



Shenzhen Sinosun Technology Co.,Ltd.

# Technical Specification

File Number: SINOSUN-DDL10×2/20×2

Product Name: Backpack Radio

Compilation/Date:

Review/Date:

Approval/Date:

Amendment No.	Modify The Content	Modified Date

# 1.Backpack Radio

The new DDL series wireless digital data link is a low-cost long-distance video&data transmission product with small size, light weight, 2X2 MIMO, complete functions and rich frequency bands. DDL series based on SDR software defined radio platform with 2X2 MIMO, It adopts Beamforming, Maximal Ratio Combining (MRC), Maximal Likelihood(ML) algorithm, low density parity check (LDPC) coding, intelligent frequency selection and autonomous frequency hopping technology to achieve strong radio frequency performance and strong anti-jamming. DDL series data link radio provides ultra-long distance, low latency, bidirectional multi-channel network video&data&voice integrated wireless transmission. The world's leading code-modulated physical layer waveform technology and flexible anti-jamming and secure encryption design for the unmanned field are applied to reliable remote data links for UAVs, helicopters, robots, unmanned ships, unmanned vehicles and special vehicles.

The application system is mainly composed of the airborne radio with the airborne camera, and the ground radio with the ground computer, as well as the necessary accessories (including power supply, antenna feed system, connection lines and connectors, etc.).

The system can simultaneously transmit three IP/HDMI/SDI/CVBS HD video and multiple two-way transparent data (such as flight control/pod, Beidou /GPS, voice, etc.). AES encryption ensures transmission security.

Radio the transmission power of the station can reach up to 40W, providing a stable and reliable communication link.

## Features

- 400M/600M/800M/900M/1.4G/2.3G/2.4G/5.8GHz, transmitting power can be change, support NLOS high speed mobile transmission, open transmission distance of more than 50 km.
- 70Mbps data stream, adaptive dynamic bit allocation technique. Support one way 4K, multi way 1080P or 720P HD video.
- 3 serial port and 2 video interface running at the same time, flight controller, voice, GPS and other data can transmit with video.
- Support PtoP, PtoMP, MPtoMP technique,centerless of no-master/slave.Support VLAN.
- Local diagnostic interface, telnet, network management. Local and remote wireless firmware update through FTP.
- Low power consumption. Tiny volume, lightweight structure, body building for UAV.



# 2.Backpack Radio Specifications

Wireless Specifications	
Frequency Range	320-450/450-550/550-700MHz, 1000-1300/1300-1500MHz, 1.8-2.2/2.2-2.5GHz, 4.4-5.0/5.0-6.0GHz, 70M-6GHz Customized
Channel Bandwidth	1.25/2.5/5/10MHz Adjustable
Modulation Mode	COFDM, DSSS-CCK/BPSK/QPSK/16QAM/64QAM (Adaptive)
Throughput	70Mbps@10MHz/25Mbps@5MHz/10Mbps@2.5MHz/4Mbps@1.25MHz
Sensitivity	-102dBm@5MHz
Transmission Distance (line-of-sight)	over 150 km (10Watts x 2)、over 200 km (20Watts x 2)
Transmission Power	10Watts x2 20Watts x2
Networking Capabilities	
Communication Mode	Point-to-point、 point-to-multipoint and multipoint-to-multipoint, Reapter
Network Topology	Centerless of no-master/slave to MPtoMP
Wireless Protocol	HTDMA
Network Protocol	IPv6, QoS, DNS, HTTPS, IP, ICMP, NTP, DHCP, VLAN
Encryption	DES56/AES128/AES256
Anti-jamming	Intelligent frequency selection/Autonomous frequency hopping
Mobility	Support movement speed greater than 200 km/h
Transmission Delay	Less than 10 ms

