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Proximity 14 Click





PID: MIKROE-4744

Proximity 14 Click is a compact add-on board that contains a close-range proximity sensing solution. This board features the VCNL36825T, a fully integrated proximity sensor from Vishay Semiconductors. It combines a high-power VCSEL (vertical-cavity surface-emitting laser) and a photodiode for proximity measurement and signal processing IC in a single package with a 12-bit ADC. It provides proximity detection in applications with highly tight space requirements through its standard I2C bus serial digital interface and comes with a programmable interrupt function. With a range of up to 20cm (7.9"), the VCNL36825T greatly simplifies its usage in consumer and industrial applications because no mechanical barriers are required to isolate the emitter from the detector optically.

Proximity 14 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?

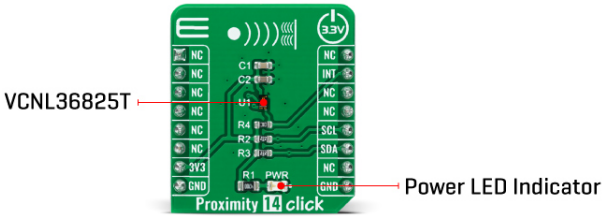
Proximity 14 Click as its foundation uses the VCNL36825T, a new fully integrated proximity sensor designed to increase efficiency and performance in consumer and industrial applications from Vishay Semiconductors. Featuring a vertical-cavity surface-emitting laser (VCSEL), the VCNL36825T combines a photodiode, signal processing IC, and 12-bit ADC in a compact SMD package, with a small 1.6mm light hole. With a range of 20cm, it also provides collision detection and features low power consumption down to 6.63µA to increase efficiency in these applications.

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ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
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ISO 9001: 2015 certification of quality management system (QMS).

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The VCNL36825T simplifies the use and design-in of a proximity sensor as no mechanical barriers are required to isolate the emitter from the detector optically. The proximity sensor uses intelligent cancellation to eliminate cross-talk, while a smart-persistence scheme ensures accurate sensing and faster response time. The VCSEL wavelength peaks at 940nm and has no visible “red-tail”.

Proximity 14 Click communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting Standard Mode operation with a clock frequency up to 100kHz and Fast Mode up to 400kHz. It also features an intelligent interrupt function that enables the sensor to work independently until a predefined proximity event or threshold occurs. It then sets an interrupt that requires the MCU to awaken, which reduces power consumption by eliminating polling communication traffic between the sensor and MCU.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before use with MCUs with different logic levels. 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 consumer and industrial applications because no mechanical barriers are required to isolate the emitter from the detector optically
On-board modules	VCNL36825T - fully integrated proximity sensor from Vishay Semiconductors
Key Features	Low power consumption, high precission, integrated proximity sensor with vertical cavity surface emitting laser, I2C configurable, interrupt feature, and more
Interface	I2C
ClickID	No
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)

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Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Proximity 14 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	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator

Proximity 14 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Range	-	-	200	mm
Proximity Resolution	-	12	-	bits
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Proximity 14 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

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

Library Description

This library contains API for Proximity 14 Click driver.

Key functions:

- proximity14_cfg_setup - Config Object Initialization function.
- proximity14_init - Initialization function.
- proximity14_default_cfg - Click Default Configuration function.

Examples description

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This example showcases the ability of the device to read proximity value. It can be configured to detect objects up to 20cm of distance.

The application is composed of three sections :

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

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Proximity14

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. The terminal available in all MikroElektronika compilers, or any other terminal application of your choice, can be used to read the message.

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™

mikroSDK

Click board™ Catalog

Click boards™

Downloads

Proximity 14 click 2D and 3D files

VCNL36825T datasheet

Proximity 14 click schematic

Proximity 14 click example on Libstock

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