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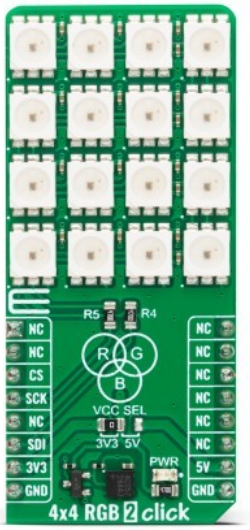
4x4 RGB 2 Click



PID: MIKROE-5661

4x4 RGB 2 Click is a compact add-on board that contains a matrix of 16 “intelligent” RGB LEDs, forming a 4x4 display screen. This board features 16 IN-PC55TBTRGB, 5x5mm RGB LEDs with an integrated IC from Inolux. The LEDs feature an 8-bit color control in 256 steps (256-level greyscale) and a 5-bit brightness control in 32 steps. The intelligent LEDs are cascaded (daisy-chained); thus, every one of them can communicate with the host MCU using the same data lines. This Click board™ makes the perfect solution for the development of LED-shaped screens, color LED string lights, scene lighting, and more.

4x4 RGB 2 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?

4x4 EGB 2 Click is based on 16 IN-PC55TBTRGB, RGB LEDs with an integrated IC from Inolux. The LED contains a signal decoding module, a data buffer, a built-in current circuit, and an RC oscillator in the same 5050 packages forming a color-mixing uniformity and consistency. The LEDs can maintain a static image, thus, making the perfect choice for developing an LED screen. Some other features that these LEDs have are built-in support for uninterrupted oscillation PWM, double data transmission, self-detection function-specific signal, three constant current drives, and more.

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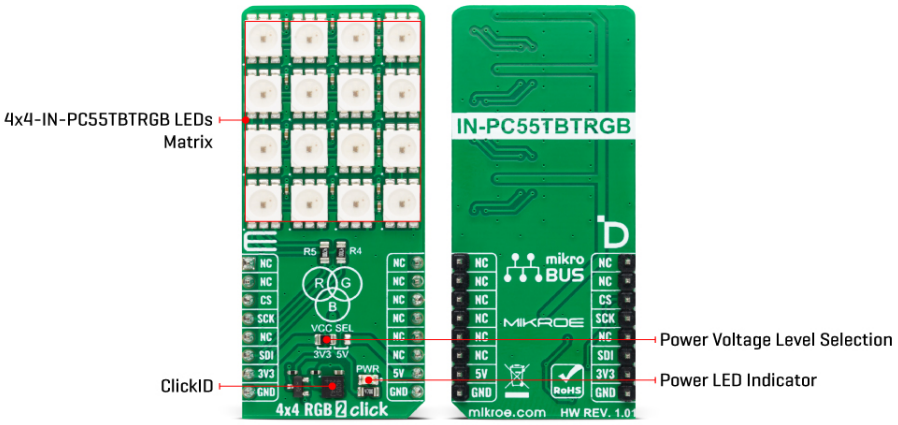

The 4x4 RGB 2 Click uses a two-wire synchronous transmission to communicate with the host MCU, routed to the SCK and the SDI pins of the mikroBUS™ socket. The maximum input serial data frequency is 30MHz. The data transmission goes from the host MCU through every single LED until the last one in a cascade manner, where the only limit is the number of the LEDs on this Click board™. The maximum LED output current is 20mA, while the LEDs' light intensity, depending on the current, varies from 300mcd at the lowest for Blue to 1500mcd at the highest for Green.

Although the chain could be bigger, this is not enabled on the 4x4 RGB 2 Click. The length of the chain can be limited only by the communication speed required to scan through all the LED devices in order to maintain a reasonable refresh speed.

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.

Specifications

Type	LED Matrix
Applications	Can be used for the development of LED-shaped screens, color LED string light, scene lighting, and more
On-board modules	IN-PC55TBTRGB - RGB LED with an integrated IC from Inolux
Key Features	Intelligent LEDs, high brightness, built-in support uninterrupted oscillation PWM output, 8-bit (256) color, 5-bit (32) brightness, double data transmission, constant current drive for all channels, self-detection function-specific signal, and more
Interface	SPI
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)

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Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on 4x4 RGB 2 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	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
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 Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

4x4 RGB 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Maximum LED Output Current	-	-	20	mA

Software Support

We provide a library for the 4x4 RGB 2 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 4x4 RGB 2 Click driver.

Key functions

- c4x4rgb2_set_led_color This function sets the color of the selected led in the led matrix.
- c4x4rgb2_set_led_brightness This function sets the brightness of the selected led in the

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led matrix.

- c4x4rgb2_write_led_matrix This function writes the led matrix data from the click context object.

Example Description

This example demonstrates the use of 4x4 RGB 2 Click board™ by setting all 16 LEDs to different colors and changing the LEDs color every 500 milliseconds.

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.4x4RGB2

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

4x4 RGB 2 click example on Libstock

4x4 RGB 2 click 2D and 3D files v101

IN-PC55TBTRGB datasheet

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[4x4 RGB 2 click schematic v101]