



### ZMOTION™ ADVANTAGE

- Complete Motion Detection Solution
- Best in Class Motion Detection Performance
- Extremely flexible interface
- Scalable to meet your application needs

### APPLICATIONS

- Unattended Vending and Kiosks
- Display Systems
- Home Appliances
- Lighting Control
- Power Management
- HVAC
- Access Control
- General Purpose Proximity Sensing Applications

## ZMOTION™ Detection Module

### Overview

Zilog's **ZMOTION™ Detection Module** is a complete and fully functional motion detection solution ideal for lighting control and other occupancy and proximity detection applications. It is a board level module that combines the unique features of Zilog's Z8FS040 Motion Detection Microcontroller with a Pyroelectric Sensor and a low profile Fresnel lens.

The ZMOTION™ Detection Module can operate in a simple to use Hardware mode which provides an output signal when motion is detected; or in an advanced asynchronous serial mode when greater control over the motion detection performance is needed. In both modes sensitivity and delay time can be controlled to match the application requirements.

The ZMOTION™ Detection Module is a great way to reduce design effort and eliminate development risk for any device that needs motion detection capability.

It is a great choice for lighting controls, access control, display systems and general purpose proximity sensing. It is also an easy way to add energy management capability to various applications such as vending machines and appliances. And Zilog's Evaluation Kit makes it quick and easy to integrate into your own custom application.

### Features

- Complete, fully functional motion detection solution including low profile Fresnel lens
- Advanced software based motion detection algorithms provide superior sensitivity and stability
- Small form factor – Only 25.5 mm x 16.7 mm
- Wide 5m x 6m, 60 degree detection pattern
- Simple hardware or advanced serial (asynchronous) based configuration and interface
- Adjustable sensitivity, delay and ambient light threshold
- SLEEP mode for low power applications
- No temperature compensation required
- Photocell input for ambient light detection in lighting applications
- Modify the application code to suite your own application requirements
- Complete evaluation kit available (ZEPIR000102ZCOG)



Zilog Part Number ZEPIR0AAS02MODG

## Block Diagram

### APPLICATIONS

#### Unattended Vending and Kiosks

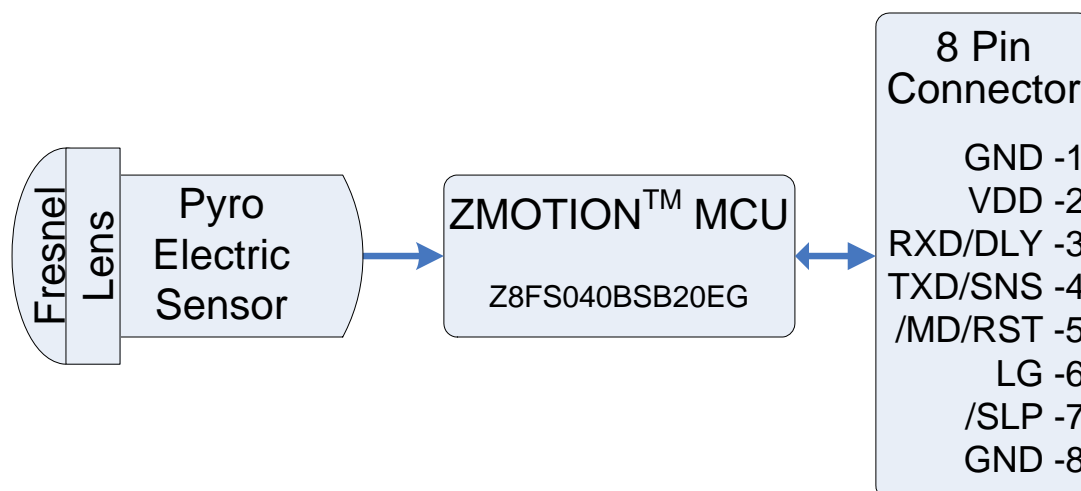
- Reduce energy consumption by auto-dimming lights when people are not present
- Attract customers when they come near
- Automated guidance

#### Display Systems

- Reduce energy consumption by turning off when people are not present
- Attract people when they come near

#### Home Appliances

- Save energy by turning off large appliances when people are not present
- Ventilators
- Air purifiers
- Televisions



## ZMOTION™ Advantages

The surface mount pyroelectric sensor and Fresnel lens combine to provide the lowest possible profile without sacrificing performance. The module is only 25.5 mm x 16.7 mm (a little over ½ square inch) so it can easily fit into many size constrained applications.

The signal from the pyroelectric sensor is sent directly to the ZMOTION™ MCU, providing it with the true, unaltered signal. This allows the software to identify and react to false trigger sources like drift, EMI and ESD; providing a more stable motion detector. This direct interface also eliminates the need for external components including large electrolytic capacitors; improving reliability and ensuring the smallest possible form factor.

The software in the ZMOTION™ MCU also automatically adapts to the environment, eliminating the need for discrete temperature compensation.

Control over sensitivity and output timing is provided through a simple hardware interface or more advanced settings and status are available through an asynchronous serial interface mode.

