White Paper

ZMOTION™ Detection Lens and Pyro Sensor Configuration Guide

Sonia Daley, Senior Product Engineer

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Revision History

Each instance of Revision History reflects a change to this document from its previous revision. For more details, refer to the corresponding pages linked within the table below.

Date	Revision Level	Description	Page Number
Mar 2012	07	Updated Recommended API Settings table.	See Table 1 on page 4.
Nov 2011	06	Updated Recommended API Settings table.	See Table 1 on page 4.
Apr 2011	05	Updated Recommended Intrusion API Settings table.	See Table 2 on page 6.
Mar 2011	04	Updated to include recommended API settings for the Intrusion Detection MCU.	See Table 2 on page 6.
Jan 2011	03	Updated to include two additional Nicera lenses.	See Table 1 on page 4.
Nov 2010	02	Updated for new Zilog/IXYS logo	All
Aug 2010	01	Initial Release	All

Introduction

Zilog's innovative ZMOTION Motion Detection products featuring PIR technology allow for a single microcontroller solution to fit a wide variety of occupancy, lighting, intrusion detection and general-purpose motion detection control applications. Zilog has paired the Z8F082A Encore! XP® MCU, featuring built-in motion detection software, with popular, high-quality lenses and pyroelectric sensors to provide a robust solution to a variety of applications. The Application Programmer Interface (API) settings allow for further customization to fit specific customer requirements.

This document establishes recommended API settings that Zilog has optimized and verified as meeting or exceeding lens manufacturers' coverage areas. These reference settings can serve as a starting point for further optimization for a customer's specific application and environment.

Test Configuration

To test a variety of lenses and pyros, the Zilog ZMOTION Detection and Control Development Kit was used throughout the verification process. For further information about this development tool, please reference Getting Started with Zilog's ZMOTION Detection and Control Development Kit User Manual (UM0230).

The development board was mounted at the lens manufacturer's recommended height. A minimum of four boards with identical hardware were used for testing purposes, with another board hosting generic settings used for control.

Test Methods

Walk tests were performed at a variety of speeds and with different target walkers. All walk tests were compared with the lens manufacturer's coverage map. The testing conformed to EN 50131-2-2 Standard, with respect to the environmental conditions, target, and walk test methods. For further information about manufacturers' coverage areas, please see the ZMOTION Lens and Pyroelectric Sensor Product Specification (PS0286).

Recommended Settings

On the next page, Table 1 displays the configuration settings recommended by Zilog to use for a given set of lens and pyro combinations. For further information about these API Register Settings, please refer to the ZMOTION Detection and Control Family Featuring PIR Technology Product Specification (PS0285).

Table 1. Recommended API Settings

API Register Number & Name	Address	Lens: AA0.9GIT1 / Pyro: SDA02-54P	Lens: CM 0.77GIV3 / Pyro: RE200B-P	Lens: NCL-9(26) / Pyro: RE200B-P	Lens: CWM 0.5GIV1 / Pyro: RE200B-P	Lens: CM 0.77 GIV5 / Pyro: RE200B-P	Lens: NCL-3B / Pyro: RE200B-P	Lens: NCL-3R / Pyro: RE200B-P	Lens: NCL-10IL / Pyro: RE200B-P	Lens: NCL-10S / Pyro: RE200B-P	Lens: NCL-11 / Pyro: RE200B-P	Lens: EWA 0.3 GI V2 / Pyro: RE200B-P
PIR Sensitivity Register	101h	12	12	15	16	15	12	12	12	12	12	12
PIR SC0, Motion Status and Engine Mode Control	102h	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
PIR SC1, Engine Status and Control	103h	0x40	0x50	0x50	0x40	0x50	0x40	0x40	0x40	0x40	0x40	0x38
PIR SC2, Range Control	104h	0x02	0x01	0x01	0x01	0x01	0x02	0x02	0x02	0x02	0x01	0x01
PIR SC3, ADC Scan Request	105h	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
PIR ASC0, EM Noise and MD origin status	F0h	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
PIR ASC2, Window size, lock level and update rate	F2h	0x5A	0x5A	0x5A	0x5A	0x5A	0x5A	0x5A	0x5A	0x5A	0x5A	0x5A

Note: *Each API file is located in the "include" folder in the ZDS project of the ZMOTION Detection and Control Development Kit Sample Code CD.

