Quick Start Guide

Product Example HMI1 (PE-HMI1)

Quick Start Guide

Renesas Synergy™ Platform
Synergy Tools & Kits
Kits: PE-HMI1

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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

Product Example HMI1 (PE-HMI1)

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Jun 15, 2017

1. In the box

The following components are included in the Renesas Synergy™ Product Example for Human Machine Interface (HMI), PE-HMI1 kit:

- PE-HMI1 with an integrated 7-in. wide-format WVGA 800x480 display with capacitive touch screen overlay
- SEGGER J-Link® Lite for ARM® Cortex®-M with USB Type-A to Mini-B cable with target cable
- Ethernet cable, 2-m length
- 5V Power Adapter cable (2.1mm center positive)
- RS232/485/CAN connector Plug
- Power over Ethernet (PoE) power supply
- Quick Start Guide (QSG, this document)

2. PE-HMI1 Product Example

NOTE: This QSG covers version 2.0 of the PE-HMI1 kit.

3. Prerequisites

3.1 Required software and tools

- Minimum PC Requirements: Microsoft® Windows® 7 with Intel® Core™ family processor running at 2.0 GHz or higher (or equivalent processor), 8 GB memory, 250 GB hard disk or SSD, USB 2.0, Connection to the Internet
- e^2 studio Integrated Solution Development Environment (ISDE) from Renesas Synergy™
- Synergy Software Package (SSP)

4. Overview

This PE-HMI1 gives the user a complete and ready Out-of-Box platform to evaluate the Renesas Synergy Solutions for HMI applications. This QSG will walk you through using the Out-of-Box Demonstration application and give step-by-step directions to develop, configure, generate, build, download and execute the “Blinky” SSP project.

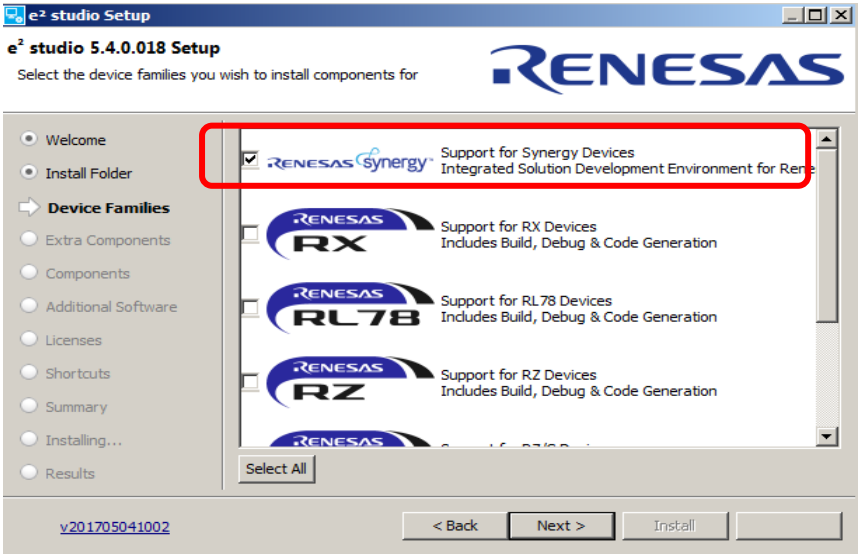
4.1 Installation

Tools are available for download at: https://synergygallery.renesas.com

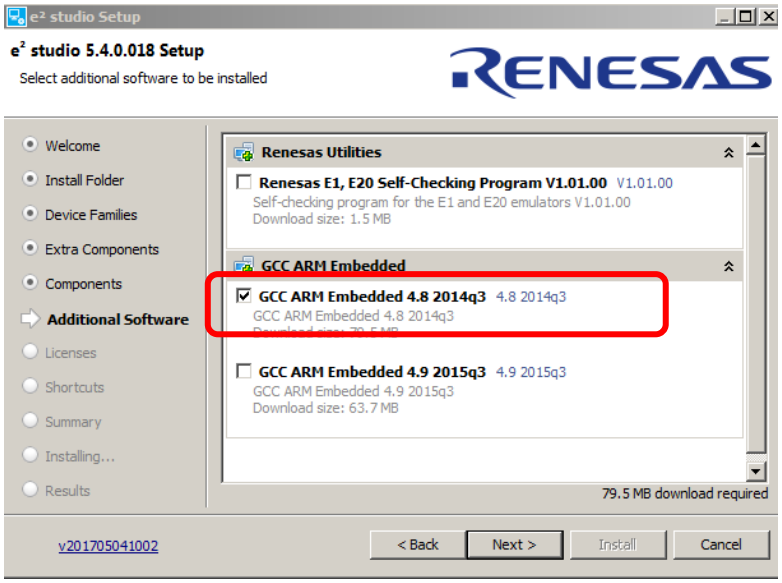
Note: Version numbers of the tools may change. Below we show the versions that were available when this document was developed.

