UM0850
User manual

Using your DEMOKIT-M24LR-A demonstration kit with your STM32-PRIMER2

Introduction

The DEMOKIT-M24LR-A is an evaluation tool that contains:

- a reference antenna with an M24LR64-R EEPROM device soldered on it
- an RF reader that can be used to send RF commands (ISO 15693) to the M24LR64-R with the *M24LRxx_Application_Software*

Please read UM0863 (M24LR64-R tool driver install guide) and UM0853 (M24LR64-R tool kit user guide) in conjunction with this user manual.

You can order an STM32-PRIMER2 (not included in the DEMOKIT-M24LR-A demonstration kit) to play the M24LR64-R demonstration. This user manual explains how to upload the STM32-PRIMER2 application software and how to play with it.

Contents

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1 Demonstration kit contents

The part number of the demonstration kit for the M24LR64-R dual-interface EEPROM is: DEMOKIT-M24LR-A.

The demonstration kit contains:

- an RF reader (see *Figure 1*)
- a reference antenna (see *Figure 2*)
- optionally, the STM32-PRIMER2, to be ordered separately (see *Figure 3*)

Figure 1. RF reader (ISO 15693, RF 13.56 MHz)

1. OBID® - RFID by FEIG ELECTRONIC (see *www.obid.eu* and *www.feig.de*)

Figure 2. Reference antenna: PRIM2-M24LR-A

Figure 3. STM32-PRIMER2 (optional, to be ordered separately)

1. The STM32-PRIMER2 is a product assembled and produced by the Raisonance company. Should you have any trouble using it, please refer to the Raisonance website (*www.raisonance.com*) or the STM32-PRIMER website (*www.stm32circle.com*).

2 Installing the software for your RF reader

You first have to install the software for the RF reader you are going to use.

This installation procedure is detailed in the software install guide. Please refer to the UM0863: “M24LR64-R tool driver install guide” for the installation process, and to UM0853: “M24LR64-R tool kit user guide” for details on how to use it.

3 Installing the software for your STM32-PRIMER2

You then have to install the STM32-PRIMER2 software and tools (Ride7), and the associated drivers (STM32-PRIMER2 USB driver) to be able to upload the Dual EE application to the STM32-PRIMER2 and execute it.

Please refer to the STM32-PRIMER2 CD-ROM or the *www.stm32circle.com* website for details on how to install the STM32-PRIMER2 and associated drivers.

4 Configuring your STM32-PRIMER2

For specific details, it is recommended to refer to the STM32-PRIMER2 user manual available from the Raisonance website, at the following address: *http://www.stm32circle.com/resources/stm32primer2.php*.

4.1 Getting started

4.1.1 Preparing the STM32-PRIMER2

The STM32-PRIMER2 is initially shipped with the battery disconnected and a basic firmware.

You first need to connect the on-board battery and charge it. *Figure 4* shows where to connect the battery in the STM32-PRIMER2.
To charge the battery, connect an USB cable onto the <debug> usb port of your STM32-PRIMER2 as shown in *Figure 5*.

