

MIMOMesh Wireless MESH/Data Link

Multiple Handheld Series

# Technical Specification



2Watts×2  
Standard



2Watts×2  
+HDMI



5Watts×2  
Standard



1T2R  
Dual-band Switching



2Watts×2/4Watts×2/5Watts×2



Dual-band Operation Simultaneously/  
ULSC Four-band Selection Operate



2Watts×2  
+Camera&Display



2Watts×2  
+5G routing



2Watts×2  
+DMR&PDT

# 1. Specifications

General			
SDR Platform, Waveform	AD936X+FPGA (7Z020、7Z030、7Z035、7Z100), Mobile network MANET+MIMO		
MIMO Technology	Space-time coding、Receive Diversity、TX/RX beamforming、Spatial multiplexing		
Receive Sensitivity	-103dBm@5MHz BW		
Channel Bandwidth	1.25/2.5/5/10/20MHz (7Z020、7Z030)/40MHz (7Z035)/80MHz (7Z100, 40MHz+40MHz dual antenna frequency transceiver of carrier aggregation), configurable		
Data Rate	1-70Mbps (20MHz BW, 7Z020)/1-130Mbps (20MHz BW, beamforming by 7Z030)/1-252Mbps (40MHz BW)/1-350Mbps (80MHz BW) Adaptive, QoS		
Modulation Mode	TD-COFDM, BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM Adaptive (Fixed setting optional)		
RF Output Power (Support TPC, transmission power control, 1dBm adjustable)	2Watts×2 4Watts×2 5Watts×2		
Mode	Distributed centerless Point-to-point/Point-to-multipoint/Multipoint-to-multipoint, Layer 2 or 3 of Dynamic routing、Multi-hop relay, Star/Line/Network/Hybrid		
Single Hop Delay	Average 6mS (Unidirectional, 20MHz BW)		
Encryption	DES, AES128/256 (SM4/SNOW3G/ZUC optional, Chip/TF card encryption customized or external encryption machine)		
Anti-Jamming Mode	Manual spectrum scanning channel selection/Full band enhanced intelligent frequency selecting(spectrum awareness)/Full band adaptive frequency hopping FHSS/Roaming mode, Multi-level anti-interference		
Local/Remote Management	Operating frequency, channel bandwidth, network ID, transmit power and other parameter settings, spectrum scanning, real-time display and statistical records of network topology, link field strength signal-to-noise ratio, upload and download traffic, node distance, BD/GPS(GNSS) positioning electronic map, temperature/voltage/jamming Monitoring, software upgrade (remote silence and wake-up optional)		
Others	The startup time is less than 28 seconds, and the network access/update/switchover time is less than 1 second; There is no limit on the user capacity of a single system (256 nodes or more) and the number of hops in Mesh networks (Data 15+ hops, voice 10+ hops, video 8+ hops); The total transmission rate loss for more than three hops is less than 70%; Automatic carrier tracking, adapted to a Doppler frequency deviation of ±6kHz frequency offset, supports mobile communication at speeds above 7200 kilometers per hour (6 Mach, 2000 meters per second)		
Bands (70M-6GHz/Uper C-X-Ku customizable. Same frequency or different frequency of TDD, 2T2R at single band or 1T2R at dual-band)			
BAND	Frequency range	BAND	Frequency range
VHF/UHF (MHz)	360-450/450-550/570-700/800-950, 225-400/225-678/320-470*	S Band (GHz)	2.0-2.2/2.2-2.4/2.3-2.5/2.5-2.7/2.7-2.9/3.2-3.4/3.4-3.6/3.6-3.8, 1.9-2.7/2.0-2.7/2.1-2.7/2.7-3.6*
L Band (GHz)	1.0-1.2/1.1-1.3/1.3-1.5/1.5-1.7/1.6-1.8, 1.0-1.5/1.1-1.6/1.2-1.7/1.3-1.8/1.6-2.3/1.7-2.4/1.8-2.5*	C Band (GHz)	4.4-5.0/5.25-5.85, 4.2-5.2/5.5-6.0/6.4-7.2*
<small>(Note: RF power, Dimensions, Weight is different)</small>			
MIIT (MHz)	336-344/512-592/566-626/606-678/1420-1520/1430-1444		
Environmental			
Operation Temperature	-40°C ~+80°C	Protection Level	IP66 (IP67/IP68 Customized)
Mechanical		Interface	
Size/Weight	19.0x6.8x3.8cm/769g, with 11.1V/77.7Wh battery 26.0x6.8x3.8cm/1.04kg, with 11.1V/114Wh battery 20.7x6.9x5.5cm/1.30kg, with 11.1V/114Wh battery (5G Routing) 21.0x6.8x5.2cm/972g, with 11.1V/77.7Wh battery (Four-band) 15.5x6.6x3.2cm/430g, Contains lithium battery, does not include antenna and back clip	Basic interface	2xIPEX/2xMMCX/2xSMP/2xSMA RF, 1-2xRJ45 Ethernet 100/1000BaseT, RS232, DC input. TTL (UART), SBUS, and Bluetooth 1.2-230.4Kbps, Wi-Fi access point, and BD/GPS (GNSS) are available. Supports transparent transmission over Ethernet and serial ports, and all communication protocols, including MAVLink. Selectable service priority
Color	Black, Iron Gray (Army Green Optional)	Push to talk/ Auxiliary interface	MIC, SPK, PTT, GND, RS485/422, USB2.0 OTG
Installation	4 Mounting Holes	Network Extension Optional	Public Network Routing/4G LTE, WB-NB integration, Fiber, Satellite
		Video Extension Optional	Low Delay HDMI/SDI/CVBS, 4K/2K/1080P/720P/D1
Power		LINK Indicator	Steady red - The network is not connected Blinking red - Starting/not connected to the network Steady green - The network is connected Blinking green - Push-To-Talk has been pushed
Supply Voltage	9-24VDC, 2Watts×2 12-28VDC, 4Watts×2/5Watts×2	RSSI Indicator	Steady green - The link quality is excellent Steady blue - The link quality is good Steady yellow - The link quality is medium Steady purple - The link quality is slightly worse Steady red - The link quality is poor or link is down Off - The link is interrupted
Power consumption	Operation 1-2A/Standby 0.4-0.6A@12V, 2Watts×2 Operation 2-4A/Standby 0.5-0.7A@12V, 4Watts×2/5Watts×2	Management Interface/ Control Interface	Web-based network management/GUI, API for secondary development interface/SNMP
Power Selection	6-8 hours for 77.7Wh polymer lithium battery (Default); 8-10 hours for 114Wh polymer lithium battery		

