

LED Flash 4 Click



PID: MIKROE-6282

LED Flash 4 Click is a compact add-on board for high-performance LED flash and torch applications. This board features the AS1170, a high-current LED driver from ams OSRAM. The AS1170 operates as an inductive, highly efficient DC-DC step-up converter with an external power supply range of 2.7V to 4.4V, featuring two internal current sinks for independent control of onboard flash LEDs. It includes essential protection functions such as flash timeout, overvoltage, overtemperature, undervoltage, and short circuit protection, ensuring reliable operation even in demanding environments. Additionally, this board easily integrates into noise-sensitive RF systems with its soft Start-Up feature. This Click board™ is ideal for applications requiring precise LED brightness control and extended battery life, such as portable flashlights and camera flashes.

How does it work?

LED Flash 4 Click is based on the AS1170, a high-current LED driver from ams OSRAM, designed for high-performance LED flash and torch applications. The AS1170 is an inductive, highly efficient DC-DC step-up converter that operates with an external power supply from 2.7V up to 4.4V at a fixed frequency of 4MHz. It includes two internal current sinks, enabling the independent control of two onboard flash LEDs ([XPCWHT-L1-R250-00A01](#)), which deliver exceptional light quality. With its soft Start-Up feature, the AS1170 integrates easily into noise-sensitive RF systems. This chip has several protection functions, including flash timeout, overvoltage, overtemperature, undervoltage, and short circuit protection, ensuring reliable operation even in demanding environments. This Click board™ is ideal for use as a flash or torch, providing significant advantages such as precise control over LED brightness and extended battery life due to the efficient power conversion.

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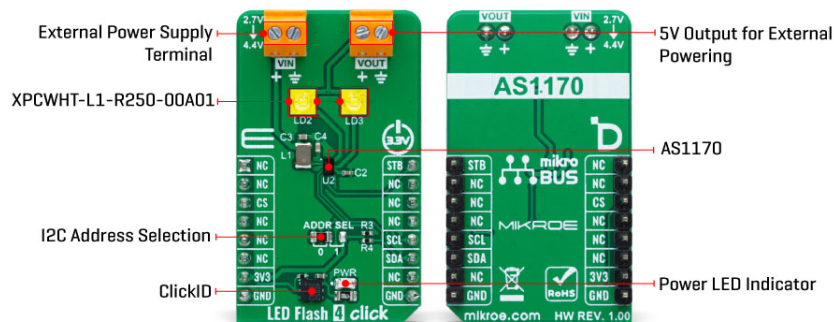
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LED Flash 4 Click uses a standard 2-wire I2C communication protocol, allowing the host MCU to control the AS1170 with ease. The I2C interface supports clock frequencies up to 400kHz, with the I2C address selectable via the onboard ADDR SEL jumpers, providing flexibility in communication setup. Additionally, the board features an STB (strobe) pin and a digital signal with a pulldown resistor, which controls the strobe time for the flash function, enabling precise timing and synchronization of the LED flash. The AS1170 also incorporates a hardware automatic shutdown mode that activates if no I2C clock signal is detected for 100ms, eliminating the need for an additional enable input to power down the device when the system shuts down.

Besides a VIN terminal for external supplying the AS1170, the board also includes a VOUT terminal that allows the AS1170 to power a 5V system, such as an audio amplifier. This operating mode can be selected via the I2C interface by setting the corresponding register bit (const_v_mode=1). In this mode, the current sinks are disabled, and the LEDs cannot be switched on, making it suitable for powering external devices.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

| Type | LED Segment |
|------------------|--|
| Applications | Ideal for applications requiring precise LED brightness control and extended battery life, such as portable flashlights and camera flashes |
| On-board modules | AS1170 - high-current LED driver from ams OSRAM |
| Key Features | High-current LED driver, fixed 4MHz frequency, two onboard flash LEDs, independent control of LEDs, soft Start-Up, protection features, I2C interface, strobe control, automatic shutdown, terminal for external system powering with 5V, and more |

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| | |
|------------------|--------------------|
| Interface | I2C |
| Feature | ClickID |
| Compatibility | mikroBUS™ |
| Click board size | M (42.9 x 25.4 mm) |
| Input Voltage | 3.3V, External |

Pinout diagram

This table shows how the pinout on LED Flash 4 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 | STB | Strobe Control |
| | NC | 2 | RST | INT | 15 | NC | |
| ID COMM | CS | 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 | NC | |
| Ground | GND | 8 | GND | GND | 9 | GND | Ground |

Onboard settings and indicators

| Label | Name | Default | Description |
|---------|----------|---------|--|
| LD1 | PWR | - | Power LED Indicator |
| LD2-LD3 | LD2-LD3 | - | Flash/Torch LEDs |
| JP1 | ADDR SEL | Left | I2C Address Selection 0/1: Left position 0, Right position 1 |

LED Flash 4 Click electrical specifications

| Description | Min | Typ | Max | Unit |
|-----------------------|-----|-----|-----|------|
| Supply Voltage | - | 3.3 | - | V |
| External Power Supply | 2.7 | - | 4.4 | V |
| Output Voltage | - | 5 | - | V |

Software Support

We provide a library for the LED Flash 4 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

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This library contains API for LED Flash 4 Click driver.

Key functions

- `ledflash4_set_led1_current` This function sets the LED1 maximum current in mA.
- `ledflash4_set_led2_current` This function sets the LED2 maximum current in mA.
- `ledflash4_set_stb_pin` This function sets the strobe (STB) pin logic state.

Example Description

This example demonstrates the use of LED Flash 4 Click board™ by toggling the LEDs output.

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.LEDFlash4

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

[LED Flash 4 click example on Libstock](#)

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[LED Flash 4 click 2D and 3D files v100](#)

[LED Flash 4 click schematic v100](#)

[AS1170 datasheet](#)

[XPCWHT-L1-R250-00A01 datasheet](#)

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