

LPC54S018M-EVK Out Of the Box Demo User Guide



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Chapter 1

Overview

This Guide walks you how to run the LPC54S018M-EVK Out Of the Box demo Including a brief description of each individual test and step-by-step guide of how to import and debug the project using MCUXpresso IDE.

Chapter 2

Requirements

2.1 Hardware requirements

- LPC54S018M-EVK
- Micro USB cables
- SD Card
- RK043FN02H-CT: 4.3" LCD Panel (for LCD test)
- USB Mouse (for USB host test)
- Speakers or headphones with 3.5 mm stereo jack (for codec test)
- Ether cable (for Ethernet test)

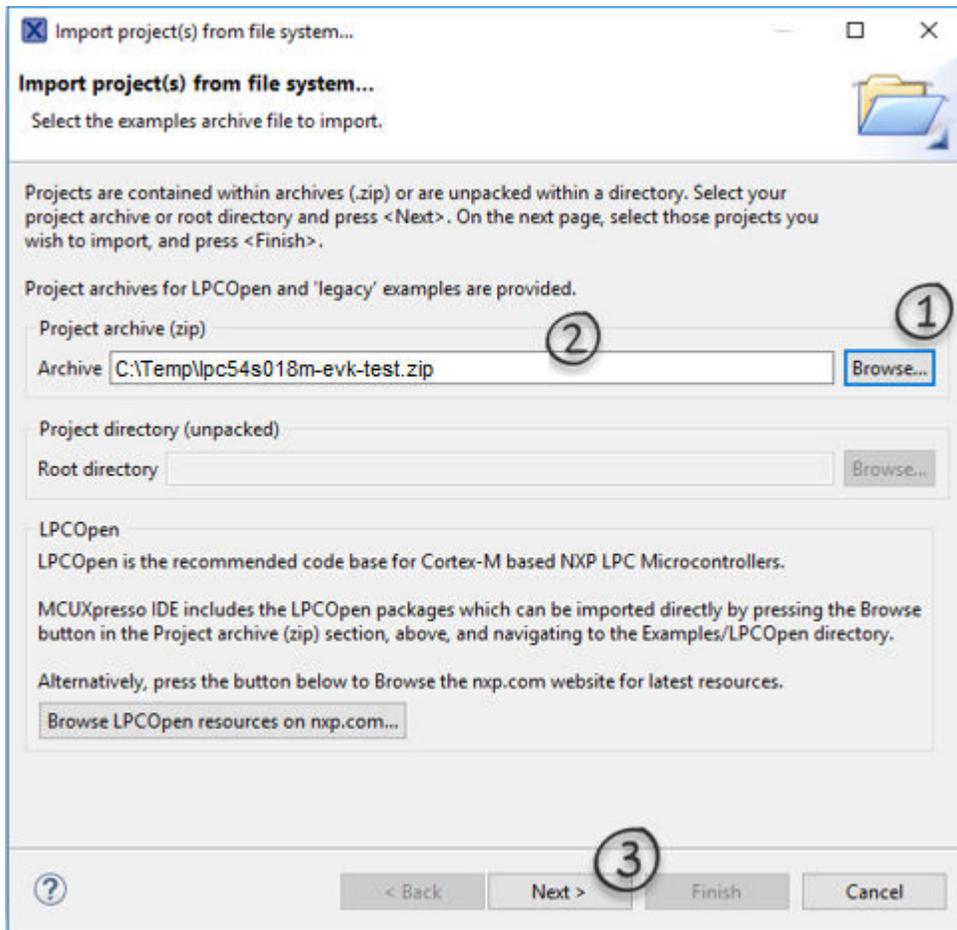
2.2 Software requirements

- MCUXpresso IDE
- LPCXpresso54S018M SDK
- Out Of the Box software package

Chapter 3

Importing and debugging project in MCUXpresso IDE

1. Open MCUXpresso IDE and choose your preferred workspace.
2. Find the Quickstart Panel in the lower left-hand corner, then click Project(s) from file system...
3. Click browse, select the project, and click Next.



