# ISELED Starter Kit

ILaS®

Guide for Hardware

## Introduction

This document describes the RH850/F1KM-S1 ISELED Starter Kit and how to assemble it.

The purpose of this board is to adapt the Inova Semiconductors ISELED ADK board on the Renesas RH850/F1KM-S1 Starter Kit V3.

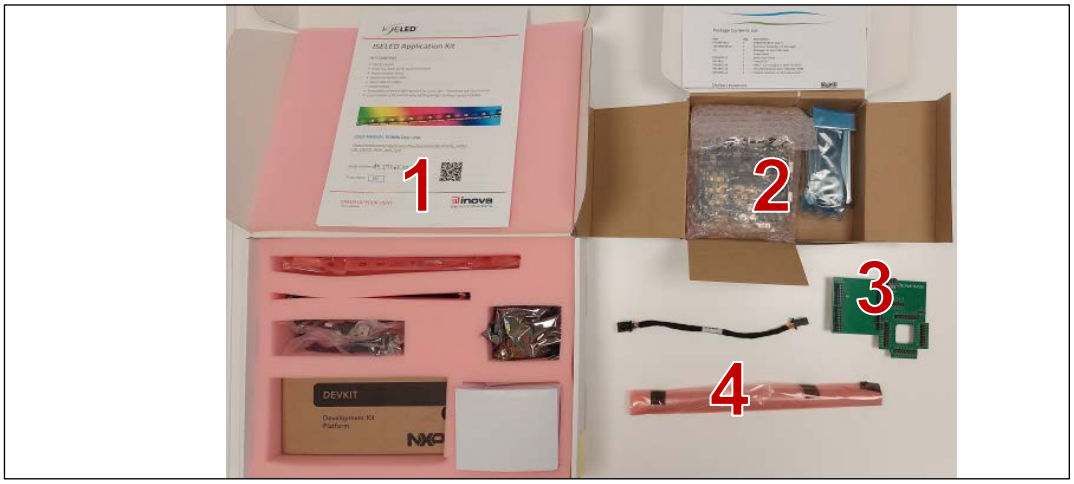
In this demonstration project the general product R7F701684 is used. Please note for ISELED additional products are available as described in the document RH850/F1KM, User's Manual Hardware, Addendum for ISELED (R01UH1024EJxxxx).

Contents

# 1. Kits descriptions

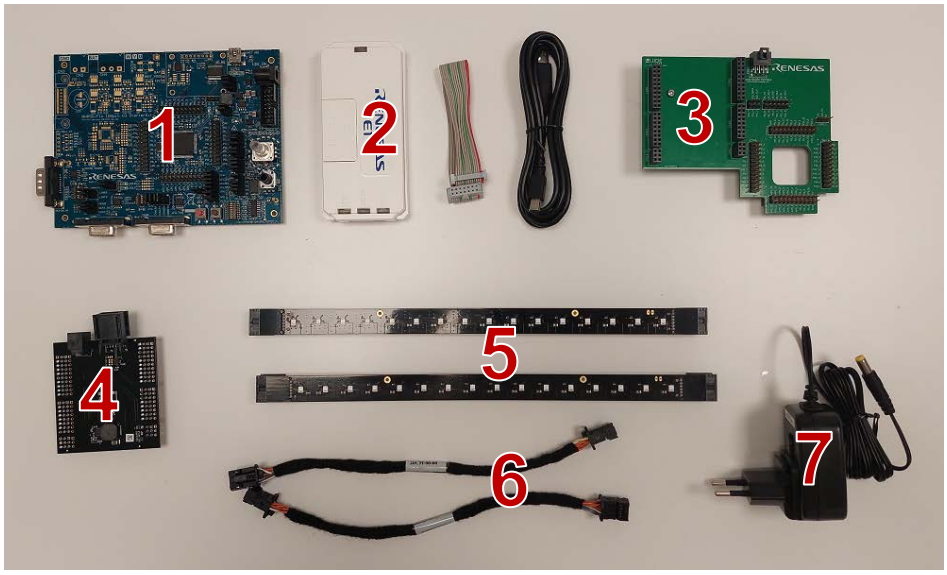
The RH850/F1KM-S1 ISELED Starter Kit is based on 3 on-the-shelf kits and one adapter board:

