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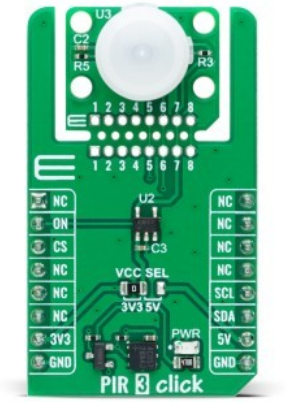
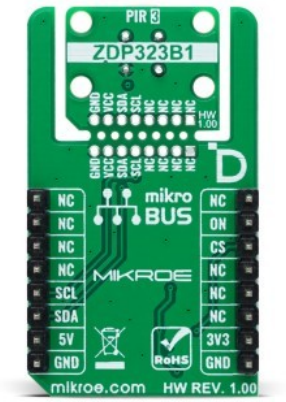
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

PIR 3 Click





PID: MIKROE-6290

PIR 3 Click is a compact add-on board designed for efficient and reliable motion detection in various applications. This board features the ZDP323B1 sensor from Zilog, with high EMI immunity and precise motion detection capabilities. It includes a spectral filter window tuned to an 8-13um wavelength, dual sensing elements with a 0.6mm spacing, and a field of view of 148° on the X-axis and 136° on the Y-axis. The board also integrates the ZNCL10S PIR lens for maximum IR transmissivity and includes the Click Snap feature for flexible implementation. Ideal for security systems, lighting control, and video doorbells, PIR 3 Click ensures high performance and flexible implementation in demanding motion detection applications.

How does it work?

PIR 3 Click is based on the ZDP323B1, a dual-element balanced differential pyroelectric (PIR) sensor from Zilog (Littelfuse). Designed for high performance and excellent EMI immunity, this sensor is ideal for demanding motion detection applications such as security/intrusion motion detectors, lighting control, video doorbells, and many more. The ZDP323B1 features a low-profile surface mount package compatible with IR reflow processes. It includes two sensing elements behind a spectral filter window tuned to an 8-13um wavelength, blocking unwanted IR energy sources. With a 0.6mm element spacing (elements are 0.75mm x 2.3mm spaced 0.6mm apart), it provides additional white light protection and a typical field of view of 148 degrees from the center of the element on the X-axis and 136 degrees on the Y-axis.

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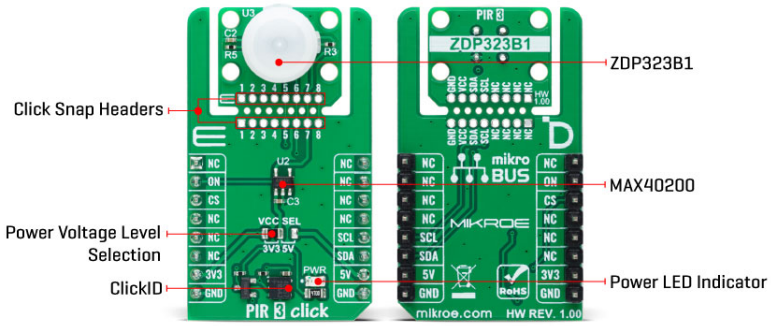

Combined with the ZDP323B1, the PIR 3 Click also integrates the ZNCL10S PIR lens made from high-density polyethylene. This lens ensures maximum IR transmissivity with well-defined beam patterns. It clips directly into the Click board™ over the ZDP323B1 sensor, simplifying mechanical design.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor area to become movable by breaking the PCB, opening up many new possibilities for implementation. Thanks to the Snap feature, the ZDP323B1 can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

PIR 3 Click uses a standard 2-wire I2C interface to communicate with the host MCU, supporting Standard mode with up to 400kHz of frequency clock. The I2C interface and registers allow for controlling various sensor functions, such as programmable gain, bandwidth, and detection thresholds. This flexibility ensures precise and customizable operations tailored to specific application needs. In addition, the SDA signal can also be used as a motion trigger output to interrupt or wake up a host MCU when motion is detected.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper and activated via the ON pin of the mikroBUS™ socket, providing a power-enable function. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, introducing a new level of flexibility and ease of use. This feature allows for easy detachment of the main sensor area by simply snapping the PCB along designated lines, enabling various implementation possibilities. For detailed information about Click Snap, please visit the official page dedicated to this feature.

Specifications

Type	Motion

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Applications	Ideal for security systems, lighting control, video doorbells, and more
On-board modules	ZDP323B1 - dual-element balanced differential pyroelectric (PIR) sensor from Zilog (Littelfuse)
Key Features	High performance, excellent EMI immunity, tuned to an 8-13um wavelength for blocking unwanted IR energy, 0.6mm element spacing for additional white light protection, typical field of view 148deg on the X- and 136 on Y-axis, integrated the ZNCL10S PIR lens for maximum IR transmissivity, Click Snap feature, and more
Interface	I2C
Feature	Click Snap,ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on PIR 3 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	NC	
Device Enable	**ON**	2	RST	INT	15	NC	
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

PIR 3 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Field of View - X-axis	-	148	-	deg
Field of View - Y-axis	-	136	-	deg

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Software Support

We provide a library for the PIR 3 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on MIKROE github account.

Library Description

This library contains API for PIR 3 Click driver.

Key functions

- pir3_set_detection_level This function sets the detection threshold level in the ctx->config structure.
- pir3_write_config This function writes a config structure to the sensor by using I2C serial interface.
- pir3_read_peak_hold This function reads a 12-bit signed peak hold data by using I2C serial interface.

Example Description

This example demonstrates the use of PIR 3 Click board™ by reading and displaying the peak hold tracking data.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on MIKROE github account.

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.PIR3

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

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For more information about mikroSDK, visit the official page.

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Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

PIR 3 click example on Libstock

PIR 3 click 2D and 3D files v100

PIR 3 click schematic v100

ZDP323B1 datasheet

ZMOTION lenses datasheet

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