

UM0693 User manual

STM8L101-EVAL demonstration firmware

1 Introduction

This document describes the demonstration firmware running on the STM8L101-EVAL evaluation board. You can use it to evaluate the capabilities of the microcontroller and the on-board peripherals.

The evaluation board is delivered with the demonstration firmware stored in the Flash program memory of the microcontroller.

The firmware is based on the STM8L10x_StdPeriph_Lib firmware library, and provides an example of how to use this library. It is divided into various smaller demonstration applications (demos).

In case the evaluation board is not factory-programmed or the demonstration application has been erased, you can reprogram the demonstration firmware into the STM8L10x Flash memory by referring to stm8l10x-eval_fw_um.chm file available in the STM8L1x-EVAL_FW package.

For more information about the evaluation board itself, please read the evaluation board user manual.

Note:

To run the demonstration firmware, JP10 jumper must be installed on the STM8L101-EVAL evaluation board.

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UM0693 User interface

User interface 2

2.1 Menu structure

The demonstration firmware user interface is based on a circular navigation menu, with submenus, item selection and back capability.

Figure 1 shows the menu system of the demonstration. The top row of items represents the main menu.

Figure 1. Menu structure and navigation WELCOME MESSAGE SEL Left/Right Left / Right Left / Right ITEM 1 ITEM 2 ITEM 3 ITEM n SEL SEL SEI dN 3 dN ITEM ITEM ITEM ITEM 1.2 1.n 2.1 2.2 2.n SEL SEL SEL SEL SEL SEL

2.2 **Documentation conventions**

In this document, the keywords in bold indicate user actions on the joystick (5-way switch), and on the KEY button (1-way switch). They follow the conventions shown in Table 1.

Keyword	User action
LEFT	Press joystick to the left
RIGHT	Press joystick to the right
UP	Press joystick up
DOWN	Press joystick down
SEL	Press joystick center
KEY	Press KEY button

Table 1. **Documentation conventions**

User interface UM0693

2.3 Navigating menus and sub-menus

To navigate the menus and sub-menus, perform the following actions as required:

RIGHT: Navigates to the next menu or sub-menu items on the right.

LEFT: Navigates to the next menu or sub-menu items on the left.

SEL: Enters sub-menu.

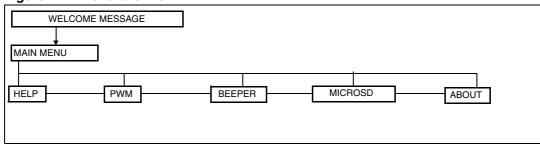
UP: Exits from a sub-menu.

3 Demonstration applications

3.1 Menu overview

The *Figure 2* shows all the menu and submenus of the demonstration applications.

Figure 2. Menu overview

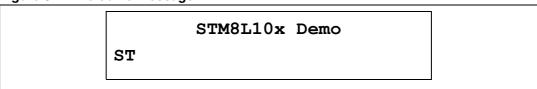


The following sections provide a detailed description of each part of the demonstration firmware.

3.2 Welcome screen and main menu

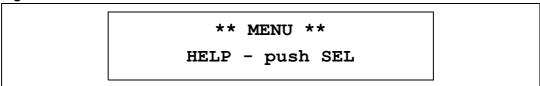
After a board RESET, a welcome message is displayed on the first line, the ST logo is displayed moving on the second line and a melody is played (see *Figure 3*). The introduction melody can be changed by using the PWM demo (see *Section 3.4*).

Figure 3. Welcome message



Once the melody is played, the main menu is activated and the message shown in *Figure 4* is displayed:

Figure 4. Main menu



Note: Pressing the joystick in any direction (for around 1 second) ends the melody.

3.3 Help mode

Pressing **SEL** from the main menu enters the *Help* mode. The following messages are displayed sequentially on the LCD screen with a few second delay:

Figure 5. Help mode submenus

LEFT or RIGHT
to scroll menu

Press SEL to
enter sub-menu

Move UP to
exit sub-menu

To exit this demo, press the joystick UP.

3.4 PWM demo

Note:

This mode demonstrates the Timer peripheral operating in PWM mode. Make sure that the JP9 jumper is installed in the PSW position.

This demo is used to select and play one melody among a selection stored in the Flash memory (see *Figure 6*):

 Navigate between the melodies by pressing the joystick LEFT or RIGHT, and press SEL to select and play the melody (see Figure 6)

Figure 6. Selecting a melody

Select Melody Bon Tabac

2. The first time **UP** is pressed, the melody is stopped.

Keep the joystick pressed UP for a short time to allow the action to be taken into account.

3. If you press **UP**, you exit from the demo.

LEFT/RIGHT: Press the joystick LEFT or RIGHT to navigate the melodies.

SEL: Press SEL to select a melody and play it.