1) Download and install the latest revision of the Development Tool - e² studio (ISDE) following the below instructions:
(NOTE: Unless informed otherwise below, use the default options.)

a) You must select at least the Renesas Synergy™ Family when the below dialog box appears.



b) You must select the additional software “GCC ARM Embedded 4.8.2014q3” when the following dialog box appears.

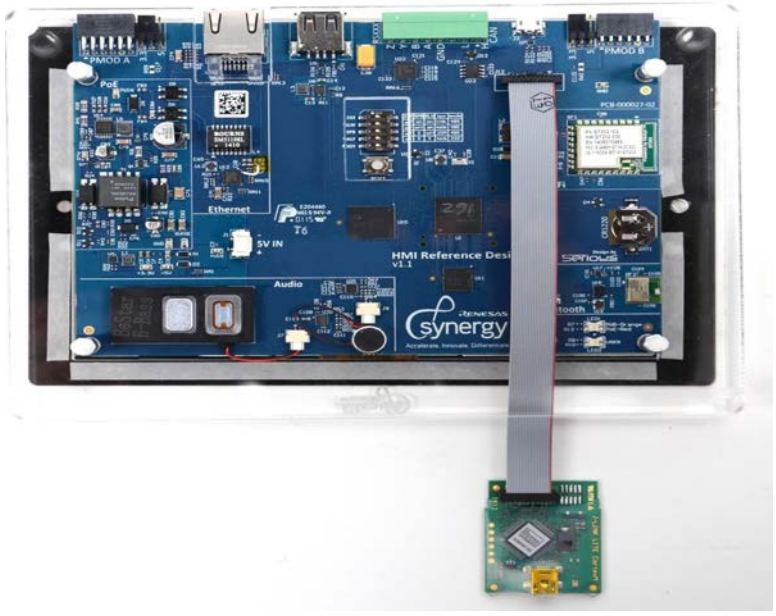


2) Download and install the latest revision of the Synergy Software Package using the default options.

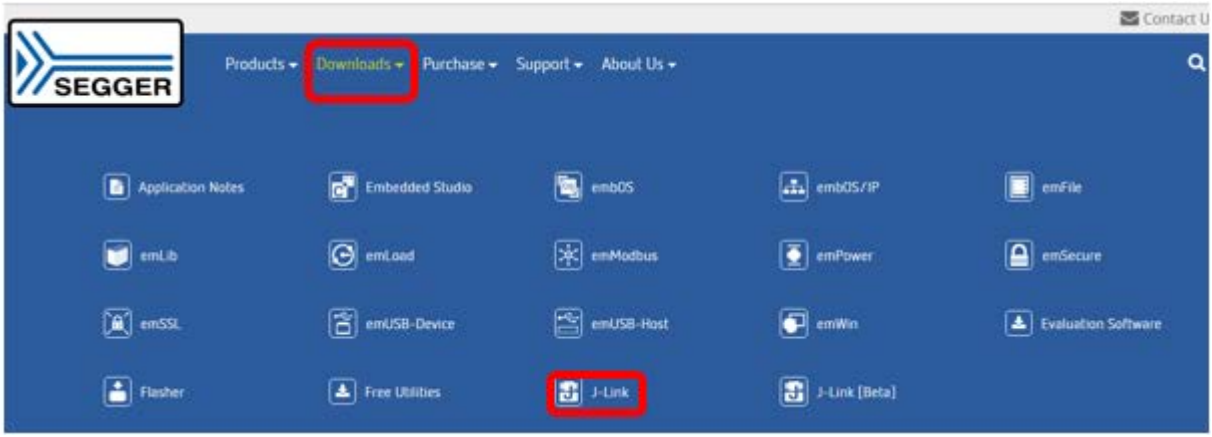
4.2 Connecting the board components

To power the board and connect the board to the PC, follow these steps:

