APAC (Asia/Pacific and South America)

» Americas and Band 14 (North America, including the US Public Safety Band, band 14).

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

These support Voice, Data and Text funtions. Cell modem support is regional so the correct region must be specified when ordering the DZMx.

4.2.1 Cell Modem Band Support by Region

Region	LTE (4G)	UMTS (3G)	GSM (2G)
Asia Pacific / South America	B1 (2100) B3 (1800) B5 (850) B7 (2600) B8 (900) B28 (700)	B1 (2100) B5 (850) B8 (900)	 900 1800
Europe	B1 (2100) B3 (1800) B7 (2600) B8 (900) B20 (800) B28 (700)	B1 (2100) B8 (900)	 900 1800
Europe 450MHz	B3 (1800) B7 (2600) B20 (800) B31 (450)	B1 (2100) B8 (900)	900 1800
Americas	B2 (1900) B4 (1700) B5 (850) B12 (700) B13 (700) B14 (700) B17 (700) B66 (1700)	B2 (1900) B4 (1700) B5 (850)	-

5 Antennas

The DZMx Plus requires external antennas for the GPS, Iridium and Cell devices. Contact Flightcell for information on recommended antennas.

6 Part Numbering

The DZMx Plus part number is: DZP_07. The unique configuration of the DZMx Plus is defined by a dash number, consisting of up to 7 digits which specify the configuration of the modems and special purpose cards.

The complete part number format is: DZP_07-XXX-XXXX. The detailed break down of the dash number is contained in: 113-00002 DZP_07 Flightcell DZMx Plus Dash Number Definition Table.

7 Data Interfaces

The DZMx Plus supports the following data interfaces:

7.1 Serial Port

The DZMx Plus has a 3-wire serial port to allow connection to legacy devices such as external modems, PC's etc.

7.2 RS-485/422

The 4-wire RS-422/485 port allows the DZMx Plus to connect to other devices with RS-485 or RS-422 interfaces.

7.3 ARINC-429

The DZMx Plus optionally supports connection to ARINC-429 buses with 2 receivers and 1 transmitter. This is used to interface to aircraft FMS and ACARS systems or GPS systems.

7.4 USB

The DZMx Plus supports connections to USB devices to allow connection of USB drives for downloading data.

7.5 10/100 Ethernet

The DZMx Plus contains a 10/100 Ethernet port. This is used for interfacing to a variety of networked components such as Wi-Fi routers, PC's or to an Ethernet hub. An optional second Ethernet port can also be added, the optional second port is available on the D-sub connector.

7.6 Wi-Fi

The DZMx Plus supports Wi-Fi. This is enabled via an App and allows access to the DZMx Plus from connected tablets or phones. The DZMx can act as a Wi-Fi access point to share any available data connection with connected devices.

7.7 Bluetooth

The DZMx Plus can support Bluetooth connections. This is enabled via an App and allows access from the DZMx Plus to the user's cell phone audio connection and contact list.

7.8 I/O

The DZMx Plus contains 5 x General Purpose inputs as well as the 2 x isolated outputs. The general purpose inputs are user configurable as either analog or digital inputs. An optional additional input expansion card can be added to increase the available inputs to 12.

7.8.1 Inputs

The inputs have an active input range of 0 – 28VDC with over/under voltage protection to +/-32VDC. These inputs can be configured as either analog or digital with adjustable thresholds and can be used for a range of functions, such as oil pressure switches, collective switches, weight on wheels switch, load cell, etc.

7.8.2 Isolated Outputs

The DZMx Plus has 2 isolated outputs. The maximum load current for each output is 500mA and the maximum OFF state voltage is 60V. These can be configured to perform a range of tasks, such as an incoming call annunciator etc.

7.9 SDR (Software Defined Receiver)

The DZMx Plus optionally supports SDR (Software Defined Receiver), which allows for receiving and decoding of FM band, AIS and ADSB information.

