# FREEWAVE

## Introducting the all New
# ZumEdge™

IOEX-4440; 4422; 4404

Z9-IO-PE-ZE

## The New ZumEdge - Our ZumLink 900MHz Plus A Lot More

ZumEdge adds seamless IO integration and industrial intelligence at the Edge. ZumEdge is the next evolution of FreeWave's Edge intelligence product line and features I/O connectivity, easy installation, and setup. Customers can access the data they need and make decisions on the edge in the harshest environments - in minutes - not hours - without requiring traditional SCADA connections.

Without existing Ethernet or SCADA infrastructure, critical sensor data is often stranded in the field, waiting to be acted upon, creating inefficiencies, and by extension, cost.

ZumEdge with an I/O module makes it easy (and possible) to establish a direct sensor connection allowing customers to access and monitor their data in the field and make decisions based on that data quickly.

ZumEdge is ideal for any industry that requires sensor data capture and measurement in rugged, isolated, and potentially hazardous environments. ZumEdge allows the user to automate decision making and utilize data infrastructure like MQTT and other third-party platforms to make their networks smarter, faster, and more efficient, without adding infrastructure or modifying existing systems.

## Key Features

ZumEdge adds the capability to connect analog and digital IO devices directly to the IIoT network through IOEX expansion modules

ZumEdge configuration tool adds the ability to quickly and easily configure up to 15 IOEX modules (up to 180 individual IOs, depending on configuration).

The ZumEdge software implements a REST API to allow the customer to easily configure applications that control and read IO over ethernet using an API.

ZumEdge comes standard with the FreeWave IQ application environment, so customers can create their own on-board smart applications to make decisions on the Edge.

The IO and network configuration tool is self-contained on the device and served as a web page for remote configuration -- no extra software is required.

ZumEdge contains the Z9 radio module, making it over-the-air compatible with existing ZumLink networks, and implements ZumLink network management software.

ZumEdge is housed in a DIN-Rail-Mountable case.

## 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, 1612.8 (Beta), & 3225.6 kHz |
| **RF Data Rater** | 115.2, 250, 500 kbps, 1, 1.5 (Beta), &4 Mbps; user selectable |

## Receiver

| | | | |
|---|---|---|---|
| **IF Selectivity** | > 40 dB | | |
| **System Gain** | 135 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<br>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<br>Serial Rate; up to 250 kbps |
| **Data Encryption** | 128-bit and 256-bit AES CCM |
| **Advanced Features** | Packet Compression and Aggregation |

## Computing Resources (OPTIONAL UPGRADE)**

| | |
|---|---|
| **CPU** | ARM Cortex-A8 1 GHz |
| **RAM** | 1 GB |
| **Storage** | 1 GB |
| **OS** | Debian-based Linux |

## Management

| | |
|---|---|
| **Management** | HTTP, SSH |
| | SNMPv1/v2c/v3, MIB-II, Enterprise MIB, Modbus |

## Networking

| | |
|---|---|
| **VLAN** | 802.1Q |
| **Serial** | TCP server, Modbus/TCP, Modbus RTU, TCP client |
| **Traffic Filtering** | Netmask filter, ARP filter |

## Interfaces

| | |
|---|---|
| **Data Connectors** | Four RJ-45 (2 Ethernet, 2 Serial) |
| **USB Connectors** | Micro USB<br>Type A (Future Expansion) |
| **RF Connector** | TNC |
| **Power Connectors** | Phoenix Contract (#1776692) |

## Power Requirements

| | | | | |
|---|---|---|---|---|
| **Operating Voltage** | +6 to +30 VDC | | | |
| **Current Consumption** | **Voltage** | **Transmit** | **Receive** | **Idle** |
| | 12 VDC | 377 mA | 159 mA | 143 mA |

## General Information

| | |
|---|---|
| **Operating Temperature** | +6 to +30 VDC |
| **Humidity** | 0 to 95% non-condensing |
| **Dimensions** | 165.28 L x 76.89W x 27.55 (mm))<br>6.51 L x 3.03 W x 1.08 H (Inches) |
| **Weight** | 0.5lbs/250C |
| **Reliability** | MTBF 206,186 |
| **Safety** | Class I, Division 2, Groups A-D |
| **UL** | |

## Information to Order

| Model Number | |
|---|---|
| **Z9-IO-PE-ZE** | ZumEdge |
| **IOEX-4440; 4422;4404** | IO Expansion |

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

**Requires licensing. Contact FreeWave Sales for information.

FREEWAVE

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