Backpack station User Manual

Dual Band（KS614、KS914）

Model 1: 600M&1.4GHz
Model 2: 900M&1.4GHz
Version: 20250501V1.0

Version history

Date	Version	Modification instructions
20250501	V1.0	Initial version

Catalogue

1.Product Overview

The KS dual-frequency series is a self-developed TDD bidirectional image and data integrated backpack device. There are a total of two models. KS614 supports 600M&1.4G, and KS914 supports 900M&1.4G. The product features real-time interference detection, adaptive frequency selection, adaptive code stream, automatic retransmission and automatic power control functions, which significantly enhance its anti-multipath and anti-interference capabilities. It is characterized by high reliability, good stability and low latency.

This product is suitable for scenarios such as fire protection, inspection, and monitoring. Under good environmental conditions with air-to-ground visibility, it can transmit over a distance of more than 30 kilometers.

2.Product Features

Support dual-track technology with different frequencies: Support independent frequency hopping for transmission at each uplink and downlink frequency point

Support long-distance transmission: With a 4M code flow, the transmission distance can reach over 30km depending on the situation

Support for high bandwidth transmission: Maximum support 23.9Mbps@20MHz

Support for automatic relay transmission: Support relay mode

Support automatic frequency selection: Automatically detect interference signals and select the optimal frequency in real time

Support for automatic retransmission: Automatically retransmit sudden error data to enhance data reliability.

Support adaptive bit stream: Automatically adjust the channel modulation mode in real time according to the signal quality

Support for automatic power control: Automatically adjust the transmission power at short range to reduce power consumption

Support for automatic antenna selection: Select the optimal antenna for transmission in real time based on the occlusion situation

Support dynamic allocation of uplink and downlink: The bandwidth proportion of the master and slave uplink and downlink can be automatically allocated according to the actual data volume

Support frequency synchronization function: Frequency synchronization can be configured through software and through hardware keys

Support for external remote controls: Supports the use of external remote controls in conjunctions

3.Product indicators

3.1. Ground unit technical specifications

Ground unit parameters	
Equipment model	KS614/KS914
Working frequency	KS614：566-678MHz&&1350-1470MHz KS914：840-930MHz&&1350-1470MHz
Radio frequency channel	2T2R
Transmission power	33dBm (2W)
Transmission distance	Air to ground 30KM+
Channel bandwidth	10MHz、20MHz
Modulation mode	QPSK/16QAM
Maximum rate	23.9Mbps@20MHz
Encryption	AES256
Transmission delay	≤10ms
RF interface	N-type female head *2
Equipment interface	Lemo 8PIN： Ethernet *1
	Lemo 6PIN： TTL/RS232*1; SBUS*1
Consumption	≤15W
Protection grade	IP53
Dimensions(L*W*H)	240mm*200mm*60mm
Weight	2.5KG
Battery duration	6 hours
Charging voltage	25.2V
Working temperature	-20~+65℃

