

MUX 3 CLICK

PID: MIKROE-3916

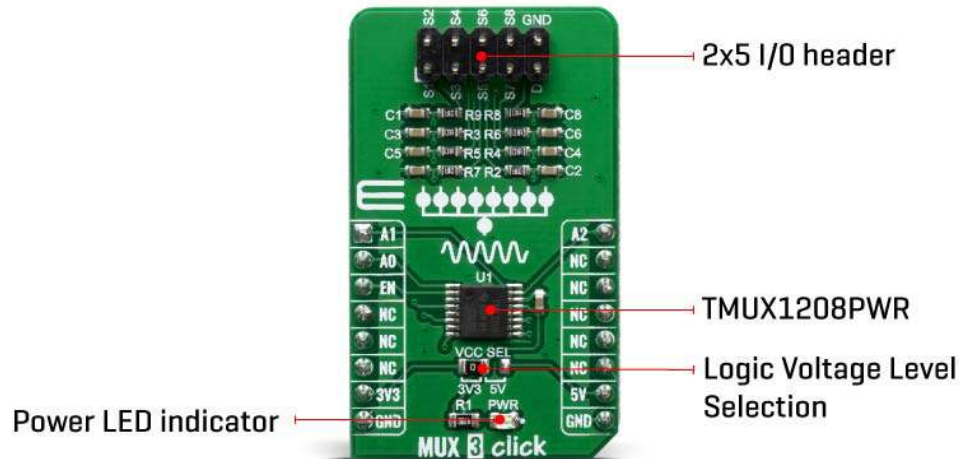
Weight: 18 g

MUX 3 Click is the general purpose multiplexer which offers multiplexing one input channel to eight single-ended output channels. Given the TMUX1208 wide operating supply options from 1.08 V to 5.5 V and support of bidirectional I/O signals, its allowing you use in a broad array of applications ranging from personal electronics to building automation applications such as: Heating, Smoke Detectors, Ventilation, Air Conditioning, Battery-Powered Equipment, Consumer Audio, etc.

MUX 3 Click board™ 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?

MUX 3 Click is a Click board™ based around the [TMUX1208](#) module, a 5-V Bidirectional 8:1, 1-Channel Multiplexer from [Texas Instruments](#). The TMUX1208 is a general purpose complementary metal-oxide semiconductor (CMOS) multiplexer (MUX). Wide operating supply of 1.08 V to 5.5 V allows for use in a broad array of applications from personal electronics to building automation applications.



The device supports bidirectional analog and digital signals on the source (Sx) and drain (D) pins ranging from GND to VDD. All logic inputs have 1.8 V logic compatible thresholds, ensuring both TTL and CMOS logic compatibility when operating in the valid supply voltage range. Fail-Safe Logic circuitry allows voltages on the control pins to be applied before the supply pin, protecting the device from potential damage.

Break-before-make delay is a safety feature that prevents two inputs from connecting when the device is switching. The output first breaks from the on-state switch before making the connection with the next on-state switch. The time delay between the break and the make is known as break-before-make delay.

One useful application to take advantage of the TMUX1208 features is multiplexing various signals into an ADC that is integrated into a MCU. Utilizing an integrated ADC in a MCU allows a system to minimize cost with a potential tradeoff of system performance when compared to an external ADC. The multiplexer allows for multiple inputs/sensors to be monitored with a single ADC pin of the device, which is critical in systems with limited I/O.

Given all the features the TMUX1208 offers, the MUX 3 Click is best used for Analog and Digital Multiplexing / Demultiplexing, HVAC: Heating, Ventilation, and Air Conditioning, Smoke Detectors, Video Surveillance, Electronic Point of Sale, Battery-Powered Equipment, Appliances, and Consumer Audio.


MUX 3 Click offers a selection between 3.3V and 5V operation, with the onboard SMD jumper, labeled as VCC SEL. This allows both 3.3V and 5V MCUs to be interfaced with this Click board™.