Figure 4. Connecting the battery

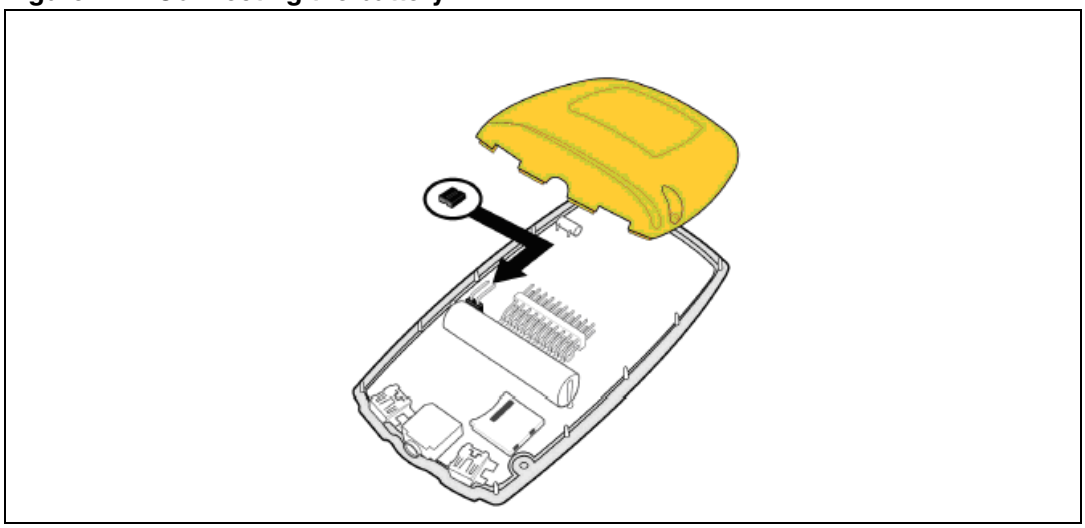
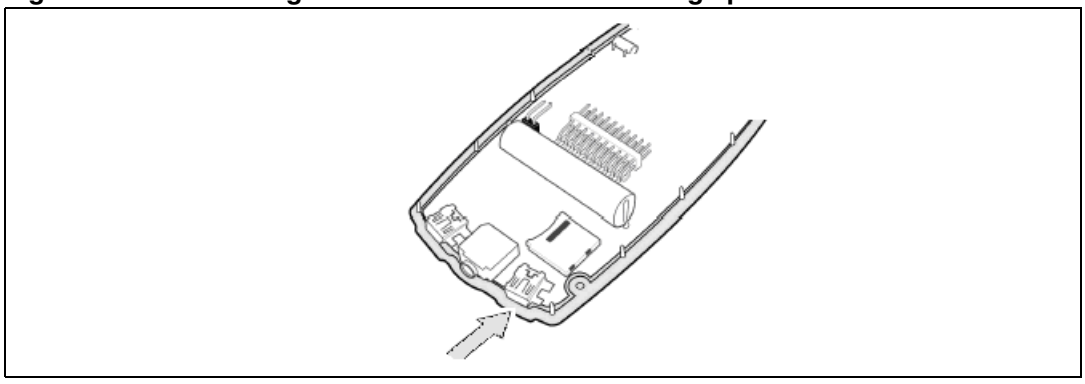


Figure 5. Connecting the USB cable onto the <debug> port



4.1.2 Power-up

If the battery charge is low, make sure that the USB cable is plugged in. This will charge the battery and supply the STM32-PRIMER2. Then press on the joystick to power up the STM32-PRIMER2 firmware.

Upload the “Duall EE” embedded application onto your STM32-PRIMER2.

Important: *To be able to execute this upload, you first have to install the STM32-PRIMER2 software and tools (Ride7), and the drivers (STM32-PRIMER2 USB driver).*
Please refer to the STM32-PRIMER2 CD-ROM or the www.stm32circle.com website.

Upload procedure

1. **Step1:** Connect the STM32-PRIMER2 to the computer through the <debug> USB port.

Figure 6. Location of the <debug> USB port on the STM32-PRIMER2

2. **Step2:** Upgrade your STM32-PRIMER2 Circle OS

   This step is mandatory only if the revision of the Circle OS installed on your STM32-PRIMER2 is lower than 3.8.

Caution: Carrying out this step will reset your STM32-PRIMER2 (that is erase its memory) and reinstall the Circle OS. This means that all previously installed embedded applications will need to be reinstalled.

Performing this step may therefore also be useful if you need to reinitialize the contents of your STM32-PRIMER2.

To reset your STM32-PRIMER2, double-click on *Program_Primer_CircleOS_only.bat* as shown in *Figure 9* (with the <debug> USB port connected to your computer).