3.2. Air unit technical specifications

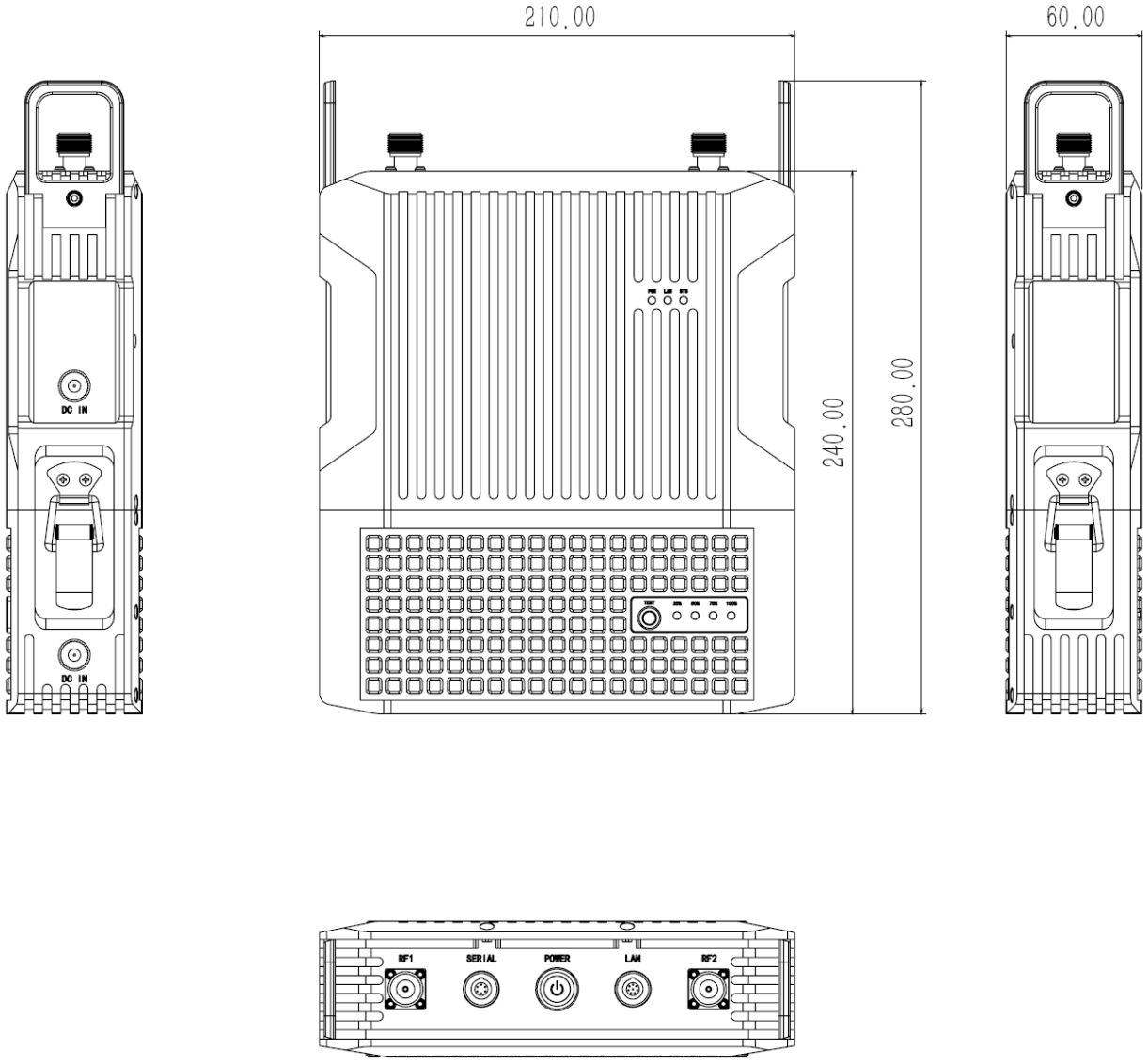
Air unit parameters	
Equipment model	P33-MINI-DUAL
Working frequency	model 1: 566-678MHz&&1350-1470MHz model 2: 840-930MHz&&1350-1470MHz
Transmission power	33dBm (2W)
RF interface	SMA*2
Equipment interface	Network port 1: Ethernet *1
	Serial port 1: TTL/RS232 *1
	Serial port 2: TTL*1/RS232*1/SBUS*2
Consumption	≤25W
Dimensions(L*W*H)	150mm*72.3mm*27mm
Weight	340g
Working voltage	DC 9~26V, Typical value : +12V@3A
Working temperature	-40~+70℃

3.3. Remote control technical specifications

Remote control parameters (Optional)	
Processor	Intel I7-7200U
System configuration	Windows 10, 8G/256G
WIFI Bluetooth	2.4G&5.8G WIFI 和 4.0 Bluetooth
Screen parameters	10.1",1280*800,1000ccd/m²
Touch mode	10-point capacitive touch
Battery level display	System display and external LED display
External interface	USB*2,HDMI*1,RJ45*1,4PIN-LEMO Network port*1
Charging time	3-4 hours
Working hours	4-5 hours
Battery charging	19V
Battery capacity	16.8V 8000mah
Dimensions(L*W*H)	335*185*78mm
Weight	1.9kg
Working temperature	-20~60℃
Control type	2 flight joysticks, 1 thumb joystick, 10 buttons Three-position switch *6, knob *2
SBUS Channel	SBUS*2 (22 channels)
Equipment material	Aviation aluminum, alloy silicone ,plastic

