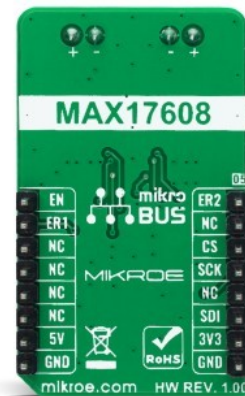


Current Limit 6 Click



PID: MIKROE-4915

Current Limit 6 Click is a compact add-on board representing a current-limiting solution. This board features the [MAX17608](#), adjustable overvoltage, and overcurrent protection device from [Analog Devices](#). This Click board™ is ideal for protecting systems with the flexible input overvoltage protection range from 4.5V to 60V, and the adjustable input undervoltage protection range is 4.5V to 59V. Also, the maximum current limit is 1A and can be programmed through a digital potentiometer [MAX5401](#). When the device current reaches the programmed threshold, the device prevents further current increases by modulating the FET resistance. This Click board™ is suitable for applications in portable equipment, process instrumentation, and condition monitoring, or with power supplies, protecting them in a short circuit or other overload conditions.

Current Limit 6 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 6 Click as its foundation uses the MAX17608, a current-limiting device with an adjustable overvoltage and overcurrent protection feature from Analog Devices. The MAX17608 offers flexible protection boundaries for systems against input voltage ranging from 4.5V to 60V and limits the output load current to a programmed level (up to 1A). The devices also feature two internal MOSFETs connected in series, with a low cumulative RON of 260mΩ typical. Input undervoltage protection can be programmed between 4.5V and 59V, while the overvoltage protection can be independently programmed between 5.5V and 60V (default Click board™ configuration is 4.5V for UVLO and 14V for OVLO). Additionally, the MAX17608 has an

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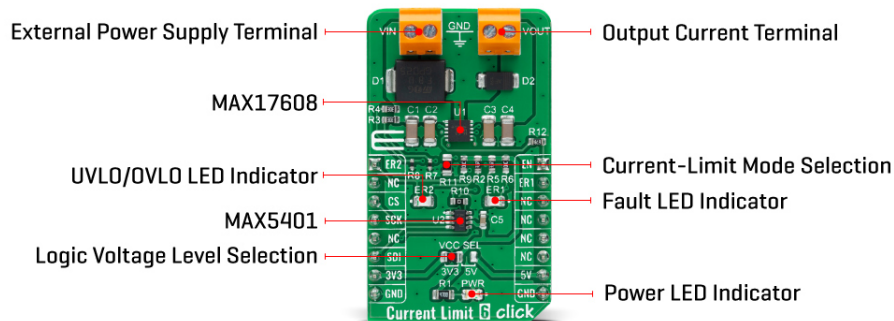


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internal default undervoltage lockout set at 4V typical.



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 MAX5401 from Analog Devices, which communicates with the MCU via 3-Wire SPI serial interface, is used to set the resistance on the MAX17608 SETI pin, adjusting the current limit for the switch between 0.1A to 1 A.

This current limiter offers several operational modes, selectable through a populated jumper labeled as R11 connected to the CLMD pin of the MAX17608. In a default configuration, this pin is connected to the ground, representing the Continuous mode of operation. When R11 is replaced with a 150kΩ resistor, this Click board™ is in the Latch-off mode, and when the user leaves this pin unconnected Autoretry mode of operation is activated. More information on the operational modes can be found in the attached datasheet.

Current Limit 6 Click can be enabled or disabled through the EN pin routed to the PWM pin of the mikroBUS™ socket; hence, offering a switch operation to turn ON/OFF power delivery to the connected load. It also provides communication signals routed to the INT and AN pins of the mikroBUS™ socket, alongside its LED indicators labeled as ER1 and ER2, to indicate different operational and fault signals such as FLAG and UVOV signals. Besides, the MAX17608 also offers internal thermal shutdown protection against excessive power dissipation.

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	Power Switch
Applications	Can be used for applications in portable equipment, process instrumentation, and

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	condition monitoring, or with power supplies, protecting them in a short circuit or other overload conditions
On-board modules	MAX17608 - current-limiting device with an adjustable overvoltage and overcurrent protection feature from Maxim Integrated, now part of Analog Devices
Key Features	OVLO/UVLO and reverse voltage protection, programmable current limiting up to 1A, wide input-supply range up to 60V, thermal overload protection, operational and fault signals indicators, and more
Interface	GPIO,SPI
Feature	No ClickID
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 6 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
UVLO/OVLO Indicator	ER2	1	AN	PWM	16	EN	Enable
	NC	2	RST	INT	15	ER1	Fault Indicator
SPI Chip Select	CS	3	CS	RX	14	NC	
SPI Clock	SCK	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
SPI Data IN	SDI	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
LD2	ER2	-	UVLO/OVLO LED Indicator
LD3	ER1	-	Fault LED Indicator
JP1	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
R11	R11	Populated	Current-Limit Mode Selection Jumper

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Current Limit 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage VCC	3.3	-	5	V
External Supply Voltage VIN	4.5	-	60	V
Output Current-Limit Range	0.1	-	1	A
Operating Temperature Range	-40	+25	+125	°C

Software Support

We provide a library for the Current Limit 6 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

This library contains API for Current Limit 6 Click driver.

Key functions

- `currentlimit6_set_current_limit` Current Limit 6 set current limit function.
- `currentlimit6_power_mode` Current Limit 6 power mode function.
- `currentlimit6_check_limit_exceeded` Current Limit 6 check limit exceeded function.

Example Description

This library contains API for the Current Limit 6 Click driver. This driver provides the functions to set the current limiting conditions in order to provide the threshold of the fault conditions.

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.CurrentLimit6

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](#).

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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

[Current Limit 6 click 2D and 3D files](#)

[MAX5401 datasheet](#)

[MAX17608 datasheet](#)

[Current Limit 6 click example on Libstock](#)

[Current Limit 6 click schematic](#)

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