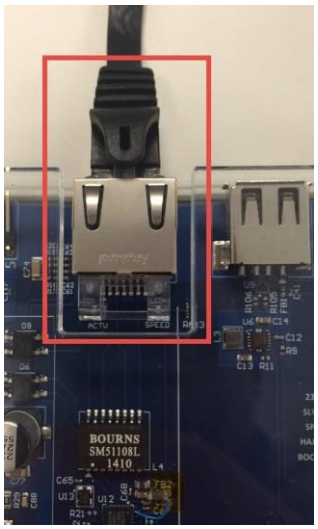
1) Connect the J-link Lite for Cortex-M, supplied with the kit, to connector J12 on the board as shown below.



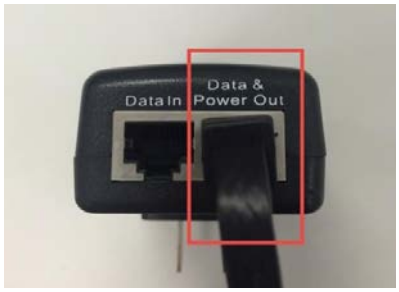
2) Connect the J-link Lite for Cortex-M to the PC with the supplied USB cable. The LED on the J-link Lite for Cortex-M illuminates solid green if communicating properly with the PC. If the LED is not solidly lit (blinking or off) check the connection to the PC and make sure the drivers are loaded. If the driver is not automatically downloaded access SEGGER Microcontroller Co. KG's website. Select "Downloads" then "J-Link" from the available icons. Always download and install the latest version of the J-Link DLL. Restart the computer after installation if you were connected to the kit and the LED is still blinking.



3) Connect the Ethernet cable provided with the PE-HMI1 kit to the Ethernet port on the PE-HMI1 board.



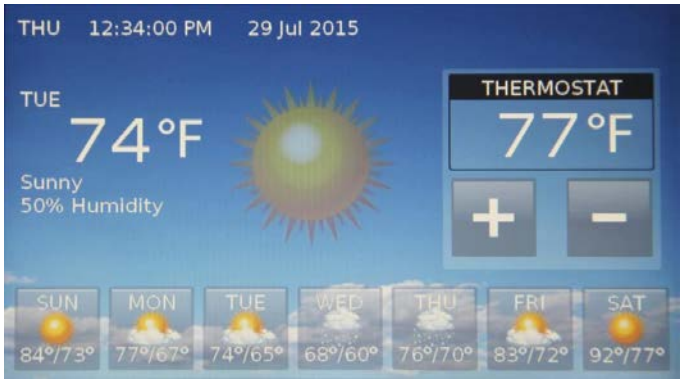
4) Connect the other end of the Ethernet cable to the PoE supply and plug in the power supply.



5) Using the included plastic screws, install the acrylic cover.

4.3 Out-of-Box Demo

1) The Weather Pane application will start and a graphics-rich image will be displayed on the LCD.



2) Take a minute to press different days of the week and see some graphic magic like Alpha Blending in action.

4.4 Running Blinky

The Blinky Project is included in the SSP. Before running the project, ensure that the J-link Lite ARM is connected to the PC.

To run the Blinky Project, you must first create a Renesas Synergy Project in the e^2 studio ISDE; you can then debug and run the project on the PE-HMI1.

4.4.1 Creating the Blinky Project

To create a project:

1) Start the e^2 studio ISDE. Click <e2 Studio> under Windows Start Menu -> Renesas Electronics e2studio -> e2 studio NOTES:

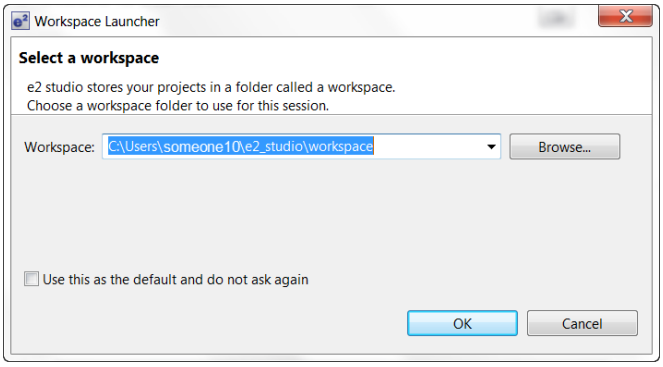
   a) The e^2 studio ISDE confirms the installed tool chain(s) the first time it is started after installing the toolchains.

   b) If the e^2 studio ISDE displays the **Welcome to e^2 studio** screen, review and click the [X] (it will not be displayed again).

   c) If you do not have a compatible tool chain installed, see section Prerequisites.

