# Getting Started Guide

## IAR KickStart Kit for Renesas RPBRX111

This guide briefly describes how to get started using IAR Embedded Workbench® with the RPBRX111 Renesas promotional board.

For more details about the RPBRX111 board, please read the RPBRX111Design Manual.

## Install IAR Embedded Workbench

1  Insert the IAR KickStart Kit CD, which contains all the software you need to get your development project up and running. The installation program starts automatically.

2  Click **Install** and follow the prompt instructions to install IAR Embedded Workbench. Note that it may take several minutes for the installation files to unpack. We recommend that you use the default directories on your installation.
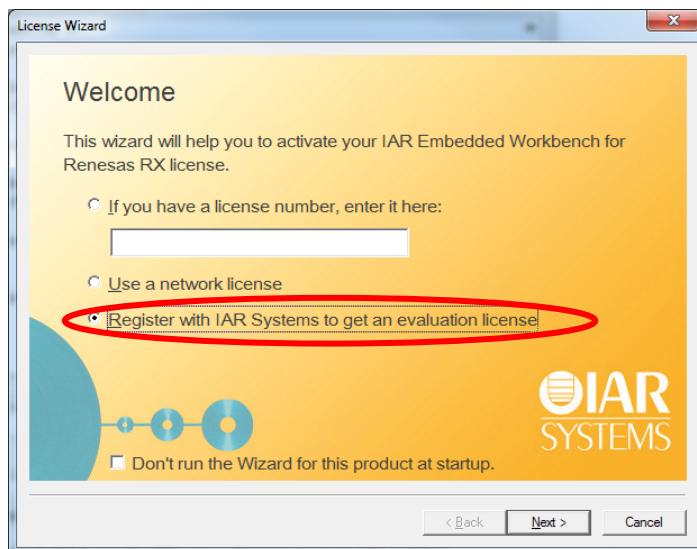


*Figure 1 - Register to get an evaluation license*

3  When you start IAR Embedded Workbench for the first time, the License Wizard will open. Choose **Register with IAR Systems to get an evaluation license**.

4  Select a time limited or code size limited evaluation license, and then register online to get your license number, which will be delivered to you via e-mail within a few minutes.

5  Activate the license in the **License Wizard** window.

You may register and activate both the kickstart and the evaluation license, and switch in between from the **License Manager**. For further information, see the *IAR Embedded Workbench, Licensing Guide*, under `\IAR Systems\Embedded Workbench 6.5\common\doc`.

For the latest software and documentation updates, please visit **www.iar.com/kit_updates** and **www.renesas.eu/rpbrx111.**

