

Getting started  
with  
SEgger Eval Software  
and  
Renesas RX RSK  
Visualisation Add On  
using HEW

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Date: June 10, 2013



A product of SEgger Microcontroller GmbH & Co. KG

[www.segger.com](http://www.segger.com)

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## Manual versions

This manual describes the current software version. If any error occurs, inform us and we will try to assist you as soon as possible.  
Contact us for further information on topics or routines not yet specified.

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Revision	Date	By	Description
0	130610	TS	First version



# About this document

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## Assumptions

This document assumes that you already have a solid knowledge of the following:

- The software tools used for building your application (assembler, linker, C compiler)
- The C programming language
- The target processor
- DOS command line

If you feel that your knowledge of C is not sufficient, we recommend *The C Programming Language* by Kernighan and Richie (ISBN 0-13-1103628), which describes the standard in C-programming and, in newer editions, also covers the ANSI C standard.

## How to use this manual

This manual explains all the functions and macros that the product offers. It assumes you have a working knowledge of the C language. Knowledge of assembly programming is not required.

## Typographic conventions for syntax

This manual uses the following typographic conventions:

Style	Used for
Body	Body text.
Keyword	Text that you enter at the command-prompt or that appears on the display (that is system functions, file- or pathnames).
Parameter	Parameters in API functions.
Sample	Sample code in program examples.
Sample comment	Comments in programm examples.
Reference	Reference to chapters, sections, tables and figures or other documents.
<b>GUIElement</b>	Buttons, dialog boxes, menu names, menu commands.
<b>Emphasis</b>	Very important sections.

**Table 1.1: Typographic conventions**



**SEGGER Microcontroller GmbH & Co. KG** develops and distributes software development tools and ANSI C software components (middleware) for embedded systems in several industries such as telecom, medical technology, consumer electronics, automotive industry and industrial automation.

SEGGER's intention is to cut software development time for embedded applications by offering compact flexible and easy to use middleware, allowing developers to concentrate on their application.

Our most popular products are emWin, a universal graphic software package for embedded applications, and embOS, a small yet efficient real-time kernel. emWin, written entirely in ANSI C, can easily be used on any CPU and most any display. It is complemented by the available PC tools: Bitmap Converter, Font Converter, Simulator and Viewer. embOS supports most 8/16/32-bit CPUs. Its small memory footprint makes it suitable for single-chip applications.

Apart from its main focus on software tools, SEGGER develops and produces programming tools for flash micro controllers, as well as J-Link, a JTAG emulator to assist in development, debugging and production, which has rapidly become the industry standard for debug access to ARM cores.

**Corporate Office:**

<http://www.segger.com>

**United States Office:**

<http://www.segger-us.com>

## EMBEDDED SOFTWARE (Middleware)



**emWin**

**Graphics software and GUI**

emWin is designed to provide an efficient, processor- and display controller-independent graphical user interface (GUI) for any application that operates with a graphical display.



**embOS**

**Real Time Operating System**

embOS is an RTOS designed to offer the benefits of a complete multitasking system for hard real time applications with minimal resources.



**embOS/IP**

**TCP/IP stack**

embOS/IP a high-performance TCP/IP stack that has been optimized for speed, versatility and a small memory footprint.



**emFile**

**File system**

emFile is an embedded file system with FAT12, FAT16 and FAT32 support. Various Device drivers, e.g. for NAND and NOR flashes, SD/MMC and Compact-Flash cards, are available.



**USB-Stack**

**USB device/host stack**

A USB stack designed to work on any embedded system with a USB controller. Bulk communication and most standard device classes are supported.

## SEGGER TOOLS

**Flasher**

**Flash programmer**

Flash Programming tool primarily for micro controllers.

**J-Link**

**JTAG emulator for ARM cores**

USB driven JTAG interface for ARM cores.

**J-Trace**

**JTAG emulator with trace**

USB driven JTAG interface for ARM cores with Trace memory. supporting the ARM ETM (Embedded Trace Macrocell).

**J-Link / J-Trace Related Software**

Add-on software to be used with SEGGER's industry standard JTAG emulator, this includes flash programming software and flash breakpoints.



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# Chapter 1

## Introduction

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This chapter describes the purpose of this manual and of the entire software package, which consists of different components.

