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Proximity 15 Click





PID: MIKROE-4822

Proximity 15 Click is a compact add-on board that contains a close-range proximity sensing solution. This board features the VL53L1, a state-of-the-art, Time-of-Flight (ToF), a laser-ranging miniature sensor from STMicroelectronics. The VL53L1 allows absolute distance measurement, whatever the target color and reflectance. It integrates a SPAD (single-photon avalanche diode) array, physical infrared filters, and optics to achieve the best-ranging performance in various ambient lighting conditions, with a wide range of cover windows. It provides accurate ranging above 4m and can work at fast speeds (60Hz). With patented algorithms and ingenious module construction, the VL53L1 is also able to detect different objects within the field of view and scene browsing and multi-zone detection. This Click board™ is suitable for consumer and industrial applications such as multi-object detection and multi-array scanning.

Proximity 15 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 15 Click as its foundation uses the VL53L1, a third-generation time-of-flight (ToF) laser-ranging sensor from STMicroelectronics. The VL53L1 brings multi-object detection and multi-array scanning, doubling the range of operation to above 4m. It also allows novel features such as multi-target detection and programmable multi-zone scanning, suitable for robotics, user detection, drones, IoT, and wearable applications.

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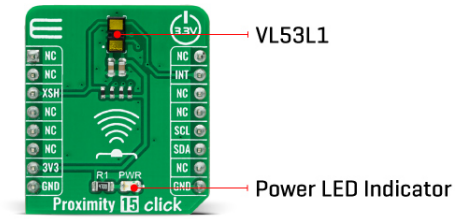

The sensor module integrates a VCSEL that emits at a wavelength of 940nm, a processor core, and a SPAD photon detector. The addition of the optical lens system increases the photon detection rate to boost the module’s ranging performance. The VL53L1 performs an entire measurement operation in as little as 5ms, and for Auto-Focus applications, the sensor detects objects twice.

Proximity 15 Click communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting Fast Mode Plus Mode up to 1MHz. It also features an intelligent interrupt function that generates every time a ranging measurement is available. Once the host reads the result, the interrupt is cleared, and the ranging sequence can repeat. Besides the interrupt pin, the Xshutdown (reset) pin labeled as XSH and routed to the CS pin of the mikroBUS™ socket optimizes power consumption used for power ON/OFF purposes. This option optimizes power consumption as the VL53L1 can be completely powered off when not used, and then woken up through the host GPIO (using the XSH pin).

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 such as multi-object detection and multi-array scanning
On-board modules	VL53L1 - third-generation time-of-flight (ToF) laser-ranging sensor from STMicroelectronics
Key Features	Low power consumption, fast accurate distance ranging, 400cm+ detection with full field of view, multi-object detection, multi-zone scanning, shutdown and interrupt feature, works with many types of cover glass, and more
Interface	I2C

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ClickID	No
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Proximity 15 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
Xshutdown (reset)	**XSH**	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 15 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Range	4	-	800	cm
Peak Wavelenght	-	940	-	nm
Operating Temperature Range	-20	+25	+85	°C

Software Support

We provide a library for the Proximity 15 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 15 Click driver.

Key functions:

- proximity15_cfg_setup - Config Object Initialization function.

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- proximity15_init - Initialization function.
- proximity15_default_cfg - Click Default Configuration function.

Example description

This example demonstrates the use of Proximity 15 Click board™.

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.Proximity15

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 15 click example on Libstock

Proximity 15 click 2D and 3D files

VL53L1 datasheet

Proximity 15 click schematic

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