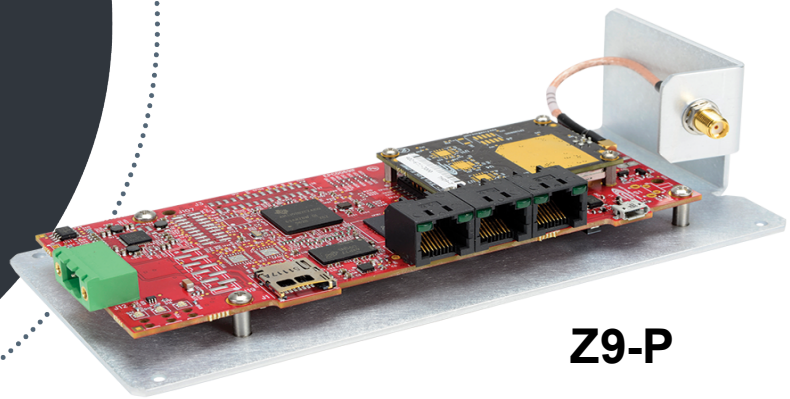
ZumLink™
900 Series Ethernet Radio

FREEWAVE

Z9-PE



Z9-P

Key Features

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

Programmability: Flexible user configuration along with acceptance of 3rd-party applications.

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: SSH, SNMP, 128- and 256-bit AES counter mode encryption.

Long Range: Up to 97 km (60 miles); clear line of sight.

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

Low Current Consumption

- 355 mA @ 12V in transmit
- 145 mA @ 12V in receive

Reliable Communication:
16-bit CRC, FEC, 16-bit 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 outdoor industrial locations 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.

Industry's 1st Programmable Radio

ZumLink includes the ZumIQ Application Environment which allows the development and/or deployment of third-party applications and puts intelligence at the edge. ZumIQ provides a Linux-based Debian operating system and storage for applications built in any Linux-compatible language (e.g., Node-RED, JavaScript, Java, Python, and C++). See the ZumIQ Application Environment Data Sheet (LDS0029AA) for detailed information.

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.

SOLUTIONS

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

FREEWAVE

Technical Specifications

Transmitter

Frequency Range*	902 to 928 MHz
Output Power*	10mW to 1W; user selectable
Range	97 km (60 miles); 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 & 4 Mbps; user selectable

Receiver

IF Selectivity	> 40 dB
System Gain	136 dB

Sensitivity

RF Data Rates	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
1.5 Mbps (Beta)	-90 dBm	-93 dBm
4 Mbps	-83 dBm	-86 dBm

Data Transmission

Type	Frequency Hopping Spread Spectrum
Modulation	2 level GFSK 4- and 8-ary FSK
Link Throughput	Up to 1.6 Mbps; 4 Mbps with Compression
Error Detection	ARQ and 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	Ethernet Rate 10/100 Mbps Serial Rate up to 250 kbps
Data Encryption	128-bit and 256-bit AES CCM
VLAN	Layer 2, pass tagged and double-tagged packets
Advanced Features	Packet Compression and Aggregation

Programmability

CPU	ARM Coretex-A8 1 GHz
RAM	512 MB
Storage	1 GB
OS	Debian (Linux Kernal 3.14.1)

Interfaces

Data Connectors	Three RJ-45 (1 Ethernet, 2 Serial)
USB Connector	Micro USB
RF Connector	**Z9-P**: SMA **Z9-PE**: TNC
Power Connectors	**Z9-P**: Phoenix Contact (# 1776692) **Z9-PE**: Switchcraft (#17282-2PG-300)

Power Requirements

Operating Voltage	+6 to +30 VDC (+/- 10%)
Transmit Current	355 mA @ 12VDC
Receive Current	145 mA @ 12VDC
Idle Current	130 mA @ 12VDC

General Information

Operating Temperature	**Z9-P**: -40°C to +85°C () **Z9-PE**: -40°C to +75°C (-40°F to +167°F)
Humidity	0 to 95% non-condensing
Dimensions	**Z9-P**: 177.29 L x 83.06 W x 40.89 H (mm) 7.0 L x 3.3 W x 1.6 H (in) **Z9-PE**: 191.04 L x 109.47 W x 41.91 H (mm) 7.52 L x 4.31 W x 1.65 H (in)
Weight	**Z9-P**: 172.37 g (0.38 lbs) **Z9-PE**: 750 g (1.7 lbs)
Reliability	MTBF 206,186
Safety	Class I, Division 2, Groups A-D
UL	**Z9-P**: c UL us **Z9-PE**: c UL us LISTED

Information to Order

Model Number	Description
Z9-P	Board Level Unit, 902 to 928 MHz
Z9-PE	Enclosed Unit, 902 to 928 MHz
Z9-PE-GREY	Grey Enclosed Unit, 902 to 928 MHz
Z9-PE-DEVKIT	Includes 2 Z9-PE units and accessories

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

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Specifications are subject to change without notice.