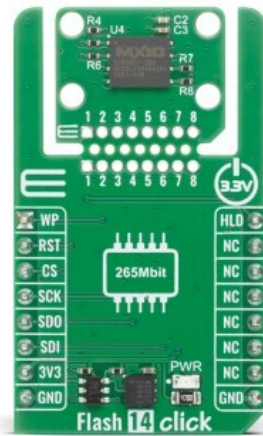


## Flash 14 Click



PID: MIKROE-6788

**Flash 14 Click** is a compact add-on board that provides reliable non-volatile data storage for embedded systems. It is based on the [MX25L25645G](#), a 256Mbit Serial NOR Flash memory from [MACOM](#), offering Single, Dual, and Quad SPI as well as QPI operation modes with clock frequencies up to 133MHz. The memory array is organized into uniform 4KB erasable sectors and larger 32KB/64KB blocks, featuring hardware and software write protection, Lock-Down and OTP security options, and a factory-programmed unique ID. This Click board™ also supports the innovative MIKROE Click Snap feature, allowing the main IC area to be detached and used independently through direct pin access. With its low power consumption, fast read performance, and robust data protection, Flash 14 Click is ideal for code shadowing, firmware storage, data logging, and bootloader applications in automotive, industrial, and consumer electronics.

For more information about **Flash 14 Click** visit the official [product page](#).

### How does it work?

Flash 14 Click is based on the MX25L25645G, a 256Mbit Serial NOR Flash memory from MACOM, organized as 33,554,432 x 8 bits and supporting multiple communication modes, including standard, dual, and quad SPI, as well as QPI operation. The device offers a combination of fast read speeds, low power consumption, and extended endurance, making it suitable for code shadowing, boot loading, data logging, and firmware storage in automotive, industrial, and consumer electronics. Its architecture allows easy transition between single, dual, and quad I/O configurations, achieving higher throughput and reducing instruction overhead through the Quad Peripheral Interface (QPI) with a maximum clock frequency of up to

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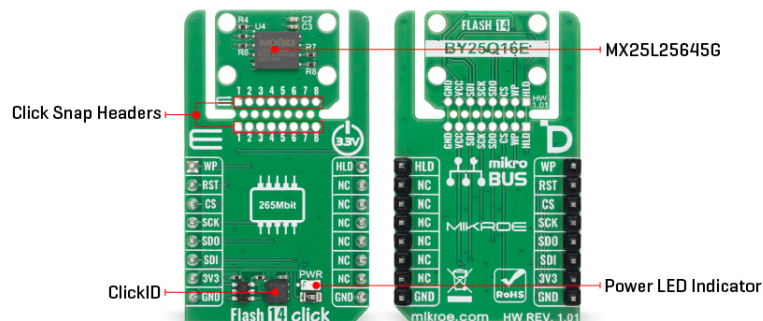


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133MHz.



The memory array is divided into uniform 4KB erasable sectors and larger 32KB and 64KB blocks, providing fine-grained or bulk erase flexibility depending on application needs. Integrated protection mechanisms include hardware and software write protection for upper and lower memory blocks, along with Lock-Down and One-Time Programmable (OTP) security features to safeguard critical data. The MX25L25645G also features factory-programmed unique identification, electronic ID with Dual and Quad I/O access, and support for Serial Flash Discoverable Parameters (SFDP), enabling users to automatically detect and configure memory parameters for optimal performance.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main IC area to become movable by breaking the PCB, opening up many new possibilities for implementation. Thanks to the Snap feature, the MX25L25645G can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

Furthermore, the board features a HOLD function, marked as HLD pin of the mikroBUS™ socket. The hold function allows the suspension of serial communications without disrupting ongoing operations. The board also has a Write Protect feature, marked as WP pin of the mikroBUS™ socket, that safeguards all registers and memory from unintended write operations through both hardware and software mechanisms.

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. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

## Click Snap

**Click Snap** is an innovative feature of our standardized Click add-on boards, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

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## Specifications

Type	FLASH
Applications	Ideal for code shadowing, firmware storage, data logging, and bootloader applications in automotive, industrial, and consumer electronics
On-board modules	MX25L25645G - 256Mbit Serial NOR Flash memory from MACOM
Key Features	256Mbit Serial NOR Flash memory, Single/Dual/Quad SPI and QPI operation modes, uniform 4KB sectors and 32KB/64KB erasable blocks, hardware and software write protection, Lock-Down and One-Time Programmable (OTP) security features, factory-programmed unique ID, electronic ID with Dual and Quad I/O access, Serial Flash Discoverable Parameters (SFDP) support, Click Snap feature, and more
Interface	QSPI,SPI
Feature	Click Snap,ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

## Pinout diagram

This table shows how the pinout on Flash 14 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Write Protect / IO2	<b>WP</b>	1	AN	PWM	16	<b>HLD</b>	Communication Pause / IO3
ID SEL	<b>RST</b>	2	RST	INT	15	NC	
SPI Select / ID COMM	<b>CS</b>	3	CS	RX	14	NC	
SPI Clock	<b>SCK</b>	4	SCK	TX	13	NC	
SPI Data OUT / IO1	<b>SDO</b>	5	MISO	SCL	12	NC	
SPI Data IN / IO0	<b>SDI</b>	6	MOSI	SDA	11	NC	
Power Supply	<b>3.3V</b>	7	3.3V	5V	10	NC	
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

## Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator

## Flash 14 Click electrical specifications

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Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Memory Size	-	256	-	Mbit
Sector Erase Size	-	4	-	KB
Block Erase Size	-	32/64	-	KB
Data Retention	-	20	-	years
Write/Erase Endurance	-	100.000	-	cycles

## Software Support

[Flash 14 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 use of Flash 14 Click board by writing specified data to the memory and reading it back.

### Key Functions

- `flash14_cfg_setup` This function initializes Click configuration structure to initial values.
- `flash14_init` This function initializes all necessary pins and peripherals used for this Click board.
- `flash14_erase_memory` This function erases the selected amount of memory which contains the selected address.
- `flash14_memory_write` This function writes a desired number of data bytes starting from the selected memory address.
- `flash14_memory_read` This function reads a desired number of data bytes starting from the selected memory address.

### Application Init

Initializes the driver and checks the communication by reading and verifying the device ID.

### Application Task

Writes a desired number of bytes to the memory and then verifies if it is written correctly by reading from the same memory location and displaying the memory content on the USB UART. The whole 4KB sector of memory that contains the `STARTING_ADDRESS` will be erased before writing data.

## 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

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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

[Flash 14 click example package](#)

[Flash 14 click 2D and 3D files v101](#)

[Flash 14 click schematic v101](#)

[MX25L25645G datasheet](#)

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