MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
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

Inclinometer 3 Click

PID: MIKROE-6050

Inclinometer 3 Click is a compact add-on board for precise tilt and leveling measurement applications. This board features the SCL3400-D01, a two-axis inclinometer sensor from Murata, leveraging advanced capacitive 3D-MEMS technology. It features a high-performance mixed-signal ASIC with a flexible SPI digital interface housed in a robust 12-pin pre-molded casing, ensuring long-term reliability and performance. The sensor offers selectable measurement modes, high resolution up to 32768LSB/g, and ultra-low noise density, making it highly accurate and versatile. It is ideal for precise tilt sensing and leveling applications, such as structural health monitoring, inertial measurement units, and positioning and guidance systems.

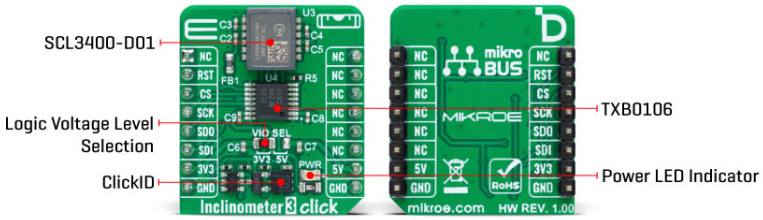
Inclinometer 3 Click is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the mikroBUS™ standard. It comes with the mikroSDK open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets this Click board™ apart is the groundbreaking ClickID feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

How does it work?

Inclinometer 3 Click is based on the SCL3400-D01, a high-performance, two-axis (XY) inclinometer sensor from Murata, employing their advanced capacitive 3D-MEMS technology for precise tilt sensing. This sensor integrates a sophisticated mixed-signal ASIC that provides signal processing through a flexible SPI digital interface, enhancing its functionality and ease of integration. Housed in a durable 12-pin pre-molded plastic casing, the SCL3400-D01 ensures consistent performance and reliability across its operational lifespan. This sensor is meticulously designed, manufactured, and tested to meet rigorous stability, reliability, and

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
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

quality standards, making it exceptionally dependable across various temperatures and vibrations. Additionally, it incorporates several advanced self-diagnostic features that further bolster its operational integrity.



Ideal for applications requiring unmatched stability and accuracy in challenging environments, the SCL3400-D01 stands out with its selectable measurement modes of ±30° with a 10Hz Low Pass Filter (LPF) and ±90° with a 40Hz LPF, providing flexible deployment options. It has an ultra-low noise density and a high resolution of up to 32768LSB/g, ensuring precise and clear signal outputs under various conditions. Typical uses of this inclinometer solution include leveling, tilt sensing, structural health monitoring, and more complex applications such as inertial measurement units (IMUs) and positioning and guidance systems, where precise movement and position tracking are crucial.

As mentioned, the Inclinometer 3 Click communicates with the host MCU through a standard 4-wire SPI, capable of up to 10MHz operational frequency (2MHz is the typical frequency). Although the SCL3400-D01 is designed to operate only at 3.3V, this Click board™ also includes a TXB0106 logic level translator, which ensures the operation of this Click board™ with both 3.3V and 5V capable MCUs.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VIO SEL jumper. 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.

Specifications

Type	Motion
Applications	Ideal for precise tilt sensing and leveling applications, such as structural health monitoring, inertial measurement units, and positioning and guidance systems
On-board modules	SCL3400-D01 - high-performance, two-axis (XY) inclinometer sensor from Murata
Key Features	2-axis (XY) inclinometer, based on the capacitive 3D-MEMS technology, SPI digital interface, selectable measurement modes,

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
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

	resolution up to 32768LSB/g, high sensitivity and precision, ultra-low noise density, ensures durability and long-term reliability, targeted at applications demanding best of class stability and accuracy with tough environmental requirements, and more
Interface	SPI
Feature	ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on Inclinometer 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	
ID SEL	**RST**	2	RST	INT	15	NC	
SPI Select / ID COMM	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
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	VIO SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Inclinometer 3 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Measurement Range	-	±90	-	deg
Sensitivity	-	-	32768	LSB/g

Software Support

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

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
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

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 Inclinometer 3 Click driver.

Key functions

- inclinometer3_get_axes This function reads the accelerometer sensor axes data by using SPI serial interface.
- inclinometer3_get_temperature This function reads the temperature measurement data by using SPI serial interface.

Example Description

This library contains API for the Inclinometer 3 Click driver. The library initializes and defines the SPI drivers to write and read data from registers, as well as the default configuration for the reading accelerator and temperature 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.Inclinometer3

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.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
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

Click boards™

Downloads

Inclinometer 3 click 2D and 3D files v100

SCL3400-D01 datasheet

Inclinometer 3 click schematic v100

Inclinometer 3 click example on Libstock

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Mikroe:

MIKROE-6050