8 Appendix

8.1 Appendix A: Commercial Connector Pinouts

- Connector type: D-SUB 62 HD male
- Mating part: M24308/2-14F (or equivalent)

Flightcell DZMx Plus Main Connector			
Pin No	**Connector**	**Direction**	**Notes**
1	POWER GROUND	Ground	
2	AUDIO FROM DZM2 HI	Output	HI audio output to ICS 2
3	AUDIO FROM DZM2 LO	Output	LO audio output to ICS 2
4	AUDIO FROM DZM1 HI	Output	HI audio output to ICS 1
5	AUDIO FROM DZM1 LO	Output	LO audio output to ICS 1
6	NC		
7	RS485 Rx+	Input	
8	NC	I/O	
9	AUX DATA GND	Ground	
10	GND	Ground	
11	GND	Ground	
12	RH_KEY	Input	Power On control (DZP_05/DZP_08 See relevant wiring diagram)
13	SPARE SHIELD	Ground	
14	POWER GROUND	Ground	
15	OUTPUT 1A	Output	Isolated output 1 Terminal A
16	OUTPUT 1B	Output	Isolated output 1 Terminal B
17	OUTPUT 2A	Output	Isolated output 2 Terminal A
18	OUTPUT 2B	Output	Isolated output 2 Terminal B
19	NC		
20	GENERAL PURPOSE INPUT 1	Input	
21	DC SUPPLY POSITIVE	Power	12-32 VDC
22	POWER GROUND	Ground	
23	NC	Ground	
24	NC	I/O	
25	NC	Power	
26	AUDIO TO AUX TXCVR HI	Output	
27	AUDIO TO AUX TXCVR LO	Output	
28	NC		
29	RS485 Rx-	Input	

30	SPARE SHIELD	Ground	
31	POWER GROUND	Ground	
32	SPARE SHIELD	Ground	
33	GPIO1	I/O	Reserved for Optional Capabilities
34	GPIO2	I/O	Reserved for Optional Capabilities
35	POWER GROUND	Ground	
36	POWER GROUND	Ground	
37	AUX DATA RX	Output	
38	MIC TO DZMx Plus 2 HI	Input	Unbiased/biased (configurable)
39	MIC TO DZMx Plus 2 LO	Input	Return for audio input from ICS 2
40	GPIO5	I/O	Reserved for Optional Capabilities
41	GPIO6	I/O	Reserved for Optional Capabilities
42	DC SUPPLY POSITIVE	Power	12-32 VDC
43	CHASSIS GND	Ground	Internally connected to DZMx Plus Chassis
44	NC	I/O	
45	AUDIO FROM AUX TXCVR HI	Input	
46	AUDIO FROM AUX TXCVR LO	Input	
47	MIC TO DZMx Plus 1 HI	Input	Unbiased/biased (configurable)
48	RS485 Tx+	Output	
49	MIC TO DZMx Plus 1 LO	Input	Return for audio input from ICS 1
50	RS485 Tx-	Output	
51	AUX DATA TX	Input	
52	NC		
53	GPIO3	I/O	Reserved for Optional Capabilities
54	GPIO4	I/O	Reserved for Optional Capabilities
55	GPIO9	I/O	Reserved for Optional Capabilities
56	GPIO8	I/O	Reserved for Optional Capabilities
57	GPIO7	I/O	Reserved for Optional Capabilities
58	GENERAL PURPOSE INPUT 5	Input	
59	GENERAL PURPOSE INPUT 4	Input	
60	GENERAL PURPOSE INPUT 3	Input	
61	GENERAL PURPOSE INPUT 2	Input	
62	DC SUPPLY POSITIVE	Power	12-32 VDC
D62 Shell	CHASSIS GND	Ground	

8.2 Appendix B: Associated documents

8.2.1 Interconnect Drawings

114-00018 DZMx Plus ICD

8.2.2 Mechanical Assembly Drawings

115-00005 DZMx Plus SkyConnect Tray Mechanical Assembly

115-00017 Flightcell 2 MCU DZMx Plus Tray Assembly General arrangement Drawing

115-00012 DZMx Plus Mechanical Assembly

8.2.3 Flightcell Dual Iridium/GPS Antenna Drawings

DRW_ANP_008 Flightcell Comant Iridium GPS Antenna

DRW_ANP_004 Flightcell Rami Blade Cell Antenna

8.2.4 Dash Number Definition

113-00002 DZP_07 Flightcell DZMx Plus Dash Number Definition Table

8.2.5 DZMx Plus Declaration of Design and Performance

120-00003 DZP_07 DZMx Plus DDP