4. Product dimensions and weight

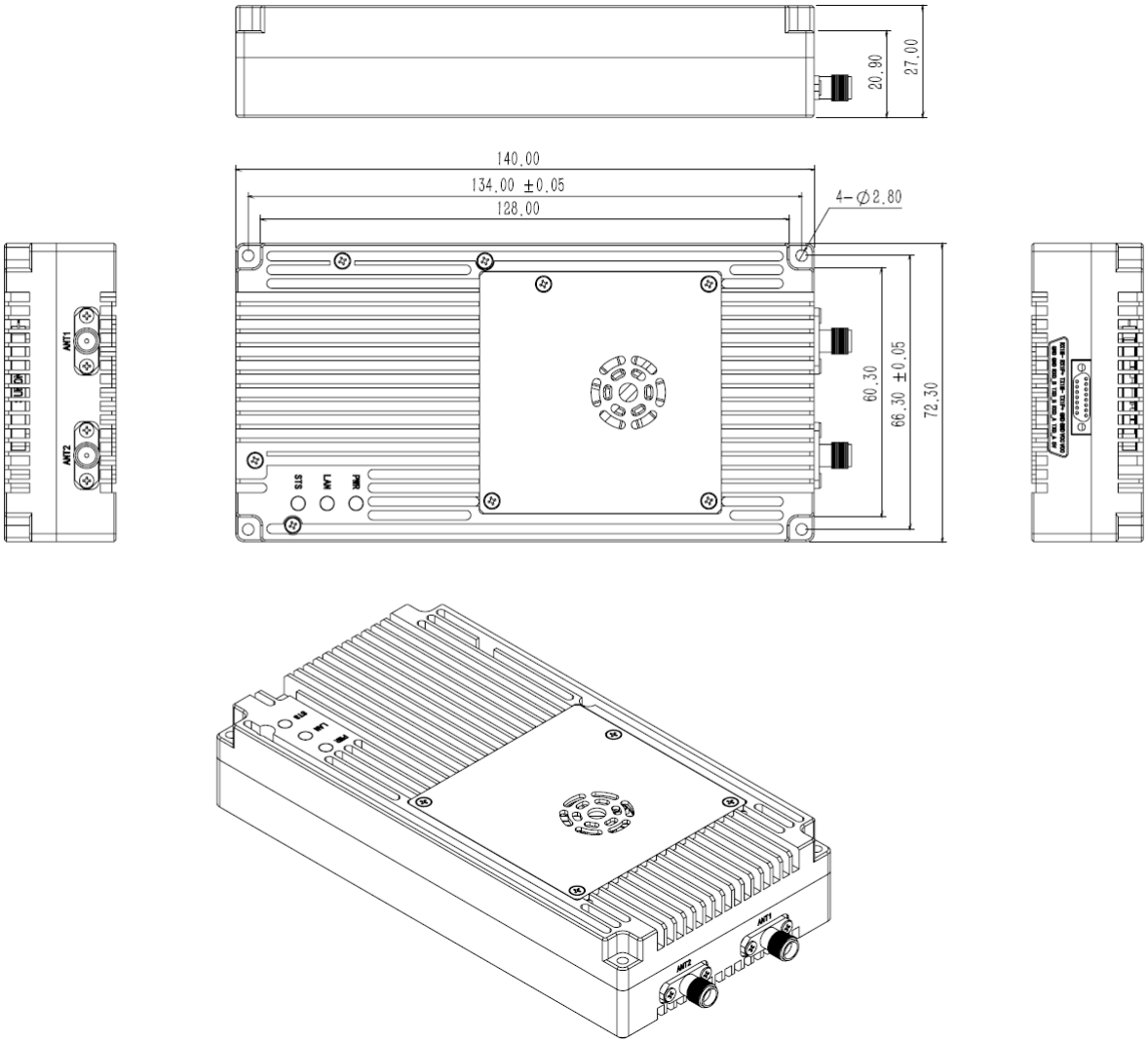
4.1. Schematic diagram of the ground unit dimensions