## Set up the evaluation board

**1**  Connect the RPBRX111 board (CN8, J-Link debugger connector) to your PC using the included USB cable.

**2**  If this is the first time you are using a J-Link, Windows will install the USB driver automatically. If not, please navigate to `\IAR Systems\Embedded Workbench x.x\rx\drivers\JLink` and start the `InstDrivers` application.
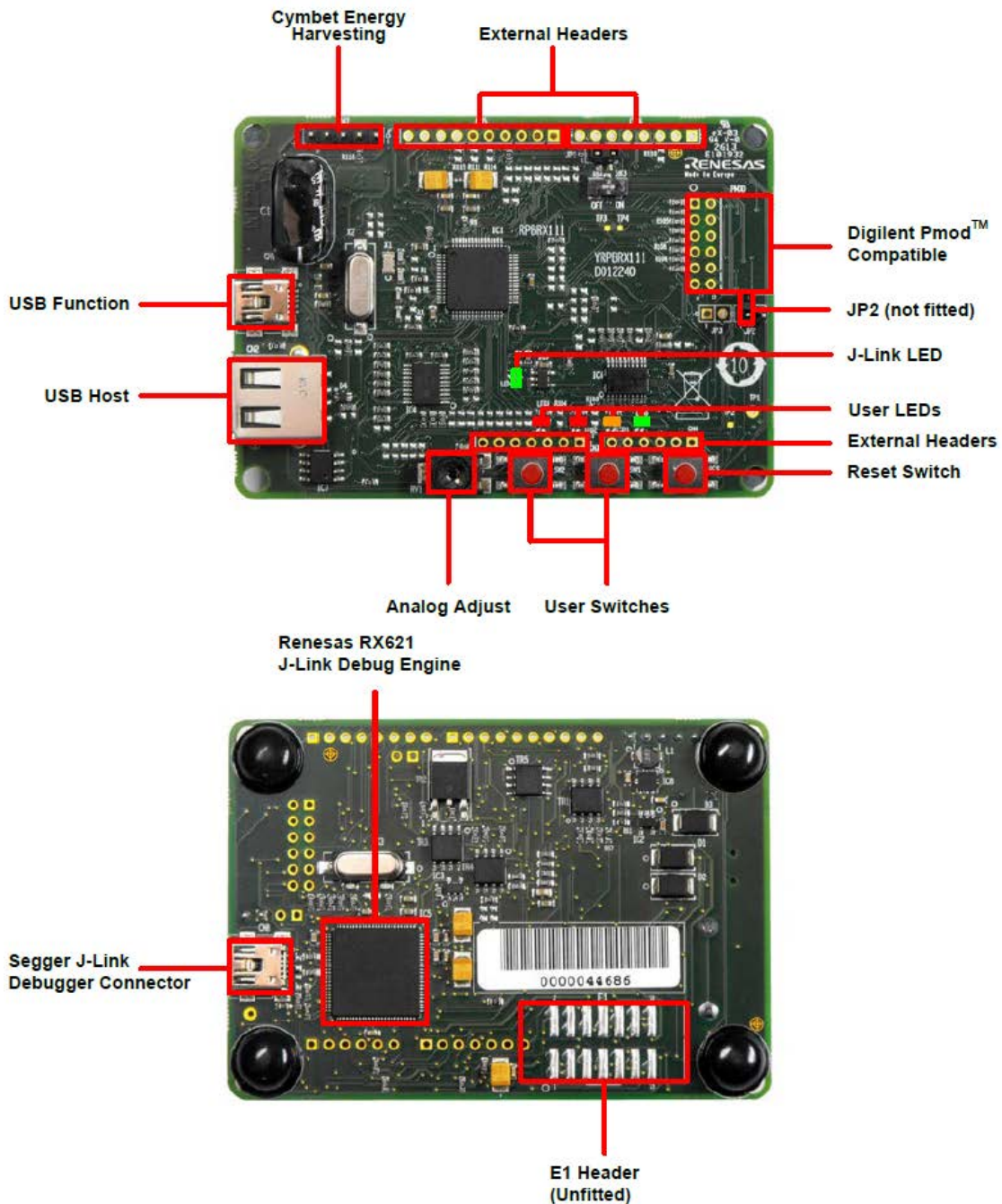
*Figure 2 - RPBRX111 board overview*

## Run example applications

We assume that you have some working knowledge of the IAR Embedded Workbench IDE. For a quick introduction, see the **GETTING STARTED** and the **TUTORIALS** in the **IAR Information Center for Renesas RX** (Figure 3).

1 From the **Start** menu, choose **All Programs>IAR Systems>IAR Embedded Workbench for Renesas RX x.xx > IAR Embedded Workbench** to start the IAR Embedded Workbench IDE. You will get straight into the **IAR Information Center**.
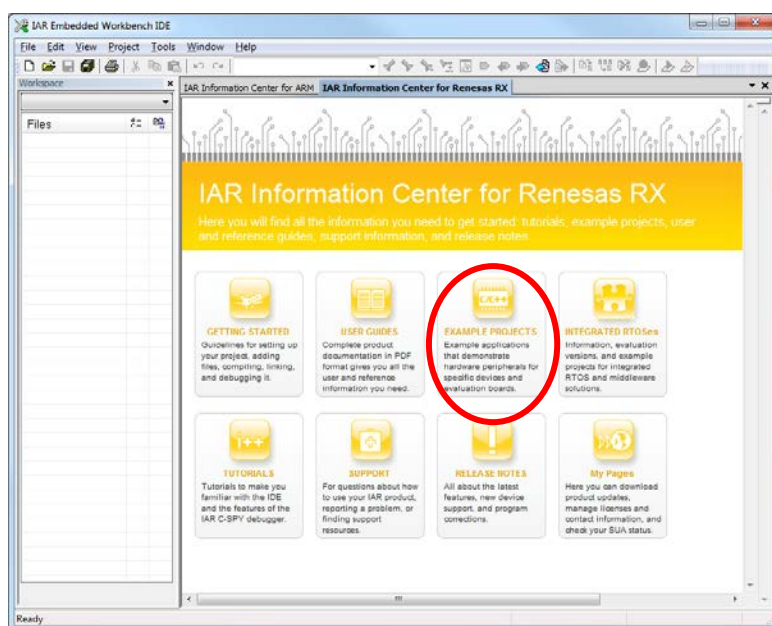
2 Click **EXAMPLE PROJECTS**.



