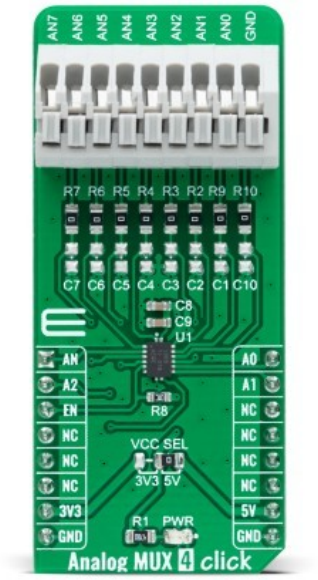
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Analog MUX 4 Click



PID: MIKROE-4795

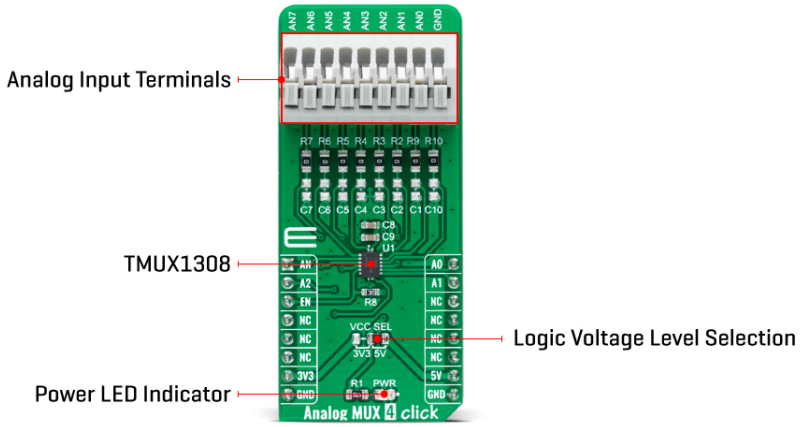
Analog MUX 4 Click is a compact add-on board that switches one of many analog inputs to one digital output. This board features the TMUX1308, a general-purpose 8:1 single-ended CMOS multiplexer (MUX) from Texas Instruments. The TMUX1308 has an internal injection current control which eliminates the need for external diode and resistor networks to protect the switch and keep the input signals within the supply voltage. It also supports bidirectional analog and digital signals ranging from 0 to 5V, alongside several protection features allowing a reliable operation and protecting the device from potential damage. This Click board™ is suitable for various applications, from industrial to instrumentation, consumer, communications, and more.

Analog MUX 4 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?

Analog MUX 4 Click as its foundation uses the TMUX1308, a general-purpose 8:1 single-ended CMOS analog multiplexer from Texas Instruments. The TMUX1308 multiplexer allows for multiple inputs/sensors to be monitored with a single AN pin of the mikroBUS™ socket supporting bidirectional analog and digital signals ranging from 0 to 5V. It has an internal injection current control eliminating the need for external diode and resistor networks to protect the switch, keeping the input signals within the supply voltage. The internal injection current control circuitry allows signals on disabled signal paths to exceed the supply voltage without affecting the signal of the enabled signal path.

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



Alongside internal injection current control, the TMUX1308 also has another protection feature, called Break-before-make delay, which represents a safety feature preventing two inputs from connecting when the device is switching. The output first breaks from the ON-state switch before connecting with the next ON-state switch. This time delay between the break and the make is known as the break-before-make delay.

This Click board™ communicates with MCU using several GPIO pins. It can be enabled or disabled through the EN pin routed to the CS pin of the mikroBUS™ socket; hence, offering a switch operation to turn ON/OFF power delivery to the TMUX1308. It also provides three address signals, labeled from A0 to A2 and routed to the PWM, INT, and RST pins of the mikroBUS™ socket, that control the switch configuration and determine the activation of the desired analog input channel based on their setup. Also, each analog input has a jumper for its hardware activation or deactivation and capacitors for additional filtering of the input channels.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. This way, it is allowed for both 3.3V and 5V capable MCUs to 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	Measurements,Port expander
Applications	Can be used for various applications, from industrial to instrumentation, consumer, communications, and more
On-board modules	TMUX1308 - general-purpose 8:1 single-ended CMOS analog multiplexer from Texas Instruments
Key Features	Injection current control, back-powering protection, bidirectional signal path, Break-Before-Make switching, VCC range signal handling, TTL/CMOS-logic compatible, pin-controllable, and more
Interface	Analog,GPIO

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

Feature	No 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 Analog MUX 4 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Analog Signal	**AN**	1	AN	PWM	16	**A0**	Switch Control 0
Switch Control 2	**A2**	2	RST	INT	15	**A1**	Switch Control 1
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	
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	Right	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

Analog MUX 4 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Analog Input Range	0	-	5	V
ON-State Resistance	-	-	195	Ω
Operating Temperature Range	-40	25	+120	°C

Software Support

We provide a library for the Analog MUX 4 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

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 library contains API for Analog MUX 4 Click driver.

Key functions

- analogmux4_enable_input This function enables analog inputs.
- analogmux4_read_an_pin_voltage This function reads results of AD conversion of the AN pin and converts them to proportional voltage level.
- analogmux4_set_input_channel This function sets the analog input channel.

Example Description

This example demonstrates the use of Analog MUX 4 Click board™.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Flash10

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 MikroElektronika compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MikroElektronika 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

Analog MUX 4 click example on Libstock

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

TMUX1308 datasheet

Analog MUX 4 click schematic

Analog MUX 4 click 2D and 3D files