4.2. Ground unit dimensions and weight

- Dimensions(L*W*H): 240mm * 200mm * 60mm
- Weight: 2.5kg

4.3. Schematic diagram of the air unit dimensions

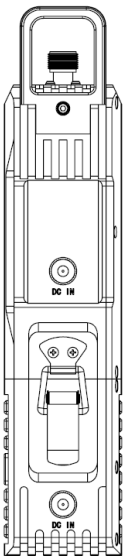


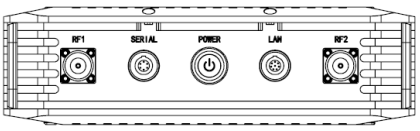
4.4. Air unit dimensions and weight

- Dimensions(L*W*H): 150mm*72.3mm*27mm（Including SMA 10mm）
- Weight: 340g

5. Product interface definition

5.1. Schematic diagram of the ground unit interface



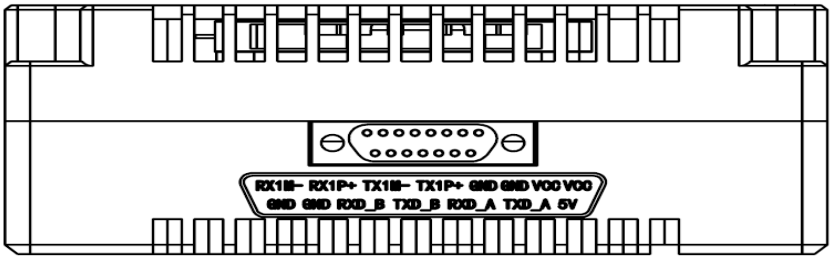


There are two DC_IN power sources on the side of the KS614 device. The upper one is the DC_IN power supply port, and the lower one is the DC_IN charging port. The top of the KS614 device has two N-male antennas, a POWER switch, an 8-pin-LEMO LAN network port, and a 6-pin-LEMO SERIAL port. The 6-pin -LEMO serial port includes one serial port and one SBUS.

5.2. Ground unit interface definition

LEMO Socket 6PIN	Serial port definition	LEMO Socket 8PIN	Definition of network Port
1	TXD_A	1	TX+
2	RXD_A	2	TX-
3	GND	3	RX+
4	SBUS_RX	6	RX-
5	SBUS_GND	4,5,7,8	Invalid
6	SBUS_5V		

5.3. Schematic diagram of the air unit interface



The interface of the P33-MINI-DUAL device adopts J30J-15pin, with a total of 1 power supply, 1 network port and 2 serial ports. One of the serial ports is fixed as RS232/TTL, and the other serial port can be modified for RS232/TTL/SBUS. The serial port level is determined by the factory hardware and cannot be modified by the customers themselves.

5.4. Air unit interface definition

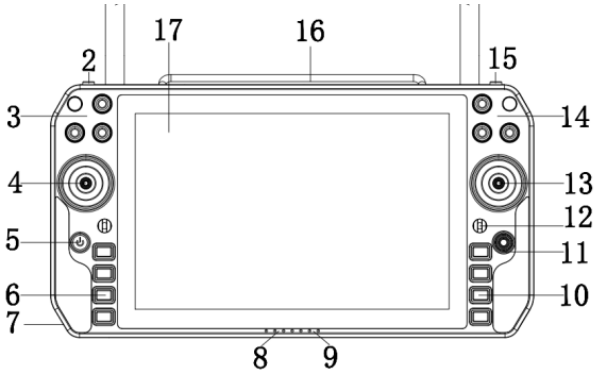
Linear order	Pin name	Interface definition	Interface description	Signal direction
1	VCC	power DC 9~26V	Power Positive	I
2	VCC		Power Positive	I
3	GND		Power Negative	I
4	GND		Power Negative	I
5	TX1P+	Ethernet *1	TX+	O
6	TX1M-		TX-	O
7	RX1P+		RX+	I
8	RX1M-		RX-	I
9	Reserve	Reserve	Reserve	IO
10	TXD_A	Serial port 1 RS232/TTL	Serial port 1 TX	O
11	RXD_A		Serial port 1 RX	I
12	SBUS /TXD_B	Serial port 2 SBUS/TTL/RS232 (note 2,3)	SBUS output(air unit)	IO
13	SBUS /RXD-B		SBUS input(ground unit)	IO
14	GND		Serial port 2 ground	O
15	GND	ground	Serial port 1 ground	O

Note 1: Signal direction I indicates radio input, and direction O indicates radio output.

