ZMOTION Microcontrollers

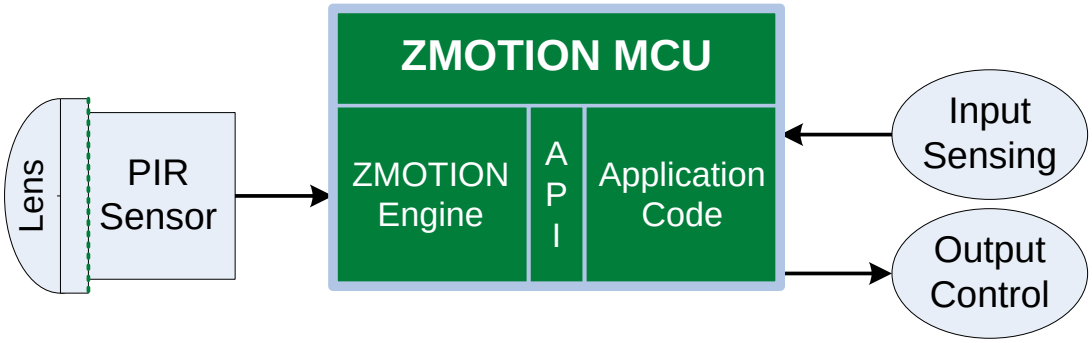
Applications

- Intrusion/Security
- Lighting Control
- Thermostats
- Access Control
- Vending
- Video Doorbells
- Smart Displays
- Proximity Detection
- Power Management
- IP Cameras
- Occupancy Sensing
- Outdoor Lighting
- IoT Sensors

ZMOTION is a unique Microcontroller plus Software solution that greatly simplifies the task of adding motion detection to many applications.

ZMOTION delivers a significant performance improvement over traditional PIR motion detection solutions while reducing system component count, design complexity, and development risk.

The ZMOTION solution consists of the **ZMOTION Microcontroller**, and the **ZMOTION Software Engine** working together in a simple and flexible manner.



The ZMOTION solution is suitable for applications requiring:

- Pet Immunity
- Low Power operation
- Real Time Configuration and OTA Updates
- Small footprint
- White Light Immunity
- High EMI and ESD Immunity
- Multiple PIR Sensors and multi-zone detection
- Sensitivity control

ZMOTION MCU

ZMOTION microcontrollers are optimized for PIR sensor applications. Integrated Op Amps, comparators, internal voltage reference systems and sigma/delta or high-resolution SAR ADC convertors make them ideal for many motion detection applications.

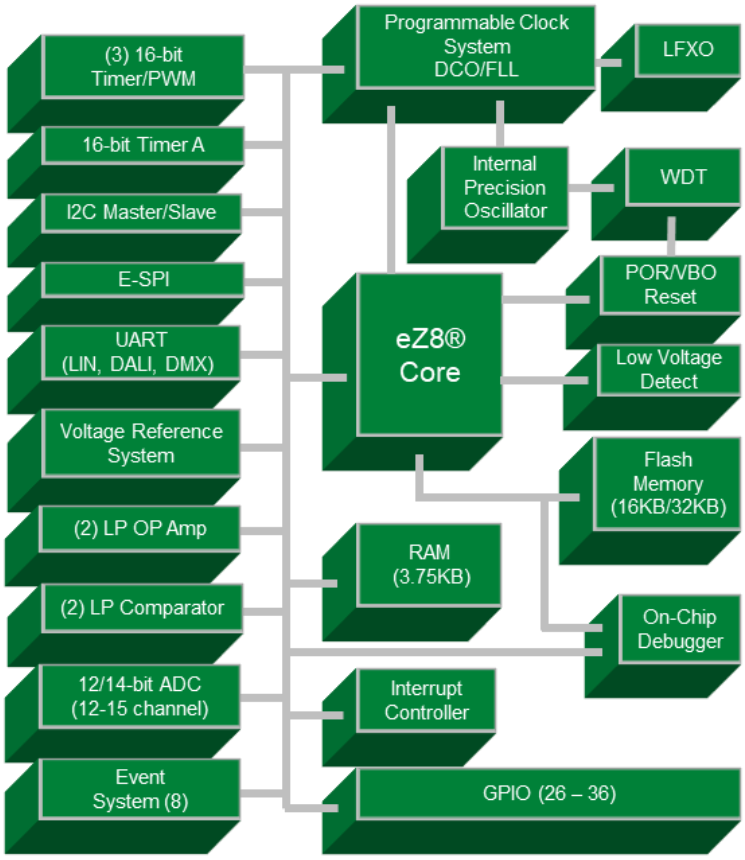
In addition to motion detection, the ZMOTION microcontroller can be used to perform additional tasks as required by the application.

