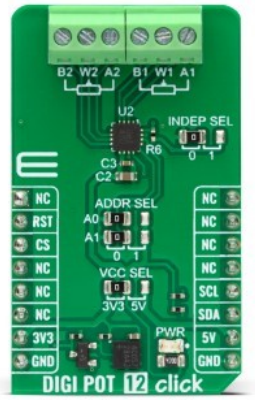
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

DIGI POT 12 Click





PID: MIKROE-5656

DIGI POT 12 Click is a compact add-on board that contains a digitally controlled potentiometer. This board features the AD5142A, a dual-channel, 256-position nonvolatile digital potentiometer from Analog Devices. On this Click board™, two digitally I2C-controlled potentiometers are realized with end-to-end resistance of 10KΩ and wiper resistance of only 40Ω. The DIGI POT 12 Click can be used in potentiometer and linear gain modes. This Click board™ makes the perfect solution for the development of mechanical potentiometer replacements, voltage-to-current conversions, gain and offset adjustment, and many other applications.

DIGI POT 12 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

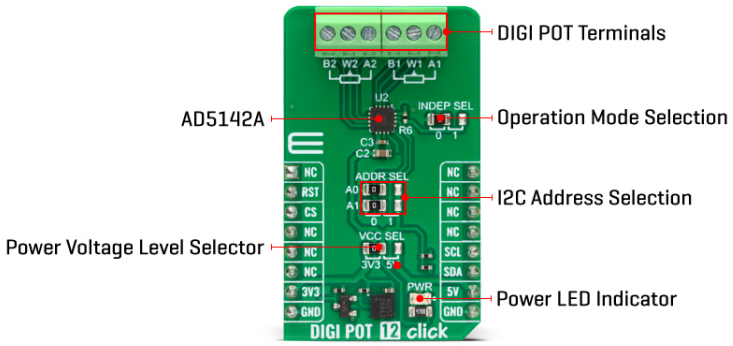
DIGI POT 12 Click is based on the AD5142A, a dual-channel, 256-position nonvolatile digital potentiometer from Analog Devices. The resistor wiper position is determined by the RDAC register contents, that act as a scratchpad register, allowing unlimited changes of resistance settings. The scratchpad register can be programmed with any position setting using the standard I2C interface by loading the 16-bit data word. The nominal resistance of the RDAC between terminals A and terminals B (RAB) is 10KΩ with 8-bit RDAC latch data decoded to select one of the 256 possible wiper settings. When a desired position is found, this value can be stored in the onboard EEPROM memory; thus, the wiper position is always restored for subsequent power-ups. The EEPROM data can be read back, written independently, and protected by software.

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).

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



This Click board™ communicates with MCU through a standard 2-Wire I2C interface and operates at Standard (100KHz) and Fast (400KHz) data transfer modes. The I2C address can be selected via the ADDR SEL jumpers with 0 selected by default. There is an RST pin for resetting the digital potentiometers RDAC registers from EEPROM, with active LOW logic. In addition, this Click board™ comes with the INDEP SEL jumper that allows you to choose between the potentiometer and the linear gain setting mode, with the potentiometer mode set by default (0).

The linear gain setting mode of operation can control the potentiometer as two independent rheostats connected at a single point. Once the jumper is set, it can not be disabled by software. In addition, there is a burst mode in which multiple data bytes can be sent to the host MCU. The Shutdown mode places the RDAC in a zero power consumption while the data in EEPROM remains. There is no polarity constraint between the B, W, and A on both terminals, but they can not be higher than the VCC (5V maximum) nor lower than the VSS (0V).

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. However, the 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	Digital potentiometer
Applications	Can be used for the development of mechanical potentiometer replacements, voltage-to-current conversions, gain and offset adjustment, and many other applications
On-board modules	AD5142A - digital potentiometer from Analog Devices
Key Features	Dual-channel, 256-position resolution, 10kΩ nominal resistance, I2C-compatible interface, nonvolatile memory stores wiper settings, 50 years of typical data retention, and more
Interface	I2C
ClickID	Yes

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).

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

Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on DIGI POT 12 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	
Reset	**RST**	2	RST	INT	15	NC	
	NC	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	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	Power/Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	INDEP SEL	Left	Operating Mode Selection 0/1: Left position 0, Right position 1
JP3-JP4	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

DIGI POT 12 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Nominal Resistance	-	10	-	kΩ
Number of Taps	-	-	256	-
Resolution	8	-	-	bits

Software Support

We provide a library for the DIGI POT 12 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.

ISOQAR REGISTERED
UKAS MANAGEMENT SYSTEMS
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.
TÜV SÜD ISO 9001
ISO 9001: 2015 certification of quality management system (QMS).

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

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

Library Description

This library contains API for DIGI POT 12 Click driver.

Key functions

- digipot12_set_resistance DIGI POT 12 set the resistance function.
- digipot12_get_resistance DIGI POT 12 get the resistance function.

Example Description

This library contains API for DIGI POT 12 Click driver. The demo application uses a digital potentiometer to change the resistance values of both channels.

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.DIGIPOT12

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, that needs to be downloaded from the LibStock and installed for the compiler you are using to ensure proper operation of mikroSDK compliant Click board™ demo applications.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

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.

ISOQAR REGISTERED
UKAS MANAGEMENT SYSTEMS
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.
TÜV SÜD ISO 9001
ISO 9001: 2015 certification of quality management system (QMS).

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

Downloads

DIGI POT 12 click example on Libstock

DIGI POT 12 click 2D and 3D files

DIGI POT 12 click schematic

AD5142A datasheet

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).