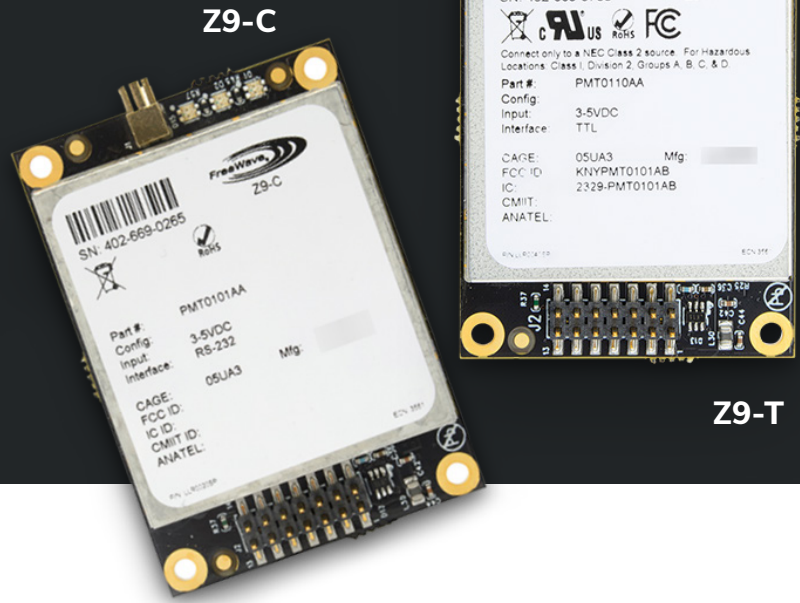


# 900 Series Serial Radio Module



## Embeddable Industrial-Grade Radio Module

FreeWave's ZumLink™ 900 Series is made for secure collection, transport, and control of data in rugged industrial environments, providing a long-range, low-power solution for remote wireless communications.

Infuse your next product with the industrial-grade reliability inherent in FreeWave's ZumLink serial radio module. The ZumLink Z9-C and Z9-T are ideal for embedded systems that demand the highest standard in quality and performance, particularly in noise congested environments. They provide a Cost, Size, Weight, and Power (CSWaP) advantage with their small, lightweight form factor, industry-leading low power consumption, and low-cost integration.

These user-configurable radio modules operate in the unlicensed 900 MHz spectrum and support multiple high-speed RF link rates up to 4 Mbps.

**Note: The ZumLink 900 Series serial radio module shares the same 14-pin interface found on FreeWave's MM2 OEM board-level radios to ease migration (although it is not a drop-in replacement).**

### Key Features

**Operates in the Unlicensed 900 MHz Spectrum:** Cost-effective, easy to deploy

**High Speed Data Rates:** Five RF link rates supporting from 80 kbps to 4 Mbps

**Long Range:** Up to 97 km (60 miles) with clear line of sight

**Industrial Grade:** Class I, Division 2 certified; operating temperature from -40°C to +85°C

**Low Current Consumption:** 843 mA @ 3 VDC in transmit; 680 mA @ 5 VDC in transmit

**Flexible Interface Options:** Either two RS232 or two TTL serial interfaces

**Diagnostics:** Allows real-time access to receive signal characteristics for all used channels

**Secure:** Using Frequency Hopping Spread Spectrum (FHSS)

**CSWaP Advantage:** Optimal Cost, Size, Weight, and Power combination


Transmitter	
Frequency Range*	902 to 928 MHz
Output Power*	10 mW to 1 W; user selectable
Range	97 km (60 miles) with clear line of sight
Channel Spacing	230.4, 345.6, 691.2, 1382.4, 3225.6 kHz
RF Data Rate	115.2, 250, 500 kbps, 1, 1.5 (Beta), & 4 Mbps; user selectable

Receiver	
IF Selectivity	> 40 dB
System Gain	135 dB
Sensitivity	
115.2 kbps	-105 dBm
250 kbps	-102 dBm
500 kbps	-99 dBm
1 Mbps	-95 dBm
1.5 Mbps (Beta)	-90 dBm
4 Mbps	-83 dBm

Data Transmission	
Type	Frequency Hopping Spread Spectrum
Modulation	2 level GFSK 8-ary FSK
Link Throughput	Up to 2.2 Mbps
Error Detection	16-bit ARQ, 16-bit CRC, retransmit on error, FEC
Hopping Rates	400, 200, 100, 50, 25 ms
Hopping Channels*	Up to 110; RF Data Rate Dependent
Hopping Patterns	Up to 16; RF Data Rate Dependent
Protocol	Adaptive Spectrum Learning (ASL)
User Interface Rates	TTL 3 Mbps RS232 5 Mbps

Power Requirements				
Operating Voltage	+3 to +5 VDC			
Current Consumption	Voltage	Transmit	Receive	Idle
	+3 VDC	843 mA	30 mA	13 mA
	+5 VDC	680 mA	30 mA	13 mA

Interfaces	
Data Interface	14-pin dual row header for power, data, and diagnostics 2 mm pin spacing Either two RS232 or two TTL serial interfaces
Diagnostics Interface	Serial, RS232 or TTL
RF Connector	MMCX

General Information	
Operating Temperature	-40°C to +85°C (-40°F to +185°F)
Humidity	0 to 95%, non-condensing
Dimensions	50.8 L x 35.56 W x 9.65 H (mm) 2.0 L x 1.4 W x 0.38 H (in)
Weight	15 g (0.03 lbs)
Reliability	91,328 hour MTBF
Safety	Class I, Division 2, Groups A-D
UL	
RoHS	Directive 2011/65/EU

Information to Order	
Model Number	Description
Z9-C	Board Level Unit, RS232
Z9-T	Board Level Unit, TTL
Z9-T-DEVKIT	Includes 2 Z9-T units and accessories

\*Country-specific models and information are available. Contact FreeWave Sales for information.