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ST25R3911B-DISCO

Discovery kit for the ST25R3911B high performance HF reader / NFC initiator

Data brief
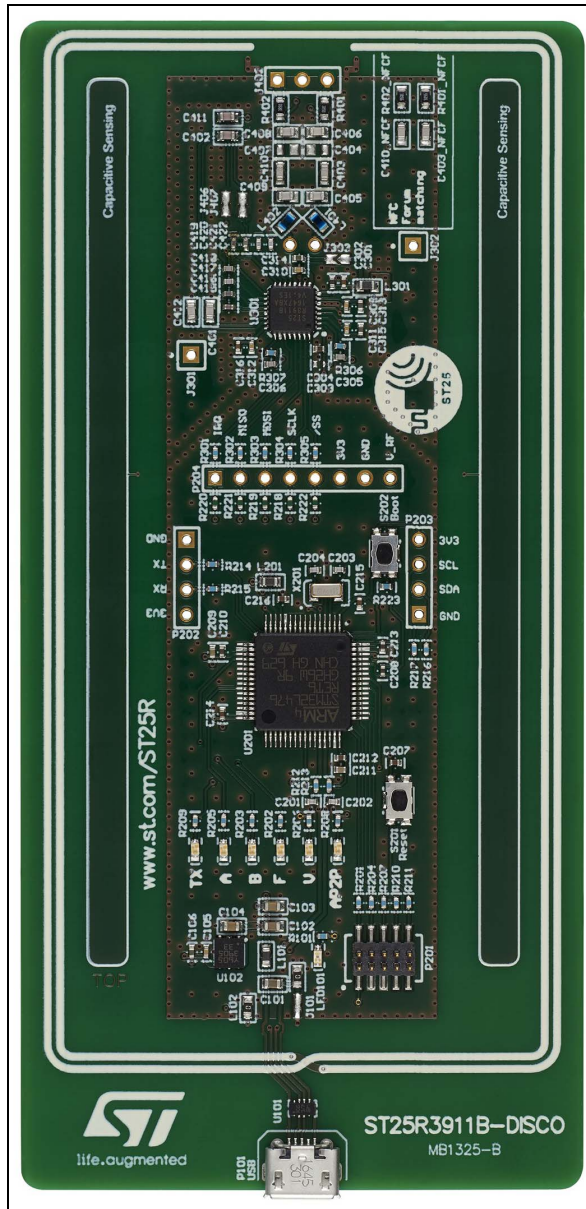
Features

- Based on ST25R3911B high performance HF reader / NFC initiator with 1.4 W output power, supporting VHBR and AAT
    - ISO 18092 (NFCIP-1) active P2P
    - ISO14443A, ISO14443B and FeliCa™
    - ISO15693
    - Supports VHBR (3.4 Mbit/s PICC to PCD framing, 6.8 Mbit/s AFE and PCD to PICC framing)
    - Up to 1.4 W output power with differential antenna
    - Possibility of driving two antennas in single ended mode
    - Inductive and capacitive Wake-up
    - Automatic antenna tuning system
    - DPO (Dynamic Power Output)
    - User selectable and automatic gain control
    - Transparent and Stream modes to implement MIFARE™ Classic compliant or other custom protocols
    - 6 Mbit/s SPI
    - Wide supply voltage range (from 2.4 V to 5.5 V)
    - QFN32, 5 mm x 5 mm package
- STM32L476RET6 32-bit microcontroller with 512 kB of Flash memory
- 105 mm x 52 mm, two turns antenna etched on the PCB, and associated VHBR tuning circuit
- Micro-USB connector for communication with the host PC and board powering
- Six LEDs indicating the presence of the RF field and of the protocol used to communicate

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1 Description

The ST25R3911B-DISCO is a ready-to-use kit featuring the ST25R3911B, an highly integrated HF reader / NFC initiator IC.

The ST25R3911B-DISCO can be operated as ISO18092 (NFCIP-1) active and passive initiator, ISO18092 (NFCIP-1) active target, ISO 14443A and B reader including very high bit rates (VHBR), long range ISO15693 and FeliCa™ reader. Implementation of other standard and custom protocols like MIFARE™ Classic is possible using the AFE and implementing framing in the external microcontroller (stream and transparent modes).

The ST25R3911B-DISCO addresses a wide range of applications such as access control, ticketing, industrial, medical and consumer, where users need optimal RF performance and flexibility combined with low power consumption.

The ST25R3911B-DISCO kit, whose block diagram is shown in *Figure 1*, allows the user to exploit several features of the ST25R3911B.

It contains a low power capacitive sensor that can be used for ultra-low power wakeup without switching on the reader field. Traditional inductive wakeup with the choice of amplitude or phase measurement can be used as well.

The automatic antenna tuning (AAT) technology enables operation close to metallic parts and/or in changing environments. The available software visually displays the impact of AAT, thus enabling an easy evaluation of the feature.

