

Step Down 8 Click



PID: MIKROE-5813

Step Down 8 Click is a compact add-on board that converts higher voltages into a lower voltage level. This board features the MAX25232, a mini buck converter from Analog Devices. It is designed to deliver up to 3A with 3.5V to 36V input voltages while using only 3.5µA quiescent current at no load. The MAX25232 integrates high-side and low-side switches and provides accurate output voltage in a range from 3 up to 18V. This Click board™ makes the perfect solution for developing automotive, industrial applications, high-voltage DC-DC converters, and many more.

Step Down 8 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?

Step Down 8 Click is based on the MAX25232, a mini buck converter from Analog Devices. The MAX25232 features an under-voltage lockout, a soft-start timer, an on-chip oscillator, skip-mode operation, output-voltage overshoot protection, thermal-overload protection, and many more features. This current-mode-controlled buck converter operates at a 2.1MHz frequency, which guarantees no AM band interference, while it can also operate at 400KHz for minimum switching losses and maximum efficiency. While maintaining a 3A output current, it can stay in dropout by running at a 99% duty cycle. Voltage quality can be monitored by the host MCU.

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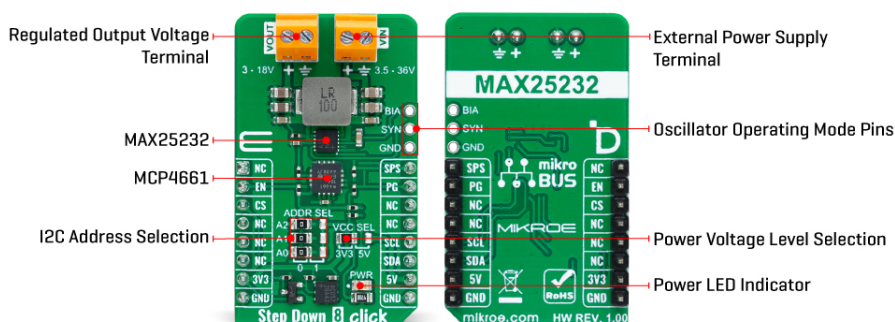
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To set the output voltage, this Click board™ uses the [MCP4661](#), an 8-bit I2C digital potentiometer with non-volatile memory. It comes with 256 resistors and 257 wiper positions, while the last position is stored in an EEPROM. By setting the wiper value of resistance, you can set the output voltage of the MAX25232 converter available on the VOUT terminal. The Step Down 8 Click also features an unpopulated 3-pin header that allows you to set an operation mode. If you connect the SYNC pin to a GND or leave it unconnected, the device operates in a highly efficient pulse-skipping mode. If you connect SYNC to a BIAS pin or apply a clock to it, the device is in a forced-PWM mode (FPWM). Switching of modes can be done during the operation.

Step Down 8 Click uses a standard 2-Wire I2C interface of the MCP4661 to communicate with the host MCU, supporting 100KHz, 400KHz, and 3.4MHz frequencies. The I2C address can be set over the ADDR SEL jumpers, where the 0 position is selected by default. There is an EN enable pin to enable the converter and a PG power good pin that allows you to monitor the voltage quality. The Spread-Spectrum feature is an option that can be enabled over the SPS pin, offered to improve the EMI performance of the device. It does not interfere with the external clock applied to the SYNC pin.

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. Also, this 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	Buck
Applications	Can be used for developing automotive, industrial applications, high-voltage DC-DC converters, and many more
On-board modules	MAX25232 - mini buck converter from Analog Devices
Key Features	Undervoltage lockout, soft-start, on-chip oscillator, skip-mode operation, highly efficient pulse-skipping mode, output voltage overshoot protection, forced-PWM mode, over-current protection, spread-spectrum option,

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	wide voltage input, and output operating range, 3A output current, an onboard 8-bit digital potentiometer, and more
Interface	I2C
ClickID	Yes
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 Step Down 8 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	SPS	Spread-Spectrum Enable
Chip Enable	EN	2	RST	INT	15	PG	Power-Good Indicator
	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	Logic Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP4	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

Step Down 8 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Input Voltage Range	3.5	-	36	V
Output Voltage Range	3	-	18	V
Output Current	-	-	3	A

Software Support

We provide a library for the Step Down 8 Click as well as a demo application (example), developed using MIKROE [compilers](#). The demo can run on all the main MIKROE [development](#)

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[boards.](#)

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

Library Description

This library contains API for Step Down 8 Click driver.

Key functions

- `stepdown8_set_en_pin` Step Down 8 set EN pin state function.
- `stepdown8_set_wiper_pos` Step Down 8 set wiper position.
- `stepdown8_set_output` Step Down 8 set output voltage.

Example Description

This library contains API for the Step Down 8 Click driver. This driver provides the functions to set the output voltage treshold.

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.StepDown8

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. 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](#)

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[Click board™ Catalog](#)

[Click Boards™](#)

[ClickID](#)

Downloads

[Step Down 8 click example on Libstock](#)

[Step Down 8 click schematic](#)

[Step Down 8 click 2D and 3D files](#)

[MCP4661 datasheet](#)

[MAX25232 datasheet](#)

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