- Switch or potentiometer input monitoring
- TRIAC/MOSFET/Relay control and zero-cross detection
- Multi-color LED control via PWM
- Real time control of motion sensitivity and Engine operation
- RF communication protocols
- Ambient light, temperature, humidity sensing
- Serial Communications (I^2C, SPI, UART)
- DALI/DMX/1-10V/PWM intelligent lighting protocols

ZMOTION MCU Selection Table

Part Number	Package	Memory	Typical Applications	Typical Power Consumption
Z8FS021AHH20EG	20-SOIC	2KB Flash 240 B RAM	Security/Intrusion Motion Detectors, Access Control	8mA
Z8FS040BSB20EG	8-SOIC	4KB Flash 256 B RAM	General-Purpose Motion Detection, Lighting Control, IP Cameras, Thermostats	8mA
Z8FS040BHH20EG	20-SOIC			
Z8F1681QK024XK2247	32-QFN	16KB Flash 2KB RAM	Security/Intrusion Motion Detectors, Access Control, IP Cameras, Thermostats, Intelligent Lighting Control (DALI/DMX/1-10V/PWM)	12uA – Analog/Digital Detection 1mA - Digital Detection
Z8F1681QN024XK2247	44-QFN			
Z8F1681AN024XK2247	44-LQFP			
Z8F3224QK020XK2258	32-QFN	32KB Flash 3.75KB RAM	Security/Intrusion Motion Detectors, Access Control, IP Cameras, Video Doorbells, Thermostats, Intelligent Lighting Control (DALI/DMX/1-10V/PWM) Supports up to 3 PIR sensors	7uA – Analog/Digital Detection 700uA - Digital Detection
Z8F3224QN020XK2258	44-QFN			
Z8F6481QN024XK2247	44-QFN	64KB Flash 3.75KB RAM	Security/Intrusion Motion Detectors, Access Control, IP Cameras, Video Doorbells, Thermostats, Keypad/displays, Intelligent Lighting Control (DALI/DMX/1-10V/PWM) Supports up to 3 PIR sensors	15uA – Analog/Digital Detection 1mA - Digital Detection
Z8F6481AN024XK2247	44-LQFP			

Z8F3224 Series



- High Performance 20MHz eZ8® CPU Core
- 32KB FLASH Program Memory; 3.75KB of Register Ram
- Flexible clocking system with DCO/FLL with low power 32KHz Internal/external oscillator
- 26 to 36 GPIO shared with peripherals
- Three 16-bit Multi-Mode Timers
- 16-bit Interrupt/Wakeup Timer A
- Master/Slave I2C
- ESPI (Enhanced Serial Peripheral Interface)
- Full duplex UART
- 12 to 15 Channel SAR ADC with 12/14-bit resolution
- Two Low-Power Operational Amplifiers
- Two Low-Power Comparators
- Voltage reference system (fixed & programmable)
- 8 Channel Event System for autonomous peripheral communication and routing
- Watch Dog Timer
- Low-Voltage Detect (LVD), Power on Reset (POR) and Voltage Brown Out (VBO)
- On-Chip Debugger – single pin with unlimited breakpoints
- Full operation from 1.8V to 3.6V@ -40C to +85C

ZMOTION Engine and API

Engine/API Features

- Real-time control of Motion detection parameters
- Independent control of Major Motion and Minor Motion detection modes
- Pet Immunity
- Sensitivity, Range & Frequency Control
- Supports up to 3 PIR sensors
- EMI/EMC detection and protection