## 2. Hardware Interfaces

### 2.1 2Watts×2 (Standard)



**1** 1-2 RF Antenna Connection Port [SMA Female]

**2** Radio switch

**3** Power/Communication Connection Port [LF10WBRB-12PD]

**4** WIFI Antenna Connection Port [SMA Female]

**5** Auxiliary Connection Port [LF10WBRB-12SD]

**6** LINK Indicator

- **Steady red:** The network is not connected
- **Blinking red:** Starting/not connected to the network
- **Steady green:** The network is connected
- **Blinking green:** Push-To-Talk has been pushed

RSSI Indicator

- **Steady green:** The link quality is excellent
- **Steady blue:** The link quality is good
- **Steady yellow:** The link quality is medium
- **Steady purple:** The link quality is slightly worse
- **Steady red:** The link quality is poor
- **Off:** The link is interrupted

### 2.2 2Watts×2 (WIFI/HDMI)



**1** Radio Switch

**3** Link Indicator

- **Steady red:** The network is not connected
- **Blinking red:** Starting/not connected to the network
- **Steady green:** The network is connected
- **Blinking green:** Push-To-Talk has been pushed

RSSI Indicator

- **Steady green:** The link quality is excellent
- **Steady blue:** The link quality is good
- **Steady yellow:** The link quality is medium
- **Steady purple:** The link quality is slightly worse
- **Steady red:** The link quality is poor or link is down
- **Off:** The link is interrupted

