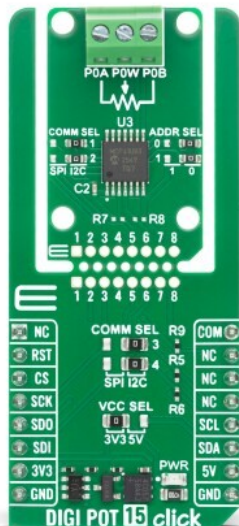


DIGI POT 15 Click



PID: MIKROE-6940

DIGI POT 15 Click is a compact add-on board designed for digitally controlled resistance adjustment, configurable voltage division, and variable resistance control. This board is based on the [MCP41U83T-502](#), a 5kΩ 10-bit single-channel digital potentiometer from [Microchip](#). It features volatile and nonvolatile MTP memory with up to 1,000 write cycles, 1,024 wiper positions across an internal 1,023-resistor ladder, configurable potentiometer or rheostat operation, independent A, B, and W terminal disconnect, a real-time status register, and dedicated reset and reinitialization commands. The board also supports user-selectable SPI or I2C communication, and Click Snap functionality for detachable use. DIGI POT 15 Click is suitable for automotive electronics, industrial control systems, calibration circuits, programmable gain and offset adjustment, sensor trimming, and signal conditioning.

For more information about **DIGI POT 15 Click** visit the official [product page](#).

How does it work?

DIGI POT 15 Click is based on the MCP41U83T-502, a 5kΩ 10-bit single-channel digital potentiometer from Microchip. The MCP41U83T-502 features both volatile and nonvolatile MTP memory, allowing the device to store configuration and wiper settings with up to 1,000 write cycles. Its 10-bit resolution provides 1,024 wiper positions across an internal resistor ladder composed of 1,023 resistors, enabling fine resistance control from zero scale to full scale. The device can be configured through a dedicated operating mode register to function either as a potentiometer or as a rheostat, making it suitable for applications that require adjustable voltage division or variable resistance control. DIGI POT 15 Click is well suited for automotive electronics, industrial control systems, calibration circuits, programmable gain and offset adjustment, sensor trimming, signal conditioning, and other applications that require stable

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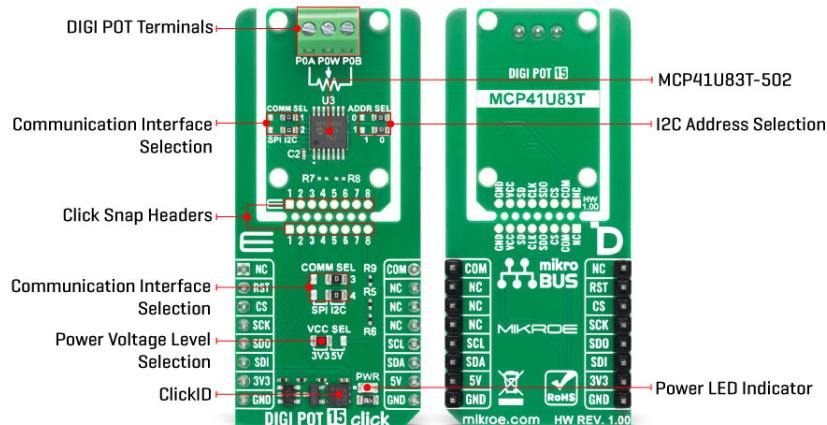


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digital resistance control.



All three terminals, A, B, and W, can be independently disconnected from the resistor ladder, allowing reduced power consumption, flexible terminal configuration, and optimized operation depending on the selected mode. The MCP41U83T-502 also includes a real-time status register that allows the host system to monitor the current device condition and respond accordingly. Dedicated commands support resetting the device to a known state or forcing reinitialization, giving the user full control over the initialization sequence and improving system reliability.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the MCP41U83T-502 can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

The board supports user-selectable serial communication, operating over either SPI or I2C interface. The SPI interface allows 20MHz read/write operations, while the I2C interface provides communication speeds up to 3.4MHz for fast data exchange. The activation of desired interface is performed via COM pin by setting it LOW for SPI or HIGH to I2C interface. The communication interface is then selected by adjusting the COMM SEL jumpers to the desired position. To enhance flexibility, particularly with the detachable Snap section of the Click Snap format, an additional COMM SEL jumpers are available. These jumpers function the same as the COMM SEL, allowing for independent communication interface selection when the Snap section is used independently. To ensure proper functionality, all COMM jumpers must be set to the same interface. For those using the I2C interface, the board also provides an ADDR SEL jumper, enabling users to configure the I2C address as needed for their specific application.

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.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring

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greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

Specifications

Type	Digital potentiometer
Applications	Ideal for automotive electronics, industrial control systems, calibration circuits, programmable gain and offset adjustment, sensor trimming, and signal conditioning
On-board modules	MCP41U83T-502 - 5kΩ 10-bit single-channel digital potentiometer from Microchip
Key Features	5kΩ 10-bit single-channel digital potentiometer, volatile and nonvolatile MTP memory, up to 1,000 write cycles, 1,024 wiper positions, internal 1,023-resistor ladder, potentiometer and rheostat operating modes, independent A, B, and W terminal disconnect, reduced-power terminal configuration, real-time status register, dedicated reset and reinitialization commands, user-selectable communication, and more
Interface	I2C,SPI
Feature	Click Snap,ClickID
Compatibility	mikroBUS™
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 DIGI POT 15 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	COM	Communication Selection
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	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

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Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2, JP4, JP6-JP7	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP3, JP5	ADDR SEL	Right	I2C Address Selection 1/0: Left position 1, Right position 0

DIGI POT 15 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Potentiometer Resistance	-	5	-	kΩ
Resolution	-	10	-	bit
Wiper Positions	-	1024	-	positions

Software Support

[DIGI POT 15 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a [mikroBUS™](#) socket.

Example Description

This example demonstrates the use of the DIGI POT 15 Click board for controlling the digital potentiometer wiper position. The application continuously changes the wiper value across its range to simulate variable resistance.

Key Functions

- `digipot15_cfg_setup` This function initializes Click configuration structure to initial values.
- `digipot15_init` This function initializes all necessary pins and peripherals used for this Click board.
- `digipot15_default_cfg` This function executes a default configuration of DIGI POT 15 Click board.
- `digipot15_set_wiper` This function sets the value of wiper volatile register.

Application Init

Initializes the logger and DIGI POT 15 Click driver, and applies the default configuration.

Application Task

Periodically updates the wiper position in steps across the full scale range and logs the current

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value to the serial terminal.

Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following [this tutorial](#).
- UART Terminal - Monitor data via the UART Terminal using a [USB to UART converter](#). For detailed instructions, check out [this tutorial](#).

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the [NECTO Studio](#). The application code can also be found on the MIKROE [GitHub](#) account.

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[DIGI POT 15 click example package](#)

[DIGI POT 15 click 2D and 3D files v100](#)

[DIGI POT 15 click schematic v100](#)

[MCP41U83T datasheet](#)

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