ZMOTION Engine

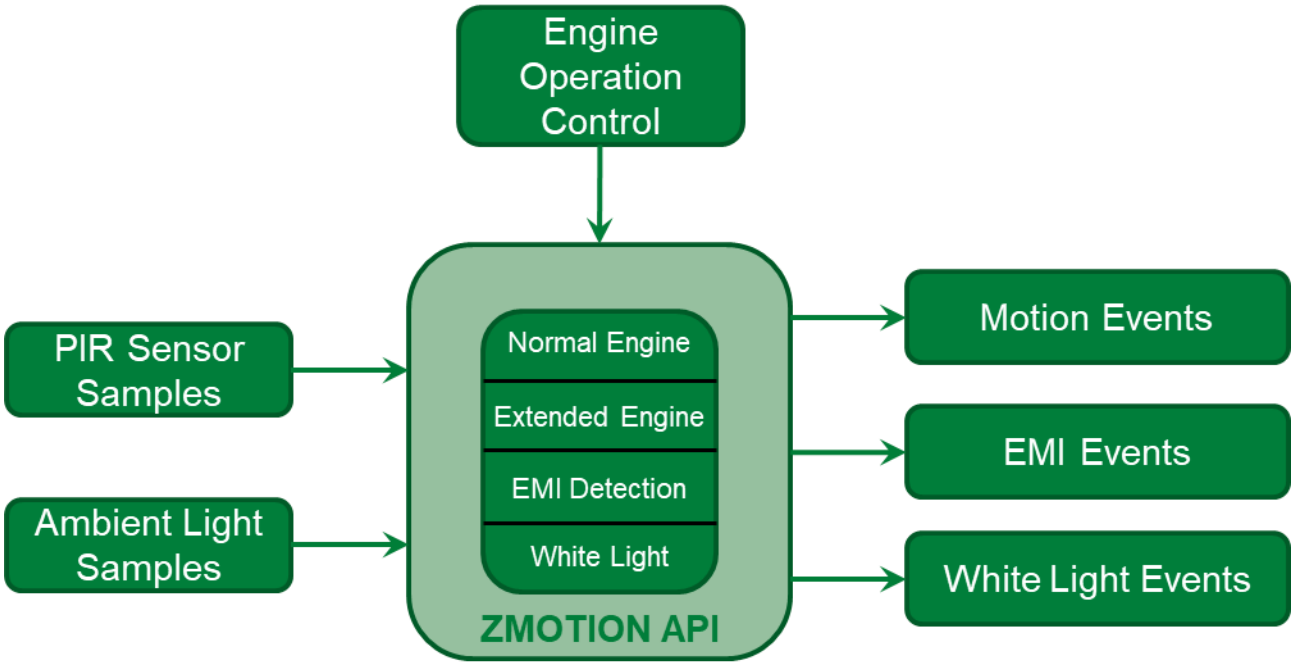
The ZMOTION Engine is Firmware that runs on the ZMOTION MCU to perform the essential PIR sensor signal processing plus additional functions such as White Light and EMI Immunity.

- Two motion detection Engines/Algorithms running in parallel
  - The "Normal Engine" detects regular motion events
  - The "Extended Engine" detects small, fast, and slow motion events (micro motion)
- EMI Immunity – Transient, Spark and Noise Detection
- White Light Detection and Immunity

ZMOTION API

An Application Programming Interface (API) allows the application code to configure, control, and monitor the ZMOTION Engine in real time. This allows designers to create their own application-specific software while taking advantage of Zilog's ZMOTION Motion Detection Technology.

- Provides real time application control and status of ZMOTION Engine operation
- Real time control of Motion Detection parameters
  - White light immunity control
  - Noise/transient control
  - Lens configuration parameters
  - PIR sensor signal monitoring
  - Sensitivity and range control
  - Motion detection status
  - PIR stability
  - Frequency response
  - 2-Pulse mode settings



ZMOTION Development Support

Development Kits

Everything you need to evaluate and begin development of your ZMOTION project.

