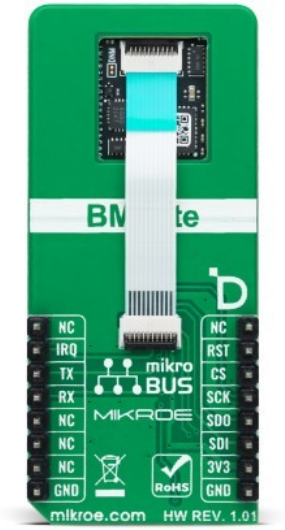
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Fingerprint 4 Click



PID: MIKROE-5465

Fingerprint 4 Click is an adapter Click board™ used to interface a compatible fingerprint sensor with the host MCU. This board features FINGERPRINTS BM-Lite Module, a complete biometric fingerprint solution ready to be used out-of-the-box. The 100018754 combines superior biometric performance and a high standard of quality components to offer a comprehensive embedded solution for increased security and enhanced user convenience. It uses a 3D pixel sensing technology that can read virtually any finger, dry or wet, alongside simple serial commands with a configurable communication interface to enroll and verify. Its protective coating helps in protection against ESD, scratches, impact, and everyday wear and tear. This Click board™ is suitable for demanding industrial conditions and all-weather applications.

How does it work?

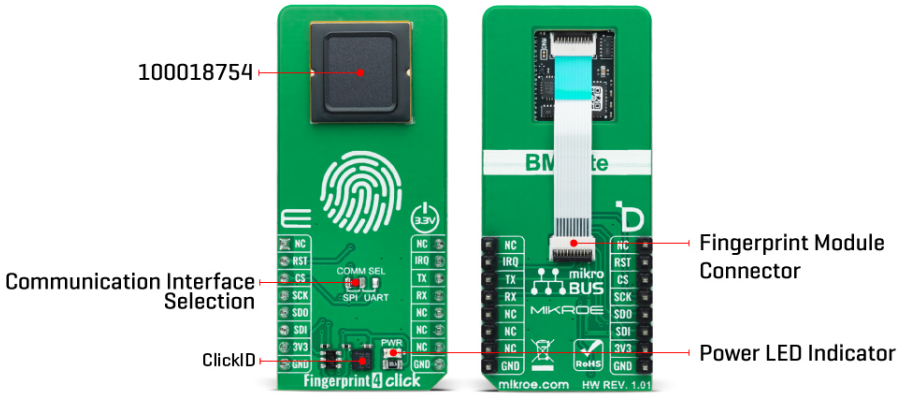
Fingerprint 4 Click is based on the FPC BM-Lite module (100018754), a standalone, compact biometric fingerprint solution from Fingerprints with a robust fingerprint sensor, biometric processor, and on-board template storage ready to be used out-of-the-box. This Click board™ can be integrated into any application and controlled by a host MCU sending some basic commands for enrollment and verification via the selectable serial interface. The BM-Lite module is based on capacitive technology and utilizes a reflective measurement method. It acquires the fingerprint image from the fingerprint sensor and stores them in the internal flash memory, which is pre-loaded with firmware from Fingerprints and used for all biometric operations and template storage.

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



The BM-Lite module, with 160x160px sensor matrix, uses a 3D pixel sensing technology that can read virtually any finger, dry or wet, and brings together superior biometric performance and a high standard of integrated quality components to offer an embedded solution for increased security and enhanced user convenience. The module has a protective coating that protects against ±15kV ESD, scratches, and daily wear and tear impact. It is also waterproof, making it suitable for demanding industrial conditions and all-weather applications.

Fingerprint 4 Click allows the UART interface with commonly used UART RX and TX pins, operating at 115200bps by default configuration, to transmit and exchange data with the host MCU or SPI interface with a maximum frequency of 20MHz. The selection can be made by positioning SMD jumpers labeled as COMM SEL in an appropriate position. While using the SPI interface, users can use the data ready pin, marked IRQ and routed to the INT pin of the mikroBUS™ socket, to inform the host MCU about detecting a finger on the module and general reset function routed on the RST pin of the mikroBUS™ socket.

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. However, the Click board™ comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Fingerprint
Applications	Can be used for demanding industrial conditions and all-weather applications
On-board modules	BM-Lite module (100018754) - compact biometric fingerprint solution from Fingerprints
Key Features	Out-of-the-box solution, superior performance, high component standard, increased security and user convenience, 3D pixel sensing technology, configurable interface, and more
Interface	SPI,UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)

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

Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Fingerprint 4 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	**RST**	2	RST	INT	15	**IRQ**	Data Ready
SPI Select / ID COMM	**CS**	3	CS	RX	14	**TX**	UART TX
SPI Clock	**SCK**	4	SCK	TX	13	**RX**	UART RX
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
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
JP1	COMMM SEL	Left	Communication Interface Selection SPI/UART: Left position SPI, Right position UART

Fingerprint 4 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V

Software Support

We provide a library for the Fingerprint 4 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika 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 Fingerprint 4 Click driver.

Key functions

- fingerprint4_version This function reads out version information from the device. The response contains a variable length string that contains version information of the device.

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

- fingerprint4_identify_finger This function captures and identifies finger against existing templates in Flash storage.

- fingerprint4_wait_finger_not_present This function waits until no finger is detected on the sensor.

Example Description

This example demonstrates the use of the Fingerprint 4 click boards by registering 3 fingerprints and then waiting until a finger is detected on the sensor and identifying if the fingerprint matches one of those stored in the Flash storage.

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.Fingerprint4

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 MikroElektronika compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MikroElektronika 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

Fingerprint 4 click example on Libstock

BM-Lite module datasheet

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.

ISOQAR REGISTERED
UKAS MANAGEMENT SYSTEMS
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.
TÜV SÜD ISO 9001
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

Fingerprint 4 click 2D and 3D files v101

Fingerprint 4 click schematic v101

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).