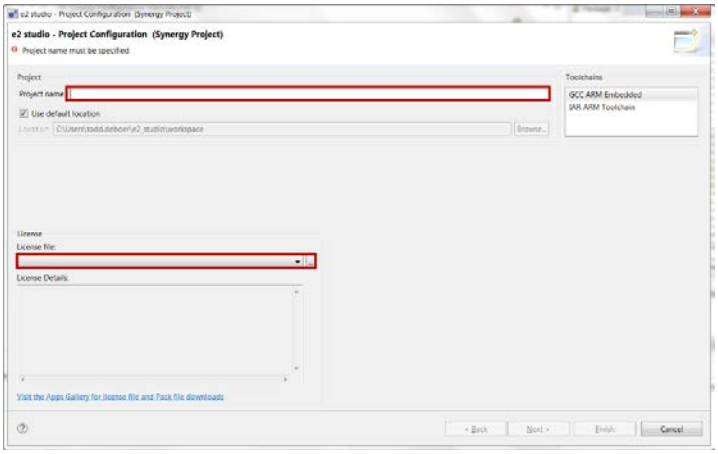
2) If the Workspace Launcher Dialog box is displayed, click <OK>.

Note: Until you select “Use this as the default (workspace) and do not ask again”, the Workspace Launch window will be displayed when e^2 studio is started.



3) Start a new Synergy Project by clicking on **File > New > Synergy Project**.

   The ISDE displays the **Project Configuration (Synergy Project)** dialog box.



4) Enter “Blinky_PE_HMI1” as the Project name.

5) The first time you configure a project you need to load a license file. Click on the browse icon of the License File and if needed browse to C:\Renesas\e2_studio\internal\projectgen\arm\Licenses\ (if you installed to the default locations).

Note: After you have loaded the license file it will be loaded and displayed in **License** window by default.

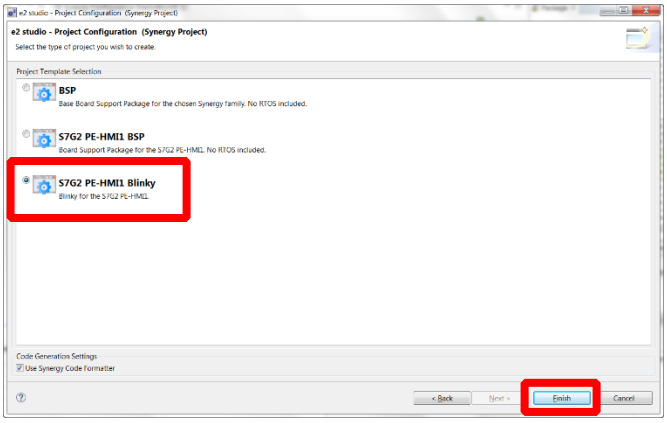
6) Click **Next**.

   The ISDE displays the **Project Configuration (Synergy Project)** window with the **Device Selection** options.

7) Select **S7G2 PE-HMI1** and leave all other options in this window at their default settings.

8) Click <**Next**>.

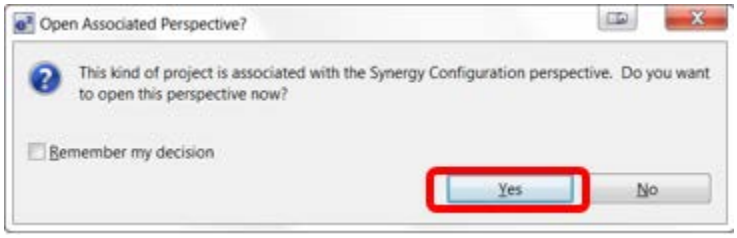
The ISDE displays the Project Configuration (Synergy Project) window with the **Project Template Selection** options.



9) Select **S7G2-PE-HMI1 Blinky**.

10) Click <**Finish**>.