Figure 7. Bat file for resetting your STM32-PRIMER2 firmware

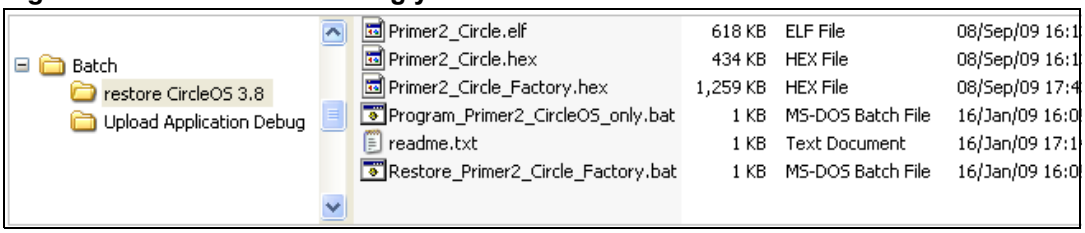
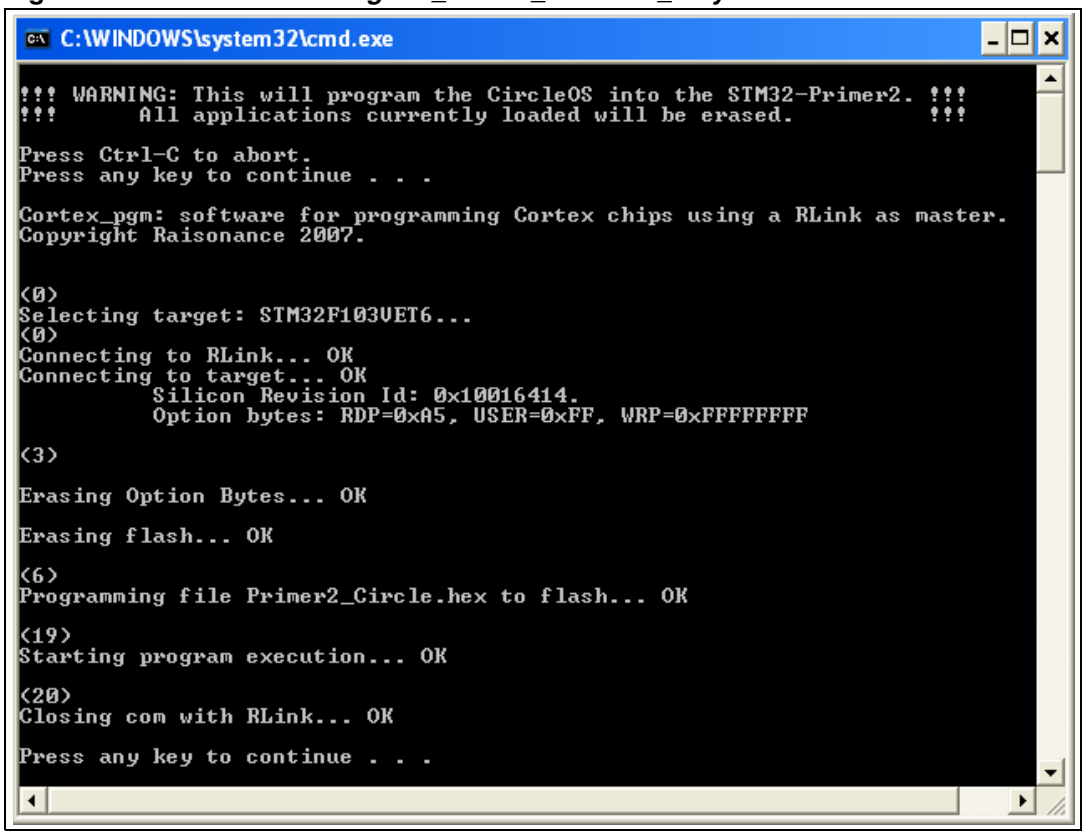


Figure 8. Execution of *Program_Primer_CircleOS_only.bat*



For later revisions, please connect to the Raisonance website and download appropriate tools (*http://www.stm32circle.com/*).

3. **Step3:** Upload the Dual EE application to your STM32-PRIMER2

Note: To run the Duall EE application on your STM32-PRIMER2, you need to have Circle OS revision 3.8 or later, installed. If the OS revision is lower than 3.8, please refer to the instructions in Step2: Upgrade your STM32-PRIMER2 Circle OS to install a suitable Circle OS revision.

To upload the Dual EE embedded application to your STM32-PRIMER2, all you need to do is double-click on the *add_to_Circle.bat* script (see Figure 9).

