

# RV-M50 Secure Wireless Modem

RV-M50 License Free  
Daisy Radio Modem

The RV-M50 OEM Daisy Radio modem is a small, very low-power radio modem for use in the license-free USA 902-928MHz ISM band and EU 868MHz band. Having the longest communication range in its class (with an unprecedented 1W max output), it is ideal for meter reading, telemetry, SCADA and network extension, GPS tracking.



## Preliminary Product Overview

### Long-Range Operation

The M50 radio modem communicates over 1 to 25 km, depending upon terrain, with an unprecedented RX sensitivity. 50X better than most radio modems in its class.

#### LoRa



The M50 works as a peer-to-peer modem communicating directly with other M50 modems using the LoRa protocol. Digital Transmission System (DTS) is FCC 15.247 compliant with RF wide-band data >500kHz DS Spread Spectrum.

### Embedded Radio Modem

The M50 is a radio transceiver and radio modem in one small module (Enclosures are available). Dozens of options and features in the modem may be user-configured to optimize for communication range, bandwidth, data rates, and security.

### Efficient Power Consumption

The M50 can operate on DC input from 5V, or 7-30V with the optional DC regulator. While receiving, the M50 draws less than 250mW of power!

### High Speed and High Efficiency

The RV-M50 operates with user-selectable over-the-air data rates and spreading factor of 890 to 21,870bps. Other data rates are available up to 37.5kbps. Standard over-the-air data rates are 1.17K, 2.14K, 3.9K, 7K, 12.5K, 12.87k. (Kbps)

### Secure Data

When secure data is enabled, the M50 will encrypt transmissions using AES128 encryption. When properly managed, your wireless network using M50 radio modems will be secure and hacker-proof.

DSSS is recommended in this, and it can also do FHSS if you want to do Frequency Hopping.

### GPS Option

The optional internal GPS allows the M50 to be a powerful Automatic Vehicle Locating (AVL) system or Time Space Position Information (TSPI) reporting device.

### Internet of Things (IoT) Modem

The M50 Daisy Radio is the perfect solution to daisy chaining your smart device to the Internet of Things. It was designed with IoT in mind and optimized for low power, low cost and long range.

### Tech Series I/O Options

RV-M50 may be installed in a Raveon M22 Tech Series enclosure with this myriad of I/O options. The following interface boards may be attached or changed at any time:

- RS-232 [ S ]
- USB [ U ]
- RS-485 [ T ]
- RS-422 [ F ]
- GPIO [ G ]
- FIO [ D ]



The Tech Series version with GPIO and FIO interfaces can utilize MODBUS messages to read and control this M22 RTU.

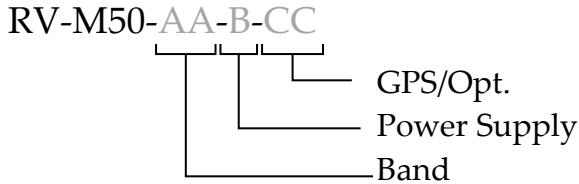
### Real-time diagnostics and statistics

Channel performance, RSSI, RF power, packet counters, and radio configuration are easily accessed via the serial port or remotely over-the-air

### Flexible Addressing and Error Correction

The M50 uses a dynamic addressing scheme with a network mask, allowing for an unlimited number of devices to be co-located without receiving each other.

## Part Numbering



### Band Options -AA:

- EC: 902-928 MHz (North/South America)
- ED: 863-870 MHz (Europe)
- EF: 779-787 MHz (China)

### Power Supply Options -B:

- A: 5V Input
- B: 7-30V Input

### GPS/Options -CC:

- [Blank]: None
- GX: GPS and Accelerometer

## General Specifications

### Size:

61mm X 37mm

### Weight:

1.5 oz

### Input Voltage:

- (A) 4.7-5.5 VDC full-spec standard (3.3V reduced spec)
- (B) 7-30 VDC optional

### Power Consumption:

- Receiving data: <250mW (50mA @5V)
- Transmitting data: <3000mW (600mA@5.0V)
- Sleep (<50uA)

### Over-the-air baud rates (programmable)

6 rates from 1170b/s to 21.87kb/s

### Full Spec Operating Temperature range

-30°C to +60°C

### TX-RX and RX-TX turn-around time

<3mS

### RF I/O Connector

MMCX (Female)

### Emission Designators: 125KF1D, 500KF1D

## Regulatory Compliance

(Assuming 3dBi gain antenna)

FCC..... Rule Part: 15C

FCC ID:.....SRS-M50-EC

Power Density .....7.5dBm (8.0dBm FCC limit)

## Security

Encryption Method..... AES128

Electronic Serial Number ..... Silicon ESN

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## Transmitter Specifications

RF Power Output ..... Up to 26dBm

(Automatically selected to comply with regulations)

Maximum Duty Cycle ..... 100% to 40C, 20% to 60C

Frequency Stability..... <10ppm

Direct Sequence Spread Spectrum (DSSS) LoRa

Frequency Hopping Spread Spectrum (FHSS)

Occupied Bandwidth in DTS mode: 550kHz - 835kHz

## Receiver Specifications

### RX sensitivity

1.17kb/s ..... < -129dBm

37.5kb/s ..... < -115dBm

## Input/Output Connection Functions

### 20-Pin Interface Port

1	GND	Ground
2	VCC	DC Input
3	CD	Carrier Detect Out.
4	TX On	Pin is High when module is transmitting. Low when off, receiving, or sleeping.
5	Data In (TXD)	Transmit data input.
6	Data Out (RXD)	Receive data output.
7	Enable	Low to shutdown the module. High to enable it.
8	Sleep	CPU Sleep input. Put in low-power fast-startup mode.
9	CTS	Clear to send output. Indicates state of internal buffers.
10	RTS	RTS input for serial flow control.
11	AUDOUT	Audio Output (Option)
12	VDIG	3.3V output
13	IOA	IO port A, USB DP
14	IOB	IO port B, USB port, DM
15	IOC	IO port C
16	STAT1	Status IO 1
17	AUDIN	Audio input (option)
18	STAT2	Status LED out
19	GND	Ground
20	V-BACK	Backup Battery In

## Mechanical Specifications

