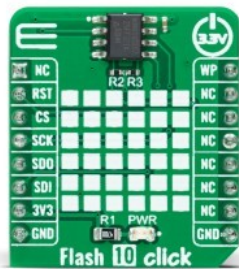


Flash 10 Click



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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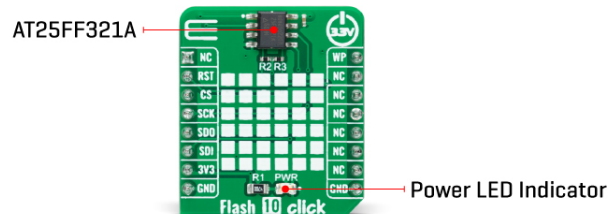


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years, giving it the capability to handle unlimited reads/writes to the memory.



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 PWR 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 |
| 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 10 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 | 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](#).

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Package can be downloaded/installed directly from NECTO Studio Package 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™](#)

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[mikroSDK](#)

[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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