System Parameters	
Interface	Network port (IP/WiFi), Serial port (232/485/422/TTL、 Sbus/USB/Bluetooth), Audio port (MIC-SP-PTT/VoIP)、 4G-5G Public Network Routing/4G LTE/Satellite/Fibe
Video Interface	IP、 HDMI/SDI、 CVBS
Local/Remote Management	PC terminal Web browsing, Mobile APP: topology, node and link status, distance monitoring, whole network parameter configuration, software upgrade and other functions
System Upgrade	Support one-click upgrade, remote upgrade
Positioning Function	GPS/BDS
Power Supply	14.8-36VDC, 10Watts×2 18-36VDC, 20Watts×2
Power Consumption	Operation 3-6A/Standby 0.7-0.9A@16.8V, 10Watts×2 Operation 6-10A/Standby 0.7-0.9A@20V, 20Watts×2
Physical Properties	
Operating Temperature	-40℃ ~ 80℃
Protection Level	IP65、 IP66/IP67(Customized)
Size/Weight	22.9x18.9x6.2cm/3.86kg(with 22.2V/9.6AH battery Backpack Radio)

### 3. Backpack Radio Hardware Interfaces



- |   |  |
|---|--|
| <p><b>1</b> WIFI Antenna [SMA Female]</p> <p><b>2</b> Power Switch</p> <p><b>3</b> Power supply port</p> <p><b>4</b> Radio switch</p> <p><b>5</b> Auxiliary Connection Port [LF10WBRB-12SD]</p> <p><b>6</b> Push-to-Talk (PTT) Connector HGG.0B.304</p> | <p><b>7</b> Link Status Indicator</p> <ul style="list-style-type: none"> <li>• Steady red: The network is not connected</li> <li>• Blinking red: Starting/not connected to the network</li> <li>• Steady green: The network is connected</li> <li>• Blinking green: Voice PTT is down</li> </ul> <p>RSSI Link Indicator</p> <ul style="list-style-type: none"> <li>• Steady green: The link quality is excellent</li> <li>• Blue Steady: The link quality is good</li> <li>• Steady yellow: The link quality is medium</li> <li>• Steady purple: The link quality is slightly worse</li> <li>• Steady red: The link quality is poor or link is down</li> <li>• Off: The link is interrupted</li> </ul> |
| <p><b>8</b> RS232, Ethernet, and Serial Port Connector[LF10WBRB-12PD]</p> <p><b>9</b> RF Channels 1-2 Connectors [TNC Female]</p>   |  |

### 4. Backpack Radio Connection Port Pin Definition

Power/Ethernet/Serial Connector Pinout	
Enclosure PWR/COMM (LF10WBRB-12PD)	Signal
1	5V OUT (For External GPS Puck)
2	GND IN
3	GND IN
4	VCC IN
5	VCC IN
6	100-Base T ETH0 M2N
7	100-Base T ETH0 M2P
8	100-Base T ETH0 M1P
9	RS232_RXD
10	RS232_TXD
11	RS232_GND
12	100-Base T ETH0 M1N

Table 1 Power/Ethernet/Serial Connector Pinout

RS-232 and PS/2 (GPS) Pinout		
RS-232	DB9 (GPS)	Signal
3	2	TxD
2	3	RxD
NC	NC	NC
NC	9	5V OUT
NC	NC	NC
5	5	Ground