Table 1. Recommended API Settings (Continued)

API Register Number & Name	Lens	AA0.9GIT1	CM 0.77GIV3	NCL-9(26)	CWM 0.5GIV1	CM 0.77 GIV5	NCL-3B	NCL-3R	NCL-10IL	NCL-10S	NCL-11	EWA 0.3 GI V2
	Pyro	SDA02-54P	RE200B-P	RE200B-P	RE200B-P	RE200B-P	RE200B-P	RE200B-P	RE200B-P	RE200B-P	RE200B-P	RE200B-P
	Address											
PIR Sample Size Register	F5h	0x20	0x20	0x20	0x20	0x20	0x20	0x20	0x20	0x20	0x20	0x20
PIR Debounce Time Register	F6h	0x78	0x78	0x78	0x78	0x78	0x78	0x78	0x78	0x78	0x64	0x82
PIR Debounce Batch Size Register	F7h	0x3F	0x3F	0x3F	0xFF	0xFF	0xFF	0xFF	0xFF	0xFF	0xFF	0x3F
PIR Transient Sensitivity Level	F8h	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
PIR Noise Sensitivity Level	F9h	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
API File Name*		API_INIT_01	API_INIT_02	API_INIT_05	API_INIT_04	API_INIT_03	API_INIT_07	API_INIT_08	API_INIT_06	API_INIT_09	API_INIT_0A	n/a

Note: *Each API file is located in the "include" folder in the ZDS project of the ZMOTION Detection and Control Development Kit Sample Code CD.

Table 2 displays the configuration settings recommended by Zilog to use for a given set of intrusion lens and pyro combinations. For further information about these API register settings, please refer to the ZMOTION Intrusion Detection Product Specification (PS0288).

Table 2. Recommended Intrusion API Settings

API Register Number and Name	Lens: Pyro: Address	WA 1.2 GI 12 V4 RE200B-P	LR 1.2 GI 12 V3 RE200B-P	VB 1.2 GI V1 RE200B-P
PIR Sensitivity Register	101h	15	15	16
PIR SC0, Motion Status and Engine Mode Control	102h	0x00	0x00	0x00
PIR SC1, Engine Status and Control	103h	0x50	0x50	0x50
PIR SC2, Range Control	104h	0x01	0x02	0x02
PIR SC3, ADC Scan Request	105h	0x00	0x00	0x00
PIR ASC0, Engine Control and Status	F0h	0x00	0x00	0x00
PIR ASC2, White Light Debounce and Scan Rate	F2h	0x5A	0x5A	0x5A
PIR Sample Size Register	F5h	0x20	0x20	0x20
PIR Debounce Time Register	F6h	0x78	0x78	0x78
PIR Debounce Batch Size Register	F7h	0x3F	0x3F	0x3F
PIR Transient Sensitivity Level	F8h	0	0	0
PIR Noise Sensitivity Level	F9h	0	0	0
PIR Extended Detection Sensitivity Level	FEh	10	10	10
PIR Extended Detection Debounce Timeout	FFh	12	12	12
API File Name*		API_INIT_09	API_INIT_10	API_INIT_11

Note: *Each API file is located in the "include" folder in the ZDS project of the ZMOTION intrusion Detection Development Kit Sample Code CD.

Summary

Zilog's ZMOTION motion detection solutions provide a flexible method for optimizing a variety of lighting, occupancy and intrusion detection applications. Zilog uses popular, high-quality lens and pyro combinations along with proven API settings to establish quick development times to meet our customers' requirements.

Note: Individual results may vary based on environmental conditions, mounting height, the detector's insulation or exposure to the environment, and the application being developed.

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