Note: The upload process will not erase any of the embedded applications already present in your STM32-PRIMER.

Figure 9. Bat file for uploading the Dual EE application to your STM32-PRIMER2

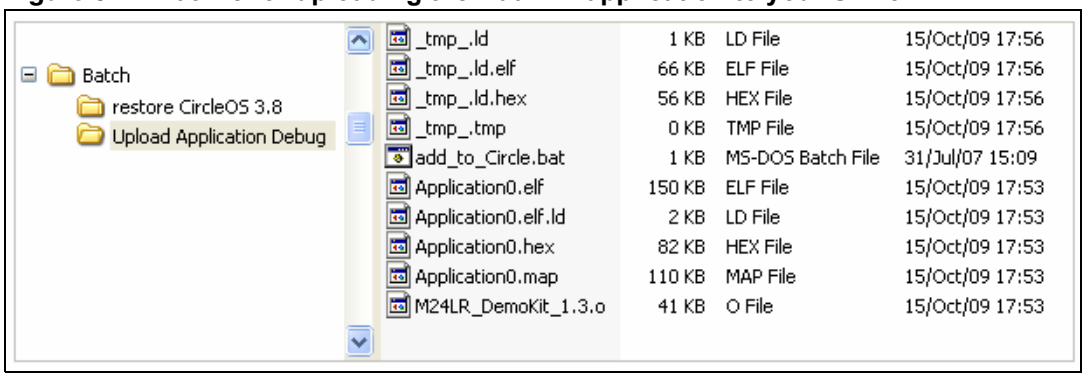
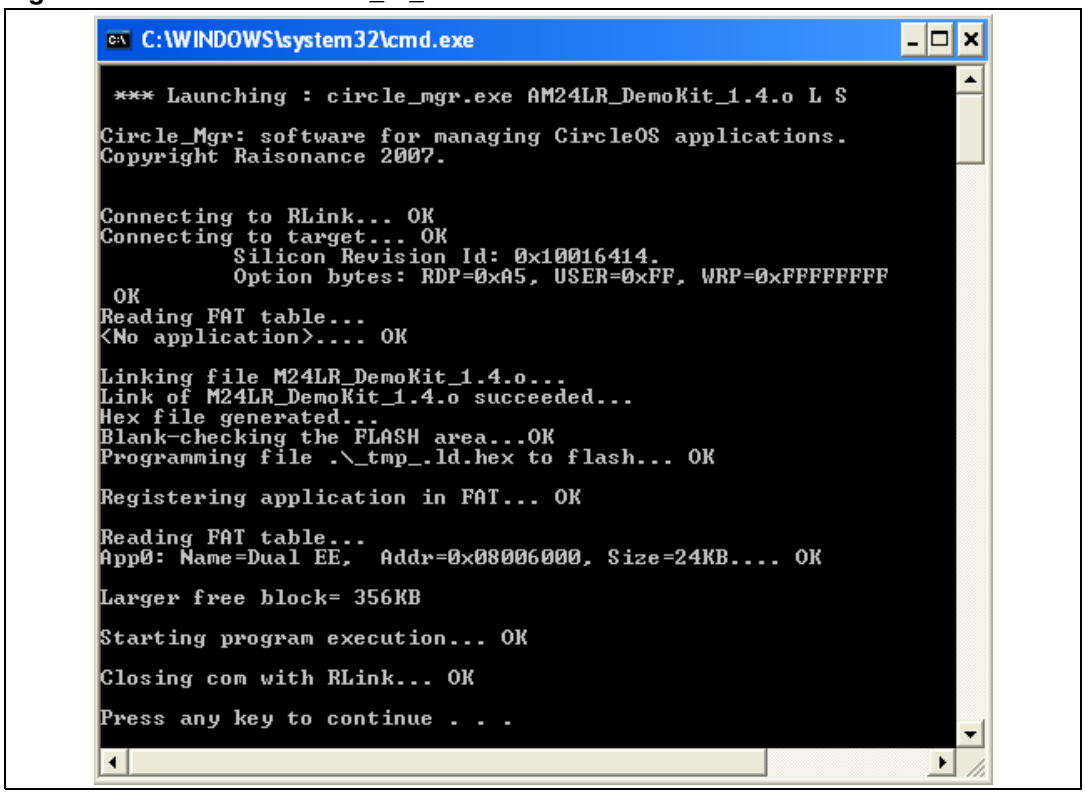