Note: The e^2 studio ISDE has built in Perspectives. Until you inform the tool to remember your selection, it will ask if it can use the Synergy Configuration Perspective as shown below.



11) If the Open Associated Perspective dialog box appears click <Yes>.

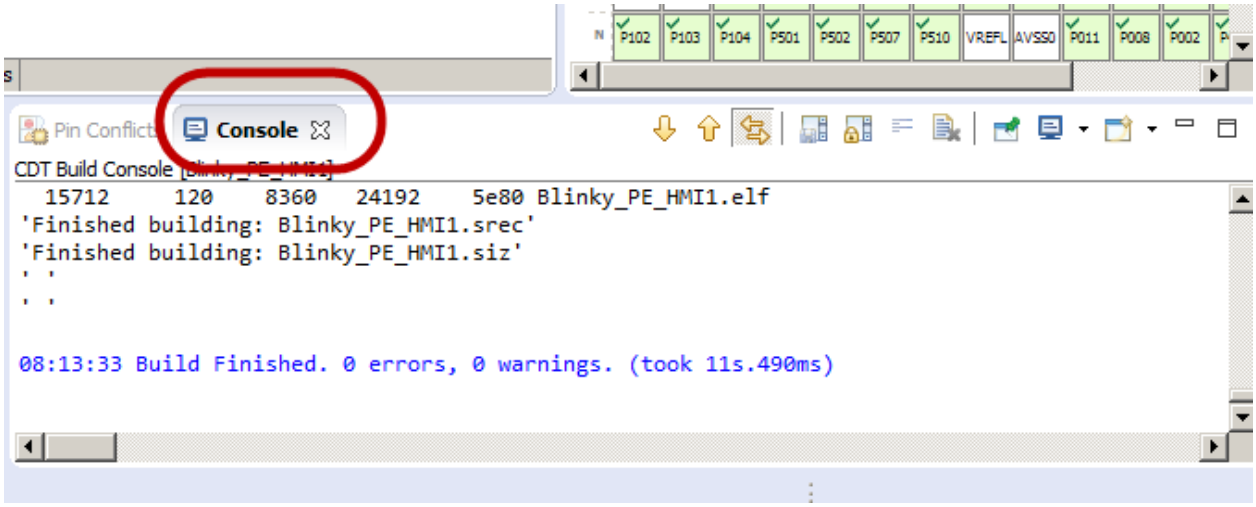
12) The ISDE automatically configures the SSP to load and generate the necessary configuration files for the microcontroller hardware associated with the selected board.

The ISDE displays the **Synergy Project Editor** where you can see all generated files and configurations by selecting the **Clocks**, **Pins**, **Threads**, **ICU**, and **Components** tabs.

IMPORTANT NOTE:

Do not be afraid to look around and check things out. The most important thing to remember is Edit->Undo will fix most anything you do that you want to take back!

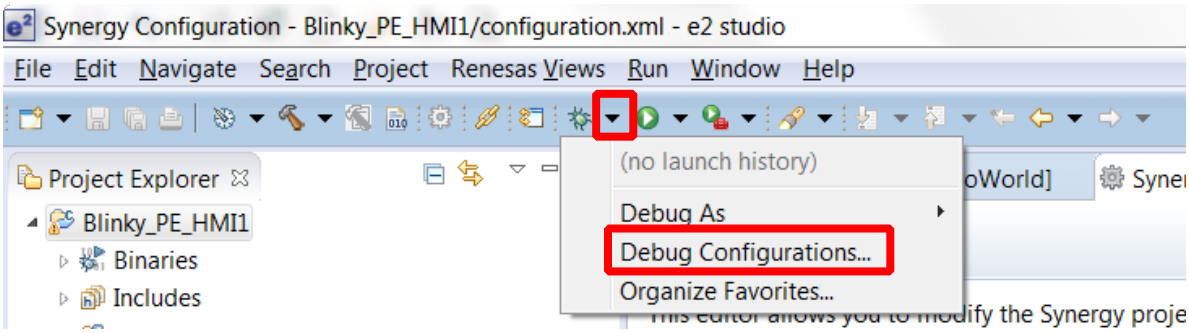
Generate the project by clicking the “Generate project content” button. Then build it with the build icon



