Quick Start Guide

Development Kit S124 (DK-S124)

Quick Start Guide

Renesas Synergy™ Platform
Synergy Tools & Kits
Kits: DK-S124

Renesas Electronics
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(Rev.4.0-1 November 2017)

General Precautions

1. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

The state of the product is undefined at the time 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 time 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 time 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 time when power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. 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 the 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.

5. Clock signals

After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is 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. Additionally, 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.

6. Voltage application waveform at input pin

Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

7. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of 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.

Renesas Synergy™ Platform

Development Kit S124 (DK-S124)

R12QS0006EU0102
Rev.1.02
Apr 9, 2018

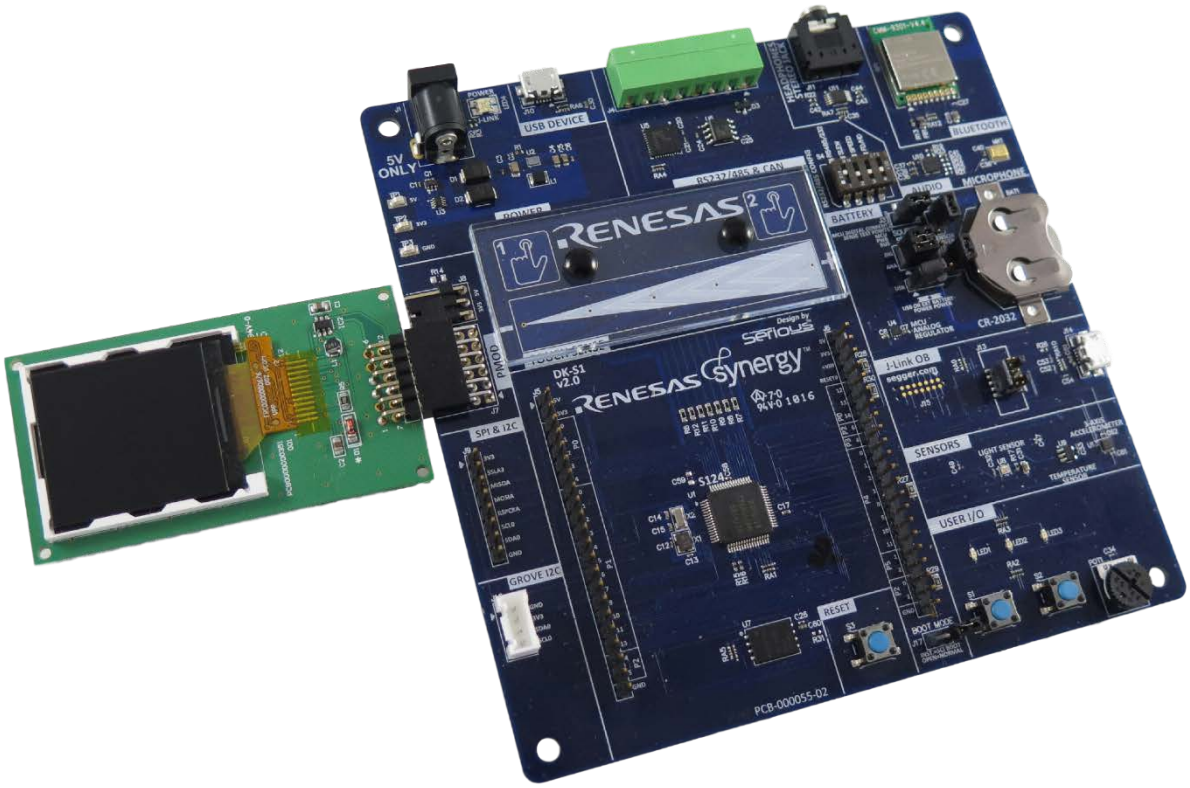
1. Introduction

This is the Quick Start Guide for the Renesas Synergy™ Development Kit S124 (DK-S124).

2. In the box

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

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



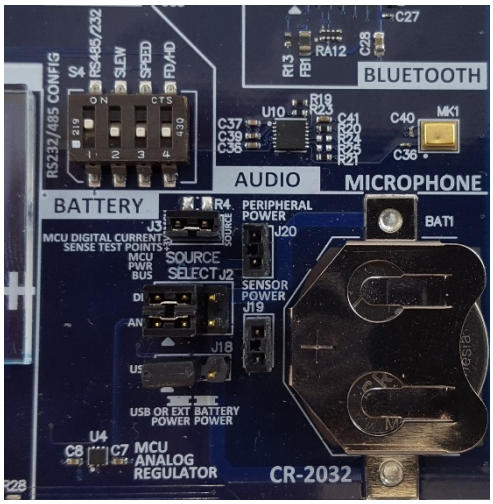
3. Overview

This Synergy Development Kit and the associated development tools allow you to evaluate the Synergy Platform using the DK-S124. This development board uses a device from Synergy S124 Microcontrollers (MCUs) Group. This QSG walks you through the Out-of-Box Demonstration application. 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).