Figure 10. Execution of *add_to_Circle.bat*

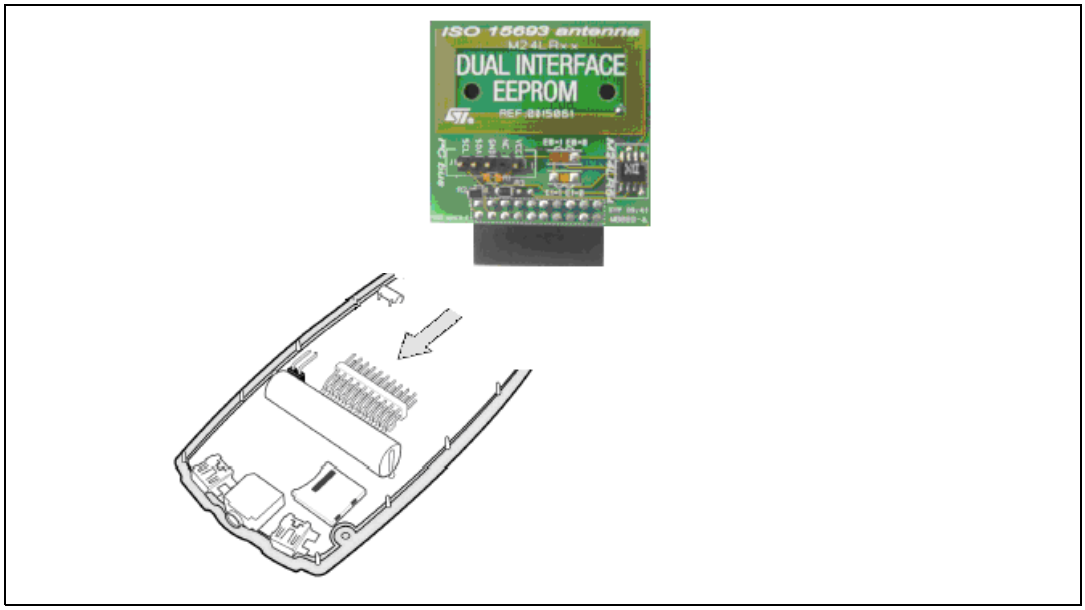


5 Using the demonstration kit application

5.1 Inserting the PRIM2-M24LR-A reference antenna

Insert the reference antenna into the STM32-PRIMER2.

Figure 11. Plugging the reference antenna (PRIM2-M24LR-A) into your STM32-PRIMER2



5.2 Playing the demonstration kit of the dual-interface EEPROM

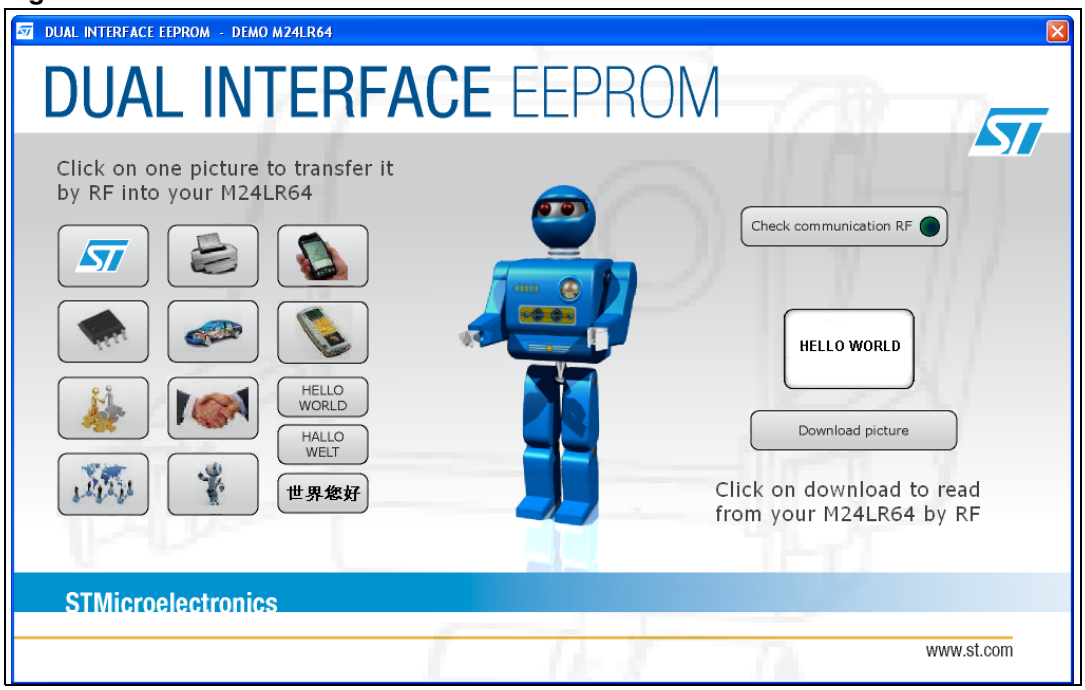
Note: With the RF interface, use the RF reader. With the I²C interface, use STM32-PRIMER2.

