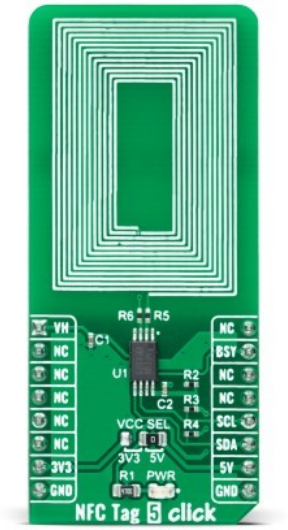
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NFC Tag 5 Click





PID: MIKROE-5230

NFC Tag 5 Click is a compact add-on board that contains a compact NFC tag IC. This board features the M24LR64E-R, a dynamic NFC/RFID tag IC with a dual interface 64-Kbit EEPROM from STMicroelectronics. It features an I2C interface alongside an RF contactless interface operating at 13.56MHz, organized as 8192×8 bits in the I2C mode and 2048×32 bits in the ISO 15693 and ISO 18000-3 mode 1 RF mode. The M24LR64E-R also features an energy harvesting analog output and a user-configurable digital output pin, used as an interrupt, toggling during either RF write in progress or RF busy mode. This Click board™ represents an ideal solution for rapidly integrating NFC tag technology in any custom application such as industrial or medical equipment, consumer electronics, and more.

NFC Tag 5 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?

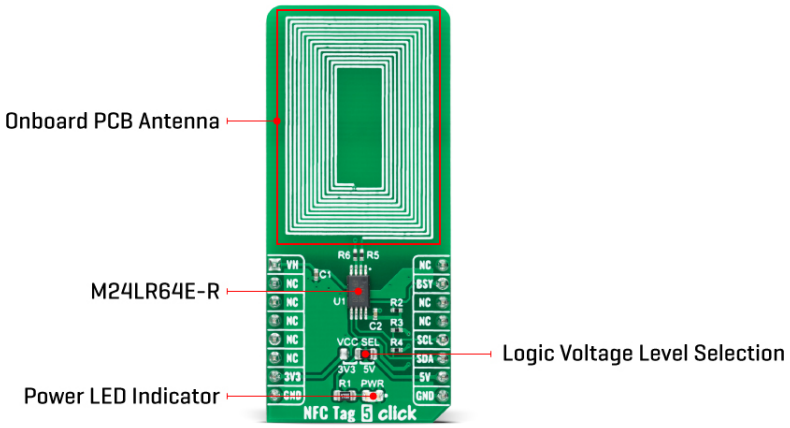
NFC Tag 5 Click as its foundation uses the M24LR64E-R, a 64-Kbit dynamic NFC/RFID tag with password protection, energy harvesting, and RF status functions from STMicroelectronics. This highly integrated Near Field Communication tag module comes with a dual-interface electrically erasable programmable memory (EEPROM), an I2C interface alongside an RF contactless interface operating at 13.56MHz, organized as 8192×8 bits in the I2C mode and 2048×32 bits in the ISO 15693 and ISO 18000-3 mode 1 RF mode.

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This Click board™ contains the properly tuned integrated trace antenna on the PCB to power and access the device using the ISO/IEC 15693 and ISO 18000-3 mode 1 protocol. Power is transferred to the M24LR64E-R by radio frequency at 13.56MHz via coupling antennas.

As mentioned before, this Click board™ communicates with MCU using the standard I2C 2-Wire interface with a maximum clock frequency of 400kHz, fully adjustable through software registers. It also provides an Energy harvesting mode on the analog pin of the mikroBUS™ socket marked as VH. When the Energy harvesting mode is activated, the M24LR64E-R can output the excess energy from the RF field on the VH pin. If the RF field strength is insufficient or when the Energy harvesting mode is disabled, the VH pin goes into a high-Z state, and the Energy harvesting mode is automatically stopped.

Besides, it also features a user-configurable pin marked as BSY, routed to the AN analog pin of the mikroBUS™ socket, used either to indicate that the M24LR64E-R is executing an internal write cycle from the RF channel or that an RF command is in progress. When configured in the RF write in progress mode, the BSY pin is driven low for the entire duration of the RF internal write operation, and when configured in the RF busy mode, this pin is driven low for the whole period of the RF command progress.

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

Specifications

Type	RFID/NFC
Applications	Can be used in any custom application such as industrial or medical equipment, consumer electronics, and more
On-board modules	M24LR64E-R - dynamic NFC/RFID tag IC from STMicroelectronics
Key Features	Dual interface (I2C interface and RF contactless) 64-Kbit EEPROM, password protection, energy harvesting, and RF status

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	functions, ISO 15693 and ISO 18000-3 mode 1 compatible, and more
Interface	Analog,I2C
ClickID	No
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on NFC Tag 5 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Energy Harvest	**VH**	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	**BSY**	RF Status
	NC	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Right	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

NFC Tag 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External RF Signal Frequency	-	13.56	-	MHz
EEPROM Size	-	64	-	kBit
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the NFC Tag 5 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.

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Library Description

This library contains API for NFC Tag 5 Click driver.

Key functions

- nfctag5_write_ndef_uri_record This function writes specific NDEF URI record to the memory address specified with NTAG5LINK_NDEF_MESSAGE_START_ADDRESS macro.
- nfctag5_write_message_to_memory This function writes specified number of data bytes to the user memory starting from @b block_addr.
- nfctag5_read_message_from_memory This function reads specified number of data bytes from the user memory starting from @b block_addr.

Example Description

This example demonstrates the use of NFC Tag 5 Click board™ by programming the specified NDEF URI record to the memory, and showing the memory read/write feature.

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.NFCTag5

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

Click board™ Catalog

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Click boards™

Downloads

NFC Tag 5 click example on Libstock

NFC Tag 5 click 2D and 3D files

M24LR64E-R datasheet

NFC Tag 5 click schematic

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