

# Step Down 11 Click



PID: MIKROE-5936

**Step Down 11 Click** is a compact add-on board that converts higher voltages into lower voltage levels. This board features the [TPSM82913](#), a low-noise and low-ripple buck power module from [Texas Instruments](#). It is a fixed-frequency current-mode converter module with a filtered internal reference to achieve a low-noise output similar to low-noise LDOs. It uses voltages from 3V up to 17V as an input voltage to step it down from 1V up to 5.5V as an adjustable output with up to 3A of current. This Click board™ makes the perfect solution for the development of telecom infrastructure, test and measurement applications, medical equipment, and more.

Step Down 11 Click is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the [mikroBUS™](#) standard. It comes with the [mikroSDK](#) open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets this [Click board™](#) apart is the groundbreaking [ClickID](#) feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

## How does it work?

Step Down 11 Click is based on the TPSM82913, a low-noise and low-ripple buck power module from Texas Instruments. The devices operate at a fixed switching frequency of 2.2MHz or 1MHz, which depends on the smart configuration input of the buck module. The [AD5142A](#), a dual-channel 256-position nonvolatile digital potentiometer, controls the smart configuration input. By controlling the smart configuration input, you enable or disable spread spectrum modulation. DC/DC converters generate an output voltage ripple at the switching frequency. The AD5142A also controls the feedback input of the buck module with its other wiper. In addition, the Step Down 11 Click features a soft start, high output accuracy, power-good

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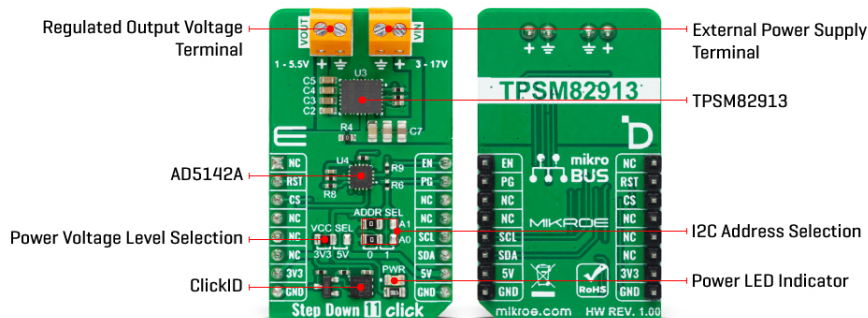


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output, and more.



Step Down 11 Click uses a standard 2-wire interface of the AD5142A to allow the host MCU to set the output voltage, supporting 3MHz bandwidth. You can reset the digital potentiometer over the RST pin in case of need. The I2C address can be selected over the ADDR SEL jumpers (0 set by default). The power-good PG pin will be asserted if the output voltage is not within the specified window threshold. The EN pin is a precision enable input to the regulator.

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 the development of telecom infrastructure, test and measurement applications, medical equipment, and more                                                                                             |
| On-board modules | TPSM82913 - low-noise and low-ripple buck power module from Texas Instruments                                                                                                                                         |
| Key Features     | A low-noise and low-ripple buck power module, fixed frequency peak current mode control, wide input voltage range, wide output voltage range, precise enable input, power-good output, high output accuracy, and more |
| Interface        | I2C                                                                                                                                                                                                                   |
| ClickID          | Yes                                                                                                                                                                                                                   |
| Compatibility    | mikroBUS™                                                                                                                                                                                                             |
| Click board size | M (42.9 x 25.4 mm)                                                                                                                                                                                                    |
| Input Voltage    | 3.3V or 5V, External                                                                                                                                                                                                  |

## Pinout diagram

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This table shows how the pinout on Step Down 11 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

| Notes        | Pin         | mikroBUS |      |     |    | Pin        | Notes             |
|--------------|-------------|----------|------|-----|----|------------|-------------------|
|              | NC          | 1        | AN   | PWM | 16 | <b>EN</b>  | Enable            |
| Reset        | <b>RST</b>  | 2        | RST  | INT | 15 | <b>PG</b>  | Power Good Output |
| ID COMM      | <b>CS</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                                                        |
| JP2     | VCC SEL  | Left    | Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V |
| JP1-JP3 | ADDR SEL | Left    | I2C Address Selection 0/1: Left position 0, Right position 1               |

## Step Down 11 Click electrical specifications

| Description          | Min | Typ | Max | Unit |
|----------------------|-----|-----|-----|------|
| Supply Voltage       | 3.3 | -   | 5   | V    |
| Input Voltage Range  | 3   | -   | 17  | V    |
| Output Voltage Range | 1   | -   | 5.5 | V    |
| Output Current       | -   | -   | 3   | A    |

## Software Support

We provide a library for the Step Down 11 Click as well as a demo application (example), developed using MIKROE [compilers](#). The demo can run on all the main MIKROE [development 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 11 Click driver.

Key functions

- `stepdown11_get_resistance` Step Down 11 get the resistance function.
- `stepdown11_set_voltage` Step Down 11 set voltage output function.

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- `stepdown11_set_mode` Step Down 11 set S-CONF device configuration mode function.

## Example Description

This library contains API for the Step Down 11 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.StepDown11

## 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](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

## Downloads

[Step Down 11 click example on Libstock](#)

[TPSM82913 datasheet](#)

[Step Down 11 click 2D and 3D files](#)

[Step Down 11 click schematic](#)

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[AD5142A datasheet](#)

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