**2** Power/Communication Connection Port [LF10WBRB-12PD]

**4** WIFI Antenna Connection Port [SMA Female]

**5** HDMI Switch

**6** 1-2 RF Antenna Connection Port [SMA Female]

**7** HDMI Port

**8** Auxiliary Connection Port [LF10WBRB-12SD]

### 2.3 2Watts×2 (WIFI/HDMI/5G)



- 1** HDMI Switch
- 2** 1-2 RF Antenna Connection Port [SMA Female]
- 3** SIM Card Slot
- 4** Power/Communication Connection Port [LF10WBRB-12PD]
- 5** Link Indicator
  - **Steady red:** The network is not connected
  - **Blinking red:** Starting/not connected to the network
  - **Steady green:** The network is connected
  - **Blinking green:** Push-To-Talk has been pushed

- 6** WIFI Antenna Connection Port [SMA Female]
- 7** Radio Switch
- 8** 5G Antenna Connection Port [SMA Female]
- 9** Auxiliary Connection Port [LF10WBRB-12SD]
- 10** HDMI Port

- RSSI Indicator
- **Steady green:** The link quality is excellent
  - **Steady blue:** The link quality is good
  - **Steady yellow:** The link quality is medium
  - **Steady purple:** The link quality is slightly worse
  - **Steady red:** The link quality is poor or link is down
  - **Off:** The link is interrupted

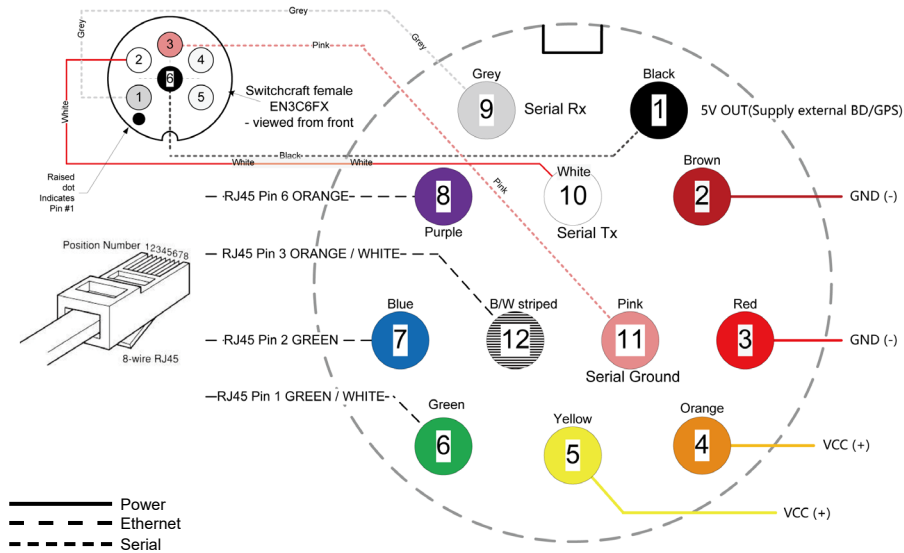
### 3. Connection Port Pin Definition

PRI: Power/Ethernet/Serial Connector Pinout-7Z020/7Z030	
Enclosure PWR/COMM (LF10WBRB-12PD)	Signal
1	5V OUT (Supply external BD/GPS)
2	GND (-)
3	
4	VCC (+)
5	
6	ETH_TX+
7	ETH_TX-
8	ETH_RX-
9	RS232(Default)/TTL(UART)_RXD
10	RS232(Default)/TTL(UART)_TXD
11	RS232(Default)/TTL(UART)_GND
12	ETH_RX+