4. Click Finish.
5. Once you have the project in your workspace, select it and click build.



6. Connect the board through J8 (debug link) and click debug.

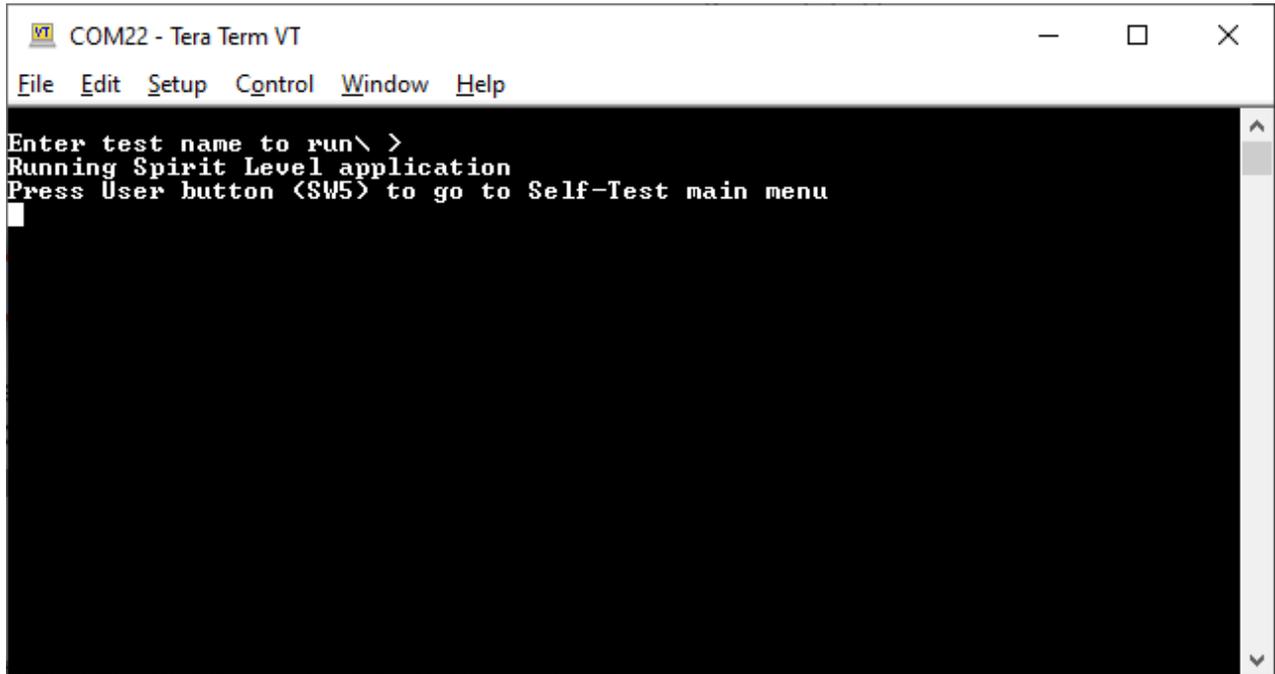


7. Open a terminal program and connect to the COM port the board enumerated as. Configure the terminal with these settings:
 - 115200 baud rate
 - No parity

- 8 data bits
 - 1 stop bit
8. Start the application by clicking the Resume button.



9. The application starts and the start menu prints to the terminal.



```
COM22 - Tera Term VT
File Edit Setup Control Window Help
Enter test name to run\ >
Running Spirit Level application
Press User button <SW5> to go to Self-Test main menu
█
```

Chapter 4

Project Overview

The project includes a Spirit level application and an on-board diagnostic software (self-test). The Spirit level star just after starting the debug or power on the board. The user LEDs (LED1, LED2, and LED3) indicate if the board is level along the horizontal axis of the board. Tilt the board towards or away from you to see the LEDs change. To start the diagnostic self-test, press the user button SW5.

