

# RV-R50 Skyline Base Station

RV-R50 902-928MHz  
Skyline Base Station

The RV-R50 Skyline Base Station is a fully contained wireless hub for use with Raveon's M50 series radio modems and GPS transponders. It uses either LoRa or DART WAN protocols to communicate with 1 to millions of Wireless Devices (WDs). Its powerful Intel motherboard enables R50's on the same system automatically mesh together to form as large of a network as desired.



## Preliminary Product Overview

### Long-Range Operation

The R50 communicates with M50 radio modems over 1 to 30 kilometers. Range depends upon terrain, and is 50X better than most radio modems in its class. Additional wireless base stations can be added to extend coverage if needed. Quality and elevated Hub antennas give a system awesome range.

**DART and LoRa** 

The Skyline Base Station can operate in two modes:

**DART:** Raveon developed the DARTWAN protocol for managing nodes and messaging routes with security and expandability in mind.

**LoRa:** Using the ubiquitous LoRaWAN protocol, the Skyline Base Station can connect to thousands of other networks and devices already deployed.

### Secure Skyline Meshing

Using secure SSH protocol, any number of Skyline Base Stations can mesh together. One is designated as the Master Gateway. This Master Gateway automatically pairs up with all other base stations in the system, and seamlessly provides access to all WDs within radio range of any base.



### Multiple Communication Options

For M2M communications, different applications often have different communication needs and protocols. Some use Telnet sockets, others use RS232 serial, UDP, and many other methods. Users communicate to their WDs via the system's Master Gateway. This enables the option of connecting any of the aforementioned protocols and many more.

### Scalable and Secure Data

The data encryption features secure transmissions using AES128 encryption. No one will be able to monitor your private wireless system. A single Skyline Base Station can track thousands of assets in real-time. Add more hubs to expand the system to millions of devices as your network grows.

### Private Network

The Skyline is a private base station that collects the data and GPS information from the M50s, decrypts it, and passes it on to your applications. Skylines are inexpensive and can be added to the system to extend range around multiple locations. You own them, so there are no recurring fees and only you decide who is given access rights.

### Application Agnostic

Raveon offers two different GPS tracking applications for the R50, and has an open API so customers may provide their own GPS tracking application.

**RavTrack PC:** A windows-based asset tracking application. It is optimized for dispatch, industrial, buses and mining vehicle tracking.

**Dart Gate:** A server application for asset management. With user-configurable fields, users can track items and view and sort through a database of information about each item.

### 1.3 Management Security

Skyline Base Stations and the DART Master Gateway are available in Gated, Keyed, and Locked versions for convenience and flexibility. These versions operate slightly differently depending on the desired Management Security.

GATED	Consumer applications and quick deployment.
KEYED	Industrial applications, secure setup.
LOCKED	Ultra-secure (banks, medical...) intrusion locked.

## General Specifications

Model:  
RV-R50-EC-oo (oo = options)  
Size:  
90mm X51mm  
Weight:  
3.5 oz  
Input Voltage:  
110-240VAC  
12 V AC-DC wall adaptor supplied with device  
Power Consumption:  
Receiving data: <15W  
Frequency Bands:  
EC 902-928MHz  
Full Spec Operating Temperature range  
-30°C to +60°C  
Inputs / Outputs  
RS232 serial  
Ethernet  
1 digital input  
1 digital output (for a relay)  
1 analog output  
GPS antenna connector (SMA)  
RF antenna connector (TNC)  
Addressing  
Individual ID address: 4,398,046,000

## Security

Encryption Method..... AES128  
Electronic Serial Number..... Silicon ESN  
Configuration Monitor..... Serialized on update

## Transmitter Specifications

RF Power Output..... 100mW – 1W (programmable)  
Maximum Duty Cycle..... 100% to 40C, 20% to 60C  
TX Spurious outputs..... < -70dBc  
Occupied Bandwidth..... Per FCC  
Frequency Stability..... Better than ±5ppm

## Receiver Specifications

RX sensitivity (.1% BER)9600bps.... < -125dBm  
4800bps..... < -128dBm  
1200..... < -130dBm  
512..... < -132dBm  
  
Blocking and spurious rejection..... -75dB  
RX intermodulation rejection..... -75dB

## Mechanical Specifications



## Communication Range

The R50 incorporates LoRa technology, multiple RF filters, and a discrete low-noise receiver amplifier to boost its communication range beyond most all radios in its class.

Range is always limited by terrain and local RF noise. In line-of-site, this product will communicate 30-100km. In real-world environments, it is limited by terrain, buildings, and local RF noise. Compared to WiFi, it will have 100X the range. Compared to 4GLTE, it will have 2X the range. The higher the antenna above average terrain, the better the range.

Some typical ranges:

In desert terrain, 3m antenna	5-30km
Wooded environment outdoors	1-5km
Urban, 1-3m antenna	1-5k
Urban, roof-top antenna	3-7km
Aircraft/drone line-of-site	30-100km
Golf Course, 10m antenna	5-15km

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