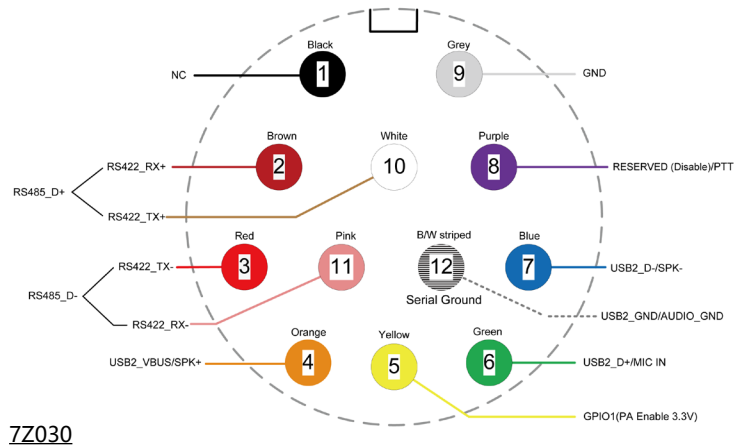
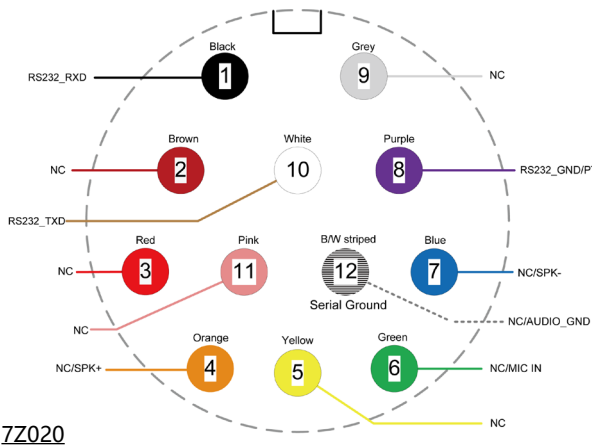
**Table 1 PRI: Power/Ethernet/Serial Connector Pinout**

AUX: USB/GPIO Connector Pinout			
Enclosure USB/GPIO (LF10WBRB-12SD)	7Z020 Signal	7Z030 Signal	Voice interface definition
1	RS232_RXD	NC	/
2	NC	RS422_RX+/RS485_D+ (Parallel With PIN10)	/
3		RS422_TX-/RS485_D-(Parallel With PIN11)	/
4		USB2_VBUS	SPK+
5		GPIO1 (PA Enable 3.3V)	/
6		USB2_D+	MIC
7		USB2_D-	SPK-
8		RS232_GND	RESERVED (Disable)
9	NC	GND	/
10	RS232_TXD	RS422_TX+/RS485_D+(Parallel With PIN2)	/
11	NC	RS422_RX-/RS485_D-(Parallel With PIN3)	/
12		USB2_GND	AUDIO_GND

