MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

2x2 RGB Click

PID: MIKROE-5917

2x2 RGB Click is a compact add-on board that contains a matrix of 4 "intelligent" RGB elements, forming a 2x2 display screen. This board features the KTD2052A, a 12-channel RGB LED driver from Kinetic Technologies. It is a fully programmable current regulator for up to four RGB LEDs (12 LEDs in total). The LED matrix consists of four LRTB GFTG, a 6-lead in-line MULTILEDs, from ams OSRAM. The LEDs have a 120-degree viewing angle. This Click board™ makes the perfect solution for the development of AI smart speakers, Bluetooth/Wi-Fi loudspeakers, automotive indicators and ambiance lighting, IoT, gaming, consumer electronics, and more.

2x2 RGB 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 2x2 RGB Click 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?

2x2 RGB Click is based on the KTD2052A, a 12-channel RGB LED driver from Kinetic Technologies. It can be powered from mikroBUS™ socket supply rails, both with 3.3V and 5V selected over the VCC SEL. A 4-wire bus is multiplexed to reduce the pin count, as each pin on the bus integrates a switch to the input voltage and a programmable low-dropout current sink regulator. The driver is capable of 14 million colors with a controllable LED current from 125µA to 24mA in 125µA steps. There is also a night mode (8µA to 1.5mA in 8µA steps). There are 12 independent exponential fade engines with ultra-smooth 3072-step fade resolution and a 3-bit

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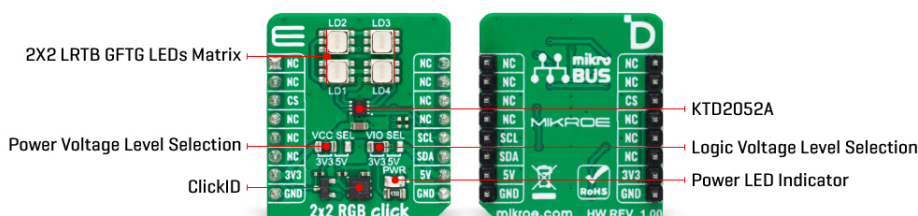
ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.

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

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

programmable fade rate.

2x2 RGB Click uses a standard 2-Wire I2C interface to communicate with the host MCU, supporting clock frequency of up to 1MHz. The I2C interface allows you to set the ON/OFF status and individual LED current, as well as adjust the fade rate. An internal flexible pattern generator with a watchdog counter enables set-and-forget pattern executions, while more complex patterns may be executed from system firmware via the I2C interface.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VIO 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	LED Matrix
Applications	Can be used for the development of AI smart speakers, Bluetooth/Wi-Fi loudspeakers, automotive indicators and ambiance lighting, IoT, gaming, consumer electronics, and more
On-board modules	KTD2052A - 12-channel RGB LED driver from Kinetic Technologies
Key Features	The driver can drive up to 12 LEDs (4RGB LEDs), multiplexed LED current driver outputs, 14 million colors, 12 independent exponential fade engines, a flexible pattern generator with watchdog, and more
Interface	I2C
ClickID	Yes
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V

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.

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).

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Pinout diagram

This table shows how the pinout on 2x2 RGB 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	NC	
	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	**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 Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	VIO SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

2x2 RGB Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V

Software Support

We provide a library for the 2x2 RGB 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 2x2 RGB Click driver.

Key functions

- c2x2rgb_set_rgb_led 2x2 RGB set RGB LED function.

- c2x2rgb_set_control 2x2 RGB set control function.

Example Description

This example demonstrates the use of the 2x2 RGB Click board™ by controlling the color of the LEDs [1-4].

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.2x2RGB

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

2x2 RGB click example on Libstock

2x2 RGB click 2D and 3D files

LRTB GFTG datasheet

2x2 RGB click schematic

KTD2052 datasheet