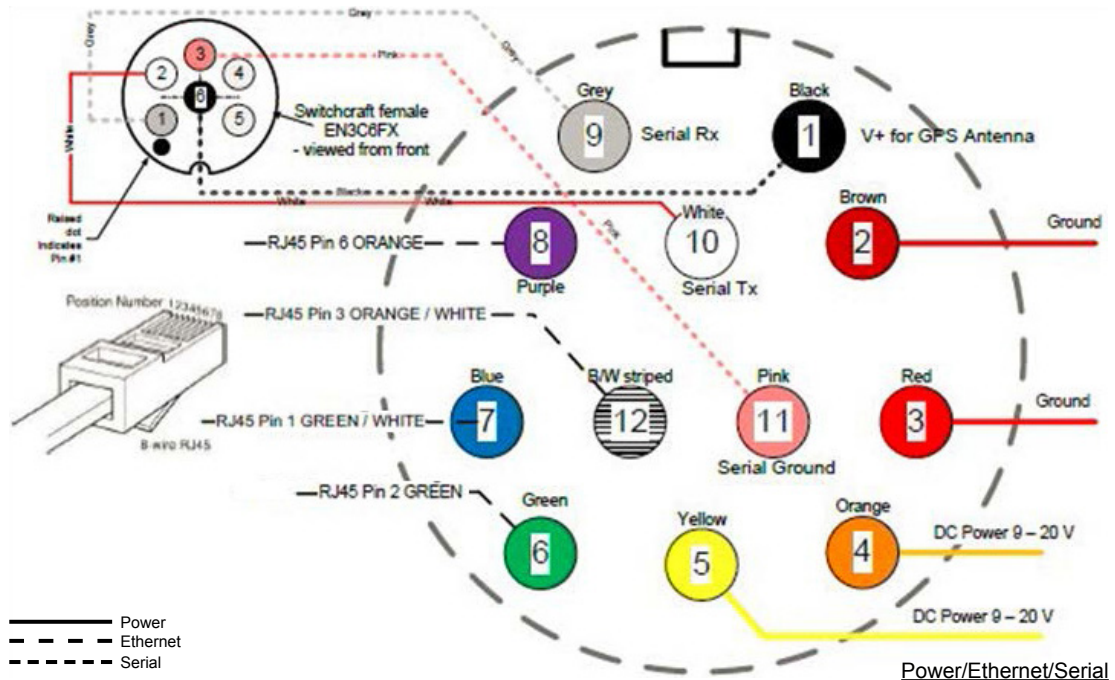
Table 2 Serial and GPS Pinout

USB/GPIO Connector Pinout		
Enclosure USB/GPIO (LF10WBRB-12SD)	Signal	Voice interface definition
1	NA	/
2	NA	/
3	RS458 D-	/
4	USB2_VBUS	AUDIO_GND
5	GPIO1 (PA Enable 3.3V)	/
6	USB2_D+	MIC IN
7	USB2_D-	SPEAKER_OUT
8	RESERVED (Do Not Connect)	PTT
9	GND	/
10	RS458 D+	/
11	NA	/
12	USB2_GND	AUDIO_GND

**Table 3 USB/GPIO Connector Pinout**  
(USB1 is USB 2.0 OTG, USB2 is USB 2.0 Host Mode Only)

PTT Connector(Limited to Backpack Radio)	
Enclosure PTT Connector (ODU GKCWAM-P07UB00-000L)	定义
1	AUDIO_GND
2	PTT
3	SPEAEKR_OUT
4	MIC_IN

**Table4 PTT Connector Pinout\*(Generally Adopted)**



**Figure1 Power (Optional)/Serial/Ethernet Pinout Diagram (Cable Side)**

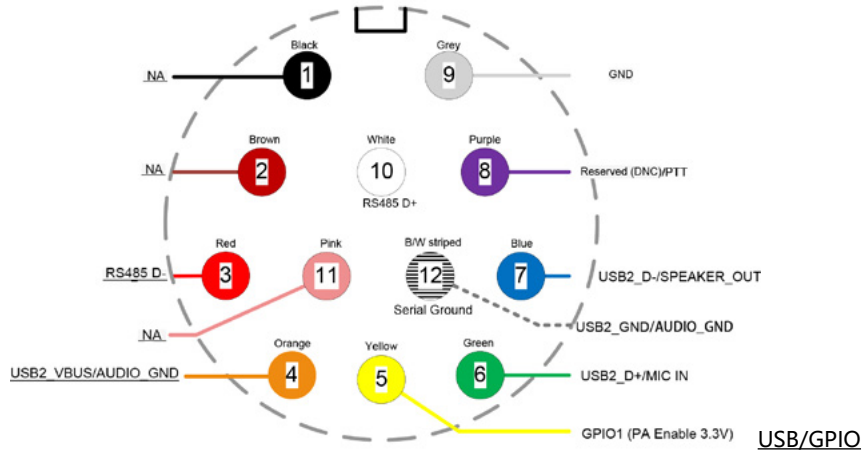


Figure 2 USB/GPIO Pinout Diagram (Cable Side)