Features

- Development board with ZMOTION MCU programmed with sample S/W
- Selection of lenses
- USB Smart Cable (Debugger/Programmer)
- ZDS-II (IDE including C-Compiler & Debugger)
- Sample applications

Kit Part Numbers

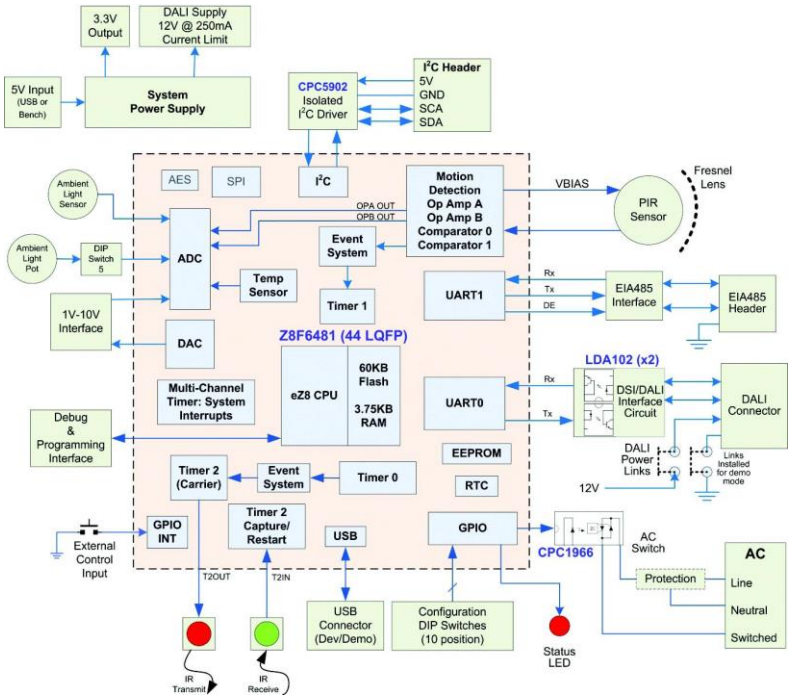
- ZMOTIONL100ZCOG - Z8FS040 (8-Pin)
- ZMOTIONL200ZCOG - Z8FS040 (20-Pin)
- ZMOTIONS200ZCOG - Z8FS021
- ZMOTIONL300ZCOG - Z8F6481
- ZMOTIONL400ZCOG - Z8F3224

Reference Designs

Zilog offers several reference designs to help speed your evaluation and design process. Each reference design comes with schematics, BOMs, layout files, and software.

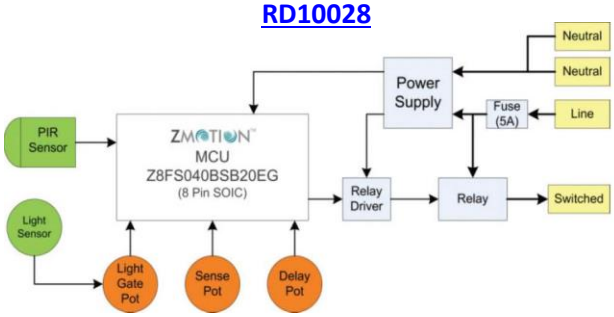
ZMOTION Intelligent Lighting Control Reference Design

RD10038



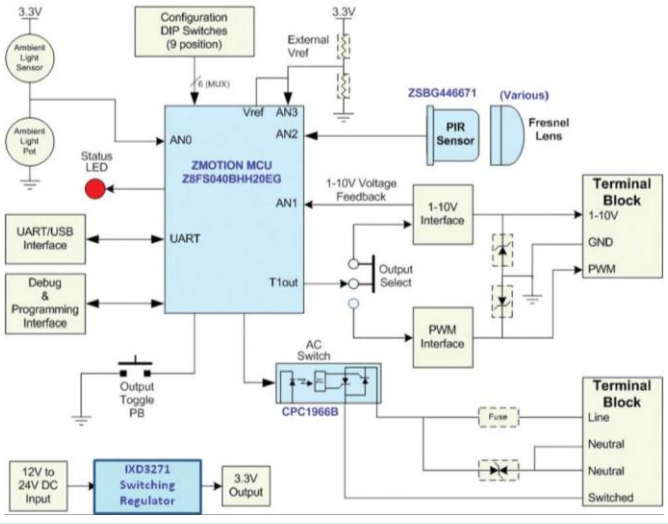
ZMOTION AC Load Controller Reference Design

RD10028



ZMOTION Occupancy Sensor Reference Design

RD0035



Contact Zilog for additional hardware design examples and reference software