The RF reader is included in the DEMOKIT-M24LR-A demonstration kit. You can use it to upload data into the M24LR64-R EEPROM soldered on the reference antenna. With it, you can also read the EEPROM contents.

After installing the *M24LRxx_Application_Software* (please refer to UM0863: “M24LR64-R tool driver install guide”), you will be able to play with the M24LR64-R EEPROM.

With the *M24LRxx_Application_Software* you can manage the RF interface and send read and write commands to the M24LR64-R EEPROM. The DEMOKIT-M24LR-A’s user interface shown in *Figure 12* can be used to upload pictures by RF to the reference antenna:

Figure 12. Dual interface EEPROM interface



- Click on an image or a text to upload it by RF into the M24LR64-R (RF write operation) (see *Figure 13*)

Figure 13. Picture or text to be uploaded

- Click on the “Download picture” button to read data from the M24LR64-R by RF (RF read operation) (see *Figure 14*)

Figure 14. Picture or text to be downloaded

If a reference antenna is plugged in an STM32-PRIMER2, you can display the uploaded pictures by playing with the Dual EE application installed on the STM32-PRIMER2.

Press on the Joystick to power up the STM32-PRIMER2. The opening screen appears (see *Figure 15*). Press again on the Joystick to call the main menu.

Figure 15. STM32-PRIMER2's opening screen

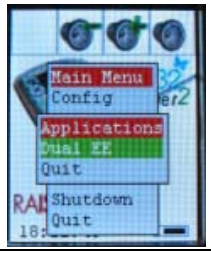
To select the M24LR64-R's demonstration kit application (Dual EE):

- Press the Joystick to recall the main menu (see *Figure 16*).
- Press the Joystick once more to select "Applic." (see *Figure 17*).

Figure 16. STM32-PRIMER2's main menu

- Select "***Dual EE***" in the list of applications.

Figure 17. STM32-PRIMER2's applications



The following text appears on the screen, as shown in *Figure 18*:

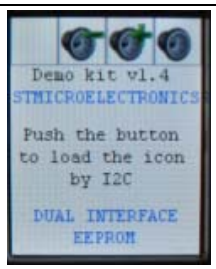
Demo Kit version 1.4

STMICROELECTRONICS

Dual Interface EEPROM

The instruction to press the button to load the picture by I²C

Figure 18. Dual EE's application details



Playing with the Dual EE application

Each time you press the joystick the demonstration process is launched:

1. The microcontroller configures the I^2C port in order to communicate with the M24LR64-R EEPROM soldered on the reference antenna.
2. The microcontroller reads the content of the M24LR64-R EEPROM through the I^2C interface.
3. Depending on the data read, the microcontroller displays the contents of the M24LR64-R EEPROM on the LCD.
4. Each time the joystick is pressed, the same process takes place, the EEPROM is read through the I^2C, and the picture is displayed on the LCD as shown below.

