

RH850/E2x

R01AN4533ED0300

Getting Started

Rev.3.0

Introduction

This document provides an overview about all available support items, related to the RH850/E2x devices, such as

- latest device documentation, i.e. Hardware and Software User's Manuals, Data Sheets, Operating Precautions
- latest tools for software development
- latest information about hardware tools for application development
- software examples to get started

The latest version of this document can be downloaded via following web link:

[Current "Getting Started" document version](#)

Target Device

RH850/E2x. In this document E2x refers to the E2L, E2M and E2x-FCC1, E2H, E2UH and E2x-FCC2 devices.

MyPages Registration

Most of the documentation, software and other tools packages are distributed via Renesas' MyPages web service. For creating your MyPages account please register yourself via

[Renesas MyPages registration and login](#)

Subscribe to the required documentation or tool and contact your local Renesas representative or distributor who will take care for authorization of your account.

Once authorized to receive the subscribed packages you will be notified by email when updates are available.

Note: For making sure to receive update notifications even if no authorization is required to download any software or documentation, Renesas strongly recommends registering at MyPages in any case.

Open MyPages Downloads

Besides the material, that is only available for registered users, the MyPages web services provides unrestricted access to a lot of other material related to Renesas' microcontrollers software, documentation, evaluation tools, etc.

This material can be accessed via

[European Downloads / MyPages](#)

Contents

1. Reference Documents.....	3
2. Software Tools.....	3
2.1 Development Tools – supported by Renesas	3
2.1.1 Green Hills Multi.....	3
2.1.2 Renesas IDE and C Compiler.....	3
2.1.3 IAR Embedded Workbench for RH850.....	3
2.2 Development Tools – supported by Tool Partners.....	3
3. Device Files Packages	4
3.1 Device File Packages for GHS MULTI.....	4
3.2 Device File Packages for IAR Embedded Workbench	4
4. Hardware Tools	4
4.1 Flash Programmer PG-FP6 (RTE0T00001FWREA000R)	4
4.2 Flash Programmer RFP	4
4.3 E2 Emulator	5
4.3.1 Emulator connection to the RH850/E2x.....	5
4.4 RH850/E2x Evaluation boards	5
4.4.1 RH850/X1x Main Board	5
4.4.2 RH850/E2x PiggyBack Boards.....	6
5. Startup Software.....	6
General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products.....	2

1. Reference Documents

An overview of all reference documents for the RH850/E2x are summarized in the “RH850/E2x Manual Package”.

The Manual Packages are provided to registered users for download via Renesas’ MyPages web service (refer to *MyPages Registration* on page 1).

2. Software Tools

2.1 Development Tools – supported by Renesas

This section contains only information about development tools directly supported by Renesas Electronics.

2.1.1 Green Hills Multi

The demo software in this application note, refer to 5. *Startup Software*, require a properly installed GHS compiler version V6.1.4/2013.5.5 or later.

EXEC & 850eserv

To support the RH850/E2x devices, the EXEC and 850eserv versions of the default GHS installation need to be replaced.

The EXEC and 850eserv software packages can be downloaded via the following link:

[Renesas software packages for GHS \(Ordercode: Y-GHS-MULTI-V800-FULL\)](#)

2.1.2 Renesas IDE and C Compiler

Renesas provides a RH850/E2x devices tool set, comprising

- Eclipse based Integrated Development Environment IDE e² studio
- C Compiler Package for RH850 Family

For further information refer to

[Renesas e² studio IDE](#)

[Renesas RH850 C Compiler.](#)

2.1.3 IAR Embedded Workbench for RH850

IAR offers their Embedded Workbench also for the RH850/E2x devices.

For further information concerning IAR Embedded Workbenches for Renesas’ RH850 MCUs refer to

[IAR Renesas RH850 Embedded Workbenches.](#)

2.2 Development Tools – supported by Tool Partners

Following development tools are not directly supported by Renesas Electronics:

- iSYSTEM WinIDEA, refer to [iSYSTEM Development Tools](#)
- Lauterbach Trace32, refer to [Lauterbach Development Tools](#)
- WindRiver Compiler, refer to [Wind River Development Tools](#)

Please contact the related tool supplier in case of any support demand.

3. Device Files Packages

The device file package comprises following content:

- Device Files (*.dvf)
- c-Header files (*.h) of device related registers
- Debugger information files (*.grd)
- Linker files (*.ld)
- Startup files (*.850)

3.1 Device File Packages for GHS MULTI

A GHS device file package for RH850/E2x can be downloaded from the Renesas web site:

[Device file packages for GHS \(Ordercode: DF-RH850-GHS\)](#)

The device file can be placed in any directory of the user's PC installation. Still, the chosen path must be supplied to the GHS environment upon start of a debug session. See 5. *Startup Software* for further details.

The header-, linker- and other files are usually placed within the directory structure of a software project. See the supplied demo project for reference.

3.2 Device File Packages for IAR Embedded Workbench

Usually device files for the RH850/E2x are included in the IAR tool package.

In case you miss the device file for your particular device in the IAR package, please check on Renesas' MyPages web service for the device file package (refer to *Open MyPages Downloads* on page 1 for the link).

4. Hardware Tools

Please note that this chapter only contains information about tools directly supported by Renesas Electronics.

4.1 Flash Programmer PG-FP6 (RTE0T00001FWREA000R)

The programming GUI for the PG-FP6 Flash Programmer can be downloaded via following links:

- PG-FP6 GUI and USB Driver:
 - [Renesas PG-FP6 Flash Programmer Software Packages \(Ordercode: RTE0T00001FWREA000R\)](#)
 - [Renesas PG-FP6 Flash Programmer Documentation \(Ordercode: RTE0T00001FWREA000R\)](#)
- Device Parameter Files are included in the PG-FP6 GUI package.

