

## SND2 20W Data Link Mesh Radio

- Supports up to 735kbps wireless link rate
- Supports Point-to-Point, Point-to-Multipoint, Multipoint-to-Point and Mesh topologies
- Supports maximum 1024 nodes mesh network
- High sensitivity: -114dBm@125kHz
- Supports frequency hopping(FHSS)
- Air-to-ground LOS(light of sight) range  $\geq 300\text{km}$ , ground-to-ground LOS range 3~10km
- Two serial ports (TTL/RS232/RS422 optional)



SND2 self-organizing network(Mesh) data link radio realizes the centerless long-distance communication between large-scale nodes, all nodes can communicate with each other independently without interfering, supports large-scale dense node access to wireless transmission, dynamic networking and flexible reorganization, supports full-multiplexing communication, the node sends data at the same time it can also receive the data of all other nodes without interfering with each other, and in the absence of the center, it can realize the interoperability of any node and all other nodes in the network. Without interfering with each other, it can realize the interconnection between any node in the network and all other nodes in the case of no center.

SND2 data link mesh radio supports large-scale node access, multi-hop self-organizing network, 20W transmit power, -114dBm sensitivity, maximum 735kbps effective data transmission rate, 2ms ultra-low latency, which can be used for swarming drones, Internet of Things, data chain, remote control, data collection, artificial intelligence, military equipment and other application scenarios.

SND2 data link mesh radio has a variety of models to choose from, the appearance and functional characteristics of each model is the same, only the working frequency band and networking scale is different.

### SND2 20W data link mesh radio models

| model         | RF power | Network scale                  | frequency bands |
|---------------|----------|--------------------------------|-----------------|
| SND2-H800-20W | 20W      | Max. 1024 nodes, up to 16 hops | 820~854MHz      |
| SND2-H900-20W |          |                                | 900~940MHz      |
|               |          |                                |                 |
| SND2-F800-20W | 20W      | Max. 256 nodes, up to 3 hops   | 820~854MHz      |
| SND2-F900-20W |          |                                | 900~940MHz      |

## Features

- Frequency: different models support different frequency bands, see models table;
- Bandwidth: 1MHz/500kHz/250kHz/125kHz selectable;
- Number of nodes and hops: Maximum 1024 nodes up to 16 hops or 256 nodes up to 3 hops, see models table;
- Frequency hopping speed:
  - More than 1800 times per second @ 1MHz
  - More than 900 times per second @ 500kHz
  - More than 450 times per second @ 250kHz
  - More than 225 times per second @ 125kHz
- Effective data rate: Maximum 735kbps@1MHz, 370kbps@500kHz, 185kbps@250kHz, 92kbps@125kHz
- Full-multiplexing communication: support
- Air-to-ground LOS(light of sight) distance:  $\geq 300\text{km}$
- Centerless self-organized network: support centerless self-organized network, any node of the network is destroyed without affecting the communication;
- Network construction time: within 1 second
- Wireless transmission delay: minimum 2ms
- Dynamic topology: support dynamic topology, support node joining and leaving, network topology change and deformation can be normal communication;
- RF power: 20W(43dBm)
- Sensitivity: -114dBm@125kHz, -111dBm@250kHz, -108dBm@500kHz, -105dBm@1MHz
- Frequency stability:  $\leq 1\text{ppm}$
- QPSK modulation LDPC coding
- Encryption: 128-bit encryption
- Low power consumption: less than 1.5W(0.06A/24V) when receiving, transmission power consumption (B is in bytes):
  - When transmitting data at 1.2KB/s, the power consumption is around 2.4W(0.1A/24V);
  - When transmitting data at 3.4KB/s, the power consumption is around 3.9W(0.16A/24V);
  - When transmitting data at 6.4KB/s, the power consumption is around 5.5W(0.23A/24V);
  - When transmitting data at 12KB/s, the power consumption is around 9.6W(0.4A/24V);
  - When transmitting data at 26KB/s, the power consumption is around 19.2W(0.8A/24V);
  - When transmitting data at 37KB/s, the power consumption is around 24W(1A/24V);
  - When transmitting data at 48KB/s, the power consumption is around 32W(1.35A/24V).
- Operating voltage: 7V~36V
- Operating temperature: -40~+55°C

