

# **HFDOCK - EMA DOCK NFC reader board – USER MANUAL**

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## 1 – Getting started

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Connect EMA NFC READER BOARD to an STM32 via an SPI differential to SPI converter (LTC6820IUD). The supply voltage has to be capable of delivering at least 300 mA at 5 V supply. A demo software is available for download at [www.st.com](http://www.st.com) to be programmed onto an STM32.

To use the STM32 Nucleo boards with the EMA NFC READER BOARD the following software and hardware are required:

- an STM32 Nucleo-64 development board
- a Windows® PC to install the firmware package
- interface board using LTC6820IUD
- a USB type A to Mini-B USB cable to connect the Nucleo board to the PC
- unit must be supplied by a safety extra low voltage (SELV) limited power source through the USB port, the source should not exceed 60Vdc / 8A / 100VA

To install the board firmware package (order code: X-CUBE-NFC5) the PC must have:

- 128 MB of RAM
- 40 MB of free hard disk space

EMA NFC READER BOARD can be loaded with firmware and has ST25R3911B related documentation both available at [www.st.com](http://www.st.com).

## 2 – Board setup

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To set up the board:

- 1 - Connect the EMA NFC READER BOARD to the STM32 board via SPI differential to SPI converter (STM32 and SPI converter could be part of the same PCB design)
- 2 - Power the STM32 board using 5V power supply
- 3 - Program the firmware on the STM32\*
- 4 - Reset the MCU and the NFC Reader board is ready to be used.

\*All required documentation for STM32 programming could be found on [www.st.com](http://www.st.com)

## 2.1 Connector interface

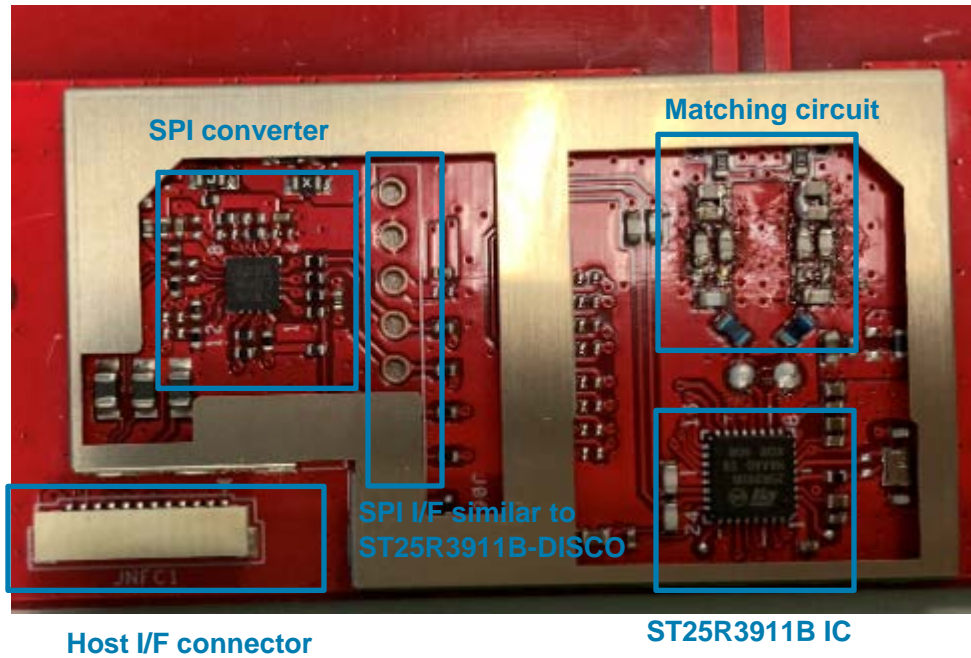
The connector used on EMA NFC reader board is a 12pins Wire to Board connector of 0.8mm pitch Right angle version (ENTERY 4260-F12N-00R).

Here is the pins assignment:

Pin #	Name	Description
1		Ground
2		Ground
3		Ground
4		Ground
5		Ground
6	SPI_IRQ_NFC_C	SPI Interrupt request
7	Ground	
8	SLAVE_IP_C	Differential SPI Positive
9	SLAVE_IM_C	Differential SPI Negative
10		Ground
11	VDD_IO_3V3_C	3.3V power supply for I/Os
12	VDD_5V_C	Main 5V power supply for RF operation

## 2.2 Components placement

The picture below shows the main components being part of EMA NFC READER BOARD



## 3 Federal Communications Commission (FCC) and Industry Canada (IC) compliance

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### 3.1 FCC Compliance Statement

#### 3.1.1 Part 15.19

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### 3.1.2 Part 15.21

Any changes or modifications to this equipment not expressly approved by Zebra may cause harmful interference and void the user's authority to operate this equipment.

#### 3.1.3 Part 15.105

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### 3.1.4 FCC ID

FCC ID: UZ7HFDOCK

## 3.2 Formal notices required by Industry Canada (“IC”)

### 3.2.1 Compliance Statement

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada’s license-exempt RSS(s). Operation is subject to the following two conditions:

- 1 This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

### 3.2.2 Declaration de Conformité

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### 3.2.3 IC ID

IC: 109AN-HFDOCK

## 3.3 Module Installation Statements

**This module is intended for OEM integrators under the following conditions:**

1. List of applicable rules:  
This module is certified pursuant to Part 15 rules sections(15.225) and RSS-210.
2. Antennas: This module has been approved to operate with the antenna types listed below.

Frequency Band	Antenna Type
13.56 MHz	Loop Antenna

3. RF exposure considerations:  
The host product manufacturer must provide following statement in end-product manual.

## **FCC**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End user must follow the specific operating instructions for satisfying RF exposure compliance.

## **ISED**

The products are compliant with SAR for general population/uncontrolled exposure limits in IC RSS-102 and has been tested in accordance with the measurement methods and procedures specified in IEEE 1528.

Le produit est le respect de SAR pour la population générale / limites d'exposition incontrôlée de CNR-102 et a été testé en conformité avec les méthodes et procédures de mesure spécifiées dans la norme IEEE 1528.

## **4.Label and compliance information:**

Label of the end product:

### **FCC**

The host product must be labeled in a visible area with the following "Contains FCC ID: UZ7HFDOCK".

The end product shall bear the following 15.19 statement: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### **ISED**

The final end product must be labeled in a visible area with the following: "Contains transmitter module IC: 109AN-HFDOCK".

## **5.Information on test modes and additional testing requirements**

This module has been approved under stand-alone configuration.

The information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host can be found at KDB Publication 996369 D04.

## **6.Additional testing, Part 15 Subpart B disclaimer**

Appropriate measurements (e.g. 15 B compliance) and if applicable additional equipment authorizations (e.g. SDoC) of the host product to be addressed by the integrator/manufacturer.

This module is only FCC authorized for the specific rule parts listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host product as being Part 15 Subpart B compliant.



## **7.The user manual of the end product should include:**

### **FCC**

1. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
2. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
3. The antenna(s) used for this transmitter must not transmit simultaneously with any other antenna or transmitter.

### **ISED**

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- 1.This device may not cause interference.
- 2.This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- 1.L'appareil ne doit pas produire de brouillage;
- 2.L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The transmitter module may not be co-located with any other transmitter or antenna.

Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

## Revision History

<b>REV</b>	<b>DESCRIPTION</b>	<b>DATE</b>	<b>AUTHOR</b>
1.0	Initial Release	11/20/2019	B. LIMONGI