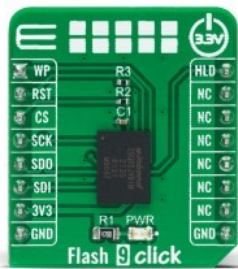


Flash 9 Click



PID: MIKROE-4987

Flash 9 Click is a compact add-on board that contains a highly reliable memory solution. This board features the W25Q02JV, an SPI configurable serial Flash memory solution from Winbond Electronics. It represents a four 512Mb stack die supporting linear addressing for the full 2Gb memory address range, offering flexibility and performance well beyond ordinary Serial Flash devices. The W25Q02JV array is organized into 1,048,576 programmable pages of 256-bytes each, where up to 256 bytes can be programmed at a time. This memory also has advanced security features, can withstand many write cycles (minimum 100k), and has a data retention period greater than 20 years. This Click board™ provides a storage solution for limited space and power systems in various embedded applications.

Flash 9 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?

Flash 9 Click as its foundation uses the W25Q02JV, a highly reliable serial Flash memory solution offering flexibility and performance well beyond ordinary Serial Flash devices from Winbond Electronics. The W25Q02JV represents a four 512Mb stack die where only one can be active at any given time to communicate with the external SPI controller. It supports linear addressing for the full 2Gb memory address range (continuously-read accessible only into four separate 512Mb address memory segments). The W25Q02JV array is organized into 1,048,576 programmable pages of 256-bytes each, where up to 256 bytes can be programmed at a time.

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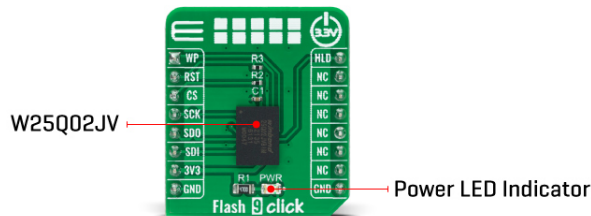
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Pages of the W25Q02JV can be erased in groups of 16 (4KB sector erase), groups of 128 (32KB block erase), groups of 256 (64KB block erase), or the entire chip (chip erase). This IC has 32,768 erasable 4KB sectors and 2,048 erasable 64KB blocks, respectively. The small 4KB sectors allow for greater flexibility in applications that require data and parameter storage. Also, it specifies a minimum of 100.000 endurance cycles with data retention of a minimum of 20 years, which gives the W25Q02JV the capability to handle unlimited reads/writes to the memory.

Flash 9 Click communicates with MCU through a standard SPI interface that enables high clock speed, supporting the two most common SPI modes, SPI Mode 0 and 3. Alongside the internal software Reset sequence, this board also has an active-low reset signal routed on the RST pin of the mikroBUS™ socket used to reset the W25Q02JV to the initial power-on state. When this signal is asserted low, any ongoing program/erase operation will be interrupted, and data corruption may happen (the device will not accept any command input).

An additional feature of this Click board™ represents the configurable Write Protection function labeled as WP routed on the AN pin of the mikroBUS™ socket. The WP pin protects the entire memory and all registers from write operations and must be set to a low logic state to inhibit all the write operations. Besides, the Flash 9 Click also has an additional hold pin, labeled as HLD and routed to the PWM pin of the mikroBUS™ socket, allowing the device to be paused while it's still actively selected.

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	FLASH
Applications	Can be used to provide a storage solution for limited space and power systems in various embedded applications
On-board modules	W25Q02JV - SPI configurable serial Flash memory solution from Winbond Electronics
Key Features	High performance, low power consumption,

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	reliability, flexible architecture with 4KB sectors, advanced security features, data retention, and more.
Interface	SPI
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Flash 9 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Write Protect	WP	1	AN	PWM	16	HLD	SPI Suspension
Reset	RST	2	RST	INT	15	NC	
SPI Chip Select	CS	3	CS	RX	14	NC	
SPI Clock	SCK	4	SCK	TX	13	NC	
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

Flash 9 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Memory Size	-	-	2	Gbit
Write Endurance	100.000	-	-	cycles
Write Endurance	20	-	-	years
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Flash 9 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 way), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

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Library Description

This library contains API for Flash 9 Click driver.

Key functions

- `flash9_erase_memory` This function erases the selected amount of memory which contains the selected address.
- `flash9_memory_write` This function writes a desired number of data bytes to the memory starting from the selected address.
- `flash9_memory_read_fast` This function reads a desired number of data bytes from the memory starting from the selected address performing the fast read command.

Example Description

This example demonstrates the use of Flash 9 Click board™ by writing specified data to the memory and reading it back.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended way), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Flash9

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](#)

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[Click boards™](#)

Downloads

[Flash 9 click example on Libstock](#)

[W25Q02JV datasheet](#)

[Flash 9 click 2D and 3D files](#)

[Flash 9 click schematic](#)

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