

## Z-Wave™ Modules – L-ZM2102 Microcontroller



## Z-Wave Module - Radio Z



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# User's Manual & Developer's Guide

## Design US/EU Radio Z

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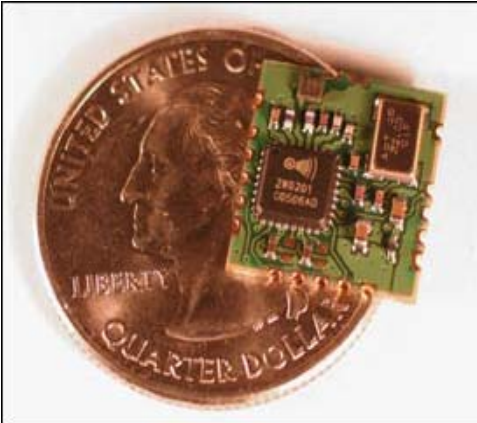
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### 1 Abbreviations

Abbreviation	Explanation
DUT	Device Under Test
PCB	Printed Circuit Board
NOP	No operation
ACK	Acknowledgement
RF	Radio Frequency
RX	Receive
TBD	To Be Determined
LCD	Liquid Crystal Display
QA	Quality Assurance
ZM1220	20cm <sup>2</sup> Z-Wave Module with integrated PCB antenna
ZW0102	Z-Wave Single Chip

## Z-Wave™ Modules – L-ZM2102 Microcontroller



### 1.1.1 Z-Wave Modules for Embedded Intelligence and Wireless Communication

Logitech's (Canada) L-ZM2102 Z-Wave Module is a manufacturing Blueprint for fully RF qualified communication PCBs that enable embedded intelligence and wireless communication capabilities in virtually any controllable device.

The L-ZM2102 Z-Wave Module is a fully integrated RF communication module that uses unlicensed Short-Range-Device (SRD) frequency of 868.42MHz in Europe and 908.42MHz in the US. The L-ZM2102 is dedicated for wireless control and monitoring of residential products like lighting and appliance control, energy management, access control, security and building automation.

Together with the patented Z-Wave Protocol the L-ZM2102 Z-Wave Module delivers a complete highly reliable RF communication solution. The Z-Wave Protocol uses Frame Acknowledgement, Retransmission, Collision Avoidance, Frame Checksum Check and sophisticated Routing Algorithms to assure full home coverage.

### 1.1.2 Modular Design for Easy Design and Integration

The L-ZM2102 Z-Wave Module contains the integrated L-ZW0201 Z-Wave Single Chip, system crystal and RF front-end circuitry. The L-ZW0201 Single Chip is an integrated chip containing RF Transceiver, 8051 MCU core, SRAM, Flash Memory for Z-Wave Protocol and OEM Application SW storage, Triac Controller and a wide range of HW interfaces.

This complete RF solution makes it very easy for OEM customers to RF enable their products without having to do the time consuming work of designing, verifying and optimizing the RF design and thereby enables faster time to market.

## 1.2 Z-Wave™ Module Designs for Your Need

Zensys has developed manufacturing Blueprints for the L-ZM2102 Z-Wave Module, which includes an on-board antenna, making it easy for OEMs to incorporate Z-Wave into almost any controllable device. At less than a third the size, the "Small Form Factor" family enables OEMs to incorporate Z-Wave into the smallest of devices, including sensors and power outlets. In addition Zensys also assist OEMs with custom designs if their particular application does not allow for using one of the existing Z-Wave Modules.