## 1.1 About this manual

The purpose of this document is to describe the SEGGER eval software components and samples delivered in this eval package.

## 1.2 What is the purpose of this eval package?

The eval package has been designed to provide customers and potential customers (you) with a complete, easy to use software package for the Renesas Visualization Add On and Renesas's High Performance Workbench and Renesas C compiler for RX. It demonstrates how to use a TFT display (QVGA, 320x240, 18 bit interface) without a display controller with a single chip hardware based on a RX210 (R5F52108ADFP) with only 64 Kbytes of RAM.

As mentioned above the used CPU has 64 Kbyte of internal RAM. The graphic software uses up to 3 bits/pixel for the color information. It refreshes the display in the background using up to 3 UARTs which transfer one bit of color information each. This package allows you to easily check out the target hardware, the target compiler and our software components. This evaluation process typically does not take a lot of time since the software can be easily recompiled and downloaded to the target.

### 1.2.1 What are the components of the software package?

The SEGGER software components are provided in library form, the applications are provided in source code form.

### 1.2.2 Can I recompile the application supplied?

Yes. All you need is the target compiler/eval version of the target compiler. Refer to "ReadMe.txt" in the "start"-folder for more information.

### 1.2.3 Can I write my own applications with this eval package?

Yes, you can write your own applications. However the purpose of this eval package is to test the soft- and hardware for fitness. You may not use the result in a product.

## 1.3 Software components in the package

### 1.3.1 emWin

emWin is SEGGER's embedded Graphical User Interface (GUI) using a feature rich API and providing an efficient, processor- and LCD controller-independent GUI for any application that operates with a display.

emWin documentation can be found under "Doc\UM03001\_emWin5.pdf".

### 1.3.2 embOS

embOS is SEGGER's embedded priority-controlled multitasking system. It is designed to be used as an embedded operating system for the development of real-time applications and has been optimized for minimum memory consumption in both RAM and ROM, as well as high speed and versatility.

embOS documentation can be found under "Doc\UM01001\_embOS\_Generic.pdf" and "Doc\UM01018\_embOS\_RX\_HEW.pdf".

# Chapter 2

# Licensing

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This chapter gives information about the licensing terms under which the SEGGER Eval Software is published.

## 2.1 License terms

The SEGGER Eval Software package may only be used when fully agreeing to the terms mentioned in this chapter and agreeing to the license terms mentioned in "License.txt".

If this description contradicts the terms of the "License.txt", the terms of the license file should supersede this description.

In case of doubt, please contact us: [info@segger.com](mailto:info@segger.com) .

### 2.1.1 What you may do

You may use the software contained in this eval package to evaluate SEGGER software on the target hardware. You may recompile and modify the sample programs provided as part of the package.

### 2.1.2 What you are not allowed to do

You are not allowed to use the software in this eval package for something other than evaluating the SEGGER software. You are not allowed to use this software package in a product.

# Chapter 3

## Project

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This chapter explains the folder structure used for the software components as well as the project structure and the limitations of the eval version.

## 3.1 Setup

### Requirements

In order to recompile the projects you will need the HEW as indicated in the ReadMe.txt file.

### Installation

All eval packages are supplied as a zip-file. The latest version of the software can be archived from the following location:

<http://www.segger.com/evalboards.html>

Extract it to any folder of your choice, preserving the directory structure of the zip-file. Assuming that you are using the HEW project manager to develop your application, no further installation steps are required. You will find prepared sample start applications, which you should use and modify to write your application.

All eval packages include evaluation builds some or all of the following products:

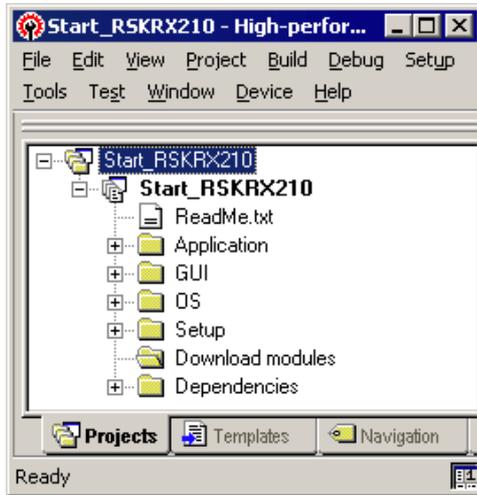
Component	Description
embOS	SEGGER's priority-controlled real time operating system.
emWin	SEGGER's graphics software and GUI

**Table 3.1: Eval package components**

All products can be combined and purchased separately. For ordering information, please contact SEGGER, [www.segger.com](http://www.segger.com).