3.5 BEEPER demo

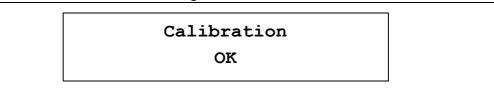
This mode demonstrates the 3 different frequencies that can be output on the BEEP pin. Prior to running the BEEPER demo,

- Install the JP9 jumper in the Beep position.
- Exit the Debug session since the BEEPER demo can be run only in standalone mode.

When this mode is entered, the LSI clock is calibrated by TIM2.

The message shown in *Figure 7* is displayed at the end of calibration:

Figure 7. End of calibration message



After a short time, another message shows the current output frequency.

Press the **KEY** button repeatedly to change the frequency in this order:

1 kHz

2 kHz

4 kHz

1-2-4 kHz

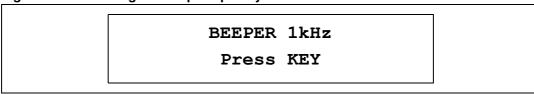
OFF

1 kHz etc...

The frequency selected is displayed on the LCD screen (see Figure 8)

The LEDs also change depending on the selected frequency.

Figure 8. Selecting the beep frequency



UP: Press the joystick **UP** to exit the demo.

KEY: Press the **KEY** button to change the beeper frequency.

3.6 MICROSD demo

This mode demonstrates the basic operation of the MicroSD card interface.

- 1. When this mode is entered, a MicroSD card must be inserted in the slot.
 - The message shown in Figure 9 is displayed on the LCD screen:

Figure 9. No card found

Insert MicroSD Press KEY Button **UM0693**

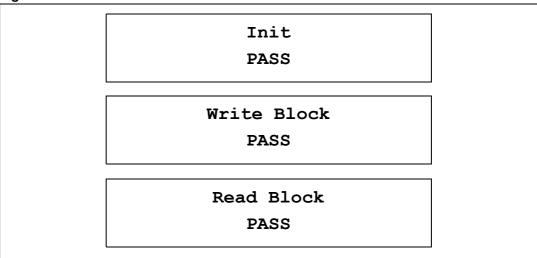
When a MicroSD card is detected, another message is displayed (see Figure 10):

Figure 10. Card detected

MicroSD card Start Operation

 Then the MicroSD card is initialized, followed by a Write block (512 bytes) and a Read block operation. See *Figure 11* for the messages displayed consecutively on the LCD screen:

Figure 11. MicroSD card initialization



3. When this phase is complete, the message shown in *Figure 12* is displayed.

By pressing the joystick to **LEFT** or **RIGHT**, the MicroSD card is read, and the string 'DEMO MICROSD' is displayed on the LCD screen, one character at a time.

Figure 12. Reading 512 bytes from the MicroSD card

LEFT or RIGHT to see data

Addr: 0x00 Character: D

3.7 About menu

This menu shows the firmware version. When this submenu is selected the message shown in *Figure 13* is displayed on the LCD screen:

Figure 13. Displaying the demonstration firmware version

STM8L101-EVAL Version x.y.z

UP: Press the joystick **UP** to exit this menu.

4 STM8L10x peripherals used

The following table lists the STM8L10x peripherals used in each demo:

Table 2. Peripherals used

Peripheral	Demo
GPIO	All demos (buttons, LEDs)
Clock Controller	All demos
BEEPER	Beeper demo
SPI	All demos (LCD + MicroSD)
TIM2	LSI Calibration
TIM3	PWM demos (Buzzer)
TIM4	All demos (time base)

5 Demo firmware architecture

This section describes the demo firmware architecture. It is divided into two parts:

- **Library**: contains the firmware library source files. These files do not need to be modified by the user.
- Application: contains the specific files of the demonstration firmware that can be modified:
 - stm8l10x_conf.h: this header file is used to configure the library
 - stm8l10x_it.h: header for the stm8l10x_it.c file
 - stm8l10x_it.c: this file provides all the interrupt sub-routines
 - stm8_interrupt_vector.c: this file provides the interrupt vector table
 - demo_xxx.h: header for the demo_xxx.c file
 - demo_xxx.c: this file provides all functions related to the xxx demo
 - functions.h: header for the functions.c file
 - functions.c: this file provides miscellaneous functions.
 - joystick_button.h: header for the joystick_button.c file
 - joystick_button.c: this file provides all functions related to the management of the joystick and button
 - mono_lcd.h: header for the mono_lcd.c file
 - mono_lcd.c: this file provides LCD management functions
 - main.h: header for the main.c file
 - main.c: this file provides the main function
 - menu.h: header for the menu.c file
 - menu.c: this file provides menu functions and menu definition

Revision history UM0693

6 Revision history

Table 3. Document revision history

Date	Revision	Changes
17-Apr-2009	1	Initial release.

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