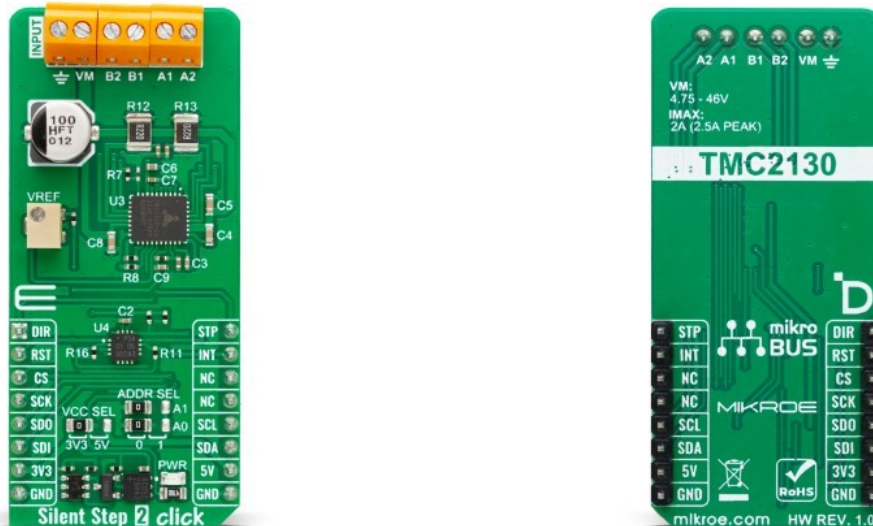


Silent Step 2 Click



PID: MIKROE-5934

Silent Step 2 Click is a compact add-on board that allows extremely smooth and silent operation of the connected motor. This board features the TMC2130, a high-performance two-phase stepper motor driver from Analog Devices. The driver uses an external motor power supply of 4.75 up to 43V to power a 2-phase stepper motor up to 2A coil current (2.5A peak). In addition, its sophisticated StealthChop chopper ensures noiseless operation combined with maximum efficiency and the best motor torque. This Click board™ makes the perfect solution for the development of a direct substitution for many complex motion controllers for various industrial purposes.

Silent Step 2 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?

Silent Step 2 Click is based on the TMC2130, a high-performance two-phase stepper motor driver from Analog Devices. The highest resolution is 256 microsteps per full step. Some other integrated techniques are SpreadCycle™ as a highly dynamic motor control chopper, DcStep™ as load-dependent speed control, sTallGuard2™ as a high precision sensorless motor load detection, and more. The motor driver supports passive breaking and freewheeling mode. This motor driver also supports a few operating modes that can be used per your needs.

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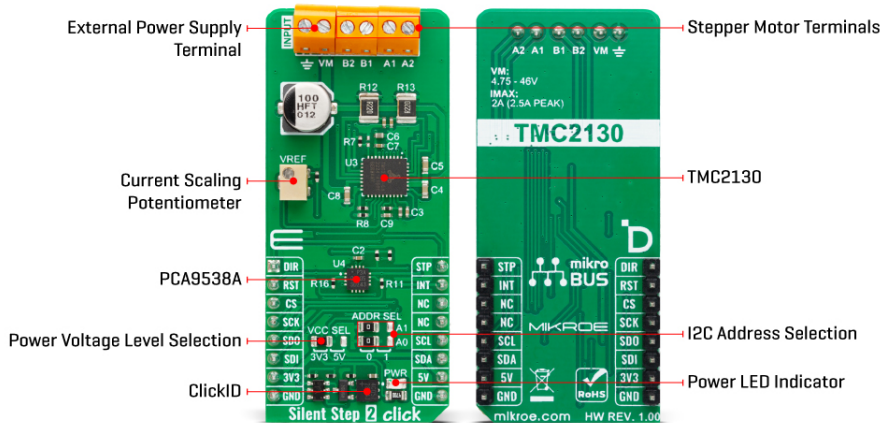
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ISO 9001: 2015 certification of quality management system (QMS).



Silent Step 2 Click can communicate with the host MCU using a standard 4-wire SPI serial interface. It can also use the step/direction driver mode, which allows you to control the motor position by sending pulses on the step signal STP pin while indicating the direction on the direction signal DIR pin. The driver uses an external motor power supply of 4.75 up to 43V to power a 2-phase stepper motor up to 2A coil current (2.5A peak). The motor current can be set over the onboard VREF potentiometer.

Additional functionalities on this Click board™ are achieved over the PCA9538A, an 8-bit I/O port from NXP. This I/O port communicates with the host MCU over the I2C interface, and you can change the I2C address over the ADDR SEL jumpers. The PCA9538A allows you to control the driver enable function of the motor driver. It also monitors two driver motors' diagnostic outputs, and if a condition is met (say, stall of the motor), it will interrupt the host MCU over the INT pin. The I/O port can be reset over the RST pin.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC 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	Stepper
Applications	Can be used for the development of a direct substitution for many complex motion controllers for various industrial purposes
On-board modules	TMC2130 - high-performance two-phase stepper motor driver from Analog Devices
Key Features	2-phase stepper motor driver, high resolution per full step, wide input voltage range, passive braking and freewheeling mode, full protection and diagnostic, load-dependent speed control, highly dynamic motor control chopper, and more
Interface	GPIO, I2C, SPI
Feature	ClickID

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Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V, External

Pinout diagram

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

Notes	Pin					Pin	Notes
Direction Control	DIR	1	AN	PWM	16	STP	Step Control
Reset / ID SEL	RST	2	RST	INT	15	INT	Interrupt
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	SCL	I2C Clock
SPI Data IN	SDI	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
JP1	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP3	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1
P1	VREF	-	Current Scaling Potentiometer

Silent Step 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	4.75	-	43	V
Output Current	-	-	2	A

Software Support

We provide a library for the Silent Step 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 (recommended), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

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Library Description

This library contains API for Silent Step 2 Click driver.

Key functions

- `silentstep2_rotate_by_angle` Silent Step 2 rotates the shaft through a desired angle function.
- `silentstep2_set_direction` Silent Step 2 sets the clockwise or counterclockwise direction movement function.

Example Description

This example demonstrates the use of Silent Step 2 Click board™ by driving the motor in both directions for a desired rotation angle.

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.SilentStep2

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](#)

[Click boards™](#)

Downloads

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[Silent Step 2 click example on Libstock](#)

[Silent Step 2 click 2D and 3D files](#)

[PCA9538A datasheet](#)

[Silent Step 2 click schematic](#)

[TMC2130 datasheet](#)

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