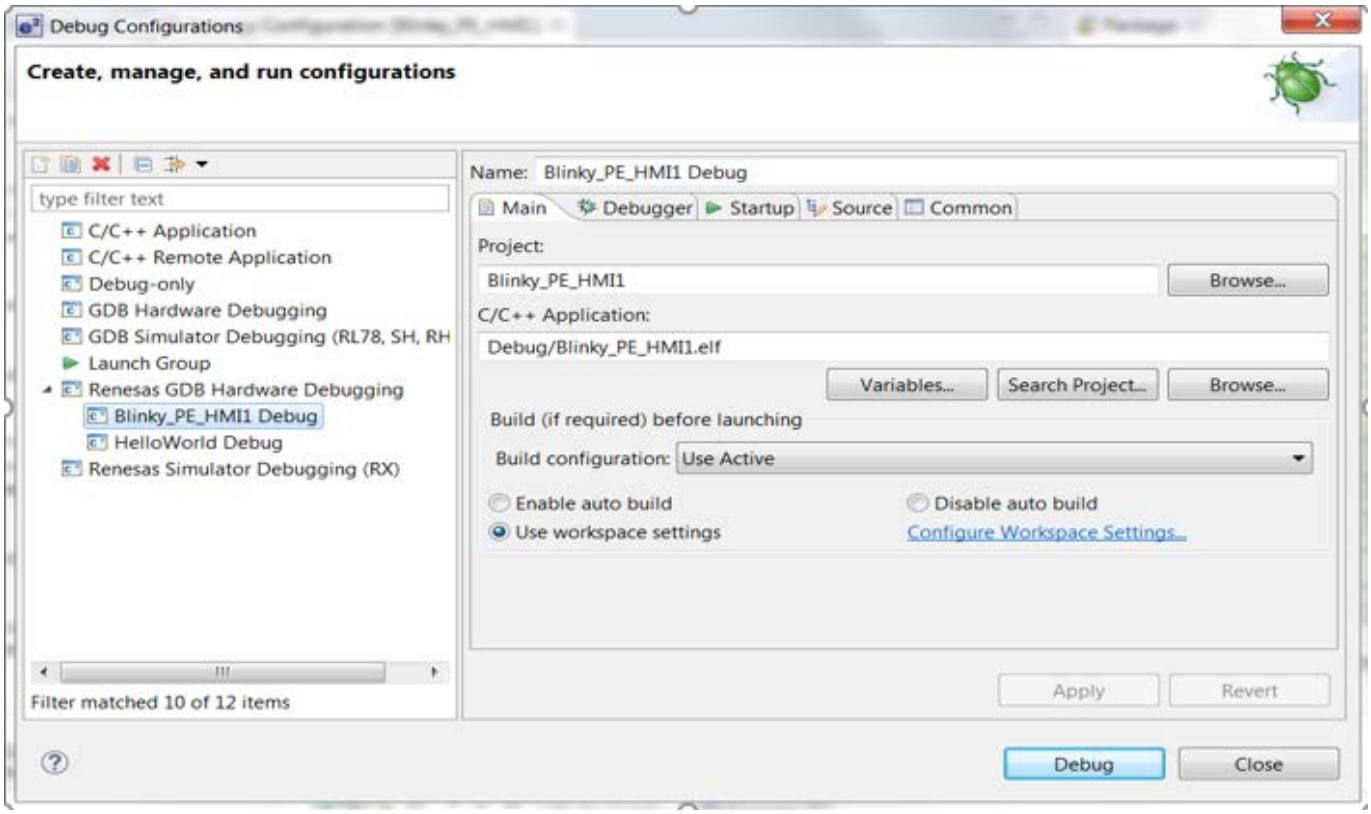
13) Debugging and running the Blinky Project.

To debug and run the project, follow these steps:

1) Configure the debugger by selecting the drop-down menu next to the debug icon and select <Debug Configurations…>.

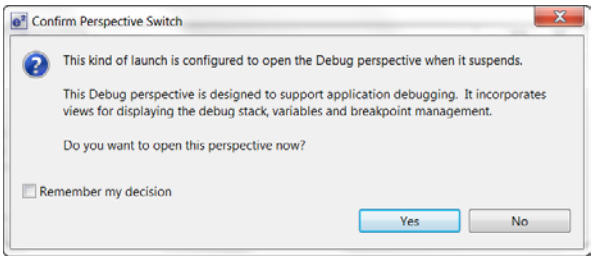


2) Select your Blinky Project Blinky_PE_HMI1 Debug.