The ZMOTION™ Detection Module employs a direct interface to the Pyroelectric sensor allowing it to dynamically monitor the signal and determine when it has stabilized. This minimizes the required power on stabilization time.

## Operation

### Hardware Interface Mode

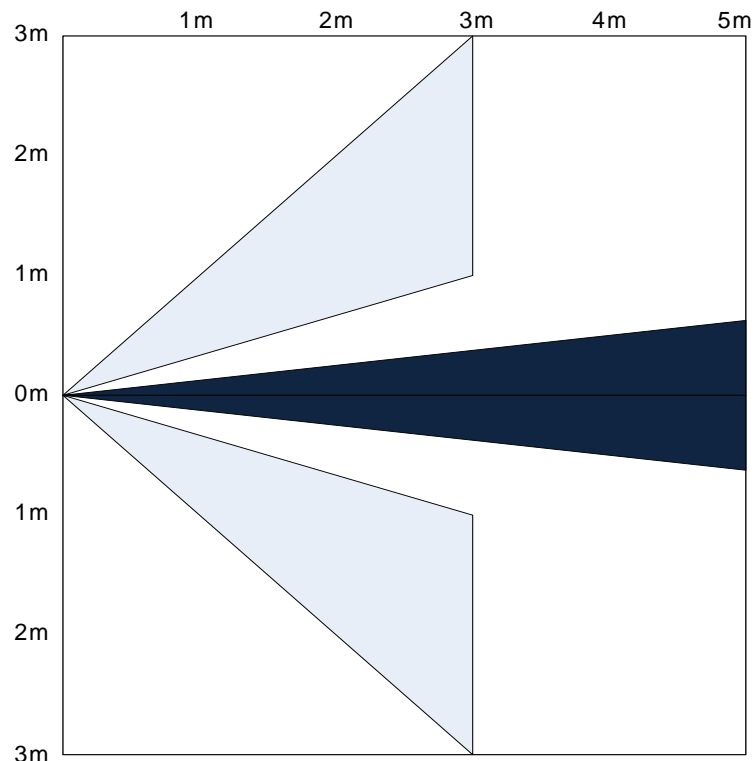
- Sensitivity, output timing and ambient light threshold are controlled by the voltage present on the 3 configuration pins (SNS, DLY and LG)
- Sleep mode is entered by driving /SLP low
- Digital output on /MD pin is activated when motion is detected

### Serial Interface Mode

- Advanced configuration and status via serial interface
- /MD, LG and /SLP remain functional
- The serial interface (RXD and TXD) operates at: 9600 bps, no parity, 8 data bits and 1 stop bit
- Provides access to additional features:
  - Wider selection of activation times, sensitivity and range
  - Low frequency rejection
  - Directional detection

## Detection Pattern

The ZMOTION™ Detection Module lens provides a typical range of 5m x 6m with a 60 degree angle. The actual distance is dependent on the sensitivity setting and ambient temperature.



## APPLICATIONS

### Lighting Control

- Conveniently turn lights on automatically
- Reduce energy consumption by automatically turning off lights when people are not in the room
- Lights do not turn on when ambient light is sufficiently high
- Adjustable delay from 1 second to 128 minutes

### Access Control

- Sense when someone approaches a controlled entry door
- Automatically unlock the door from one side while maintaining access control on the other
- Eliminates need for readers on both sides of the door

## Electrical Characteristics

### APPLICATIONS

#### Power Management

- Control power to any publicly accessed device based on activity in addition to time of day.

#### HVAC

- Automatically room heating sources on an off based on occupancy
- Turn on and off air conditioners when people enter and leave a room
- Reduce power consumption of air purifiers and fans by turning them on only when people are in the room

Item		Min.	Typ.	Max.
Operating Voltage		2.7V	3.3V	3.6V
Operating Current			8.9mA	
Sleep Mode Current			400uA	
/MD Output Drive				25mA
/MD Output Duration		Programmable H/W Mode: 2s - 15min Serial Mode: 1s to 128min		
Stabilization Time		Dynamic		
Coverage	Angle		60°	
	Range		5m	
Dimensions		25.5mm x 16.7mm		
Temperature Range		-40°C		+70°C

## Ordering Information

Order the ZMOTION™ Detection Module from your local Zilog Distributor using the part numbers below. For more information, or to download product collateral and software, please visit us at [www.zilog.com](http://www.zilog.com).

Part Number	Description
ZEPIR0AAS02MODG	ZMOTION™ Detection Module
ZEPIR000102ZCOG	ZMOTION™ Detection Module Evaluation Kit

## Documentation

The collateral referenced below is a sample of the documentation available for the ZMOTION™ Detection Module. For a complete listing of all available application notes, product specifications, user manuals, and sample libraries, please visit us at [www.zilog.com](http://www.zilog.com).

Document Number	Description
PS0284	ZMOTION™ Detection Module Product Specification
UM0223	ZMOTION™ Detection Module Evaluation Kit User Manual





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