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Rotary W 2 Click

PID: MIKROE-5892

Rotary W 2 Click is a compact add-on board that allows you to add a precision input knob to your design. This board features the TLC5925, a low-power 16-channel constant-current LED sink driver from Texas Instruments that, combined with a high-quality rotary encoder from ALPS, the EC12D1564402, allows you to add a precision input knob to your design. It also features an LED ring composed of 16 individual white LEDs that can be used to represent the encoder position more visually. This Click board™ makes the perfect solution for the development of various interesting visual effects for any application, such as flexible position, value indicator, and more.

Rotary W 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 Rotary W 2 Click 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?

Rotary W 2 Click is based on the TLC5925, a low-power 16-channel constant-current LED sink driver from Texas Instruments that, combined with a high-quality rotary encoder from ALPS, the EC12D1564402, allows you to add a precision input knob to your design. The EC12D1564402 incremental rotary encoder is surrounded by a ring of 16 green LEDs where a single rotation is divided into 15 discrete steps (in contrast to a potentiometer, a rotary encoder can be spun around continuously). The driver can control each LED individually, allowing various lighting effects to be programmed. The encoder outputs A and B signals (out of phase to each other) on the two mikroBUS™ lines, alongside the knob push-button feature,

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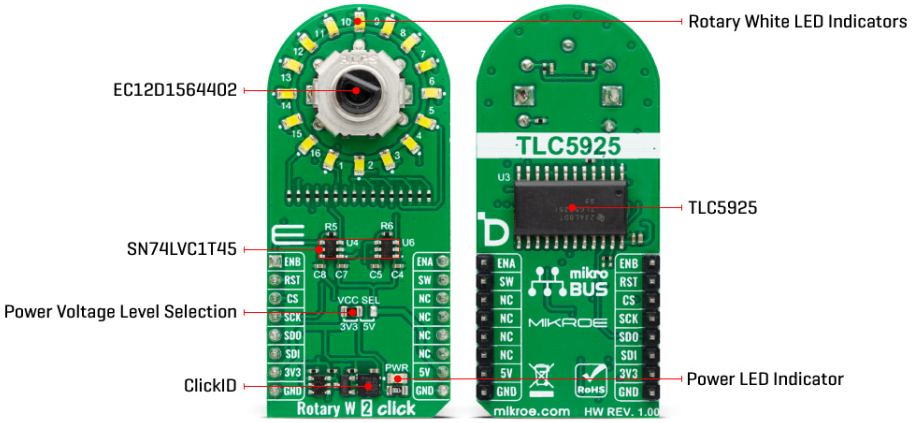
which outputs through the interrupt line.



The EC12D1564402 is a 15-pulse incremental rotary encoder with a push button. This encoder has unique mechanical specifications (debouncing time for its internal switches goes down to 2ms), and it can withstand a huge number of switching cycles, up to 30.000. The supporting debouncing circuitry allows contacts to settle before the output is triggered fully.

Rotary W 2 Click uses a standard 4-wire SPI serial interface of the TLC5925 LED driver to communicate with the host MCU supporting clock frequency of up to 30MHz. Rotating the encoder, it outputs A and B signals (out of phase to each other) on the two mikroBUS™ lines, ENA and ENB pins of the mikroBUS™ socket, alongside the push-button contact, which outputs through the SW pin (interrupt line) of the mikroBUS™ socket. Two SN74LVC1T45 single-bit dual-supply bus transceivers from Texas Instruments are used for logic-level translation.

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	Rotary encoder
Applications	Can be used for the development of various interesting visual effects for any application, such as flexible position, value indicator, and more
On-board modules	TLC5925 - low-power constant-current LED sink driver from Texas Instruments
Key Features	High quality, SPI interface, a ring of 16 LEDs controlled individually, various lighting effects, knob feature, low power consumption, flexibility, efficiency, precision, and more
Interface	GPIO,SPI
ClickID	Yes
Compatibility	mikroBUS™

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Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

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

Notes	Pin	mikroBUS				Pin	Notes
Encoder Output B	**ENB**	1	AN	PWM	16	**ENA**	Encoder Output A
ID SEL	**RST**	2	RST	INT	15	**SW**	Switch Output
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
1-16	1-16	-	Rotary White LED Indicators
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Rotary W 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V

Software Support

We provide a library for the Rotary W 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.

Library Description

This library contains API for Rotary W 2 Click driver.

Key functions

- rotaryw2_set_led_pos Rotary W 2 set LED position function.

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- rotaryw2_set_led_data Rotary W 2 set LED data function.
- rotaryw2_get_state_switch Rotary W 2 get switch state function.

Example Description

This library contains the API for the Rotary W 2 Click driver to control LEDs states and a rotary encoder position readings.

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.RotaryW2

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™

ClickID

Downloads

Rotary W 2 click example on Libstock

Rotary W 2 click schematic

TLC5925 datasheet

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EC12D1564402 datasheet

SN74LVC1T45 datasheet

Rotary W 2 click 2D and 3D files