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## Z-Wave™ Modules – L-ZM2102 Microcontroller

Z-Wave Module Specifications L-ZM2102	
LZM0201 Single Chip	Optimized 8051 CPU core 32Kbyte Flash 2Kbyte SRAM 16MHz internal system clock freq Power-on-Reset/Brown-Out Detection Supply Voltage: 2.2V-3.6V
X-tal frequency	32 mhZ
RF frequency	868.42mhZ (EU)
RF data rate	908.42MHz 9.6kbps
High Sensitivity	Typ: -101dBm @ 9.6kbit/s
Modulation	FSK
Programmable transmit power	-20 to +5dBm -
Power Consumption:	Typ: 23mA @ -5dBm
Transmit	Typ: 21mA Typ:
Receive	3µA @ 25°C
Power down (Timer Wake up and POR enabled)	
Operating temperature	15 to 85°C
Applications	Home Automation - - Lighting/Drape Control - - Automated Meter Reading - - Access Control - - Universal Remotes Controls - - Thermostats - - Sensors
Interfaces available through application connector	10 GPIOs - - UART - - SPI - - Triac Control - - PWM
Regulatory Compliance	4 multiplexed 12/8 bit inputs FCC CFR47 part 15 EN 300 220

Note: data is applicable for Z-Wave Developer's kit v4.0

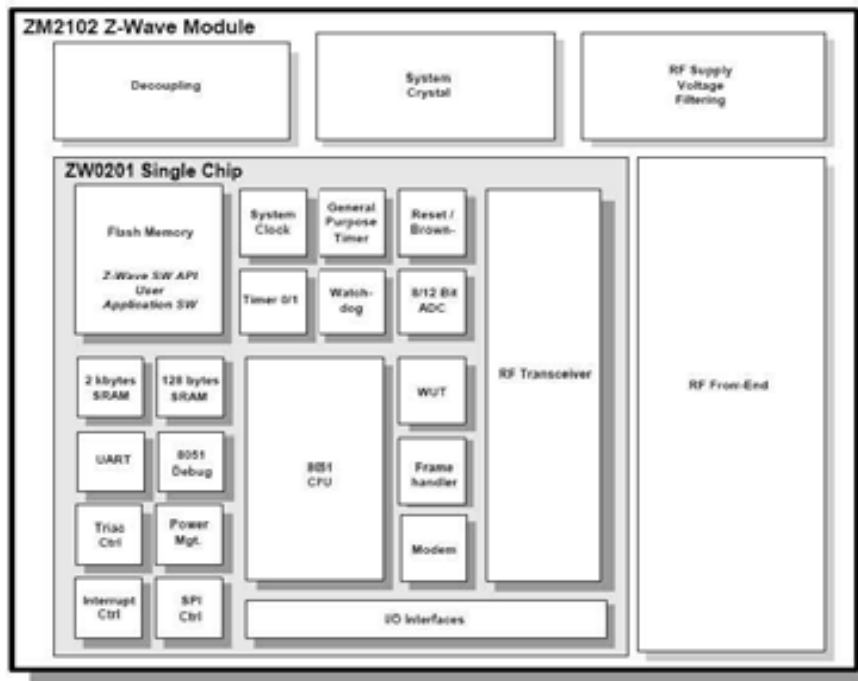
## Z-Wave™ Modules – L-ZM2102 Microcontroller

### 1.2.1.1 Z-Wave Module Features:

- Completely RF qualified design
- Compliant with FCC Part 15 and R&TTE 1999/5/EC
- Available to OEMs as fully production matured Blueprint Documentation Packages
- Handling and storage of both Z-Wave Protocol and OEM Application SW
- Application Connector for interfacing to and controlling Application hardware
- Serial (UART) and SPI interfaces for easy communication with any other MCUs in final OEM product

#### 1.2.1.1.1

#### Z-Wave L-ZM2102 Block Diagram



#### 1.2.1.1.2

#### Fast Manufacturing Ramp-up with Z-Wave Module Blueprints

The Z-Wave Module manufacturing Blueprints have already been production matured and tested to be in compliance with FCC and R&TTE requirements. The OEM can therefore quickly set up volume production of Z-Wave Modules. The Blueprint Documentation package contains:

- Datasheet
- Bill of material
- Schematic
- PCB documentation
- Manufacturing guidelines
- Programming instructions
- RF/EMC report



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