

# M24LR-DISCOVERY

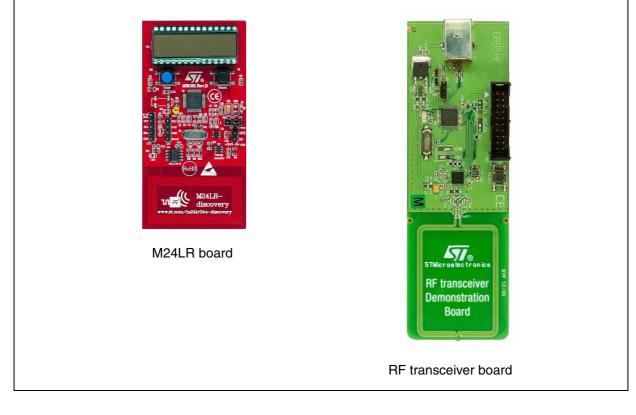
## M24LR-DISCOVERY evaluation kit

#### Data brief

## 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

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## 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 (see *Figure 1*):

- 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/m24lr04e-discovery and installed on your PC. It consists in:

- an M24LR/CR95 application software setup file [STSW-M24LR011]
- an 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/m24lr04e-discovery.

### 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

Date	Revision	Changes
17-Jul-2012	1	Initial release.
11-Mar-2013	2	Updated the first item of the M24LRxx application software in <i>Section 1.1: Demonstration software</i> . Updated the name of the executable file in <i>Section 1.1.1: M24LRxx application software</i> .

#### Table 1. Document revision history



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