4.1 Self-test application

The self-test application works through a command-line interpreter. Once start, it displays a list of the tests included in the terminal, following you could find a list of the tests:

- level: Spirit level test (accelerometer running at the start)
- SDRAM: test the on-board SDRAM
- SDCARD: test the SD card
- lcd: test the LCD and touch controller
- led: test the ISP buttons and users LEDs.
- ether: test the ethernet PHY
- spifi: test the QSPI/SPIFI
- usb: test the usb as host on HS
- audio: test the audio lines and codec as well as USB device on FS
- rtc: test the RTC

You can access to this menu by pressing the command “h” followed by an enter. You can find a brief description of each test and their necessary settings in the following sections.

4.1.1 SDRAM test

This test will initialize the External Memory Controller (EMC) and write some data to the SDRAM, and later read the same address to compare if the write and read connect match.

Settings: JP14 and JP15 in SD position (2-3).

Results:

SDRAM Write Data and Read Data TEST PASSED (write/read data match)

DRAM Write Data and Read Data TEST FAIL, this could be caused by:

- write/read data do not match
- Data bus check fail

```
Enter test name to run\ >sdram
SDRAM Test starting...

JP14 and JP15 must be in SD position <JP14 1-2, JP15 2-3> to pass

SDRAM Write Start, Start Address 0xa0000000, Data Length 2097152 ?
SDRAM Write finished
SDRAM Read/Check Start, Start Address 0xa0000000, Data Length 2097152 ?

SDRAM Write Data and Read Data TEST PASSED.

SDRAM test complete.
```

4.1.2 SD CARD test

This test will write some data into a SD card, and later read it to verify if the write/read content match.

Settings: No special settings required, just insert a SD card in J7.

Results:

TEST PASSED (write/read data match)

TEST FAIL could be caused by:

- write/read data do not match
- SD card detect failed
- SD host init failed
- SD card init failed

```
Enter test name to run\ >sdcard
LPC54018 SDCARD test
Please insert an SD card into the board.
Card inserted.
Card size 15523840 * 512 bytes

Working condition:

Voltage : 3.30

Timing mode: High Speed

Freq : 48000000 HZ

Write/read one data block.....
Compare the read/write content.....
The read/write content is consistent.
Write/read multiple data blocks.....
Compare the read/write content.....
The read/write content is consistent.
Erase multiple data blocks.....
TEST PASSED.
```

4.1.3 LCD test

The test will display in the LCD a color bar pattern and a cursor that will follow the touch position.

Settings: JP4 and JP5 should be in SD position (2-3). RK043FN02H-CT: 4.3" LCD Panel required.

Results: The test will show the image in the screen for an identified time until the user press SW5.

TEST FAIL could be caused by:

- LCD init failed
- I2C init failed
- Touch panel init failed

```
Enter test name to run\ >lcd
LCD touch panel test

LCD will display color bar test pattern and cursor.
Ensure JP14 and JP15 are in the SD position; restart test if this is not the case.
Press User button to exit test.
```

4.1.4 LED test

The test will flash the in-board LEDs while its respective ISP button is held down: press ISP2 for LED1, ISP1 for LED2, and SPI0 for LED3.

Settings: No special settings required.

Results: You should see the LEDs toggling; the test will run indefinitely until press SW5.

```
Enter test name to run\ >led
LPC54018 LEDs & Buttons Test
LEDs will flash on and off while a button is held down:
Press ISP2 for LED1, ISP1 for LED2, ISP0 for LED3.
Press User button to end test and go to Self-Test main menu
```

4.1.5 Ethernet test

The test will transmit 20 number broadcast frame and print the number of received frames. To avoid the received number overflow, the transmit/receive loop will automatically break when 20 numbers are received.

Settings: JP11-12-13 in Ethernet position (1-2) and JP4-5 in EN position (1-2).

Results: You should see the package transmit and receive success in the terminal.