- 1: Inova Semiconductors ISELED evaluation kit dominant (ISELED_ADK_D)
- 2: Renesas evaluation kit for RH850/F1KM-S1 chip (RH850/F1KM-S1 Starter Kit V3 for ILaS)
- 3: Renesas ISELED adapter board (LL-220693)
- 4: Inova Semiconductors ISELED ADK extension kit dominant (ISELED_ADK_EXT_D)



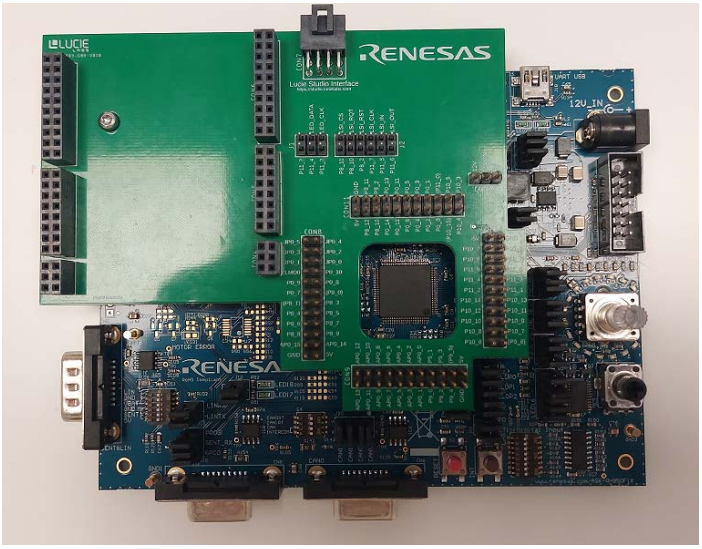

To assemble the RH850/F1KM-S1 ISELED Starter Kit, you need from kits above:

- 1: RH850/F1KM-S1 Starter Kit V3 for ILaS board
- 2: E1 On-Chip debugger
- 3: Renesas ISELED adapter board
- 4: ISELED power adapter board
- 5: 1 or 2 ISELED strips
- 6: 1 or 2 cables for ISELED Strips
- 7: Power supply 12v



## 2. Assembly

Connect the Renesas ISELED adapter board to the RH850/F1KM-S1 Starter Kit V3 for ILaS board.



The ISELED interface uses shared hardware resources with the rotary encoder of the RH850/F1KM-S1 Starter Kit V3 Board.

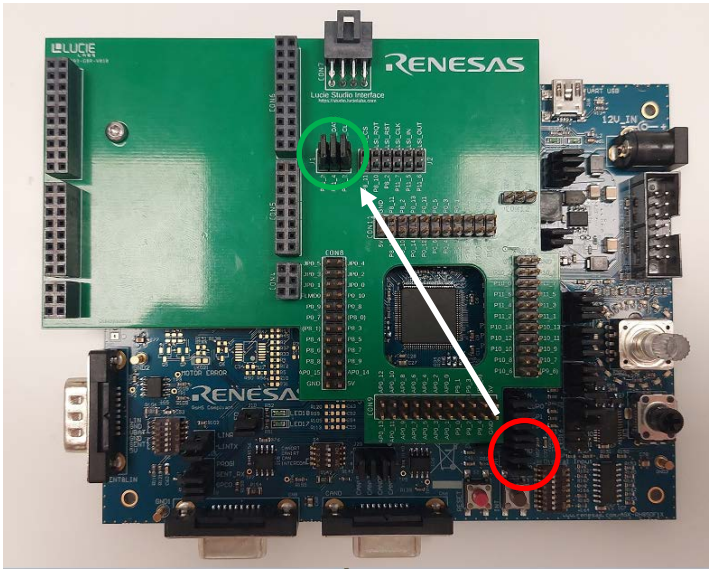
The individual signal pin-connections used for the ILaS interface are as follows:

P11.4: CSIH2 Input P11.3: CSIH2 Clock

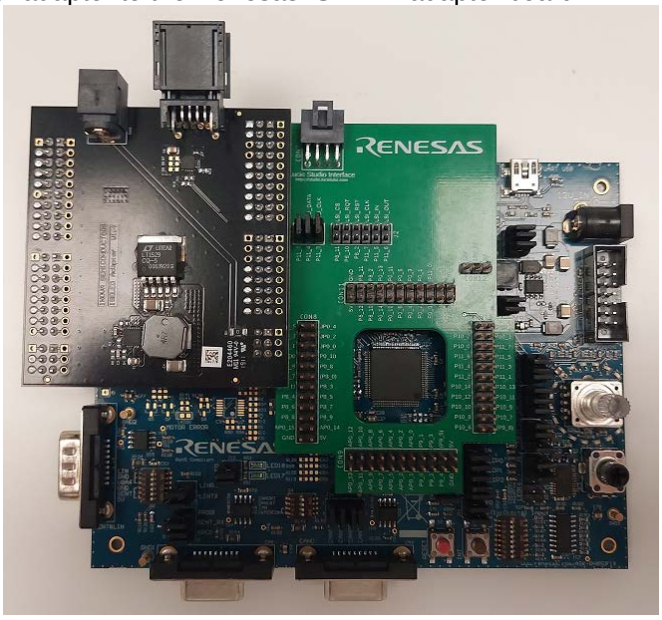
P11.2: CSIH2 Output

To disconnect rotary encoder and connect ISELED interface, take MI, MO and MC jumpers on LED16 connector of the RH850/F1KM-S1 Starter Kit V3 board.

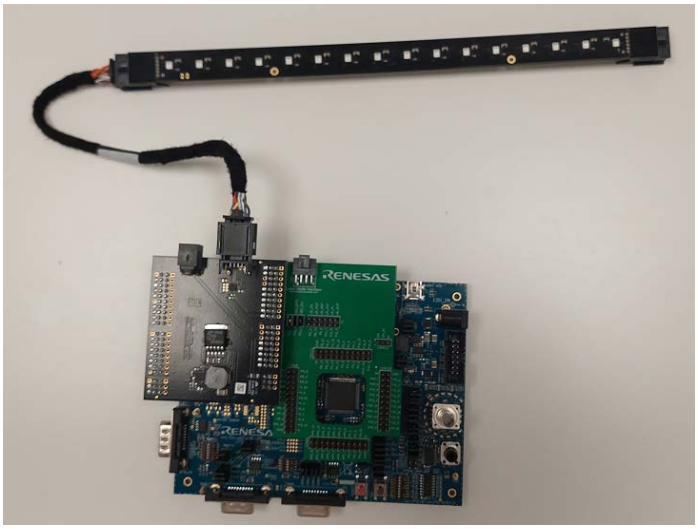
Put them to J1 jumper connector on the Renesas ISELED adapter board.



Connect the ISELED power adapter to the Renesas ISELED adapter board.

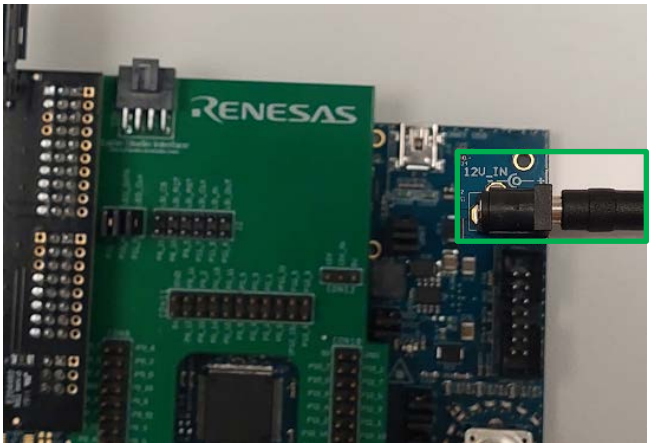


Connect ISELED Strip to ISELED power adapter using the cable for ISELED Strip.

