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SWI EEPROM Click

PID: MIKROE-4521

SWI EEPROM Click is a compact add-on board that provides a highly reliable memory solution. This board features the AT21CS01, a single-wire serial EEPROM with a unique, factory-programmed 64-bit serial number from Microchip Technology. The AT21CS01 has an ultra-high write endurance capability allowing more than one million cycles for each memory location to meet the requirements for today's high-write endurance applications. It is internally as 128 words of 8 bits each with achieved communication through a single I/O pin with Standard-Speed and High-Speed mode options. Also, it offers a security register with a factory-programmed serial number, which makes it the easiest way to add identification to various accessories and consumables. This Click board™ is suitable for applications where identification or memory storage is required.

SWI EEPROM 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?

SWI EEPROM Click, as its foundation, uses the AT21CS01, 2-pin serial electrically erasable and programmable read-only memory (EEPROM) that harvests energy from the SI/O pin to power the integrated circuit from Microchip Technology. It provides 1,024 bits organized as 128 words of 8 bits each, a security register with a 64-bit factory programmed serial number, and an extra 16-bytes of user-programmable and permanently lockable storage. It delivers a guaranteed unique serial number for inventory tracking, asset tagging and can always protect the data if needed.

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ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.

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

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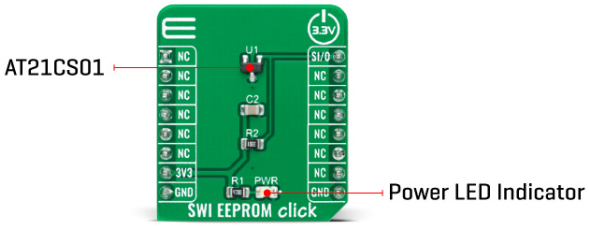

The AT21CS01 benefit from 100 years of data retention, combining their unprecedented data storage with excellent energy efficiency. It is characterized by high reliability and ultra-high writing endurance capability, allowing more than one million cycles for each memory location to meet today's high-write endurance applications' requirements.

SWI EEPROM Click communicates with MCU using the Single-Wire interface that, by definition, requires only one data line (and ground) for communication with MCU. The SI/O pin routed to the PWM pin of the mikroBUS™ socket is a bidirectional input/output pin used to serially transfer data to and from the device featuring a maximum 15.4Kbps bit rate in Standard-Speed mode and 125Kbps in High-Speed mode.

The AT21CS01 uses a modified I2C interface to extract power from the reading and writing sequences. The software sequence sent to the device is an emulation of what would be sent to an I2C serial EEPROM, except that a 4-bit opcode replaces a typical 4-bit device type identifier of 1010b in the device address. The device has been architected to allow for rapid deployment and significant reuse of existing I2C firmware.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before use with 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	EEPROM
Applications	Can be used for applications where identification or memory storage is required.
On-board modules	AT21CS01 - 2-pin serial electrically erasable and programmable read-only memory (EEPROM) that harvests energy from the SI/O pin to power the integrated circuit from Microchip Technology
Key Features	High reliability, a unique, factory-programmed 64-bit serial number, ultra-high write endurance, Standard-Speed and High-Speed mode options, and more.

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Interface	SWI
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 SWI EEPROM 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	**SI/0**	Single-Wire Data IN/OUT
	NC	2	RST	INT	15	NC	
	NC	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
	NC	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

SWI EEPROM Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Memory Size	-	-	1	Kbit
Write Endurance	1.000.000	-	-	Write Cycles
Data Retention	100	-	-	Years
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the SWI EEPROM 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.

Key functions:

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- swieeprom_init - SWI EEPROM initialization function.
- swieeprom_write_data_to_memory - SWI EEPROM write data to memory.
- swieeprom_read_data_from_memory - SWI EEPROM read data from memory.

Examples description

This application shows capability of SWI EEPROM Click board. It checks if device is present, initializes it and show it's functionality to read from memory and write to memory.

The demo application is composed of two sections :

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.

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

Click board™ Catalog

Click Boards™

Downloads

SWI EEPROM click 2D and 3D files

AT21CS01 datasheet

SWI EEPROM click schematic

SWI EEPROM click example on Libstock

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