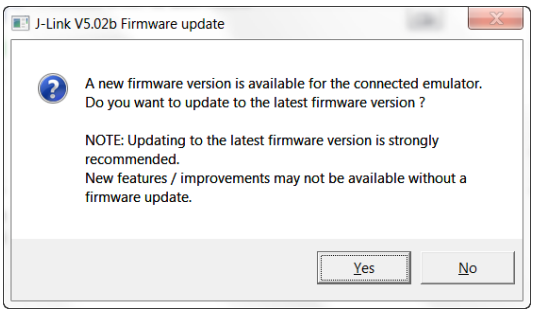


Click **Debug**.

Note: IF asked to Confirm Perspective Switch, click <Yes>. (If you click the <Remember my decision> check box before clicking <Yes> you will not see this selection again.)

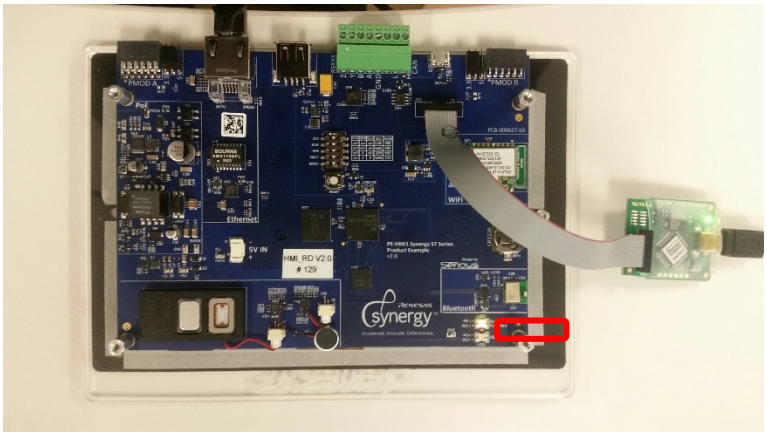


Note: If the update J-Link firmware dialog box is displayed, we highly recommend that you click <Yes>.



The ISDE downloads the project onto the board.

3) Click on the **Resume** icon, , and the software will run till hal_entry ().
4) Click on the **Resume** icon, , and the software will run, turning LED1 on and off.



4.5 Next steps

You can review the code for the Blinky Project in the src directory of your project.

Application Notes and Demonstration Applications are available in the Synergy Software Package page → "Demos and Applications" tab of the Renesas Synergy Gallery https://synergygallery.renesas.com/ssp. Examples of the categories we are developing are:

- Wired Connectivity (CAN, RS232/485, TCP/IP, Web Server, networking services)
- Bluetooth Connectivity (Bluetooth Classic and Bluetooth Low Energy connection to mobile devices using various profiles)
- Wi-Fi Connectivity (Access Point Enumeration, Access Point connection using secure protocols, TCP/IP, Web Server, networking services)
- Multi-media (webcam, audio playback & record, audio processing, GUIX™ tutorials)
- MCU Performance & Power Measurement (thread, throughput, and I/O performance, low-power modes & power measurement)
- Security (protected memory and bus access examples, stack security examples, security protocols and services examples)

4.6 Reload the Out-of-Box Demo

Should you desire to reload the original Out-Of-Box Demonstration application, you can find it and the instructions to reload it, in the SSP page → "Demos and Applications" tab of the Synergy Gallery. https://synergygallery.renesas.com/ssp.

NOTE. The Out-of-Box demo on the Synergy Gallery may be an updated and improved demo. This kit contained version 1.0 of the PE-HMI1 Out-of-Box Demo.

5. Additional Resources

Learn more about:

- Synergy kits at http://www.renesassynergy.com/kits
- Synergy Microcontrollers at http://www.renesassynergy.com/microcontrollers
- Synergy Software at http://www.renesassynergy.com/software
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Website and Support

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

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Revision History

		Description	
Rev.	**Date**	**Page**	**Summary**
1.00	Oct 9, 2015	-	Initial version
1.01	Jun 15, 2017	-	Updated graphics

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Colophon 4.1

Renesas Synergy™ Platform
Product Example HMI1 (PE-HMI1)

Renesas Electronics Corporation

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