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NFC 5 Click

PID: MIKROE-6029

NFC 5 Click is a compact add-on board designed for advanced NFC applications. This board features the ST25R3918, a multipurpose NFC transceiver from STMicroelectronics. This Click board™ is built to cater to the growing needs of the Internet of Things (IoT) ecosystem, providing robust NFC reader functionalities, passive peer-to-peer communication, and card emulation modes with outstanding analog performance. Its notable features include exceptional read range with minimal power output, advanced noise reduction, and compatibility with ISO14443, ISO15693, and NFC Forum Tag types 1, 2, 4, and 5. Additionally, the board supports SPI and I2C interfaces, offering operational flexibility and making it suitable for various applications, from consumer electronics to IoT, brand protection, access control, and customer engagement.

NFC 5 Clickk is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the mikroBUS™ standard. It comes with the mikroSDK open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets this Click board™ apart is the groundbreaking ClickID feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

How does it work?

NFC 5 Click is based on the ST25R3918, a multipurpose NFC transceiver from STMicroelectronics that enables NFC reader capabilities, passive peer-to-peer functions, and NFC card emulation. This component is designed to meet the needs of Internet of Things (IoT) applications and various consumer or industrial uses, providing outstanding analog performance. The ST25R3918 chip is adept for many NFC and HF RFID tasks, including

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applications in consumer electronics, IoT for accessory recognition, parameter adjustments, brand security, access management, customer engagement, and more. It complies with ISO14443 and ISO15693 standards, facilitating various NFC functions such as accessory recognition, brand protection, and consumer interaction, alongside supporting NFC Forum Tag types 1, 2, 4, and 5 in reader mode.
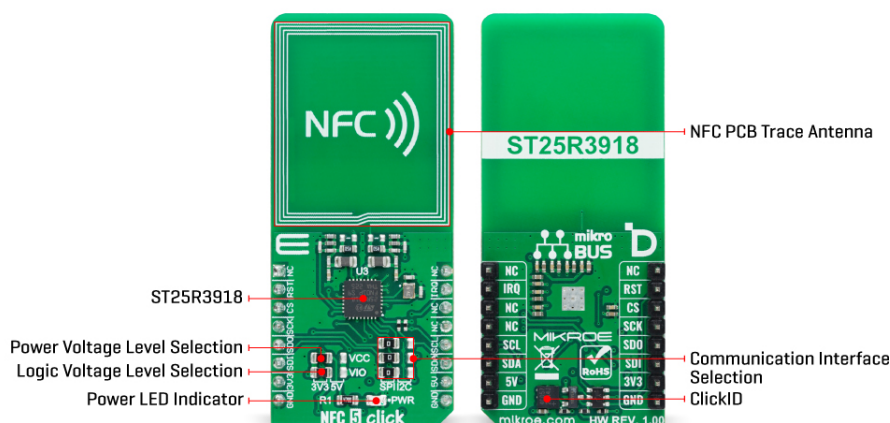
Thanks to its noise-reduction receiver technology, the chip stands out for its excellent read range with minimal power output, even in challenging conditions. It incorporates an advanced analog front end (AFE) and a comprehensive data framing system for NFC-A/B (ISO 14443A/B) readers, offering higher bit rates, and supports NFC-V (ISO 15693) reading up to 53 kbps. Additionally, it facilitates ISO 18092 passive initiation and targeting, along with NFC-A / NFC-F card emulation, enhancing device interaction with Android™ phones and enabling the use of Apple® App Clips through simple NDEF data exchanges.

The ST25R3918 also features a low-power wake-up mode that detects cards by measuring the antenna signal's amplitude or phase, coupled with a low-power RC oscillator and wake-up timer that activates the device at set intervals to search for tags.

NFC 5 Click offers flexibility through its support for both SPI and I2C interfaces, selectable via the COMM SEL jumpers. By default, the I2C interface is active, supporting High-speed mode operation up to 3.4MHz, whereas the SPI mode accommodates clock frequencies up to 10MHz. To notify the host MCU of completed commands or external events, like the peer device field, the ST25R3918 signals an interrupt on the IRQ pin.

The ST25R3918 has separated power and logic supply pins, and thanks to two onboard jumpers, labeled VCC and VIO, this Click board™ can operate with either 3.3V or 5V power/logic voltage levels. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this 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	Ideal for various applications, from consumer electronics to IoT, brand protection, access control, and customer engagement

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On-board modules	ST25R3918 - multipurpose NFC transceiver from STMicroelectronics
Key Features	High performance, reading, passive peer-to-peer communication, and card emulation modes, outstanding analog performance, exceptional read range with minimal power output, compatibility with ISO14443, ISO15693, and NFC Forum Tag types 1, 2, 4, and 5, selectable communication interface, and more
Interface	I2C,SPI
ClickID	Yes
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 5 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS			Pin	Notes
	NC	1	AN	PWM	16	NC	
ID SEL	**RST**	2	RST	INT	15	**IRQ**	Interrupt
SPI Select / ID COMM	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	**SCL**	I2C Clock
SPI Data IN	**SDI**	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	VIO SEL	Left	Logic Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP3-JP5	COMM SEL	Left	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C

NFC 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Operating Frequency	-	13.56	-	MHz

Software Support

We provide a library for the NFC 5 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 NFC 5 Click driver.

Key functions

- nfc5_get_mifare_tag_uid This function reads the UID of a mifare tag.

- nfc5_write_reg This function writes a desired data to the selected register.

- nfc5_read_reg This function reads a desired data from the selected register.

Example Description

This example demonstrates the use of NFC 4 Click board by reading MIFARE ISO/IEC 14443 type A tag UID.

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.NFC5

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. 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

[NFC 5 click example on Libstock](#)

[NFC 5 click 2D and 3D files v100](#)

[ST25R3918 datasheet](#)

[NFC 5 click schematic v100](#)