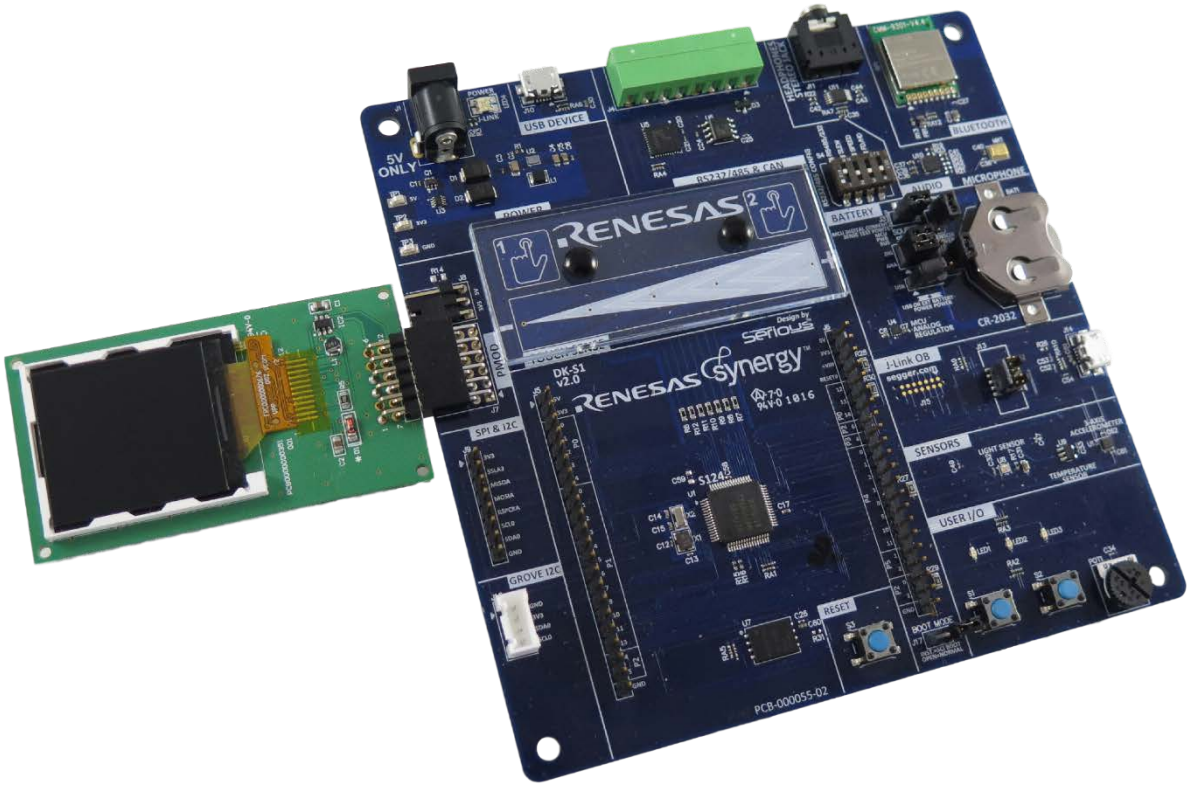
Renesas Synergy™ Development Kit (DK-S124)

R12QS0006EU0101
Rev.1.01
Jun 7, 2016

In the box

The following components are included in the Renesas Synergy™ Development Kit (DK-S124):

- DK-S124 Board
- One Pmod™ LCD screen
- One USB Type A to Micro-B cable
- Quick Start Guide (QSG, this document)



Overview

This Synergy Development Kit and the associated development tools allow you to evaluate the Synergy Platform using the DK-S124 Development Kit. This development board uses an MCU from the Synergy S124 Group. This QSG walks you through the Out-of-Box Demo. It also points you to the website that guides you through downloading and installing additional software. The website also shows you how to load, configure, generate, build, and execute the Blinky Project using the Synergy Software Package (SSP).

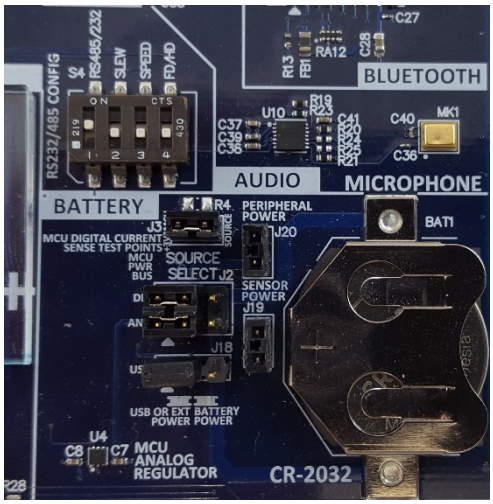
DK-S124 Development Kit

NOTE: This QSG is for the DK-S124 Development Kit.

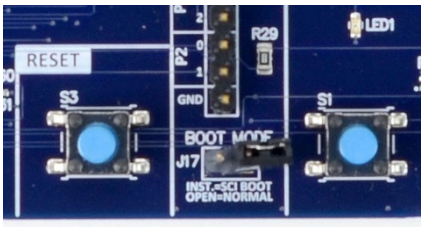
Connecting the board components

To power up the board and get started with the preloaded Out-of-Box Demo, follow these steps:

1) Ensure that the jumper settings on your board are in the configuration as shown below. This should be the default out-of-box configuration.



