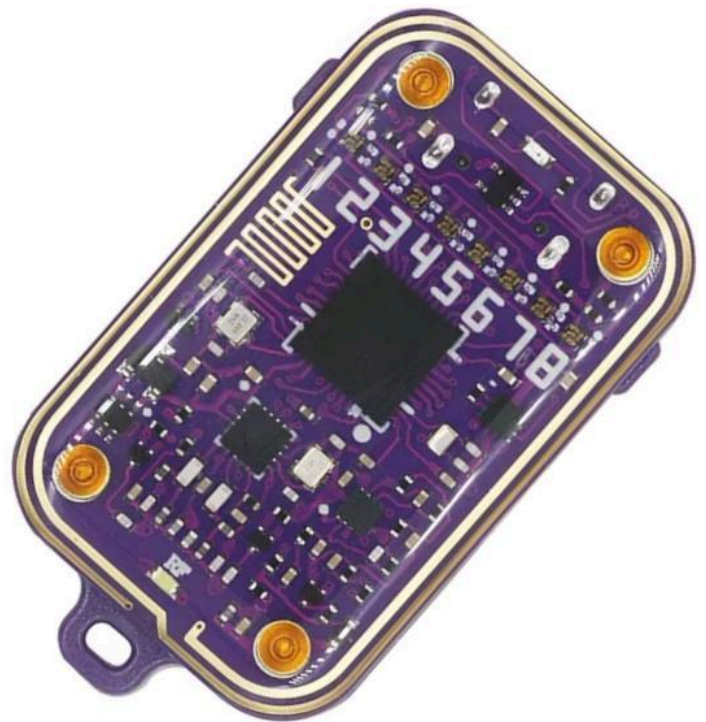


RFID, often abbreviated Radio Frequency Identification, is a method for automatic identification of objects, where the object's ID reads or writes data using radio waves. The technology is based on radio frequency communication between a specially crafted identifier (label, tag, card, keychain, sticker or other) and a Reader. Each chip contains an identifier stored inside, with a unique number and antenna. Depending on the system configuration, in "reading" the number may take action, for example, to open a door, barrier or other reaction, or information can be sent to the computer for proper decision making. Some types of RFID cards allow multiple recordings of information, which opens opportunities they further expansion. Distance, which can be a "read" identifier, depends on many factors such as frequency, size and shape of the antenna, the environment and more. Even distance can reach tens of meters using active RFID tags, ie, using additional power (like a battery or other).

This RFID Smart Card Chip Reader is a versatile and powerful tool for RFID research and development, and its ability to emulate, clone, and test different RFID systems makes it a valuable addition to any RFID toolkit. This device is an essential resource for anyone working with RFID technology, whether you're a security professional or just a curious hobbyist. With this device, you can create copies of RFID tags and cards, which can be used to access secure areas or equipment that requires RFID authentication. You can also emulate and store different types(125khz/13.56mhz) of RFID cards. Each channel can store 2, allowing for a total of 16 to be stored. It also features a card writing function and supports writing UID cards, CUID cards, FUID cards, and ID5577 cards.



## Free Open Source Tool Name:

- NFC Tool
- IOS and Android App: Mtool

## Here's how it works:

- **Emulator:** This Module can be programmed to behave like a specific RFID tag or system, and can be used to test and validate the behaviour of other RFID readers and systems. To emulate an RFID tag or system, it can be programmed with specific data and commands using a programming language such as Lua and can then transmit this data to other RFID readers and systems, which will interpret it as if it were coming from a real RFID tag.
- **Cloning:** Cloning refers to the process of creating a copy of an existing RFID tag. This can be useful in situations where an RFID tag needs to be replaced or when multiple copies of the same tag are required. The device is placed in “tag emulation mode” and is programmed to behave like the target RFID tag, and then it can be used to read the data from the target RFID tag, and this data can be written onto a blank RFID tag, effectively creating a clone of the original tag.
- **Testing:** It can also be used to test and validate the behaviour of RFID readers and systems. By emulating different types of RFID tags and systems, this module can be used to test the behaviour of RFID readers and systems under different conditions.

**For example**, this module can be programmed to emulate an RFID tag with a weak signal or an RFID system that is operating at a different frequency. This can help to identify potential issues or weaknesses in RFID systems and can be used to optimise their performance.

This RFID Smart Card Chip Reader Emulator developed here is designed with open software and hardware, and is subject to dynamic progression in finding new ideas for professionals of developers, or just a curious hobbyist.

### **A/B button Function:**

- Click the A button to switch the card slot to the right. If the card slot is not enabled, it will automatically skip and switch to the next one.
- Click the B button to switch the card slot to the left, and other features are the same as above.
- In the sleep state, press and hold the B button, insert the data cable, and then release the B button to enter the UPDATE mode.

### **In the implementation plan:**

- Put a card on the Module, and click the A button to quickly copy the card number (standalone)
- Click the button to forcibly acquire time-consuming tasks. For example, when planning to implement HardNested, you can press the button to end the collection of random numbers.

- When connecting to the Module for the first time, you need to press and hold the A button, and then click Connect, otherwise, any API request will be rejected

## RGB Lighting Effect:

### ***Already implemented:***

- System startup animation
- USB wake-up animation
- BTN wake-up animation
- FIELD wake-up animation
- Shutdown animation
- USB plug-in charging and communication animation
- Click the button to switch the animation of the card slot

### **Tip: .**

- *When the colour of the card slot is R, the card slot is enabled with IC simulation + ID simulation at the same time.*
- *When the colour of the card slot is G, the card slot only enables IC card simulation.*
- *When the card slot colour is B, only ID card simulation is enabled for this card slot.*