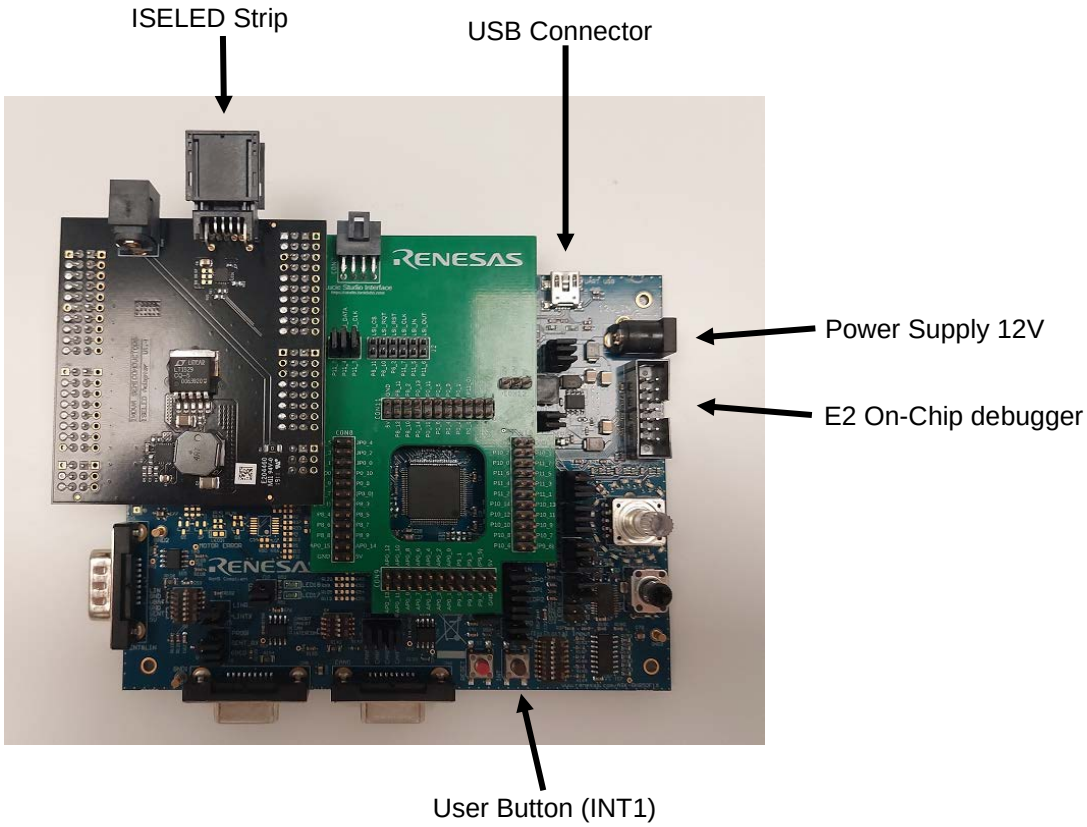


**Warning:** Connect ISELED strip on the right order: Ensure that the orange capacitor on the backside is first in line, as depicted below.

Supply the kit by the 12V_IN connector on the RH850/F1KM-S1 Starter Kit V3 board.