## 3.2 Project structure

All components of the eval package are provided as libraries and the required header files. The sample applications are provide in source form. The sample project is organized in the following way:



The root directory of the eval package includes two folders, "Doc" and "Start" and this documentation.

The "Doc"-folder contains the user guides for the included SEGGER Eval Software and the "License.txt". The "Start"-folder contains all files necessary for the SEGGER Eval Software itself.

The "Start"-folder contains the following sub directores:

Directory	Description
Application	Includes the sample application.
GUI	Includes the emWin header files and the emWin libraries.
OS	Includes the embOS header files, the embOS libraries, main.c and the linker file
Setup	Includes the configuration and hardware related files of the included software packages

**Table 3.2: Eval package structure**

## 3.3 Eval limitations

The included eval versions of the different components of the eval package have the following limitations:

Component	Description
embOS	The eval version of the embOS libraries run without a time limit with a maximum of three tasks. If your application creates more than three tasks stops embOS after a time limit of 12 hours.
emWin	emWin The eval version of the emWin library shows an evaluation notification before the actual application starts.

**Table 3.3: Limitations of eval package components**

Your use of the eval package or of any part included in the project indicates your acknowledgment and agreement to the SEGGER eval software license. License.txt is located in the root directory of the eval package.

# Chapter 4

## Getting started

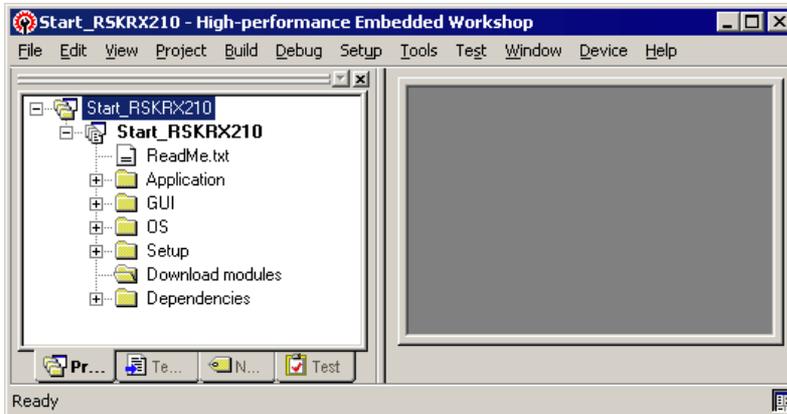
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This chapter contains all required information to start working with the sample application.

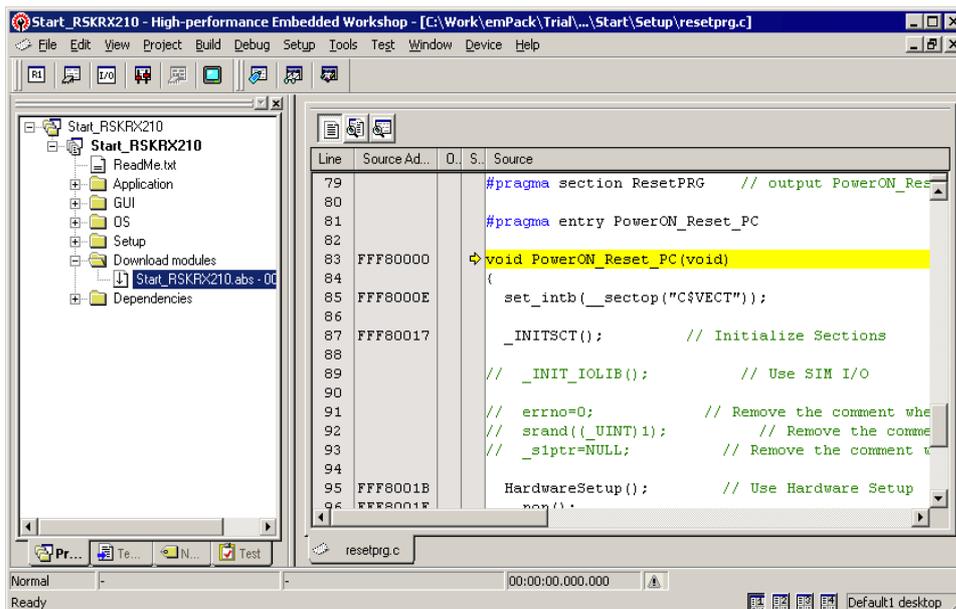
## 4.1 Evaluating the SeggerDemo

The following steps describe what to do step by step to fully evaluate the Segger-Demo software on the Renesas RX210 RSK.

