



# NFC NUTSHELL KIT

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NFC Modules

**USER MANUAL**

REVISION 1.2

## Document information

Info	Content
<b>Keywords</b>	User Manual GMMC
<b>Abstract</b>	This document describes how to use NFC Modules of the GMMC's NFC Nutshell KIT

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## 1. NFC Nutshell NFC Modules

### 1.1 General Kit component topology

The Kit consists of different types of modules, which can be connected application specific. Each module type has a different color.

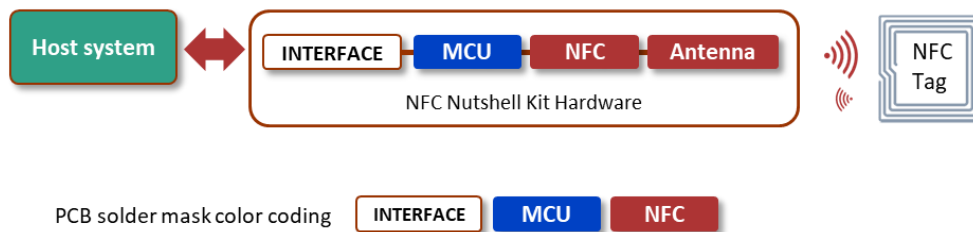


Fig 1 always insert FFC cable straight

### 1.2 Module interconnection concept

The Nutshell Kit can be operated in different configurations. The connection between the different modules is done via FFC cables and zero force sockets. The Kit modules can be connected to a host via different interface modules see details in the NFC Nutshell Kit interface module user manual.

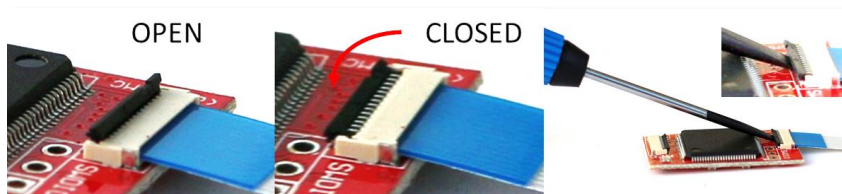


Figure 2 Kit modules interconnection via FFC cables



Fig 3 always insert FFC cable straight

#### **Important Notes:**

- **Open and close the connector carefully.**
- **Always insert straight – do not apply force**
- **Avoid cable/connector misalignment – potential short cut and damage**
- **If you observe communication issues over time, exchange the FFC cable with a spare one.**
- **DO NOT disconnect, bend or move the Kit while modules are powered to avoid short circuits.**

## 2. NFC Modules



Fig 4 NFC Module

Different NFC Modules are available to cover most applications. Currently the NFC Nutshell KIT supports the following NFC ICs:

- **CLRC663, CLRC663plus** family members
- **PN5180**
- **PN7462 family** - t.b.released
- **PN512** (for legacy reasons)
- **PN7150** - t.b. released (with LPC 11u68 MCU Module and GMMC 7150 firmware)

## 3. NFC Module hardware topology

The topology of the NFC modules is shown next:

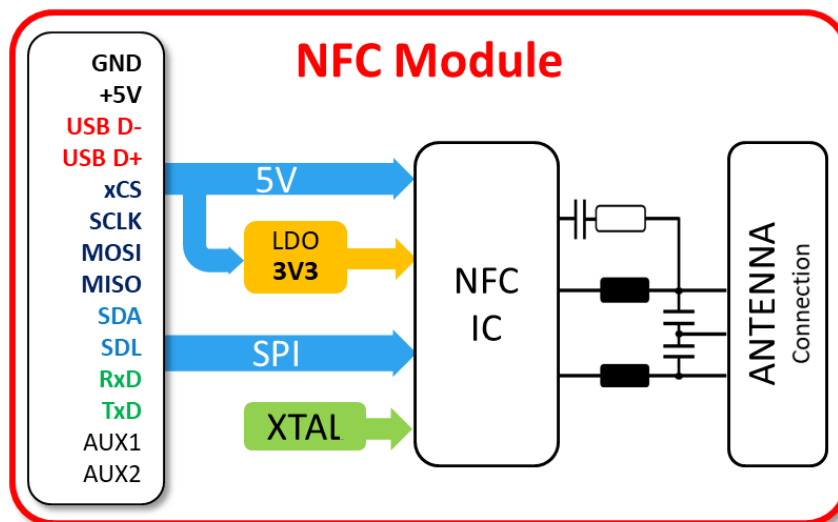


Fig 5 NFC Module interface MCU/HOST interface, power and antenna connection

As can be seen above, the NFC frontends are connected to the MCU via SPI interface. This allows the user to operate with the maximum performance.

The modules also features the EMC filter which is necessarily close to the output of the NFC front end.

**Note:** 3 pin antenna connection is symmetrical with no preferred direction

## 4. PC – NFC Direct Communication Mode

### 4.1 Standard Kit configuration



Fig 6 – Standard connection Interface - MCU- NFC

Besides using the Kit with an MCU Module connected, there is the possibility to connect the Modules directly

This mode allows an easy implementation using the PC as direct communication interface.