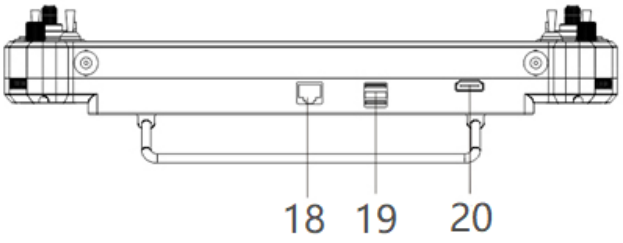
Note 2: On the ground end, both the 12 and 13 pins of SBUS are in, while on the sky end, both the 12 and 13 pins are out.

Note 3: When using dual serial ports, configure the sky terminal SBUS to Line12->Line12; line13->line13.

5.5. Schematic diagram of the remote-control interface



Front view of the remote control

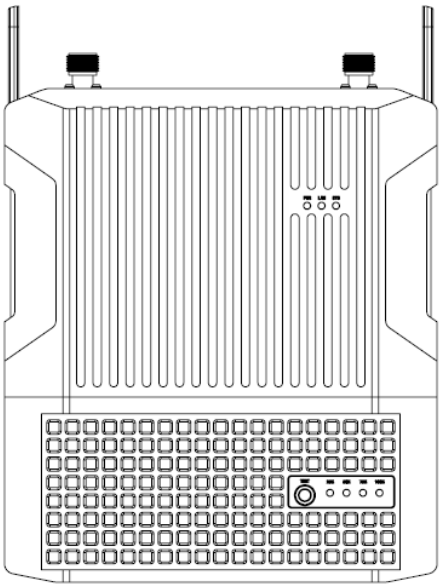


Remote control interface diagram

5.4. Definition of Remote-Control Interface

Definition of remote-control buttons and interfaces			
1	Reserve	13	Right flight joystick
2	S13 Button press	14	S4,S5,S6 Three-position switch and T4 knob
3	S1, S2, S3 three-gear switch and T3 knob	15	S14 Button press
4	Left flight joystick	16	Handle
5	Power on button	17	Screen
6	S7+,S7-,S9,S15 Touch the button lightly	18	RJ45
7	Type C Charging port	19	USB3.0
8	The top four Power level indicator light	20	HDMI OUT
9	Reserve	21	LEMO Network port
10	S8+,S8-,S10,S16 Touch the button lightly	22	
11	Thumb joystick	23	
12	Lifting ring hook		

6.The meaning of the product status light



PWR（green）

When the device is powered on, the PWR remains on.

LAN（green）

When there is data transmission and reception at the network port, the network port light flashes.

STS（Four-color lamp)

Lights of different colors indicate the current signal quality.

Power level indicator light（4 gear）

Power: 0-25%-50%-75%-100%

The STS lamp represents the size of the SNR of the received signal	
STS colour	Received signal quality SNR
Blue (not synchronized)	Failed connection
Green (Good quality)	SNR>10dBm
Yellow (Medium quality)	6dBm<SNR<10dBm
Red (Poor quality)	SNR<6dBm

Module type	Mode	PWR	LAN	STS
master	Not synchronized	The power-on green light is constantly on	Data transceiver, flashing	The blue light remains on
master	After synchronization	The power-on green light is constantly on	Data transceiver, flashing	(Green /yellow/ red) It is proportional to the received signal strength
slave	Not synchronized	The power-on green light is constantly on	Data transceiver, flashing	The blue light is flashing.
slave	After synchronization	The power-on green light is constantly on	Data transceiver, flashing	(Green /yellow/ red) It is proportional to the received signal strength

When the master and slave devices are not synchronized, the power PWR light of the master and slave devices remains on constantly, while the STS blue light of the master device stays on all the time. The STS blue light of the device is flashing. When the master and slave are synchronized, the STS lights of the master and slave change to three-color lights. If the signal quality is good, a green light will be displayed. A yellow light indicates that the communication quality is average. A red light indicates poor communication quality. When the network port is transmitting and receiving data, the LAN lights corresponding to the master and slave devices will flash accordingly.