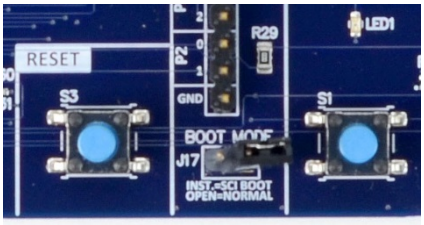
4. Connecting the board components

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.

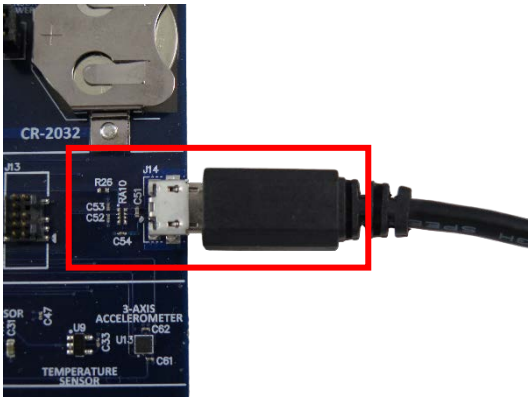


Note: For the purposes of this Out-of-Box Demo, ensure the jumper at J17 (BOOT MODE) is not installed across the pins.



2. With the screen facing upward, plug the enclosed Pmod™ LCD Display into the Pmod™ connector (J4). Make sure that the pins line up properly.
3. Connect the Micro USB end of the supplied USB cable to the DK-S124 board J14 connector (DEBUG_USB).

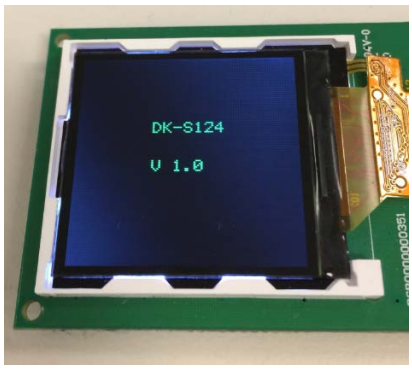
   Note: The kit contains a SEGGER J-Link® OB (On-board). The J-Link provides full debug and programming capabilities for the DK-S124 kit.



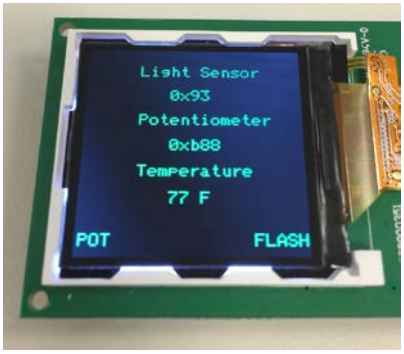
4. Connect the other end of the USB cable to the USB port on your workstation. LED4 turns green, indicating a good connection.

5. Running the Out-of-Box application

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 as shown below.



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 left 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 (a flashlight, for example) closer and farther away from the Light Sensor U8. Observe that the flashing rate of the LEDs will change while the raw hex value displayed to the screen also changes.

6. Next Steps

1. Visit renesassynergy.com/tools to learn more about development tools & utilities. Visit http://www.renesassynergy.com/gallery to download them.
2. Visit http://renesassynergy.com/kits/dk-s124 for more information such as board schematics, application projects collateral about the DK-S12 Kit.
3. If you need technical support or want to live chat with a Synergy Platform expert, visit http://renesassynergy.com/support.
4. Learn more about:
   - Synergy Kits at http://www.renesassynergy.com/kits
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Website and Support

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

Technical Contact Details:

- America: https://www.renesas.com/en-us/support/contact.html
- Europe: https://www.renesas.com/en-eu/support/contact.html
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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 release
1.01	Jun 7, 2016	2, 4	Clarified default switch position Removed reference to downloading additional software and reloading demo.
1.02	Apr 9, 2018	-	Minor update

Development Kit S124 (DK-S124) Quick Start Guide

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