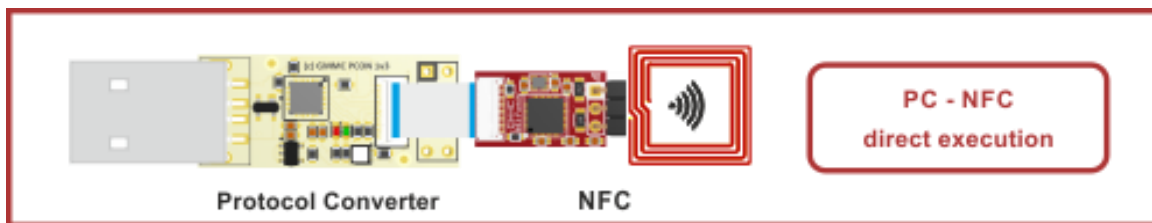


Fig 7 PC - NFC direct execution

For using the KIT without any MCU the kit has to be connected as shown above. Using the Protocol Converter Tool, the user has to choose the NFC Direct mode.

This changes the NFC interface to UART and allows easy access to the NFC front end using the converter module as USB to UART converter.

For further development, the export controlled version of the NXP reader library can be used. This version features C++ based projects which can be used to communicate with the front end.

**Note:** *This works only with the export controlled version of the NXP reader library. A valid NXP Doc store account and access is needed.*

*More details can be found in the Interface User Manual of the Protocol Converter Module.*

## 5. NFC Module Antenna connection



*Fig 8 NFC Module antenna connection*

## 6. Software Tools

### 6.1 RFIDDiscover / Pegoda reader selection and usage example

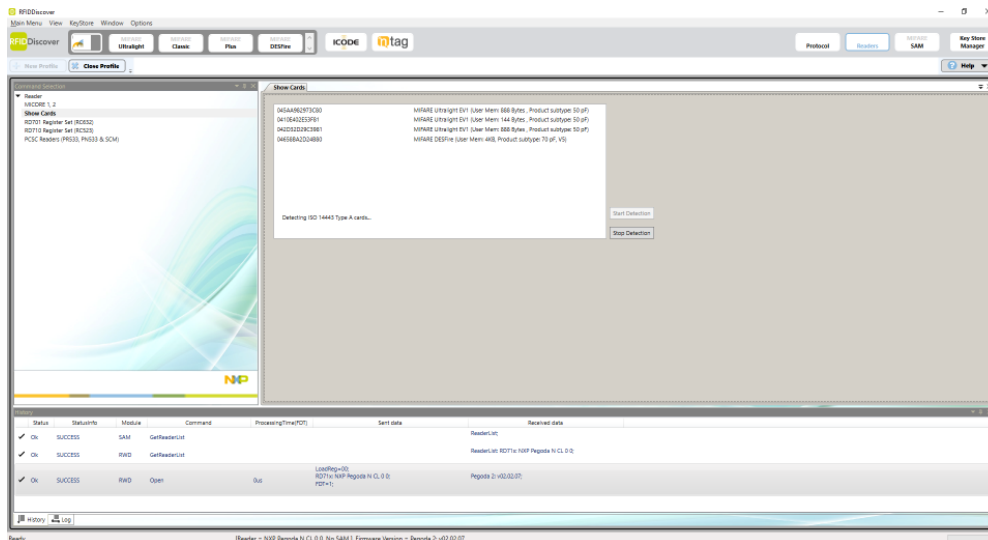


Fig 9 Example RFIDDiscover show cards command

### 6.2 NFC Cockpit GUI

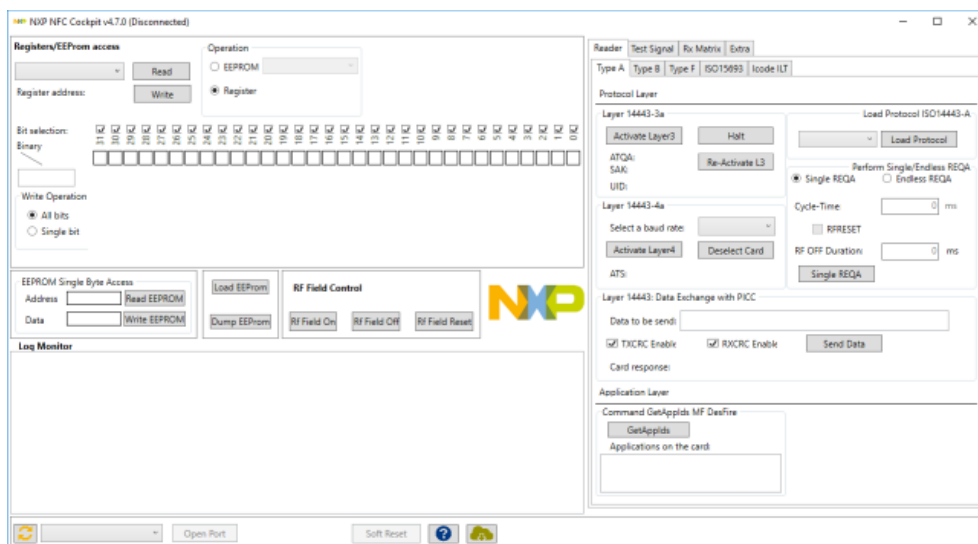


Fig 10 . NFC cockpit start up screen

*Please Note: the LPC1769 needs to be updated with the corresponding Secondary boot loader for the supported NFC IC file which comes with the regarding NFC Cockpit from within the NFC cockpit software tool version.*

# NFC NUTSHELL KIT

NFC Modules

REVISION 1.2 - 9-MAR-18



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## Revision history

Rev	Date	Description
1.0	2018 Feb. 6 <sup>th</sup>	Initial version MGA
1.1	2018 Mar. 5 <sup>th</sup>	Added features TPI