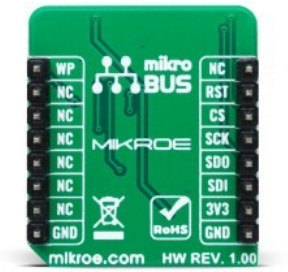
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Flash 10 Click





PID: MIKROE-5289

Flash 10 Click is a compact add-on board representing a highly reliable memory solution. This board features the AT25FF321A, an SPI configurable 32Mbit (2Mx16) serial Flash memory solution from Dialog Semiconductor. The AT25FF321A is an ideal solution for systems in which program code is shadowed from Flash memory into embedded or external RAM (code shadow) for execution and where small amounts of data are stored and updated locally in the Flash memory. It has a flexible and optimized erase architecture for code and data storage applications, non-volatile protection, and four specialized 128-byte OTP security registers to store a unique device ID and locked key storage. This memory can withstand many write cycles (minimum 100k) and has a data retention period greater than 20 years. This Click board™ is suitable for storage and data transfer in consumer devices, enterprise systems, and industrial applications.

Flash 10 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.

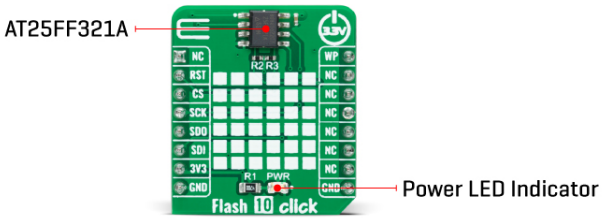
How does it work?

Flash 10 Click as its foundation uses the AT25FF321A, a highly reliable serial Flash memory solution designed for use in a wide variety of high-volume consumer and connected applications from Dialog Semiconductor. The AT25FF321A is organized as a 32Mbit (16x2 Mbit physical block) Flash memory ideally suited for systems in which program code is shadowed from Flash memory into embedded or external RAM (code shadow) for execution and where small amounts of data are stored and updated locally in the Flash memory. The AT25FF321A specifies a minimum of 100.000 endurance cycles with data retention of a minimum of 20

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years, giving it the capability to handle unlimited reads/writes to the memory.



The AT25FF321A's erase block sizes are optimized to meet the needs of today's code and data storage applications, supporting flexible and optimized erase architecture for code and data storage applications (4kB, 32kB, and 64kB block erase operations) and a full-chip erase feature. The most efficient use of memory space can be achieved by optimizing the erase blocks' size. Also, the AT25FF321A contains four specialized 128-byte One-Time Programmable (OTP) security registers which can be used to store a unique device ID and locked key storage.

Flash 10 Click communicates with MCU through a standard SPI interface supporting the two most common SPI modes, SPI Mode 0 and 3. Furthermore, this Click board™ provides additional hardware-controlled functions. The configurable Write Protection, marked as WP and routed on the PWM pin of the mikroBUS™ socket, protects all registers (including status and configuration) from write operations and must be held low to inhibit all the write operations to registers. When this pin is low, all memory and register writes are prohibited, and the address counter is not incremented.

Also, it is possible to use the Reset or Hold function through the RST pin of the mikroBUS™ socket, depending on the state of the HOLD/RESET bit 7 in Status Register 3. In the case of the Hold function, this pin temporarily pauses serial communication without deselecting or resetting the device, while in the case of the Reset feature, a low logic level on the RST pin puts the AT25FF321A into a Reset state.

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 for storage and data transfer in consumer devices, enterprise systems, and industrial applications
On-board modules	AT25FF321A - serial Flash memory solution from Dialog Semiconductor

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Key Features	32Mbit (16x2Mbit physical block) flash memory, optimized erase architecture for code and data storage applications, flexible non-volatile block protection, high performance, write protection, data endurance and retention, low power consumption, and more
Interface	QSPI,SPI
ClickID	No
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 10 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	**WP**	QSPI IO2 / Write Protection
QSPI IO3 / Reset	**RST**	2	RST	INT	15	NC	
SPI Chip Select	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
QSPI IO1 / SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
QSPI IO0 / 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 10 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Memory Size	-	-	32	Mbit
Write Endurance	100k	-	-	Cycles
Data Retention	20	-	-	Years
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Flash 10 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

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Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for Flash 10 Click driver.

Key functions

- flash10_erase_memory This function erases the selected amount of memory which contains the selected address.
- flash10_memory_write This function writes a desired number of data bytes starting from the selected memory address.
- flash10_memory_read This function reads a desired number of data bytes starting from the selected memory address.

Example Description

This example demonstrates the use of Flash 10 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.Flash10

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

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Click board™ Catalog

Click Boards™

Downloads

AT25FF321A datasheet

Flash 10 click 2D and 3D files

Flash 10 click schematic

Flash 10 click example on Libstock

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