SPECIFICATIONS

Type	DAC
Applications	Analog and Digital Multiplexing / Demultiplexing, HVAC: Heating, Ventilation, and Air Conditioning, Smoke Detectors, Video Surveillance, Electronic Point of Sale, Battery-Powered Equipment, Appliances, Consumer Audio
On-board modules	TMUX1208, a 5-V Bidirectional 8:1, 1-Channel Multiplexer from Texas Instruments
Key Features	Features such as the break-before-make switching action, electrostatic discharge protection up to 2kV, low on-resistance and low input current leakage, make this circuit a perfect solution for various switching applications, especially those that utilize differential signals
Interface	GPIO
Compatibility	mikroBUS
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V,5V

PINOUT DIAGRAM

This table shows how the pinout on MUX 3 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Control pin 1	A1	1	AN	PWM	16	A2	Control pin 2
Control pin 0	A0	2	RST	INT	15	NC	
Enable Chip	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	Left	Power supply voltage selection: left position 3.3V, right position 5V

SOFTWARE SUPPORT

We provide a library for the MUX 3 Click on our [LibStock](#) page, as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

Library Description

The library covers all the necessary functions to control MUX 3 Click board.

Key functions:

- `void mux3_setChannel(uint8_t selectChannel)` - Set active MUX channel function.

Examples description

The application is composed of three sections :

- System Initialization - Initializes GPIO and LOG structures, sets AN, RST, CS and PWM pins as output and start to write log.
- Application Initialization - Initialization driver enable's - GPIO, also write log.
- Application Task - (code snippet) This is an example which demonstrates the use of MUX 3 Click board. Sets the current active and changes the channel every 1 sec. Results are being sent to the Usart Terminal where you can track their changes. All data logs write on Usart Terminal changes for every 1 sec.

```
void applicationTask()
{
    mikrobus_logWrite( "-----", _LOG_LINE );
    mikrobus_logWrite( " Enable Channel: ", _LOG_LINE );

    _displayLog( _MUX3_ENABLE_CHANNEL_S1 );
    mux3_setChannel( _MUX3_ENABLE_CHANNEL_S1 );
    Delay_1sec();

    _displayLog( _MUX3_ENABLE_CHANNEL_S2 );
    mux3_setChannel( _MUX3_ENABLE_CHANNEL_S2 );
    Delay_1sec();

    _displayLog( _MUX3_ENABLE_CHANNEL_S3 );
    mux3_setChannel( _MUX3_ENABLE_CHANNEL_S3 );
    Delay_1sec();

    _displayLog( _MUX3_ENABLE_CHANNEL_S4 );
    mux3_setChannel( _MUX3_ENABLE_CHANNEL_S4 );
    Delay_1sec();

    _displayLog( _MUX3_ENABLE_CHANNEL_S5 );
```

```

mux3_setChannel( _MUX3_ENABLE_CHANNEL_S5 );
Delay_1sec();

_displayLog( _MUX3_ENABLE_CHANNEL_S6 );
mux3_setChannel( _MUX3_ENABLE_CHANNEL_S6 );
Delay_1sec();

_displayLog( _MUX3_ENABLE_CHANNEL_S7 );
mux3_setChannel( _MUX3_ENABLE_CHANNEL_S7 );
Delay_1sec();

_displayLog( _MUX3_ENABLE_CHANNEL_S8 );
mux3_setChannel( _MUX3_ENABLE_CHANNEL_S8 );
Delay_1sec();

mikrobus_logWrite( "-----", _LOG_LINE );
mikrobus_logWrite( "    Disable    ", _LOG_LINE );
mikrobus_logWrite( "  All Channels  ", _LOG_LINE );
mux3_setChannel( _MUX3_DISABLE_ALL_CHANNELS );
Delay_1sec();
}

```

Additional Functions :

- `void _displayLog(uint8_t selCh)` Display logs on Usart Terminal.
The full application code, and ready to use projects can be found on our [LibStock](#) page.
Other mikroE Libraries used in the example:
- GPIO
- UART
- Conversions

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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

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.