1. Get a fresh copy of the project and files.
2. Open the project file "Start\_RSKRX210.hws" with the HEW Workbench. Your screen should look similar to the screenshot below.

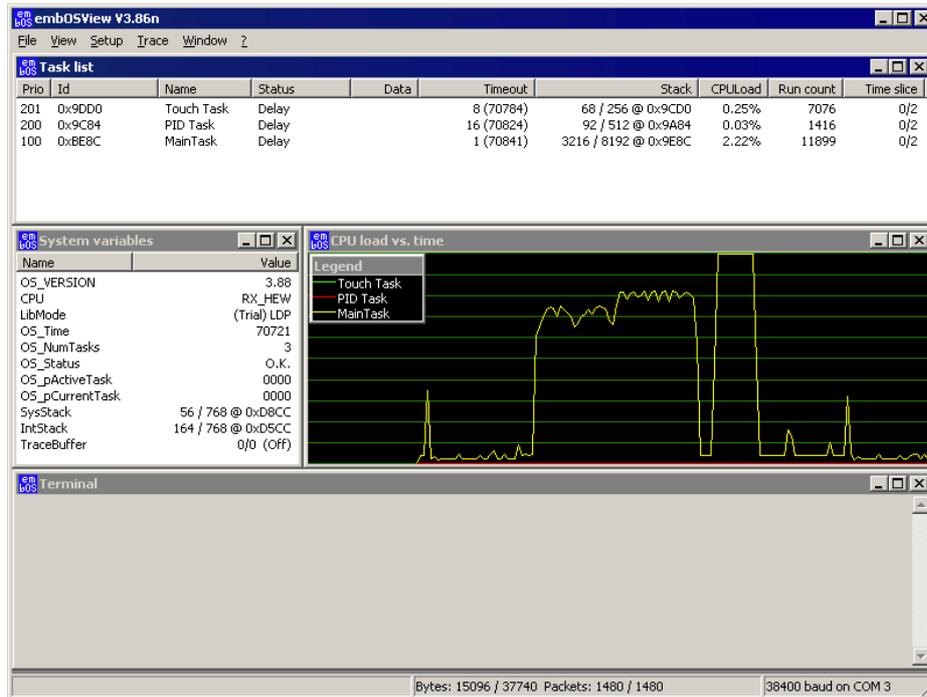


3. Select the Debug configuration and press [F7] to compile the sample application. The build log should report:  
*Total number of errors: 0*  
*Total number of warnings: 0*
4. Make sure the E1 emulator is connected to your eval board and your PC.
5. Make sure your eval board is powered.
6. Connect to the E1 and download the application. The "Emulator Settings" dialog appears. Select "Erase Flash and Connect" and press OK for starting the debug session. After download your screen should look similar to the screenshot below, halting at reset.



7. Press [F5] to run the application. After that a dialog for selecting the desired color mode appears. The small joystick below the display should be used to select the desired mode.

8. Start "Windows\OS\embOSView.exe" to verify that the UART is sending OS specific data. Your screen should look similar to the screenshot below:



If not please refer to the embOS Generic Documentation: (Doc\embOS\_Generic.pdf) for troubleshooting.



# Chapter 5

## Literature

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This chapter lists documents, which we think may be useful to gain deeper understanding of technical details. The files can be found in the Doc\ directory.

Reference	Title	Comments
[UM01001]	User's & reference manual for embOS	This document gives information about using the generic parts of embOS. It is publicly available from SEGGER ( <a href="http://www.segger.com">www.segger.com</a> ).
[UM03001]	User's and reference manual for emWin	This document gives information about using the SEGGER GUI software. It is publicly available from SEGGER ( <a href="http://www.segger.com">www.segger.com</a> ).

**Table 5.1: Literature and References**