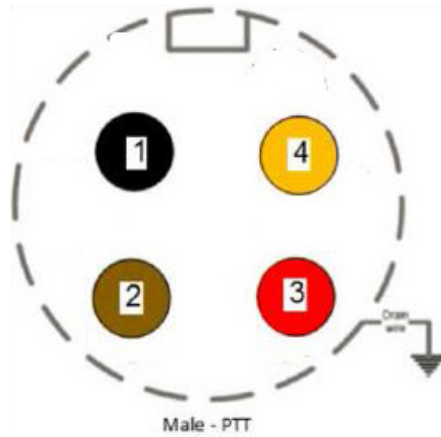
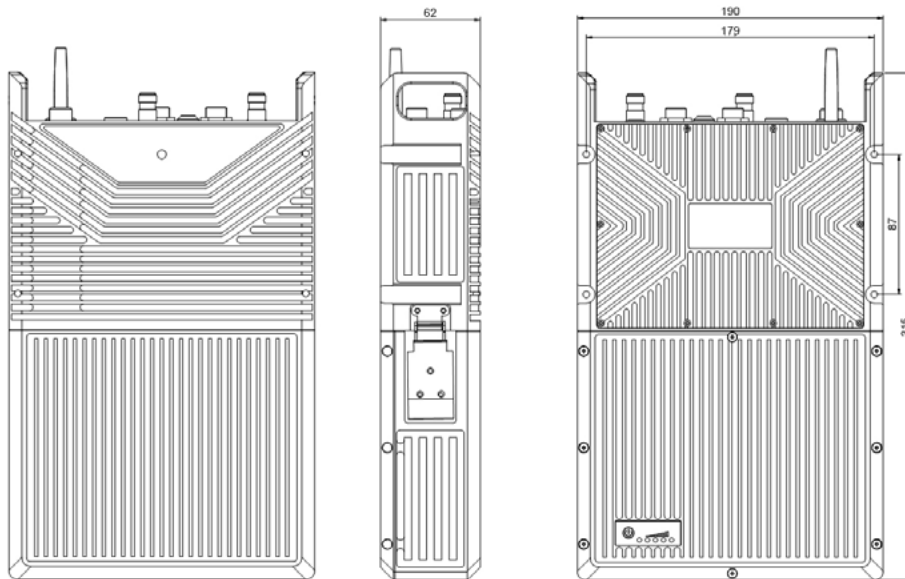


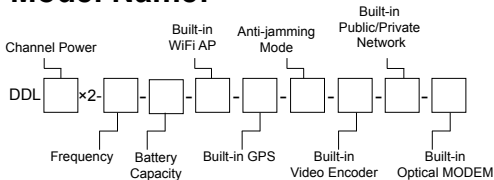
Figure 3 PTT Pinout Diagram (Cable Side)

## 5. Backpack Radio Dimension Figure



## 6. Backpack Radio Model Name

Model Name:



Channel Power (W)	Frequency (MHz)	Battery Capacity (AH)	Built-in WiFi AP	Built-in GPS	Anti-jamming Mode	Built-in Video Encoder	Built-in Public/Private Network	Built-in Optical MODEM
0.5,1	600,U	0(N)	0(N)	0(N)	0(Single Frequency)	0(N)	0(N)	0(N)
2,4	1400,L	6.8,10.2	1(Y)	1(Y)	1(Intelligent Channel Selection)	HDMI	4G/5G	1(Y)
10	2300,S	9.6,28.8			2(Autonomous Frequency Hopping)	SDI/AV	4G LTE CPE	
20	4500,C							

DDL2×2-1400-10-28.8-0-0-1-0-0-0, Express: 2W×2, L Band, Maximum Channel Bandwidth 10MHz, with intelligent frequency selection Backpack Radio.