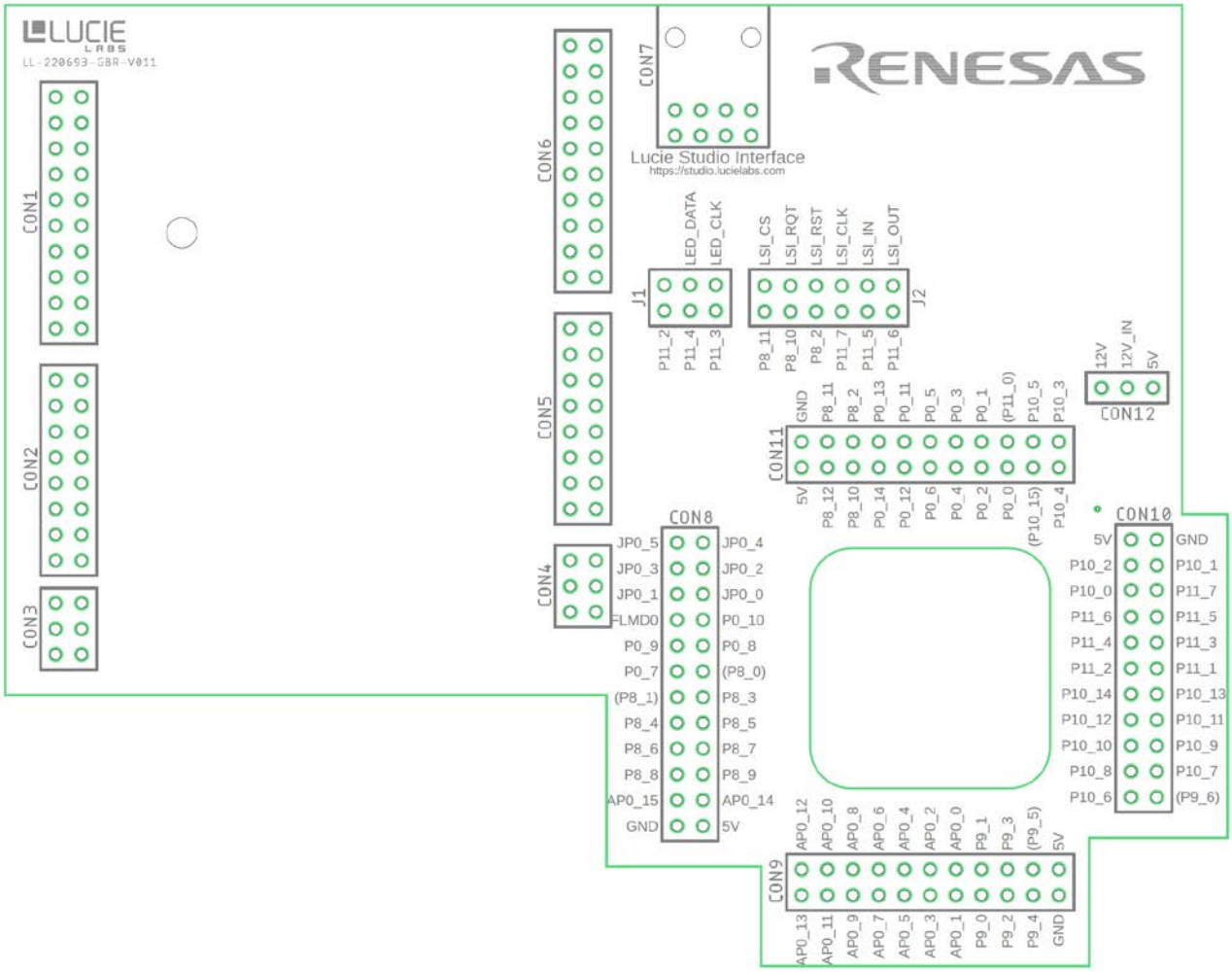
## 3. Connections description



# 4. Renesas ISELED Adapter board

## 4.1 Description

To ease debugging and development, Renesas ISELED Adapter board exposes all pins of RH850/F1KM-S1 chip.



## 4.2 Bill Of Material and Components Placement

| Qty | Name | Manufacturer | Ref | Side Mount |
|---|---|---|---|---|
| 3 | CON9, CON10, CON11 | Samtec | SSQ-111-23-G-D | Bottom |
| 1 | CON8 | Samtec | SSQ-112-23-G-D | Bottom |
| 2 | CON1, CON6 | Samtec | SSQ-110-21-G-D | Top* |
| 2 | CON2, CON5 | Samtec | SSQ-108-21-G-D | Top* |
| 2 | CON3, CON4 | Samtec | SSQ-103-21-S-D | Top* |
| 1 | CON12 | Samtec | SSQ-103-23-G-S | Bottom |
| 1 | CON7 | Molex | 105314-1108 | Top* |
| 1 | J1 | Samtec | TSW-103-07-T-D | Top* |
| 1 | J2 | Samtec | TSW-106-07-T-D | Top* |

## Revision History

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| 1.00 | May 07, 2024 | - | Initial release |

# 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. 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.

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## Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
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