

## RE01 1500KB Group, 256KB Group

### Software Development Kit using Smart Configurator Rev1.10

#### Introduction

This document explains how to use the Software Development Kit using Smart Configurator (SC) for the RE01 1500 KB Group, RE01 256 KB Group and its restrictions. The Software Development Kit using Smart Configurator for RE family was originally named the Flexible Software Package (FSP) for RE family.

The SDK using SC is a configurator package for the RE CMSIS driver software that runs in e<sup>2</sup> studio<sup>1</sup>. Using this package and the CMSIS driver software, you can be short development time and increase development efficiency.

Table Rename list of RE Software Development Kit

Name before changed	Name after changed	Abbreviation after name changed
RE01 1500KB Group CMSIS Driver Package	RE01 1500KB Group Software Development Kit (CMSIS Driver Package)	SDK
RE01 256KB Group CMSIS Driver Package	RE01 256KB Group Software Development Kit (CMSIS Driver Package)	SDK
Flexible Software Package for RE family	Software Development Kit using Smart Configurator for RE family	SDK using SC

#### Caution

The driver API specifications included in the SDK using SC for RE family are different from the driver packages included in the FSP for RA family. The usage of this system is the same.

#### Target devices

RE Family RE01 1500KB Group

RE Family RE01 256KB Group

#### Contents

Watch the video below to learn how to use the RE family, including launching development tools and using Software Development Kit (CMSIS Driver packages). <https://academy.renesas.com/?eid=1625><sup>2</sup>

<sup>1</sup> The e<sup>2</sup> studio is an Eclipse-based integrated development environment (IDE) for Renesas MCUs.

<sup>2</sup> This is an example of using the included driver without using the Smart Configurator.

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## 1. How to install and use SDK using SC package

For information on how to install and use the SDK using SC package, refer to the following documents.

Document file: Renesas e2 studio 2021-07 or higher User's Manual: Quick Start Guide Renesas MCU RE Family

Document number: R20UT5034

### 1.1 Reference documents

If customer does not use the Smart Configurator of e<sup>2</sup> studio, customer find out how to use the driver in the following documents.

Table 1.1 Reference documents

No	Document name	Summary	Document number
1	Getting Started Guide to Development Using CMSIS Package	Introduction of how to use CMSIS PACKAGE and how to implement user code.	R01AN4660

## 2. Operating Environment

### 2.1 Device

RE Family RE01 1500KB Group

RE Family RE01 256KB Group

### 2.2 Development Environment

It is recommended to use the CMSIS package with the development environment listed below:

Table 2.1 Development Environment (Recommended)

IDE	Compiler	Debugger
Renesas e <sup>2</sup> studio V.2021-07 or later	GCC V.6 GNU 6-2017-q2-update (Optimize -O2)	Segger J-Link(OB)

## 3. Improvements from Older Version

## 3.1 Improvements in Rev1.10

Table 3.1 Restriction List

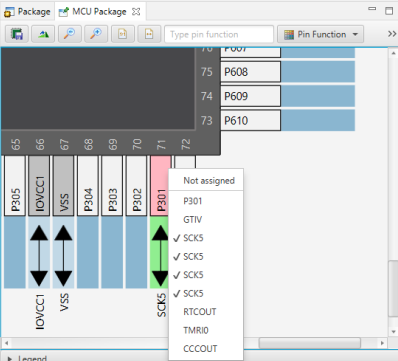
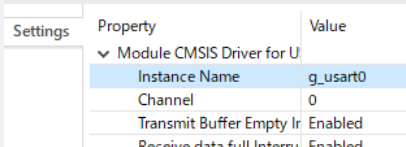
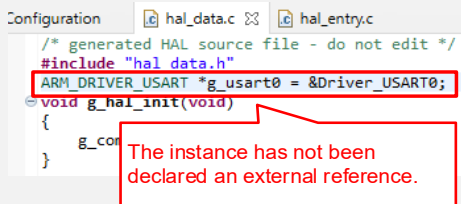
No	Category	Target File	Details
1	Specification change	-	Package name changed from Flexible Software Package (FSP) to Software Development Kit using Smart Configurator.
2	Specification change	Linker file	Added standard library to expand RAM.
3	Update	R_SYSTEM driver	The following inline functions have been updated to comply with ARM CMSIS pack Ver.5.7.0: <ul style="list-style-type: none"> <li>• R_NVIC_EnableIRQ</li> <li>• R_NVIC_GetEnableIRQ</li> <li>• R_NVIC_DisableIRQ</li> <li>• R_NVIC_GetPendingIRQ</li> <li>• R_NVIC_SetPendingIRQ</li> <li>• R_NVIC_ClearPendingIRQ</li> <li>• R_NVIC_SetPriority</li> <li>• R_NVIC_SetVector</li> <li>• R_NVIC_GetVector</li> </ul>
4	Specification change	R_DTC driver	Added R_DTC_GetAvailabilitySrc function and R_DTC_Release function.
5	Specification change	R_DMAC driver	Added R_DMAC_GetAvailabilitySrc function and R_DMAC_Release function.
6	Specification change	R_PMIP driver	Added R_PMIP_Reconfig function.
7	Specification change	R_SPI, R_USART, R_ADC driver	Changed the process up to the execution of the R_DTC_Close function when using DTC: <ul style="list-style-type: none"> <li>• Added a process to clear the activation source used in the driver and check that no valid DTC activation source remains.</li> <li>• Changed to the specification to execute R_DTC_Close processing only when there is no valid DTC activation source.</li> </ul>
8	Bug fix	R_CORE [RE01 256KB Group]	Fixed the property settings of the Option Function Select Register 1 (OFS1).
9	Bug fix	R_CORE	Fixed reserved bitmask value in the Security MPU Access Control Register (SECMPUAC).

4. Restrictions

4.1 Restriction List

For the latest complete list of restrictions, please see the tool news of this package on our website.

Table 4.1 Restriction List

No	Category	Contents	Countermeasures and improvement status
1	Compile option settings	Some compiler settings differ from the evaluation criteria when starting a RE SDK using SC project.	Refer to Build Option Settings in the introductory material (R20UT5034) introduced in Chapter 1 and set manually.
2	Pin settings	If customer select a terminal on the MCU package screen, the terminal name may be displayed in duplicate. 	[Improved with SDK using SC Rev1.10] Fixed so that the terminal name is not displayed in duplicate.
3	Pin settings [RE01 1500KB Group]	If SCK5 is selected, the terminal group is "SCK5_B" and "_ C" cannot be selected.	[Improved with SDK using SC Rev1.10] Fixed so that "SCK5_C" can be selected.
4	Driver instance	The instance created by the configurator cannot be used in the user program because it has not been declared as an external reference.  Example: For USART driver <ul style="list-style-type: none"> <li>Configurator settings   </li> <li>Generated instance (hal_data.c)   </li> </ul>	[Improved with SDK using SC Rev1.10] Fixed so that the instance has been declared as an external reference and can be used by the user program.

Revision History

Rev.	Date	Description	
		Page	Summary
1.10	Jul.20.21		First edition issued

# 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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