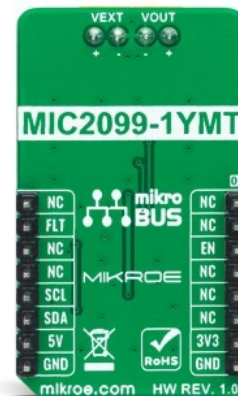
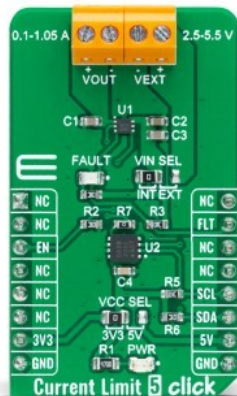


## Current Limit 5 Click



PID: MIKROE-4999

**Current Limit 5 Click** is a compact add-on board representing a current-limiting solution. This board features the MIC2099, a current-limit power distribution switch from Microchip Technology. This Click board™ represents a programmable current limit solution with various protection features and fault indication, which operates from a 2.5V to 5.5V input voltage range. Also, the current limit is adjustable from 100mA up to 1.05A programmed through the MCP4561 digital potentiometer. This Click board™ is suitable for applications in portable equipment and condition monitoring or power supplies, protecting them in short circuits or other overload conditions.

Current Limit 5 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?

Current Limit 5 Click as its foundation uses the MIC2099, a current-limiting device with an adjustable overcurrent protection feature from Microchip Technology. The MIC2099 offers flexible protection boundaries for systems against input voltage ranging from 2.5V to 5.5V and limits the output load current to a programmed level (up to 1.05A). Additional safety features include thermal shutdown protection to prevent overheating, under-voltage lock-out, a soft start that prevents large current inrush, as well as automatic-on output after a fault condition.

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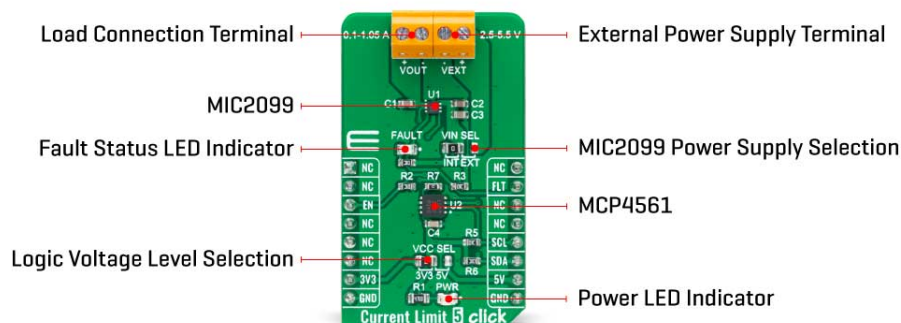
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The current-limit switch is virtually ubiquitous in system control and provides a safe means for regulating the current delivered to a load circuit. It allows the load current to increase to a programmed limit but no higher. Typically, the current limit is a function of the voltage across an external resistor, and this voltage serves as the reference for an internal current-limiting amplifier. By replacing the resistor with a digital potentiometer, you can easily program the current limit as performed on this Click board™. For this purpose, the digital potentiometer MCP4561 from Microchip Technology which communicates with the MCU via 2-Wire I2C serial interface, is used to set the resistance on the MIC2099 LIMIT pin, adjusting the current limit for the switch between 0.1A to 1.05A.

Current Limit 5 Click 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 connected load. It also provides a fault status indication signal, labeled as FLT and routed to the INT pin of the mikroBUS™ socket, alongside its LED indicator marked as FAULT to indicate different fault conditions such as current limit and thermal shutdown.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. It allows for both 3.3V and 5V capable MCUs to use the communication lines properly. Additionally, there is a possibility for the MIC2099 power supply selection via jumper labeled as VIN SEL to supply the MIC2099 from an external power supply VEXT terminal in the range from 2.5V to 5.5V or with VCC voltage levels from mikroBUS™ power rails. 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	Power Switch
Applications	Can be used for applications in portable equipment and condition monitoring or power supplies, protecting them in short circuits or other overload conditions
On-board modules	MIC2099 - current-limiting device with an adjustable overcurrent protection feature from Microchip Technology
Key Features	Integrated protection features, programmable current limiting up to 1.05A, soft start that

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	prevents large current inrush, enable feature, automatic-on output after fault, and more
Interface	I2C
ClickID	No
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V, External

## Pinout diagram

This table shows how the pinout on Current Limit 5 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	NC	
	NC	2	RST	INT	15	<b>FLT</b>	Fault Indication
Enable	<b>EN</b>	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	<b>SCL</b>	I2C Clock
	NC	6	MOSI	SDA	11	<b>SDA</b>	I2C Data
Power Supply	<b>3.3V</b>	7	3.3V	5V	10	<b>5V</b>	Power Supply
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

## Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	FAULT	-	Fault Status LED Indicator
JP1	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	VIN SEL	Left	MIC2099 Power Supply Selection INT/EXT: Left position INT, Right position EXT

## Current Limit 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage VCC	3.3	-	5	V
External Supply Voltage VEXT	2.5	-	5.5	V
Current Limit Range	0.1	-	1.05	A
Operating Temperature Range	-40	+25	+85	°C

## Software Support

We provide a library for the Current Limit 5 Click as well as a demo application (example),

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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

This library contains API for Current Limit 5 Click driver.

Key functions

- `currentlimit5_set_ilimit` This function sets the current limit value by configuring the onboard digital potentiometer.
- `currentlimit5_get_fault_pin` This function returns the fault pin logic state.
- `currentlimit5_enable_limit` This function enables the current limiting switch.

## Example Description

This example demonstrates the use of Current Limit 5 Click board™ by limiting the current to a certain value and displaying an appropriate message when the current reaches the limit.

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.CurrentLimit5

## 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™](#)

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[mikroSDK](#)

[Click board™ Catalog](#)

[Click Boards™](#)

## Downloads

[Current Limit 5 click example on Libstock](#)

[Current Limit 5 click schematic](#)

[MIC2099 datasheet](#)

[MCP4561 datasheet](#)

[Current Limit 5 click 2D and 3D files](#)

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