- Dimensions: 83.8\*53\*16mm, fixed through-hole diameter 3.2mm
- Weight: 91.3g

## Specification

| I/O        | Description                                                                                                                                                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power-in   | Power-input, XT30PW-M connector                                                                                                                                                                                                                                                 |
| Dip-switch | Dial switch, switch between configuration mode and transparent transmission mode                                                                                                                                                                                                |
| Uart1      | Configure/transparent data serial port 1, default TTL 3.3V level, can also be changed to RS232 or RS422 serial port during shipment                                                                                                                                             |
| Uart2      | Transparent data serial port 2, default TTL 3.3V level, can also be changed to RS232 serial port during shipment                                                                                                                                                                |
| ANT        | SMA female, antenna port, the required antenna impedance is 50Ω                                                                                                                                                                                                                 |
| PWR-LED    | Red, power input status indicator led, continuous light on when power input is normal                                                                                                                                                                                           |
| RX-LED     | Green, data receiving indicator led, briefly lit during power on self-test, light on when receiving data                                                                                                                                                                        |
| TX-LED     | Green, data transmitting indicator led, briefly lit during power on self-test, light on when transmitting data                                                                                                                                                                  |
| CA-LED     | Blue, interference indicator led, briefly lit during power on self-test, frequently lit in configuration mode. In transparent transmission mode: When the light is on, there is interference with the air interface, and the brighter the light, the stronger the interference. |



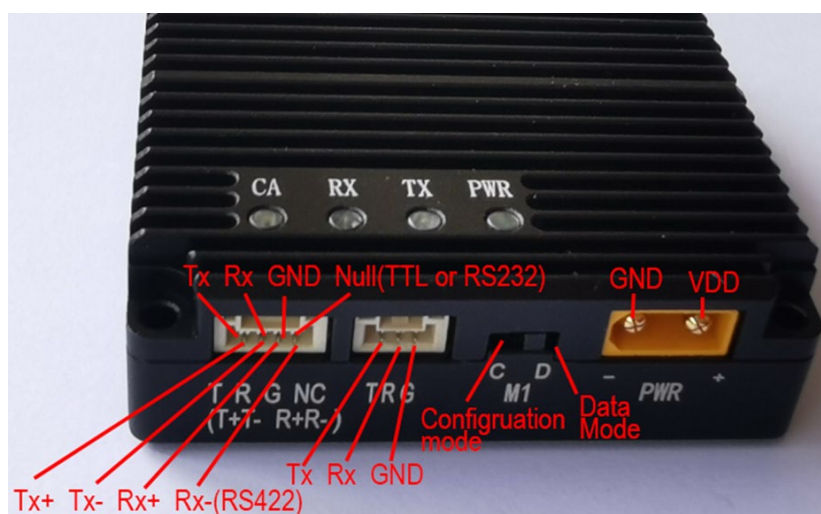
## Power input

The supply voltage range of SND2 is 7V~36V, 24V as default for 20W RF power.

## Uart1 and uart2 port

Before shipment, the uart1 port can be assembled as TTL uart port, or RS232 uart port, or RS422 uart port according to customer's requirement. The uart2 port can be assembled as TTL uart port, or RS232 uart port according to customer's requirement. The TTL/RS232 uart port data bit is 8-bit, the stop bit is 1-bit, and there is no parity check bit. When the radio operates in configuration mode, the baud rate of uart1 is fixed at 9600. When operating in data transparent mode, the baud rate can be configured as 9600 / 19200 / 38400 / 57600 / 115200 / 230400 / 460800 / 921600. Suggest selecting a baud rate of 921600 when the RF bandwidth is 1MHz; When the RF bandwidth is 500kHz, select a baud rate of 460800; When the RF bandwidth is 250kHz, select a baud rate of 230400; When the RF bandwidth is 125kHz, select 115200 baud rate, so that the uart port baud rate matches the wireless throughput to avoid packet loss during uart port data transmission and reception. Uart1 ports are mainly used for radio parameter configuration and data transmission.

Uart2 is a transparent data serial port, and the default baud rate of Uart2 is the same as Uart1. When changing the baud rate of Uart1, Uart2 will also change accordingly.



## Dip-switch

The dip switch can control the working mode of the radio. As shown in the above figure, when the dip switch is turned to "D", Uart1 operates in transparent mode. When the dip switch is turned to "C", Uart1 operates in configuration mode. The configuration mode and transparent transmission mode are switched in real-time without the need to restart the system.

When SND2 is in configuration mode, Uart1 will only respond to configuration commands and will not transmit received serial data to the air interface, nor will it output data to the serial port when receiving signals from the air interface. In configuration mode, the serial port baud rate is fixed at 9600, with 8 data bits, 1 stop bit, and no parity check bits.

When SND2 is in transparent mode, Uart1 will configure parameters if it receives serial data as a configuration packet; If the received serial data is not a configuration packet, it will be transmitted to the air interface, and the signal received from the air interface will be ejected to the serial port.

In configuration mode, only local configuration parameters are supported, while in transparent transmission mode, both local and remote parameter configurations are supported.

## SND2 device size(mm)

