Slider 2 Click

PID: MIKROE-3301

The **Slider 2 click** is a very accurate potentiometer Click Board, featuring a high-quality mechanical slide-action potentiometer (slider), which in conjunction with the accurate voltage reference IC, provides very precise analog control voltage (CV) at its output. Featuring an accurate voltage reference IC, the output of the Click board™ can be directly sampled by the A/D peripheral of the microcontroller (MCU). Since there are many different MCU architectures with different reference voltage requirements, Slider 2 click offers a possibility to select the voltage reference between 4.096V and 2.048V, two most commonly used values for different MCU peripherals.

It comes in the package which also includes the mikroSDK™ software and a library with all the functions. The Click board™ comes as a fully tested and approved prototype, making it a reliable device ready to use on the development board.

The output from the potentiometer is buffered by the high-performance rail-to-rail operational amplifier, which ensures clean and low-noise signal to the VO pin of the Click Board. Featuring a very accurate voltage reference and a high-quality 30 mm slider, this Click board™ can be used in any application that requires an analog control voltage, or it can be used to build HMI applications, adding them an accurate slider potentiometer.

How does it work?

The **Slider 2 click** utilizes the PTA3043, a linear, high-grade, 10K potentiometer made by Bourns. This potentiometer has a 30 mm travel distance. The long travel distance of the wiper allows more accurate movements and combined with the high-quality manufacturing process it allows to dial-in the desired voltage with ease. This type of potentiometers are also known as

![MIKROE logo]
Time-saving embedded tools

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sliders, thus the name for this Click board™. The potentiometer has a small dent in the middle, which enables tactile feedback when the center position is reached. The potentiometer is connected between the VREF and GND, acting as a voltage divider. Its wiper terminal outputs voltage in the range from 0 to 4.096V, depending on its position. The used potentiometer is linear, so the wiper potential changes linearly with its position.
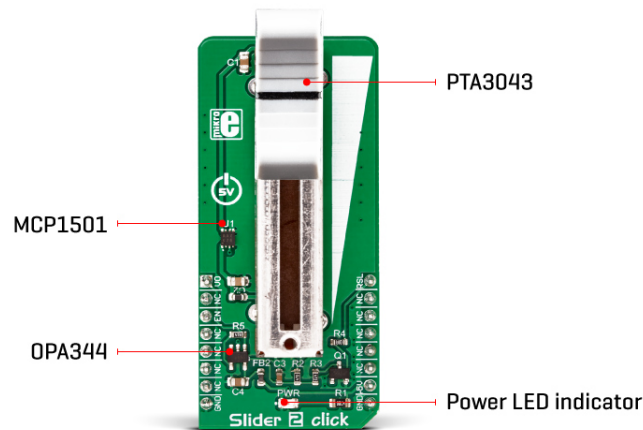
The voltage reference(VREF) is obtained from the MCP1501, a high-precision voltage reference IC from Microchip. The main purpose of this IC is to provide and retain a very accurate voltage of 4.096V. Its voltage reference is accurate enough for most applications where the analog output from the Slider 2 click can be utilized as a control voltage signal (CV). The output is buffered with a rail-to-rail, low-power operational amplifier, labeled as OPA344, produced by Texas Instruments. After the buffering op-amp, the output signal is delivered at the AN pin of the mikroBUS, labeled as VO on this Click Board, so it can be easily sampled by the internal A/D converter of the host microcontroller unit (MCU.

Most MCUs have A/D peripherals that can use 4.096 as the reference voltage for the full-scale value (PIC 8-bit family is a good example). However, there are many cases where 2.048V is more adequate, so the Click board offers a choice: if there is a HIGH logic level at the RSL pin, the N-type MOSFET will open and another resistor will be introduced to the circuit. A voltage divider will be formed at the input of the buffering op-amp, which will halve the voltage from the potentiometer, reducing its maximum value to 2.048V. When the logic level at the RSL pin is LOW, the N-type MOSFET will stay closed, so the second resistor of the voltage divider remains isolated. This will cause the full voltage level from the potentiometer to appear at the VO pin of the Click Board, in the range from 0 to 4.096V max.

The MCP1501 IC has the #SHDN pin, used to shut down the IC when it's set to a LOW logic level. When this pin is set to a LOW logic level, the voltage reference output will be turned OFF, so there will be no voltage changes at the VO pin. By enabling the MCP1501 the voltage reference is established once again, so the Click Board can deliver an analog signal with the voltage ranging from 0 to 4.096V, or from 0 to 2.048V if the RSL pin is set to a HIGH logic level. It is recommended to start up the Click Board with the EN pin at the LOW logic level, to allow the internal power supply of the MCP1501 to reach its operational values.

Specifications

Type	Potentiometer
Applications	Slider 2 click can be used in any application

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	that requires an analog control voltage, or it can be used to build HMI applications, adding them an accurate slider potentiometer.
On-board modules	PTA3043, a linear 10K potentiometer with 30 mm travel distance, made by Bourns, Inc; MCP1501, a precise 4.096V voltage reference, by Microchip; OPA344, a low-power rail-to-rail operational amplifier, from Texas Instruments.
Key Features	An accurate and precise slider with long travel distance of its wiper, a precise buffered voltage reference output which can be directly sampled by the integrated A/D section of the microcontroller, features a digitally selectable reference voltage (4.096V or 2.048V) to allow compliance with different MCU architecture.
Interface	Analog,GPIO
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	5V

Pinout diagram

This table shows how the pinout on **Slider 2 Click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS			Pin	Notes
Analog Voltage OUT	**VO**	1	AN	PWM	16	**RSL**	Ref. Voltage Selection
	NC	2	RST	INT	15	NC	
MCP1501 Chip Enable	**EN**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
	NC	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

Software Support

We provide a library for the Slider 2 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

Mikroe produces entire development toolchains for all major microcontroller architectures.
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.

ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.

ISO 9001: 2015 certification of quality management system (QMS).

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(recommended), downloaded from our LibStock™ or found on MIKROE github account.

Library Description

This library contains API for Slider 2 Click driver.

Key functions

- This function sets desired state to EN pin.

- This function sets desired reference to RSL pin.

Example Description

This click utilizes potentiometer with long travel distance of the wiper witch allows more accurate movements and combined with the high-quality manufacturing process it allows to dial-in the desired voltage with ease.

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.Slider2

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.

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Click board size	M (42.9 x 25.4 mm)
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Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click Boards™

Downloads

Slider 2 click example on Libstock

Slider 2 Click 2D and 3D files

MCP1501 datasheet

PTA datasheet

Slider 2 click schematic

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