zilog
An IXYS Company

ZMOTION™

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ZMOTION ADVANTAGE

- Complete Motion Detection Solution
- Best in Class Motion Detection Performance
- Extremely Flexible Interface
- Adjustable 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

Right-Angle connector version shown (ZEPIR0AAS02MODG)

Straight connector version also available (ZEPIR0ABS02MODG)

ZMOTION Detection Module

Overview

Zilog's **ZMOTION Detection Module** is a complete motion detection solution ideally suited for applications that need to detect a human presence. It is an excellent solution for detecting people as they approach entrances, kiosks, product displays, vending machines, appliances and advertising displays.

The ZMOTION Detection Module is a board-level product that combines the unique features of Zilog's Z8FS040 Motion Detection Microcontroller with a Pyroelectric Sensor and a Low-Profile Lens. The module is only 25.5 mm x 16.7 mm (and less than 10mm thick) so it can easily fit into many size constrained applications.

The ZMOTION Detection Module is simple to use. It can operate in a Hardware mode which simply activates an output signal when motion is detected; or in a serial mode allowing it to "talk" to another processor in your system when greater control over the motion detection performance is required. In both modes, sensitivity and output activation time can be controlled to match application requirements. For applications that require ambient light sensing, an input supporting an external light sensor is provided that can be used to gate the motion detection output.

Zilog's Detection Module Development Kit makes it quick and easy to integrate the ZMOTION Detection Module into your own custom application.

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

Features

- Complete motion detection solution including low-profile lens
- Direct sensor interface and advanced software-based motion detection algorithms provide superior sensitivity and stability
- Small form factor – only 25.5 mm x 16.7 mm x 9.5 mm
- 8-pin interface connector with two available orientations (right-angle and straight)
- Wide 5m x 6m, 60-degree detection pattern
- Simple hardware- or advanced serial (UART)-based configuration and interface
- Adjustable sensitivity and output activation time and support for Ambient Light Sensor input
- Unique Hyper Sense feature automatically increases sensitivity after motion is detected
- SLEEP Mode for low-power applications
- Minimal components ensure high reliability (no electrolytic capacitors)
- Modify the application code to suite your own application requirements
- 2.7V to 3.6V operation from 0°C to 70°C
- Complete development kit available (ZEPIR000102ZCOG)