4.2 Flash Programmer RFP

RH850/E2x is supported by Renesas Flash Programmer RFP V3.00.xx.

The RFP software and documentation can be downloaded via the following links:

[Renesas Flash Programmer \(RFP\) Software Packages \(Ordercode: RFP-EE\)](#)

[Renesas Flash Programmer \(RFP\) Documentation \(Ordercode: RFP-EE\)](#)

4.3 E2 Emulator

No dedicated actions or updates are required to use the E2 Emulator with the RH850/E2x devices.

Renesas' Emulator E2 additional documentation and USB drivers:

[Renesas E2 Emulator Software Packages \(Ordercode: RTE0T00020KCE00000R\)](#)

[Renesas E2 Emulator Documentation \(Ordercode: RTE0T00020KCE00000R\)](#)

4.3.1 Emulator connection to the RH850/E2x

Special documents detail the connection of the Emulator to the target system.

The documents can be downloaded via the above-mentioned Emulator Documentation links:

- RH850/E2x:
 - Title: E2 Emulator Additional Document for User's Manual (Notes on Connection of RH850/E2x series)
 - Document: [R20UT4140EJxxxx](#) (xxx = revision number)

4.4 RH850/E2x Evaluation boards

The RH850/E2x evaluation board system comprises

- the RH850/X1x Evaluation Main Board
- a RH850/E2x specific PiggyBack board

4.4.1 RH850/X1x Main Board

The latest version of the User's Manuals for the RH850/X1x MainBoards can be found at this location:

[Renesas RH850/X1x MainBoard documentation \(Ordercode: Y-RH850-X1X-MB-T1-V1\)](#)

[Renesas RH850/X1x Network MainBoard documentation \(Ordercode: Y-RH850-X1X-MB-T2-V1\)](#)

4.4.2 RH850/E2x PiggyBack Boards

Following table provides links to the latest versions of the User's Manuals for the RH850/E2x PiggyBack Boards:

Table 4.1 PiggyBack Boards User's Manuals

Device	Package	PiggyBack Ordercode	User's Manual document number ¹
E2L, E2M, E2x-FCC1	292 pin BGA	Y-RH850-E2X-292PIN-PB-T1-V1	R20UT4048EDxxxx
E2M, E2H E2x-FCC1,	373 pin BGA	Y-RH850-E2X-373PIN-PB-T1-V2 ²	R20UT4126EDxxxx
E2M, E2H, E2UH, E2x-FCC1, E2x-FCC2		Y-RH850-E2X-373PIN-PB-T1-V3	R20UT4317EDxxxx
E2H, E2UH, E2x-FCC2	468 pin BGA	Y-RH850-E2X-468PIN-PB-T1-V1	R20UT4287EDxxxx

Notes: ¹ "xxxx" in the document number stands for the current document version number. Download the current version via the given link.

² These PiggyBack Boards are replaced by their next version. Thus, they are not delivered anymore, though their User's Manuals are still available.

5. Startup Software

Note: The startup sample software is intended as generic example which shows basic initialization and setup. The software is provided for reference only.

The startup sample software is included in the device file package described in *3.1 Device File Packages for GHS MULTI*.

Additional sample software can be provided for the Piggyback Boards described in *4.4.2 RH850/E2x PiggyBack Boards*.

For detailed information about the functions of additional sample software refer to the description included in the package.

Website and Support

Renesas Electronics Website

<http://www.renesas.com/>

Inquiries

<http://www.renesas.com/contact/>

All trademarks and registered trademarks are the property of their respective owners.

Revision History

Rev.	Date	Description	
		Page	Summary
V1.0	2017-05-23	–	Initial release
V2.0	2018-01-23	–	Updated GHS compiler and 850ersev version. Updated device files in sub directory '01 – Tools\01 – GHS\Device File.' Removed documentation (references) for Y-RH850-E2X-373PIN-PBT1-V1. Added documentation (references) for following PiggyBack Boards: Y-RH850-E2X-373PIN-PB-T1-V2 Y-RH850-E2X-373PIN-PB-T2-V2 Added chapter 4.6 for the RH850/E2x Emulation Adapter Board. Removed demo code examples Getting_Started_R7F702Z02 and Getting_Started_R7F702Z02_SB in chapter 5. Added demo code examples Getting_Started_R7F702Z02A, Getting_Started_R7F702Z02A_SC, Getting_Started_R7F702Z04A and Getting_Started_R7F702Z04A_SC in chapter 5.
V3.0	2018-11-06	–	General update of document content

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.

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.
"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.
"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.
Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.
6. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
7. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
9. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
10. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
11. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

(Rev.4.0-1 November 2017)



SALES OFFICES

Renesas Electronics Corporation

<http://www.renesas.com>

Refer to "<http://www.renesas.com/>" for the latest and detailed information.

Renesas Electronics America Inc.

1001 Murphy Ranch Road, Milpitas, CA 95035, U.S.A.
Tel: +1-408-432-8888, Fax: +1-408-434-5351

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: +44-1628-651-700, Fax: +44-1628-651-804

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, 200333 P. R. China
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, HAL 2nd Stage, Indiranagar, Bangalore 560 038, India
Tel: +91-80-67208700, Fax: +91-80-67208777

Renesas Electronics Korea Co., Ltd.

17F, KAMCO Yangjae Tower, 262, Gangnam-daero, Gangnam-gu, Seoul, 06265 Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5338