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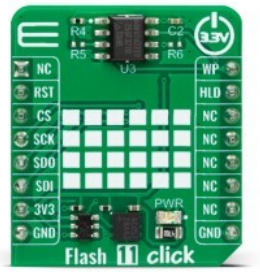
Flash 11 Click



PID: MIKROE-5740

Flash 11 Click is a compact add-on board representing a highly reliable memory solution. This board features the AT25SF321B, a 32-Mbit SPI serial Flash memory with Dual I/O and Quad I/O support from Dialog Semiconductor. It is designed for applications in which the program code is shadowed from Flash memory into embedded or external RAM 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, three specialized protected programmable 256-byte OTP security registers, and a 64-bit factory programmable UID register. This Click board™ makes the perfect storage and data transfer solution for consumer devices and industrial applications.

Flash 11 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 11 Click is based on the AT25SF321B, a 32-Mbit SPI serial Flash memory with Dual I/O and Quad I/O support from Dialog Semiconductor. The AT25SF321A is organized as a 32Mbit (4Mx8 physical block) Flash memory where the memory array can be erased in four levels of granularity, including a full-chip erase, which depending on the blocks, can be done typically in 10 seconds. In addition, the optimized erase architecture allows erasing data in 4kB, 32kB, and 64kB block erase operations. Optimizing the erase blocks' size can be the most efficient use of memory space. The AT25SF321B specifies a minimum of 100.000 endurance cycles with data retention of a minimum of 20 years, allowing it to handle (almost) unlimited reads/writes to the memory.

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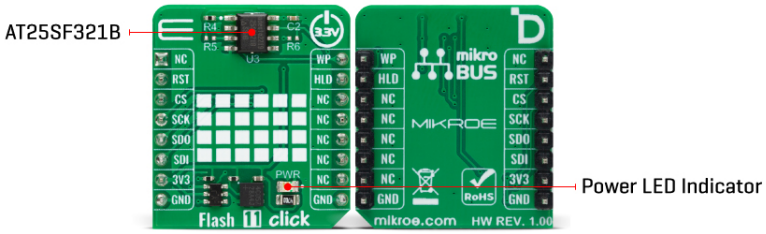

Flash 11 Click communicates with MCU through a standard SPI interface supporting the two most common SPI modes, SPI Mode 0 and 3, and a maximum clock frequency of up to 108MHz. Furthermore, this Click board™ provides additional hardware-controlled functions. The configurable Write Protection, marked as WP and routed on the default position of 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 in a low logic state, all memory and register write are prohibited, and the address count is not incremented. In addition, there is software write protection too.

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 AT25SF321B into a Reset state. This is a part of the Program and Erase, Suspend, and Resume features of the Flash 11 Click.

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, and industrial applications
On-board modules	AT25SF321B - a 32-Mbit SPI serial Flash memory with Dual I/O and Quad I/O support from Dialog Semiconductor
Key Features	32Mbit (4Mx8 memory organization) flash memory, optimized erase architecture for code and data storage applications, flexible non-volatile block protection, high protection, write protection (both hardware and software), data endurance and retention, low power consumption, and more

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Interface	QSPI,SPI
ClickID	Yes
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 11 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	**HLD**	SPI Communication Pause
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 11 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Memory Size	-	-	32	Mbit
Organization	4Mx8			
Write Endurance	100K	-	-	Cycles
Data Retention	20	-	-	Years

Software Support

We provide a library for the Flash 11 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for Flash 11 Click driver.

Key functions

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- flash11_memory_write Flash 11 memory write function.
- flash11_memory_read Flash 11 memory read function.
- flash11_block_erase Flash 11 block erase function.

Example Description

This example demonstrates the use of Flash 11 Click board™ The demo app writes specified data to the memory and reads it back.

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

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Flash11

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 MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit, that needs to be downloaded from the LibStock and installed for the compiler you are using to ensure proper operation of mikroSDK compliant Click board™ demo applications.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click Boards™

ClickID

Downloads

Flash 11 click 2D and 3D files

AT25SF321B datasheet

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Flash 11 Click schematic

Flash 11 click example on Libstock