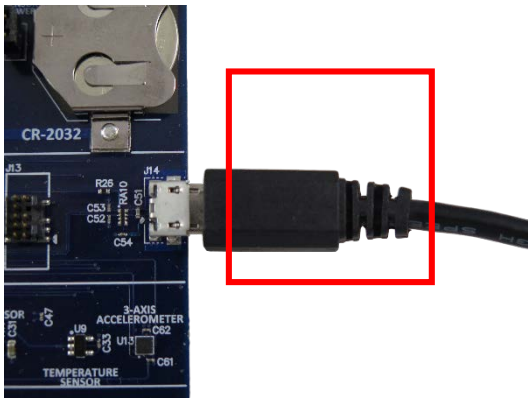
NOTE: For the purposes of this Out-of-Box Demo, ensure the jumper at J17 (BOOT MODE) is not installed across the pins.



2) With the screen facing upward, plug the enclosed Pmod™ LCD Display into the Pmod™ connector (J7). Make sure that the pins line up properly.

3) Connect the Micro USB end of the supplied USB cable to the DK-S124 board J-14 connector (DEBUG_USB).

NOTE: The kit contains a SEGGER J-Link® On-board (OB). The J-Link® provides full debug and programming capabilities for the DK-S124 Kit using the Renesas e^2 studio (ISDE) which is free to download from the following link (login required): https://synergygallery.renesas.com/isde.

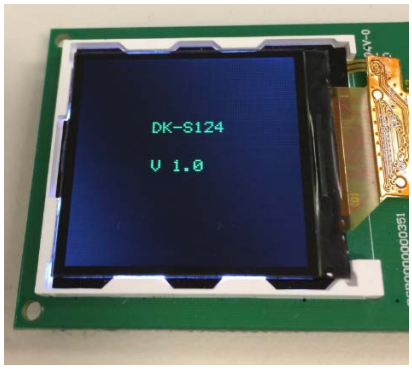


4) Connect the other end of the USB cable to the USB port on your workstation.

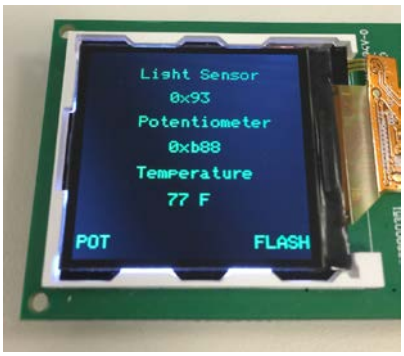
   The LED4 will turn green, indicating a good connection.

Running the Out-of-Box Demo

Once the DK-S124 is plugged-in, it powers up. It immediately starts flashing the three LEDs (LED1, LED2, and LED3) and displays a simple splash screen on the Pmod™ LCD for two seconds. This splash screen will show the board number and the version of the out of box demo software that shipped with the board.



After 2 seconds, the screen will change to the measurement screen shown below. The SSP Out-Of-Box Demo application uses the A/D converter to read the voltage values present on the Potentiometer (POT1), the Light Sensor U8 (APDS-9005) and the Temperature Sensor U9 (TMP35). The program displays the raw hex value read from the Light Sensor and the Potentiometer. It converts the raw value read from the Temperature Sensor to the equivalent Fahrenheit temperature.



You may interact with the Out-of-Box Demo program in the following ways:

1) The three LEDs, (LED1, LED2 and LED3) will all flash at once or chase each other. Pushing the momentary switch S2 will alternate between flashing and chasing. The bottom right corner of the screen will indicate which mode the LEDs are operating in. (FLASH/CHASE)

2) The flashing rate of the LEDs is determined by the value read from the Light Sensor or the Potentiometer. You toggle between these two by pushing momentary switch S1. The bottom right corner of the screen will indicate which sensor is driving the LEDs flashing rate. (POT/LIGHT).

3) Push S1 to select POT mode, then push S2 to select FLASH mode. Rotate POT1 clockwise and counterclockwise. The flashing of the LEDS will increase or decrease appropriately; the screen will display the raw value reported by the A/D converter.

4) Push S1 to select LIGHT mode, then push S2 to select CHASE mode. Move a light source (e.g. flashlight) closer and farther away from the Light Sensor U8. Observe the flashing rate of the LEDs will change while the raw hex value displayed to the screen also changes.

Next steps

Examples of the application categories that Renesas is developing are:

- Bluetooth Low Energy example using on-board sensors and an iPhone app
- Touch slider example that reflects movements across the touch slide by changing the frequency of the audio signal and the intensity of an LED
- Simple frame buffer drawing example
- Low power application note using various low power modes

Support

Support: https://synergygallery.renesas.com/support

Technical contact details:

- America: https://renesas.zendesk.com/anonymous_requests/new
- Europe: http://www.renesas.eu/support/index.jsp
- Japan: http://japan.renesas.com/contact/index.jsp

FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Revision History

		Description	
Rev.	**Date**	**Page**	**Summary**
1.00	May 23, 2016	-	First publication
1.01	Jun 7, 2016	2	Clarified default switch position
		4	Removed reference to downloading additional software and reloading demo.

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Handling of Unused Pins

   Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.

   — The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment when power is supplied.

   — The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
   In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.
   In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

   — When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

   — The characteristics of Microprocessing unit or Microcontroller unit products in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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Renesas Electronics America Inc.
2801 Scott Boulevard Santa Clara, CA 95050-2549, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3
Tel: +1-905-237-2004

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
Room 1709, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100191, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, P. R. China 200333
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

Renesas Electronics Hong Kong Limited
Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-6688, Fax: +852 2886-9022

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 1207, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics India Pvt. Ltd.
No.777C, 100 Feet Road, HALII Stage, Indiranagar, Bangalore, India
Tel: +91-80-67208700, Fax: +91-80-67208777

Renesas Electronics Korea Co., Ltd.
12F., 234 Teheran-ro, Gangnam-Gu, Seoul, 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141

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