

## 16x12 R Click



PID: MIKROE-6669

**16x12 R Click** is a compact add-on board that integrates a 16x12 red LED display, providing full individual control of each LED for ON/OFF switching and brightness adjustment, making it an ideal solution for visual indicators, status displays, and animation effects. It is based on the [IS31FL3733](#) matrix driver from [ISSI](#), a 12x16 LEDs driver with a 1/12 cycle rate that enables reliable LED matrix control. Each of the 192 LEDs can be dimmed individually with 8-bit PWM data, offering 256 steps of linear dimming resolution, while communication with the host MCU is performed via an I2C interface supporting up to Fast-Mode Plus operation. 16x12 R Click is most suitable for applications such as information panels, gaming devices, audio spectrum visualizations, counters, and notification systems requiring LED matrix management.

For more information about **16x12 R Click** visit the official [product page](#).

### How does it work?

16x12 R Click is based on the IS31FL3733 matrix driver from ISSI, a general-purpose 12x16 LEDs driver with a 1/12 cycle rate. This board integrates a 16x12 red LED display and allows full control of each LED for ON/OFF switching and brightness adjustment, making it an ideal solution for creating advanced visual indicators, status displays, and animation effects. Each of the 192 LEDs can be dimmed individually with 8-bit PWM data, providing 256 steps of linear dimming resolution for precise brightness control.

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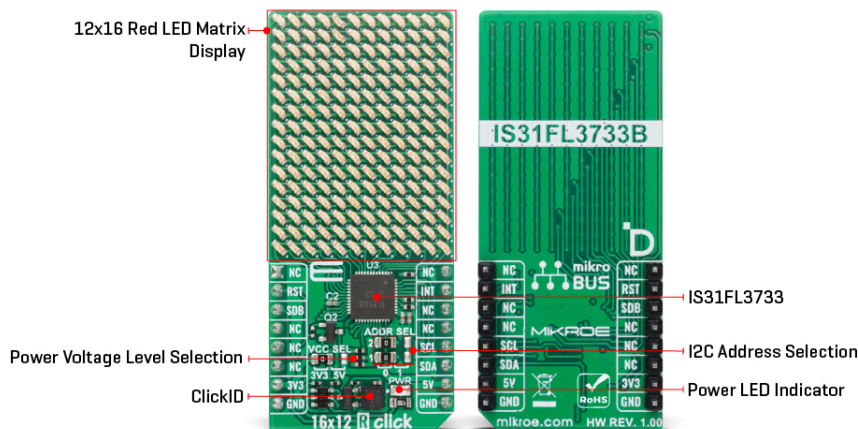
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Communication with the host MCU is achieved through the standard I2C 2-Wire interface, supporting Standard-Mode (100 kHz), Fast-Mode (400 kHz), and Fast-Mode Plus (1 MHz) operation, ensuring compatibility and flexibility across a wide range of applications. The user can configure the I2C address via onboard SMD jumpers labeled ADDR SEL, which set the last three LSBs of the I2C address, allowing multiple devices to coexist on the same bus.

In addition to the I2C communication pins, the IS31FL3733 also uses an INT pin for interrupt signaling, RST pin for chip reset, and an SDB pin for shutdown control, further enhancing functionality and power management. With its ability to manage large LED arrays, 16x12 R Click is suitable for applications such as information panels, event counters, gaming devices, audio spectrum displays, notification systems, and other embedded solutions requiring detailed LED matrix control.

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	LED Matrix
Applications	Ideal for information panels, gaming devices, audio spectrum visualizations, counters, and notification systems requiring LED matrix management
On-board modules	IS31FL3733 - matrix driver from ISSI
Key Features	16x12 red LED display with full individual control of each LED, 8-bit PWM dimming with 256 linear brightness steps, I2C communication interface, user-configurable I2C address, interrupt signaling, shutdown control, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™

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Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

## Pinout diagram

This table shows how the pinout on 16x12 R 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	
Reset / ID SEL	<b>RST</b>	2	RST	INT	15	<b>INT</b>	Interrupt
Shutdown Control / ID COMM	<b>SDB</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
LD193	PWR	-	Power LED Indicator
LD1-LD192	-	-	12x16 Red LED Matrix Display
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP3	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

## 16x12 R Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Number of LEDs	192 (16x12)			matrix
Dimming Resolution	-	-	256	steps

## Software Support

[16x12 R Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a [mikroBUS™](#) socket.

## Example Description

This example demonstrates the usage of the 16x12 R Click board which features a high-brightness red LED matrix display. It displays characters, rotates them in different orientations,

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prints a scrolling string, and renders a graphical image (MIKROE logo).

## Key Functions

- `c16x12r_cfg_setup` This function initializes Click configuration structure to initial values.
- `c16x12r_init` This function initializes all necessary pins and peripherals used for this Click board.
- `c16x12r_default_cfg` This function executes a default configuration of 16x12 R Click board.
- `c16x12r_write_char` This function writes a single ASCII character to the display.
- `c16x12r_write_string` This function scrolls a null-terminated ASCII string across the display.
- `c16x12r_draw_picture` This function draws a picture on the display from a 12-column buffer.

## Application Init

Initializes the logger and the Click board and sets the default configuration.

## Application Task

Displays single characters and a string in multiple rotations, followed by drawing and inverting the MIKROE logo image.

## Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following [this tutorial](#).
- UART Terminal - Monitor data via the UART Terminal using a [USB to UART converter](#). For detailed instructions, check out [this tutorial](#).

## Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the [NECTO Studio](#). The application code can also be found on the MIKROE [GitHub](#) account.

## Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

## Downloads

[IS31FL3733 datasheet](#)

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[16x12 R click example package](#)

[16x12 R click 2D and 3D files v100](#)

[16x12 R click schematic v100](#)

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