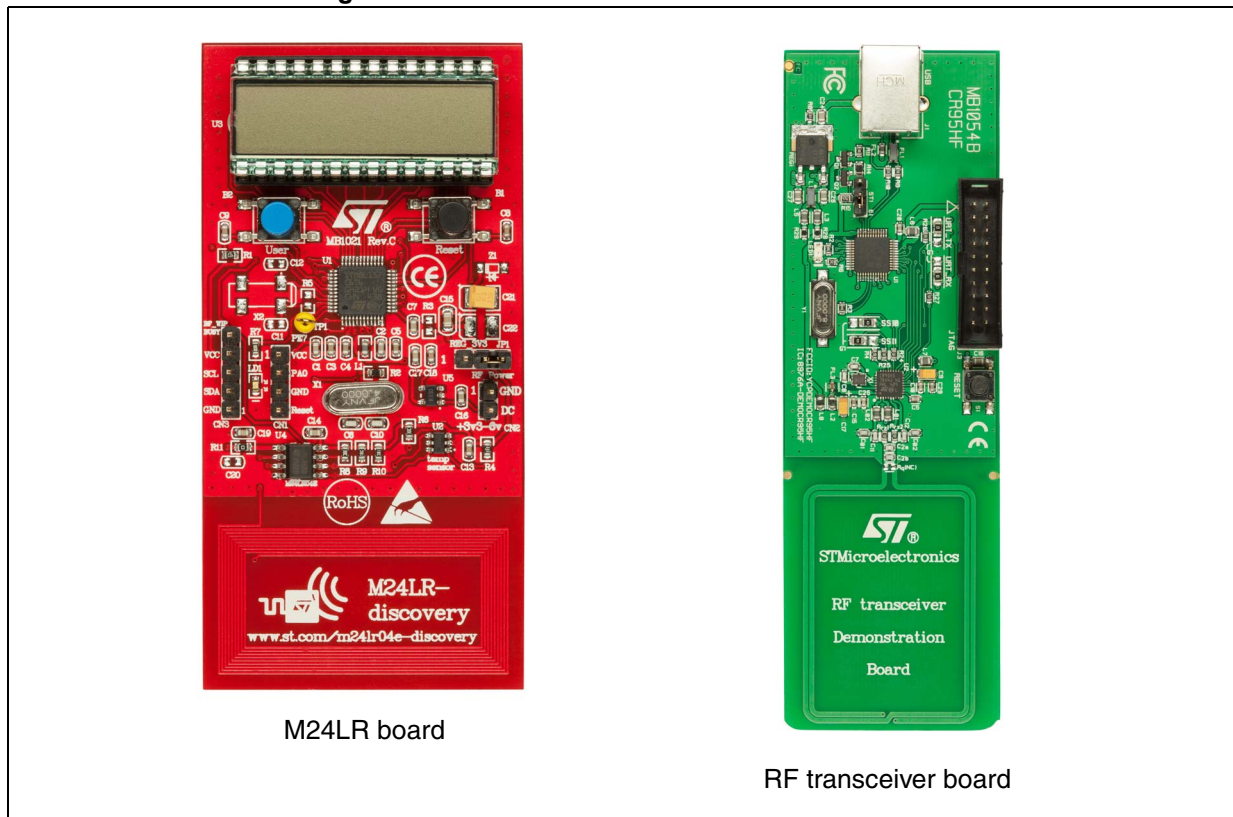


### Features

- M24LR board
  - M24LR04E-RMN6T/2 Dual Interface EEPROM with I<sup>2</sup>C and ISO/IEC 15693 RF interfaces, 4 Kbits of EEPROM and password protection in SO8N package
  - STM8L152C6T6 8-bit microcontroller, with 8 Kbytes of Flash memory
  - STTS751-0WB3F, low-voltage digital temperature sensor
  - 20 x 40 mm inductive antenna etched on the PCB
  - Two function buttons (User and Reset)
- SWIM connector for programming and debugging
- I<sup>2</sup>C connectors
- LCD (24 segments, 4 commons)
- RF transceiver board
  - CR95HF-VMD5T 13.56 MHz multi-protocol contactless transceiver IC with SPI and UART serial access
  - STM32F103CB 32-bit microcontroller, with 128 Kbytes of Flash memory
  - 47 x 34 mm 13.56 MHz inductive antenna etched on PCB and associated circuitry
  - USB connector for communication with host PC and demonstration board powering

Figure 1. M24LR board and RF transceiver board



# 1 Description

M24LR-DISCOVERY is a ready-to-use kit which features the M24LR04E-R Dual Interface EEPROM IC. It addresses a wide range of applications such as industrial or medical equipment and consumer electronics. This kit contains 2 different boards, as shown in the figure on cover page.

The M24LR board is battery-less and is powered by RFID readers or NFC-enabled phones supporting ISO/IEC 15693.

The RF transceiver board is an RFID reader demonstration board and is composed, among other parts, of a CR95HF (13.56 MHz multi-protocol contactless transceiver IC with SPI and UART serial access). This board has to be plugged in to a PC and comes with a demonstration software.

The M24LR board also works with Android NFC phones supporting ISO/IEC 15693. An application called NfcV-Reader is available on Google Play. Performance may vary depending on NFC phone's RF management.

## System requirements

- Windows® PC (2000, XP, Vista, 7)
- ISO/IEC 15693 capable NFC phones

## 1.1 Demonstration software

The M24LRxx application software can be uploaded from [www.st.com](http://www.st.com) and installed on your PC. It consists in:

- an M24LR/CR95 application software setup file [STSW-M24LR011]
- an STM8L firmware, see [STM8L firmware](#)

### 1.1.1 M24LRxx application software

The PC software allows to:

1. Launch *setup.exe* executable.
2. Choose *CR95HF DEMO KIT* tab.
3. Select *demo NDEF messages* tab.
4. Click on *demo NDEF & Energy Harvesting* tab.

The latest versions of this demonstration source code and associated documentation can be downloaded from [www.st.com](http://www.st.com).

### 1.1.2 STM8L firmware

#### Development toolchain

In case of an STM8L firmware change, the user has to download:

- STMicroelectronics, ST Visual Develop (STVD)

### STM8L firmware

Demonstration software is preloaded in the board's Flash memory. This demonstration displays on the LCD:

- The text messages stored in the M24LR04E-R Dual Interface EEPROM
- The internal voltage of the M24LR board
- The ambient temperature measured from the sensor

## 1.2 Android application

Install the NfcV-Reader applet available from Google Play. This application enables the NFC communication (Settings-Wireless & Networks-NFC) for evaluation on an Android device.

1. Download the NfcV-Reader App from Google Play and install it on the Android device.
2. Launch the NfcV-Reader application.
3. Place the device's NFC antenna close to the M24LR board antenna.

The NFC phone powers the M24LR board.

The text message can be changed using the NFC phone (select *NDEF function* and select *write NDEF message* menu).

Performance may vary depending on NFC phone's RF management.

## 2 Revision history

**Table 1. Document revision history**

| Date        | Revision | Changes   |
|-------------|----------|---|
| 17-Jul-2012 | 1        | Initial release.  |
| 11-Mar-2013 | 2        | Updated the first item of the M24LRxx application software in <a href="#">Section 1.1: Demonstration software</a> .<br>Updated the name of the executable file in <a href="#">Section 1.1.1: M24LRxx application software</a> . |
| 30-Mar-2015 | 3        | Updated <a href="#">Figure 1</a> on Cover page.   |

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