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Proximity 18 Click





PID: MIKROE-5300

Proximity 18 Click is a compact add-on board that provides a close-range proximity sensing solution. This board features the VCNL3036X01, a high-resolution digital proximity sensor from Vishay Semiconductors. Besides the proximity sensing element, the VCNL3036X01 also integrates a mux and a driver for three external LEDs, which are located near the chip on the board, photodiodes, amplifiers, and analog to digital conversion circuits into a single CMOS chip. Proximity 18 Click provides absolute distance measurement, whatever the target color and reflectance, and is accurate up to 50cm. This Click board™ is suitable for proximity/optical switch applications for consumer, computing, automotive, and industrial purposes.

Proximity 18 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

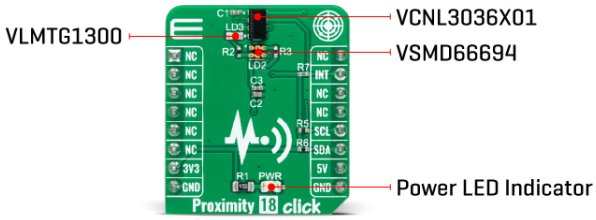
Proximity 18 Click is based on the VCNL3036X01, a close-range digital proximity sensor from Vishay Semiconductors. The VCNL3036X01 integrates a proximity sensor, a mux, and a driver for three external LEDs (green LED VLMTG1300 and dual-pack IR and Red LED VSMD66694) located near the chip on the board, alongside photodiodes, amplifiers, and analog to digital conversion circuits into a single CMOS chip. Proximity 18 Click provides absolute distance measurement that is accurate up to 50cm.

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The VCNL3036X01 supports various basic proximity function settings such as duty ratio, integration time, interrupt, proximity enable, disable, and persistence, all handled by the register configurations. Besides Normal operation mode, it also simplifies the use of proximity detection logic output mode that outputs HIGH / LOW levels, saving loading from the host selected via register settings.

Proximity 18 Click communicates with an MCU using the standard I2C 2-wire interface to read data and configure settings, supporting Fast Mode up to 400kHz. The command register controls all operations. The simple command structure helps users to easily program the operation setting and latch the light data from VCNL3036X01. It is simple for the host MCU to access proximity output data via the I2C interface without extra software algorithms.

A further benefit is that the VCNL3036X01 also provides a programmable interrupt feature of individual high and low thresholds, resulting in the best utilization of MCU resources and power, routed to the INT pin on the mikroBUS™ socket. If the interrupt function is enabled, the host reads the proximity output data from VCNL3036X01, which saves the host loading from periodically-read proximity data. More than that, an interrupt flag indicates the interrupt behavior triggered under different conditions. Once the host reads the result, the interrupt is cleared, and the ranging sequence can repeat.

This Click board™ can operate with both 3.3V and 5V logic voltage levels. It should be highlighted that the VCNL3036X01 works exclusively at 3.3V, so it is necessary to perform appropriate logic voltage level conversion before using MCUs with different logic levels. 5V is used only for powering the LEDs. However, the Click board™ comes equipped with a library containing functions and an example code that can be used, as a reference, for further development.

Specifications

Type	Proximity
Applications	Can be used for proximity/optical switch applications for consumer, computing, automotive, and industrial purposes
On-board modules	VCNL3036X01 - close-range digital proximity sensor from Vishay Semiconductors
Key Features	Fast and accurate distance ranging sensor,

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	fully integrated module, low-power consumption, I2C interface, programmable interrupt, up to 500mm ranging, various basic proximity function settings, and more
Interface	I2C
ClickID	No
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V,5V

Pinout diagram

This table shows how the pinout on Proximity 18 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	
	NC	2	RST	INT	15	**INT**	Interrupt
	NC	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
LD2	LD2	-	IRLED Emitter
LD3	LD3	-	Green LED Emitter

Proximity 18 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Operating Range	-	-	500	mm
Spectral Bandwidth Range	500	-	910	nm
Red LED Wavelength	-	660	-	nm
IR LED Wavelength	-	940	-	nm
Green LED Wavelength	-	525	-	nm
Resolution	-	-	16	bit
Operating Temperature Range	-20	+25	+85	°C

Software Support

We provide a library for the Proximity 18 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main

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MikroElektronika 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 Proximity 18 Click driver.

Key functions

- proximity18_start_measurement This function starts the measurement by setting the one time trigger bit in the PS_CONF3_MS register.
- proximity18_wait_for_data_ready This function waits for the MPX data ready interrupt flag.
- proximity18_read_proximity This function reads the proximity data from all 3 sensors.

Example Description

This example demonstrates the use of Proximity 18 Click board™ by reading and displaying the proximity data on the USB UART.

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.Proximity18

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 MikroElektronika compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MikroElektronika 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.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

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mikroSDK

Click board™ Catalog

Click boards™

Downloads

Proximity 18 click example on Libstock

VSMD66694 datasheet

VCNL3036X01 datasheet

VLMTG1300 datasheet

Proximity 18 click 2D and 3D files

Proximity 18 click schematic

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