Figure 19. HELLO WORLD displayed on the LCD

Change the contents of the EEPROM with the demo user interface commands of the *M24LRxx_Application_Software*.

Shutting down the STM32-PRIMER2

Press the joystick for several seconds to shut down the STM32-PRIMER2. *Figure 20* shows the shutdown screen.

Figure 20. STM32-PRIMER2 is shutting down

Additional information

1. Do not forget to charge the battery by connecting the <debug> USB port of the STM32-PRIMER2 to your computer. This will charge the embedded battery.
2. You can improve the use of the STM32-PRIMER2 by disabling the use of MEMs as well as the loudspeaker.

If you are using the Joystick to control the application you will find it easier to use the STM32-PRIMER2 (however you will not be able to control the internal movement detector: the MEMs). To disable the MEMS and avoid mis-decoding MEM detections, do the following:

a) select “Config” in the menu (*Figure 21*)

b) select “Interface” as shown in (*Figure 22*)

c) select “User Input” (*Figure 23*)

d) select “JOYSTICK” *Figure 24*)

Figure 21. STM32-PRIMER2’s Config menu

Figure 22. STM32-PRIMER2’s Configuration > Interface menu

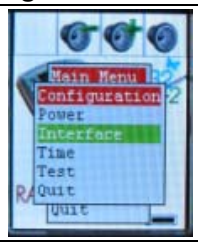


Figure 23. STM32-PRIMER2’s Configuration > Interface > User Input menu

Figure 24. STM32-PRIMER2’s Configuration > Interface > User Input > JOYSTICK

You can also disable the sound by doing as follows:

a) select “config” in the menu as shown in *Figure 21*
b) select “Interface” as shown in *Figure 22*
c) select “Loudspeaker” (*Figure 25*)
d) select “No” as shown in *Figure 26*

Figure 25. STM32-PRIMER2’s Configuration > Interface > Loudspeaker menu

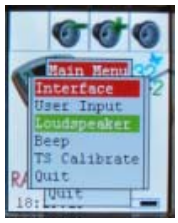
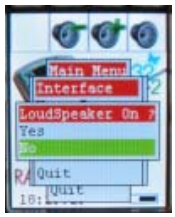