Figure 1. Functional block diagram
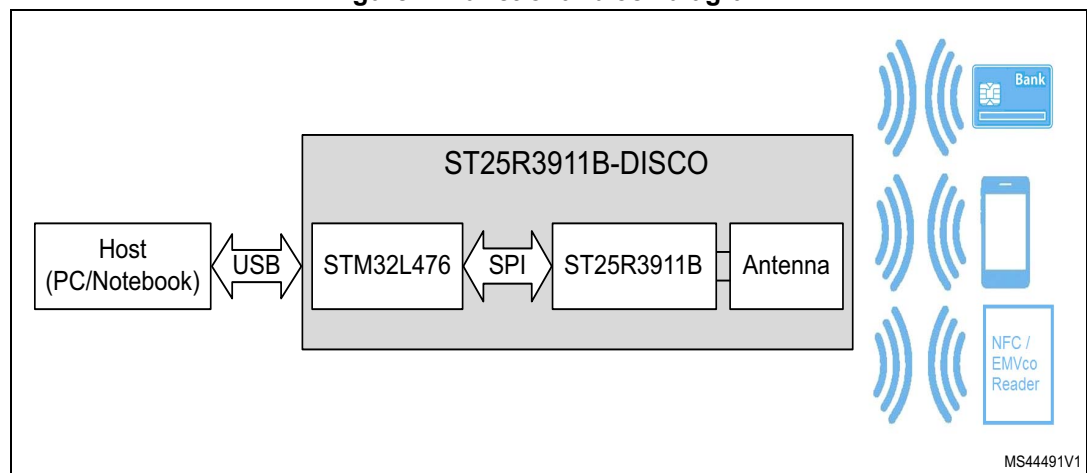
2   Hardware configuration

The ST25R3911B-DISCO board can be connected via USB with a PC, and used as a general purpose HF reader / NFC initiator. The additional UART and I²C Host interfaces (see *Figure 2*) can be used to integrate the board directly into an existing setup.

A graphical user interface (GUI) can be downloaded from the NFC pages on *www.st.com*, it enables easy communication with the board and allows the user to explore the ST25R3911B features.

The board is configured to support ISO14443A/B, ISO15693, FeliCa™ and AP2P communication.

By default a VHBR compatible matching is populated, this matching makes it possible to achieve bit rates up to 3.4 Mbps. To maximize performance in applications where such very high bit rates are not needed an alternative NFC Forum matching is available.

To switch to the NFC Forum matching the user only needs to exchange the components listed in *Table 1*. This matching doubles the Q-factor, thus increasing the read range up to 10% when operating at bit rates up to 848 kbps (HBR). Operation at bit rates of 1.6 Mbps or higher is not possible with the NFC Forum matching.

Table 1. Matching variants

Component	VHBR matching	NFC Forum matching
C404		Use C404_NFCF
C410		Use C410_NFCF
R401	Keep populated	Use R401_NFCF
R402		Use R402_NFCF

Figure 2. Position of main blocks on ST25R3911B-DISCO board
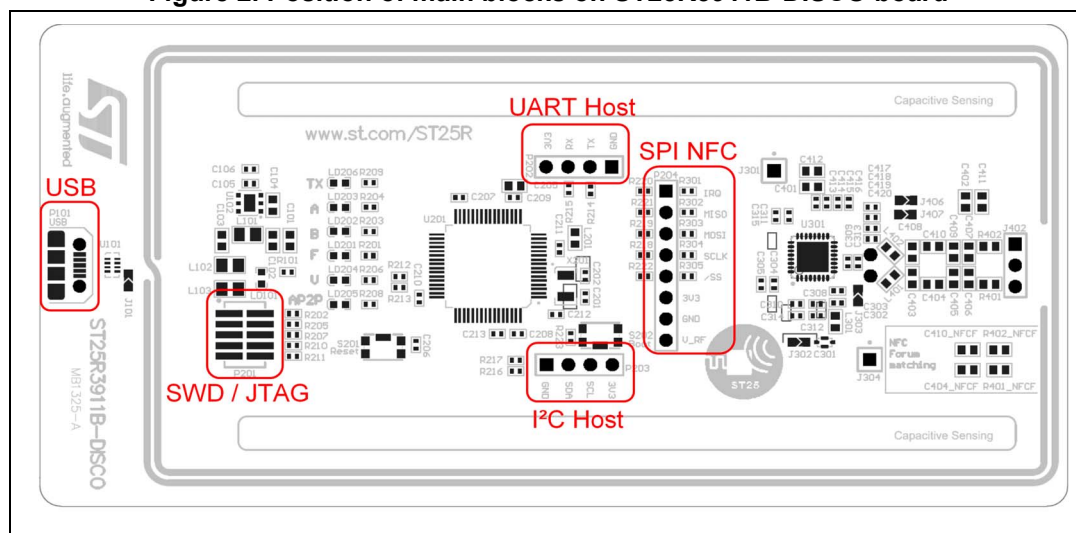
3 Revision history

Table 2. Document revision history

Date	Revision	Changes
08-Feb-2017	1	Initial release.
26-Jun-2017	2	Updated image on cover page.

IMPORTANT NOTICE – PLEASE READ CAREFULLY