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

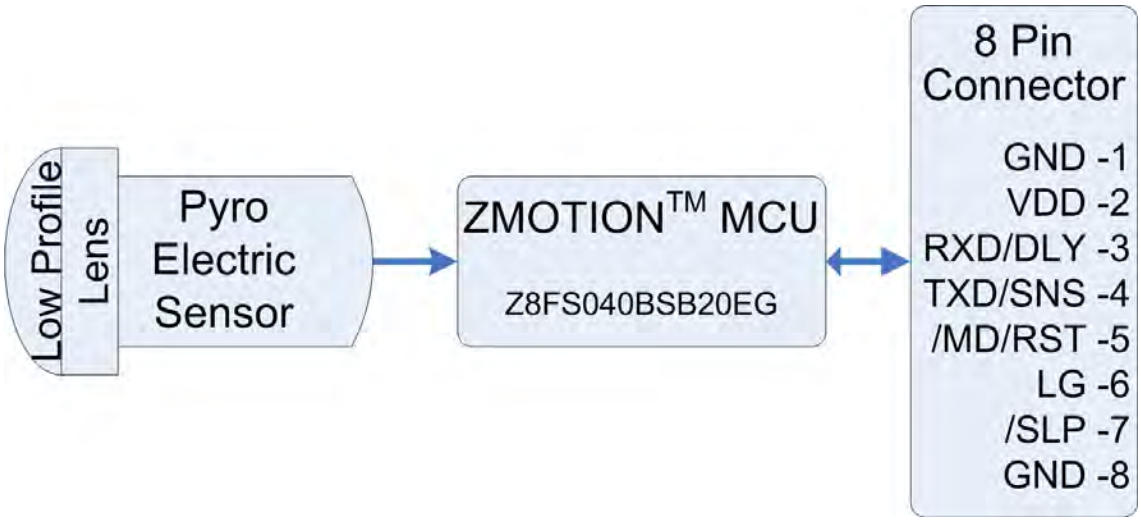
Display Systems

- 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

Block Diagram



ZMOTION Advantages

The surface-mount pyroelectric sensor and low-profile lens combine to provide small size 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 a true, unaltered signal to allow the software to identify and react to false trigger sources such as drift, EMI and ESD, thereby providing a more stable motion detector. This direct interface also eliminates the need for external components including large electrolytic capacitors, thereby improving reliability and ensuring the smallest possible form factor.

The motion detection software in the ZMOTION MCU does not require temperature compensation. As a result, stability is improved and the requirement for a discrete temperature sensor is eliminated.

Control over sensitivity and output activation time is provided through a simple hardware interface; 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. As a result, required power-on stabilization time is minimized.

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

Operation

Hardware Interface Mode

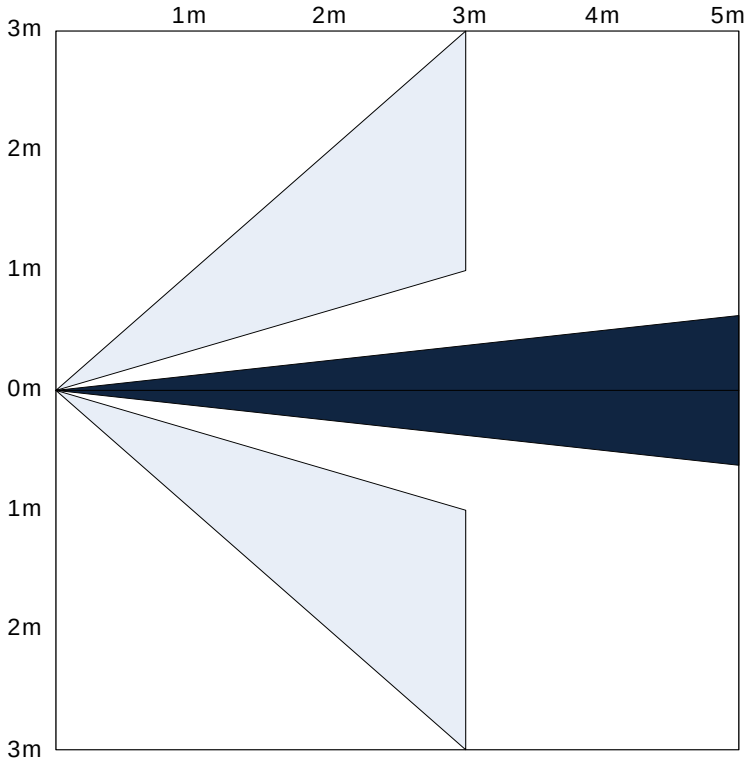
- Sensitivity, output timing and ambient light threshold are controlled by the voltage present on the 3 configuration pins (SNS, DLY and LG)
- Sleep mode is entered by driving /SLP low
- Digital output on the /MD pin is activated when motion is detected

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
  - Hyper Sense mode

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

Power Management

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

HVAC

- Room heating sources on and off automatically based on occupancy
- Turn air conditioners on and off 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

Electrical Characteristics

Item		Min.	Typ.	Max.
Operating Voltage		2.7V	3.3V	3.6V
Operating Current			8.9mA	
Sleep Mode Current			450µA	
/MD Output Drive				25mA
/MD Output Duration (Active Low)		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 x 9.5mm		
Temperature Range		–0°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.

Part Number	Description
ZEPIR0AAS02MODG	ZMOTION Detection Module (Right-Angle Connector)
ZEPIR0ABS02MODG	ZMOTION Detection Module (Straight Connector)
ZEPIR000102ZCOG	ZMOTION Detection Module Development 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.

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

Engineering Notes

Warning: DO NOT USE THIS PRODUCT IN LIFE SUPPORT SYSTEMS.

LIFE SUPPORT POLICY

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As used herein

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