Figure 26. STM32-PRIMER2’s Configuration > Interface > Loudspeaker > No



6 Schematics

Figure 27. Interconnection between the PRIM2-M24LR-A antenna and STM32-PRIMER2

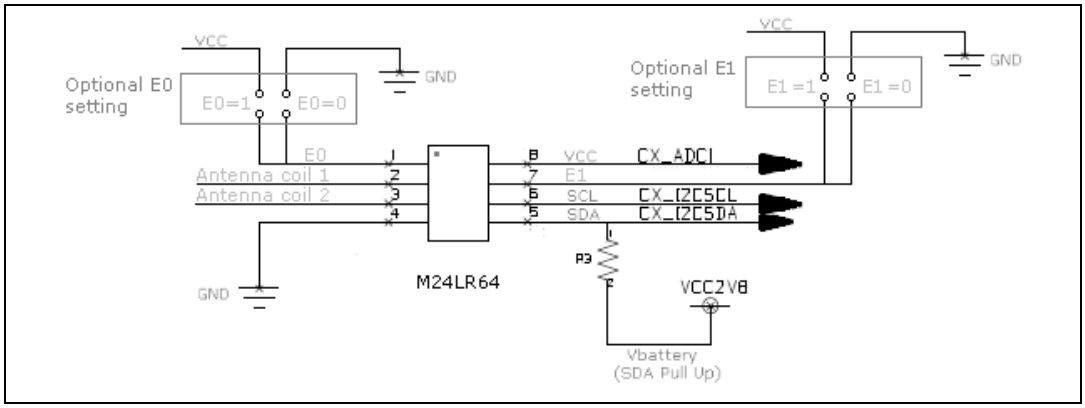


Figure 28. PRIM2-M24LR-A antenna

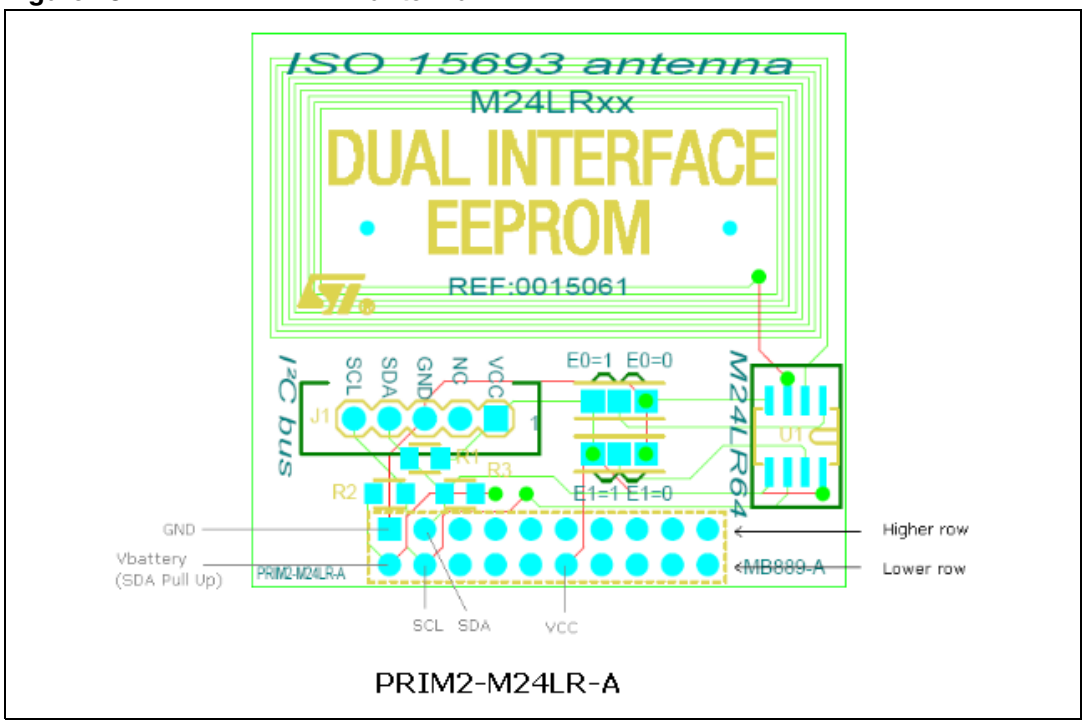
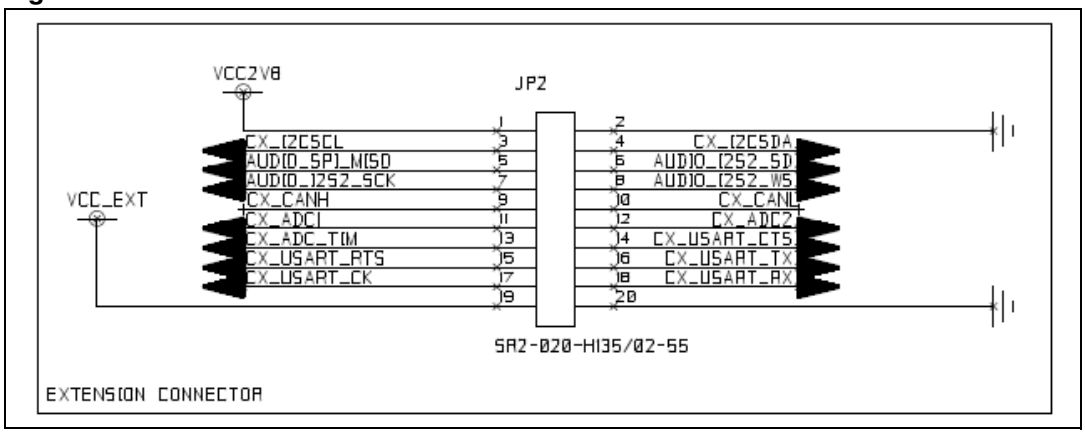


Figure 29. STM32-PRIMER2's external connector



7 Revision history

Table 1. Document revision history

Date	Revision	Changes
28-Jan-2010	1	Initial release.

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