

Time-saving embedded tools

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PID: MIKROE-5639

LED Driver 19 Click is a compact add-on board that simplifies the control of multiple LEDs. This board features the <u>LED1202</u>, a 12-channel low quiescent current LED driver from <u>STMicroelectronics</u>. It can output 5V, and each channel can provide up to 20mA with a headroom voltage of typically 350mW. Each channel is individually adjustable with 4096 pulsewidth modulated (12-bit PWM) steps and has a programmable current value of all channels with a maximum of 20mA of LED current per channel. The 8-bit analog dimming individual control can also be used. This Click board[™] makes the perfect solution for color mixing and backlight application for amusement products, LED status signalization, home automation projects, and many more.

How does it work?

LED Driver 19 Click is based on the LED1202, a 12-channel low quiescent current LED driver from STMicroelectronics. Its internal non-volatile memory can store up to 8 different patterns, each with a particular output configuration, thus enabling automatic sequencing without MCU intervention. Each channel has an output PWM dimming frequency of 220Hz in a 12-bit resolution. Analog dimming range is from 1 up to 20mA, in 256 steps per channel, and common to all patterns. In addition, using one of the PWM or analog modes, you can use both of them to achieve full control of LED brightness. This LED driver also features a built-in open LED detection and thermal shutdown function that turns OFF all output drivers during an over-temperature condition.

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ISO 27001: 2013 certification of informational security management system. ISO 14001: 2015 certification of environmental management system. OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).



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The LED Driver 19 Click uses a standard I2C 2-Wire interface to communicate with the host MCU. The I2C address can be selected via two ADDR SEL jumpers, where 0 is selected by default on both. The LED1202 driver can generate an interrupt on the INT pin if a fault or condition occurs; by that, it means an open LED, overtemperature, pattern end, and frame start. The INT pin informs the system about those statuses with active LOW.

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. 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.

| Туре | LED Drivers |
|------------------|--|
| Applications | Can be used for color mixing and backlight application for amusement products, LED status signalization, home automation projects, and more |
| On-board modules | LED1202 - 12-channel low quiescent current LED driver from STMicroelectronics |
| Key Features | 12 individual LED channels, 12-bit PWM control, 8-bit analog control, thermal shutdown protection, low power consumption, 8 programmable pattern sequences in non- volatile memory, fault flag pin, high efficiency and performance, and more |
| Interface | 12C |
| Feature | ClickID |
| Compatibility | mikroBUS™ |
| Click board size | M (42.9 x 25.4 mm) |
| Input Voltage | 3.3V or 5V |

Specifications

Pinout diagram

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This table shows how the pinout on LED Driver 19 Click corresponds to the pinout on the mikroBUS^m socket (the latter shown in the two middle columns).

| Notes | Pin | ● ● mikro™ ● ● ● BUS | | | TM- | Pin | Notes |
|--------------|------|-------------------------|------|-----|-----|-----|-----------------|
| | NC | 1 | AN | PWM | 16 | NC | |
| | NC | 2 | RST | INT | 15 | INT | Fault Interrupt |
| 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 | 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 | Power/Logic Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V | |
| JP2-JP3 | ADDR SEL | Right | I2C Address Selection 0/1: Left position 0, Right position 1 | |

LED Driver 19 Click electrical specifications

| Description | Min | Тур | Max | Unit |
|------------------------------------|-----|-----|-----|------|
| Supply Voltage | 3.3 | - | 5 | V |
| Maximum Output Current per Channel | - | - | 20 | mA |

Software Support

We provide a library for the LED Driver 19 Click as well as a demo application (example), developed using MIKROE <u>compilers</u>. The demo can run on all the main MIKROE <u>development</u> <u>boards</u>.

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 LED Driver 19 Click driver.

Key functions

- leddriver19_sw_reset LED Driver 19 software reset function.
- leddriver19_enable_channels LED Driver 19 enables channels function.
- leddriver19_set_pattern_pwm LED Driver 19 set pattern PWM value function. Mikroe produces entire development toolchains for all major microcontroller architectures. Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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Example Description

This library contains API for LED Driver 19 Click driver. The library initializes and defines the I2C bus drivers to write the default configuration for a PWM output value of the out pins.

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.LEDDriver19

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 <u>mikroSDK</u> - 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

LED1202 datasheet

LED Driver 19 click 2D and 3D files v100

LED Driver 19 click example on Libstock

LED Driver 19 click schematic v100

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