**Table 2 USB/GPIO Connector Pinout**  
 (USB1 is USB 2.0 OTG, USB2 is USB 2.0 Host Mode Only)



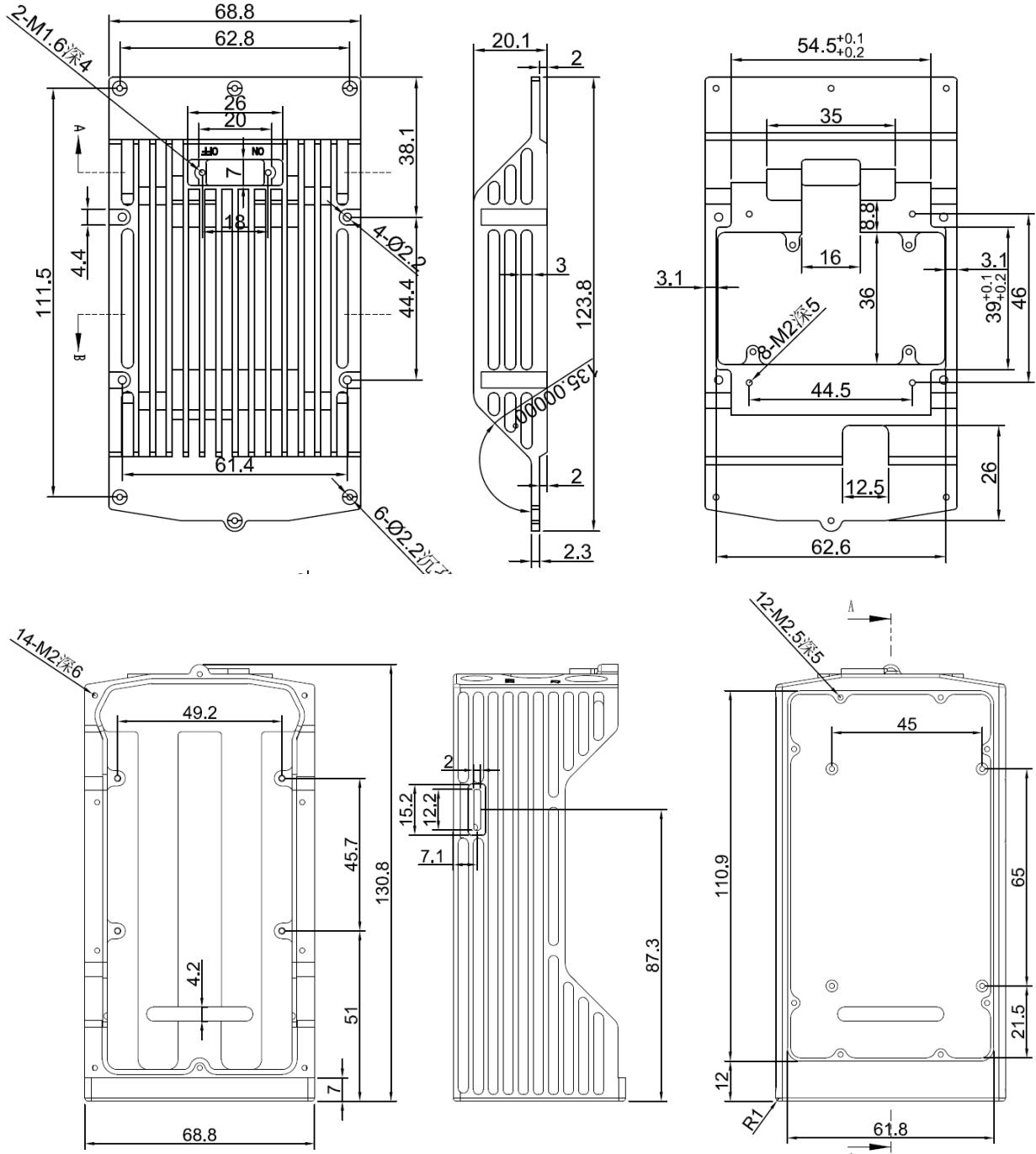
**Figure 1 Power Supply (Optional)/Ethernet/Serial Pinout (Cable Interface Front View, Non-Solder Side)**



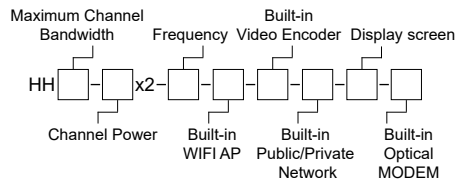
**Figure 2 USB/GPIO Pinout (Cable Interface Front View, Non-Solder Side)**



### 4.2 2Watts×2 (WIFI/HDMI/5G)



## 5. Model Name



Maximum Channel Bandwidth	Channel Power (W)	Frequency (MHz)	Built-in WIFI AP	Built-in Video Encoder	Built-in Public/Private Network	Display Screen	Built-in Optical MODEM
20	2	600, U	0(N)	0(N)	0(N)	0(N)	0(N)
40	4, 5	1400, L	1(Y)	HDMI	4G/5G	2(2")	1(Y)
80	10	2300, S		SDI/AV	4G LTE CPE	3(3.2")	
	20, 40	4500, C				4(4")	

HH20-2x2-1400-1-HDMI-4G/5G-0-0 Express: Maximum channel bandwidth 20MHz, 2Watts×2, 1400MHz, With WIFI AP, Built-in HDMI Coding, Built-in 4G/5G Public Network Module, Without display screen and without optical MODEM Handheld Radio.