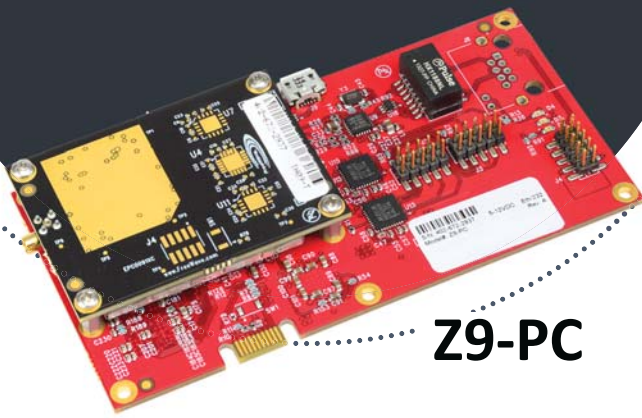# ZUMLINK™
900 Series
OEM Ethernet Radio Module

FREEWAVE

Z9-PC

Z9-PC-SR001

KEY FEATURES

Multi-High Speed Data Rates™:
Five RF Link Rates supporting throughputs from 80 kbps to 4 Mbps.

ZumBoost™ Network Acceleration Pack:

- Packet Compression: Minimizes packet transmission
- Packet Aggregation: Maximizes network efficiency
- Forward Error Correction: Improves network reliability
- Adaptive Spectrum Learning: Reduces the impact of interferences

Security: 128-bit and 256-bit AES counter mode encryption.

Long Range: Up to 60 miles line of sight.

User Selectable Channels: Manipulate channel settings to assure highest performance.

Low Current Consumption:
350 mA @ 12V in transmit
100 mA @ 12 V in receive

Reliable Communication:
CRC, FEC, and ARQ

OVERVIEW

FreeWave's new ZumLink™ 900 series platform, part of our Sensor-2-Server™ solution delivers secure collection, transport and control of data. The ZumLink 900 Series currently operates in the unlicensed 900 MHz spectrum supporting link rates up to 4 Mbps and is user configurable.

This cost effective, high-speed, rugged communication platform is specifically designed for embedded applications and is reliable under extreme environmental conditions. Its advanced technology makes it ideal in field area networks for oil and gas, utilities, mining, facility automation, municipalities, disaster recovery, or any industrial application that needs extremely reliable communications.

ZumLink's flexible, high speed, low power consumption radios also leverages FreeWave's ZumBoost™ Network Acceleration Pack to assure the most efficient network platform possible. ZumBoost introduces techniques such as compression, packet aggregation, forward error correction, and patent-pending Adaptive Spectrum Learning technology to ensure maximum throughput to meet the demands of today's wireless applications.

Virtually any M2M, SCADA, or Industrial IoT application can benefit from the enhanced features provided by our ZumLink products. The products support SSH, SNMP, and AES encryption.

FreeWave's ZumLink 900 Series and Sensor-2-Server communication solutions have been designed to provide the performance, reliability, and quality that our customers have come to know and expect in our products.

All radios are designed, manufactured, and tested in Boulder, CO.

TECHNICAL SPECIFICATIONS

TRANSMITTER

Frequency Range	902 to 928 MHz
Output Power	Up to 1W; user selectable
Data Link Range	60 miles
Modulation	GFSK and 8-ary FSK
Channel Sizes	230.4, 345.6, 691.2, 1382.4, 3225.6 kHz
RF Data Rates	115.2, 250, 500 kbps, 1 & 4 Mbps
Hopping Channels	Up to 112; RF Data Rate Dependent
Hopping Patterns	Up to 16, RF Data Rate Dependent
Hopping Rates	400ms, 200ms, 100ms, 50ms, 25ms
Protocol	Adaptive Spectrum Learning

RECEIVER

IF Selectivity	> 40 dB
System Gain	136 dB

Sensitivity

RF Data Rate	Without FEC	With FEC
115.2 kbps	-105 dBm	-108 dBm
250 kbps	-102 dBm	-105 dBm
500 kbps	-99 dBm	-102 dBm
1 Mbps	-95 dBm	-98 dBm
4 Mbps	-83 dBm	-86 dBm

DATA TRANSMISSION

Error Detection	CRC, FEC, and ARQ	
Link Throughput	Up to 1.6 Mbps; 4 Mbps with Compression	
User Interface Rates	Ethernet Rate	10/100 Mbps
	Serial Rate	up to 250 kbps
Data Encryption	128-bit and 256-bit AES CCM	
Advanced Features	Packet Compression and Packet Aggregation	

INTERFACES

Data Connectors	Dual Row 10-pin header (1 Ethernet / Power, 2 Serial)
USB Connector	Micro USB
RF Connector	MMCX

POWER REQUIREMENTS

Operating Voltage	+5 to +12 VDC (± 10%)
Transmit Current	350 mA @ 12 VDC
Receive/Idle Current	100 mA @ 12 VDC

GENERAL INFORMATION

Operating Temperature	-40°C to +85°C
Dimensions	101.60mm L x 50.80mm W x 16.77mm H
Weight	**Z9-PC**: 41g **Z9-PC-SR001**: 45g
Humidity	0 to 95%, non-condensing
Reliability	62,000 hour MTBF
Safety UL	Class 1 Div 2 Groups A-D
RoHS	Directive 2011/65/EU

INFORMATION TO ORDER

Model Number	Description
Z9-PC	Board Level Unit, 902-928 MHz
Z9-PC-SR001	Board Level Unit with RJ45, 902-928 MHz
Z9-PC-DEVKIT	Includes 2 Z9-PC units and accessories

SOLUTIONS

DRONES & ROBOTICS   EARTH MONITORING   GOV & DEFENSE   IRRIGATION & PRECISION   ASSET TRACKING   OIL & GAS   WATER & WASTEWATER   SMART CITIES   UTILITIES

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