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NFC 6 Click

PID: MIKROE-5935

NFC 6 Click is a compact add-on board that contains an NFC transceiver for contactless communication. This board features the ST25R95, a near-field communication transceiver from STMicroelectronics. It supports reader and writer operating modes and emulates ISO/IEC 14443-3 Type A cards. The RF communications are done over the 13.56MHz. The transceiver features tag detection mode, field detection mode, transmission and reception modes, and more. This Click board™ makes the perfect solution for the development of applications based on NFC technology, contactless communication, payment systems, home and industrial automation, and more.

NFC 6 Click 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 6 Click is based on the ST25R95, a near-field communication transceiver from STMicroelectronics. It manages frame coding and decoding in Reader and card emulation modes for standard applications such as near-field communication (NFC), proximity, and vicinity standards. The NFC transceiver supports ISO/IEC 14443 Type A communication in reader and card emulation modes and ISO/IEC 14443 Type B, ISO/IEC15693, and FeliCa in reader mode. The ST25R95 embeds an analog front end to provide the 13.56 MHz air interface and supports the detection, reading, and writing of NFC Forum Type 1, 2, 3, 4, and 5 tags.
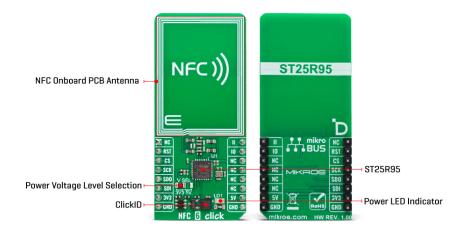
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There are two operating modes that ST25R95 supports: wait for event (WFE) and active mode. In active mode, the transceiver communicates actively with a tag or an external host, while the WFE mode includes four low-consumption states: power-up, hibernate, sleep/field detector, and tag detector.

NFC 6 Click uses a standard 4-wire SPI serial interface to communicate with the host MCU, supporting clock frequencies of up to 2MHz. There are two interrupt pins: interrupt input (II) and interrupt output (IO). The interrupt input allows you to control WFE events. When it is ready, the NFC transceiver returns a replay over the interrupt output by setting it to a Low logic level. It will remain Low until the host MCU reads the data. The application can use the Interrupt mode to skip the polling stage.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the V SEL jumper. 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	Can be used for the development of applications based on NFC technology, contactless communication, payment systems, home and industrial automation, and more
On-board modules	ST25R95 - near field communication transceiver from STMicroelectronics
Key Features	NFC/RFID card writer and reader, ISO/IEC 14443-3 Type A card emulation, dedicated internal frame controller, highly integrated analog front end (AFE) for RF communication, transmission and reception modes, optimized power management, tag detection mode, field detection mode, and more
Interface	SPI
Feature	ClickID

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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 6 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	**II**	Interrupt Input
ID SEL	**RST**	2	RST	INT	15	**IO**	Interrupt Output
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	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
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	V SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

NFC 6 Click electrical specifications

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

Software Support

We provide a library for the NFC 6 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 6 Click driver.

Key functions

- nfc6_send_command This function sends a desired command by using SPI serial

Time-saving embedded tools

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interface.

- nfc6_read_data This function reads a response data bytes by using SPI serial interface.

- nfc6_read_mifare_tag_uid This function reads the UID of a MIFARE ISO14443-A type tags with 4-byte or 7-byte UIDs.

Example Description

This example demonstrates the use of NFC 6 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.NFC6

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
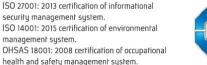
NFC 6 click example on Libstock

NFC 6 click 2D and 3D files

ST25R95 datasheet

NFC 6 click schematic