

# Flash 7 Click



PID: MIKROE-4440

Flash 7 Click is a compact add-on board that contains a high-performance memory solution. This board features the GD25LQ16C, a 104MHz SPI NOR Flash memory with advanced security features from GigaDevice Semiconductor. It is specifically designed to meet the different needs in various electronic applications in terms of density, performance, reliability, and security while providing low power consumption. It requires only 6 signals to communicate between the MCU and the memory, thus reduces the design complexity and offers a reduction in board space and total system cost. This Click board™ provides a storage solution for systems with limited space in various embedded applications.

Flash 7 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 7 Click is based on the GD25LQ16C, a high-performance 16Mbit SPI NOR Flash Memory solution with advanced security features from GigaDevice Semiconductor. Requiring only 6 signals to communicate between the MCU and the memory thus reduces the design complexity and offers a reduction in board space and total system cost. It is specifically designed to meet the different needs in various electronic applications in terms of density, performance, reliability, and security while providing low power consumption.

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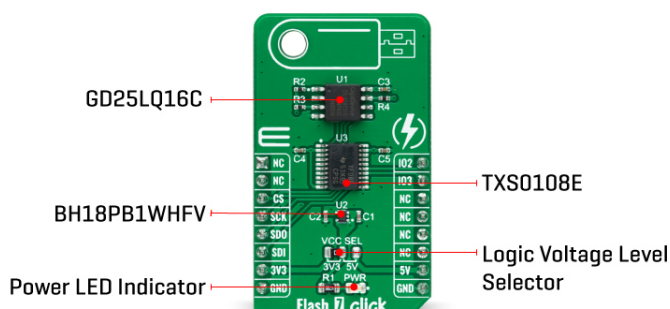
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ISO 9001: 2015 certification of quality management system (QMS).



This Click board™ includes an LDO regulator [BH18PB1WHFV](#) from [Rohm Semiconductor](#) to provide the 1.8 V supply voltage. The LDO cut power consumption by lowering its current consumption to approximately 2  $\mu$ A when the application is operating in the standby state. The output from the LDO regulator is providing a needed reference voltage for one side of the [TXS0108E](#), an 8-bit bidirectional level shifting and voltage translator for open-drain and push-pull applications from [Texas Instruments](#). The reference voltage for the other side of the level shifter is taken from the 3.3V pin from the mikroBUS™.

Flash 7 Click communicates with MCU using the SPI serial interface that supports the Dual/Quad SPI and the two most common modes, SPI Mode 0 and 3, with a maximum SPI frequency of 104 MHz. The Dual I/O data is transferred with a speed of 208 Mbits/s, and the Quad I/O data with a speed of 416 Mbits/s. In addition to the SPI communication, the Flash 7 Click also has two additional pins used for Write Protection and HOLD function routed to the PWM and INT pins of the mikroBUS™ socket.

The HOLD pin, labeled as IO3, can be used to pause the serial communication with the device without having to stop the operation of write status register, programming, or erasing in progress. On the other side, the configurable Write Protection function labeled as IO2 serves to protect the memory array contents via the Software Protection Mode.

This Click board™ is designed to operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. It allows for both 3.3V and 5V capable MCUs to use the SPI communication lines properly. However, the Click board™ comes equipped with a library that contains easy to use functions and an example code which can be used, as a reference, for further development.

## Specifications

Type	FLASH
Applications	Can be used to provides a storage solution for systems with limited space in various embedded applications.
On-board modules	Flash 7 Click is based on the GD25LQ16C, a high-performance SPI NOR Flash Memory solution with advanced security features from GigaDevice Semiconductor.

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Key Features	Low power consumption, high performance, reliability, advanced security features, data retention, and more.
Interface	QSPI, SPI
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

## Pinout diagram

This table shows how the pinout on Flash 7 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	<b>IO2</b>	QUAD SPI IO / Write Protect
	NC	2	RST	INT	15	<b>IO3</b>	QUAD SPI IO / HOLD
SPI Chip Select	<b>CS</b>	3	CS	RX	14	NC	
SPI Clock	<b>SCK</b>	4	SCK	TX	13	NC	
SPI Data OUT	<b>SDO</b>	5	MISO	SCL	12	NC	
SPI Data IN	<b>SDI</b>	6	MOSI	SDA	11	NC	
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
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Supply Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

## Flash 7 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	2.5	-	5.5	V
Memory Size	-	-	16	Mbit
Data Retention	-	20	-	Years
Clock Frequency	-	-	104	MHz
Operating Temperature Range	-40	-	+85	°C

## Software Support

We provide a library for the Flash 7 Click on our [LibStock](#) page, as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

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## Library Description

The library covers all the necessary functions to control Flash 7 Click board™. Library performs a standard SPI interface communication.

Key functions:

- void flash7\_chip\_erase ( void ) - Chip erase function.
- uint8\_t flash7\_page\_program ( uint32\_t mem\_addr, uint8\_t \*p\_tx\_data, uint16\_t n\_bytes ) - Page program function.
- void flash7\_read\_memory ( uint32\_t mem\_addr, uint8\_t \*p\_rx\_data, uint16\_t n\_bytes ) - Read memory function.

## Examples description

The application is composed of three sections :

- System Initialization - Initializes SPI and UART LOG, sets CS, PWM and INT pins as outputs.
- Application Initialization - Initialization driver enables SPI, disables write protect and hold, performs whole chip erase, targets the memory address at "4096" for page program starting point and writes data which is also displayed on the log.
- Application Task - This is an example that demonstrates the use of the Flash 7 Click board™. In this example, the data is read from the targeted memory address. The results are being sent to the Usart Terminal. This task repeats every 5 sec.

The full application code, and ready to use projects can be found on our [LibStock](#) page.

Other mikroE Libraries used in the example:

- SPI
- UART

## 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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

## 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](#)

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[Click board™ Catalog](#)

[Click boards™](#)

## Downloads

[Flash 7 click example on Libstock](#)

[BH18PB1WHFV datasheet](#)

[GD25LQ16C datasheet](#)

[TXS0108E datasheet](#)

[Flash 7 click schematic](#)

[Flash 7 click 2D and 3D files](#)

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