TEST FAIL could be caused by:

- Memory allocation failed
- PHY init failed
- Link down (There is no connection)
- The PHY link down

```

Enter test name to run\ >ether
LPC54x018x Ethernet Test
Make sure Jumpers JP11-12-13 are set to 1-2
also JP15 set in position 1-2 <EN> and JP14 in position 1-2 <EN>

Insert the Ethernet Cable into the target board's RJ45
port and connect it to a router
The test first transmit 20 packets and then wait to receive packets

Press User button to end test and go to Self-Test main menu

Transmission start now!
The 1-th frame transmitted success!
The 2-th frame transmitted success!
The 3-th frame transmitted success!
The 4-th frame transmitted success!
The 5-th frame transmitted success!
The 6-th frame transmitted success!
The 7-th frame transmitted success!
The 8-th frame transmitted success!
The 9-th frame transmitted success!
The 10-th frame transmitted success!
The 11-th frame transmitted success!
The 12-th frame transmitted success!
The 13-th frame transmitted success!
The 14-th frame transmitted success!
The 15-th frame transmitted success!
The 16-th frame transmitted success!
The 17-th frame transmitted success!
The 18-th frame transmitted success!
The 19-th frame transmitted success!
The 20-th frame transmitted success!
One frame received. the length 220
Dest Address ff:ff:ff:ff:ff:ff Src Address 80:7d:3a:48:ad:3f
One frame received. the length 220
Dest Address ff:ff:ff:ff:ff:ff Src Address b4:e6:2d:42:33:63
One frame received. the length 219
Dest Address ff:ff:ff:ff:ff:ff Src Address 50:d4:f7:6a:e2:c8

```

4.1.6 QSPI/SPIFI test

The test will program the external serial flash using polling and after read through AHB bus to compare if the write/read data match.

Settings: No special settings required.

Results:

SPIFI test succeeded if all the data match.

SPIFI test failed if no data match.

```

Enter test name to run\ >spifi
SPIFI flash polling example started
All data written is correct!
SPIFI test finished successfully

```

4.1.7 USB host test

The test will support the mouse device. It prints the mouse operation when the mouse device is attached.

Settings: JP9 1-2, JP11-12-13 in USB position (2-3), power from JP1 and a USB mouse connected to J2.

Results:

The test will display mouse operation information prints in the terminal when you operate the mouse, the test will run indefinitely until press SW5.

```
Enter test name to run\ >usb
LPC54S018M USB (HS) Host Test
Make sure Jumper JP9 is set to 1-2
Make sure Jumpers JP11-12-13 are set to 2-3
Connect a USB mouse to HS USB connector (J2)
and USB power connected to USB +5U connector (J1)
Mouse connection status, coordinates and buttons will be reported.

Press User button to end test and go to Self-Test main menu

host init done, the host stack version is 2.0.1.

hid mouse attached:pid=0x2510 vid=0x99a address=1
mouse attached
Wheel DownLeft Click
Right UP
```

4.1.8 Audio test

The test will be enumerated by the host as an audio device and user can play audio from the host using any media player, the audio should be played on the headphone connected.

Settings: JP9 1-2, JP11-12-13 in USB position (2-3), power from JP1, and connect the board to J3. Also, you should connect an output device as speaker or headphone in the line out (J6) and a MIC in the line in (J5).

Results: The audio will be played from the line in (mic) to the line out (Headphone or speaker). The test will run indefinitely until press SW5.

```
Enter test name to run\ >audio
LPC54S018M full speed USB Device Audio Test
Connect a PC to USB FS USB connector (J3)
Connect Speaker to Line Out and Mic to Line In
Board will enumerate as an audio input/output device on host computer

Press User button to end test and go to Self-Test main menu
```

4.1.9 RTC test

The test will set up the RTC hardware block to trigger an alarm after a user specified time period. The test will set the current date and time to a predefined value. The alarm will be set with reference to this predefined date and time.

Settings: No special settings required.

Results: The actual date will be displayed and the user could select the time to wait for the alarm.

```
Enter test name to run\ >rtc
LPC54018 RTC Test
Please input the number of second to wait for alarm
The second must be positive value
5
Alarm will occur at: 2014-12-25 19:00:18

Alarm occurs !!!!!
```

Chapter 5

Revision History

This table summarizes the changes made to this document since the initial release.

Rev	Date	Description
0	10/2020	Initial release

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