*Figure 3 - IAR Information Center*

3 Select the **RPBRX111** board.

4 Open the project **GUI Demonstration Sample** and click **Choose** to use the default destination folder to save a copy of this project for testing, so that the original project will not be updated for any changes you made during testing.

5 Read the example description.

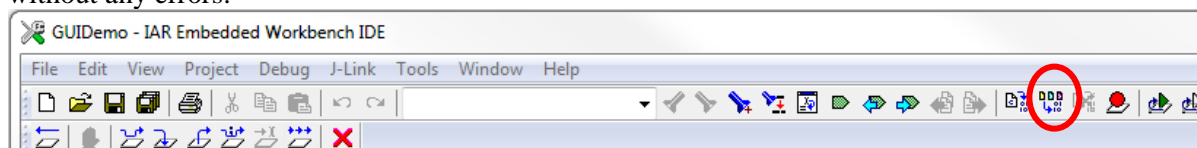6 Choose **Project>Make** or click the **Make** button ![make] on the toolbar. The project should be built without any errors.



*Figure 4 - IAR Embedded Workbench IDE-Menu and toolbar*

7 Click the **Download and Debug** button ![debug] and use the default settings in the hardware setup dialog box that is displayed. Click **OK** TWICE. This will download your program to the RPBRX111 board.

The file `r_cg_main.c` is now open in the editor window and the program is ready on the board for running. You can either run and debug your program with C-SPY Debugger* (see steps on P5), or continue the following steps to run the program together with the demo GUI application.

**8** Launch the `RX111Demonstrator.exe` application from your project folder, by default under `\IAR Embedded Workbench\rx\examples\RPBRX111\GUIDemo\YRPBRX111 Demo GUI`. The demo GUI should start.
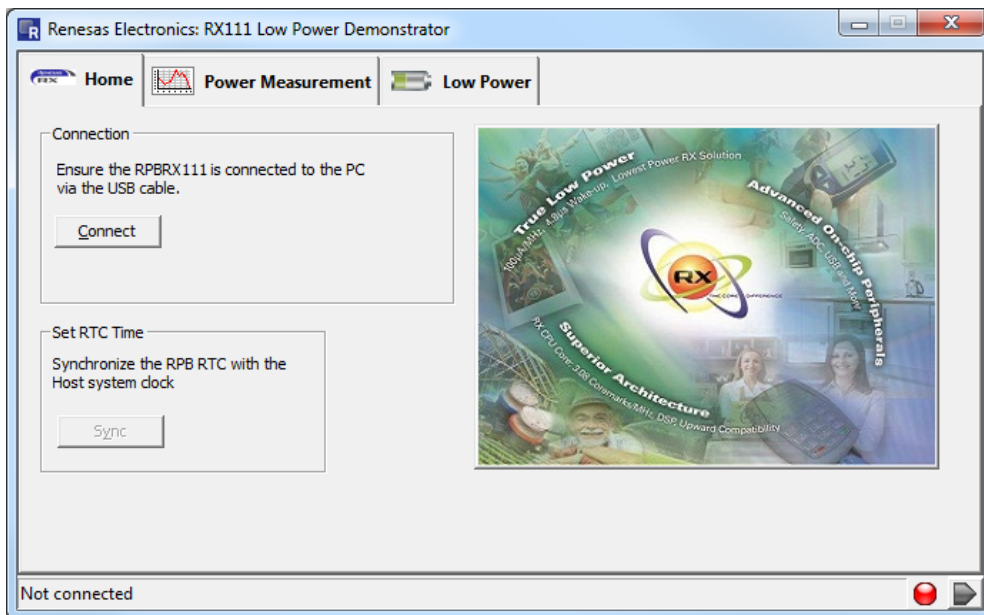


*Figure 5 - The Demo GUI*

**9** Click **Connect** to connect with the RPBRX111. After a few seconds the message in the status bar at the bottom of the window will change to show the RTC time reading from the RPB and the red circle in the bottom-right corner will go green.

**Note:** When you have some connection problems, just re-plug the board and press reset button (see Figure 2).

**10** Click the **Sync** button to set the RPBRX111 RTC with the host computer system time. A monitoring console to show communication between the PC and the RPBRX111 can be opened by clicking the arrow in the window corner.

**11** Click on the **Power Measurement** tab. This tab accesses the current measurement circuit on the RPBRX111, and displays current measurements taken from the MCU.
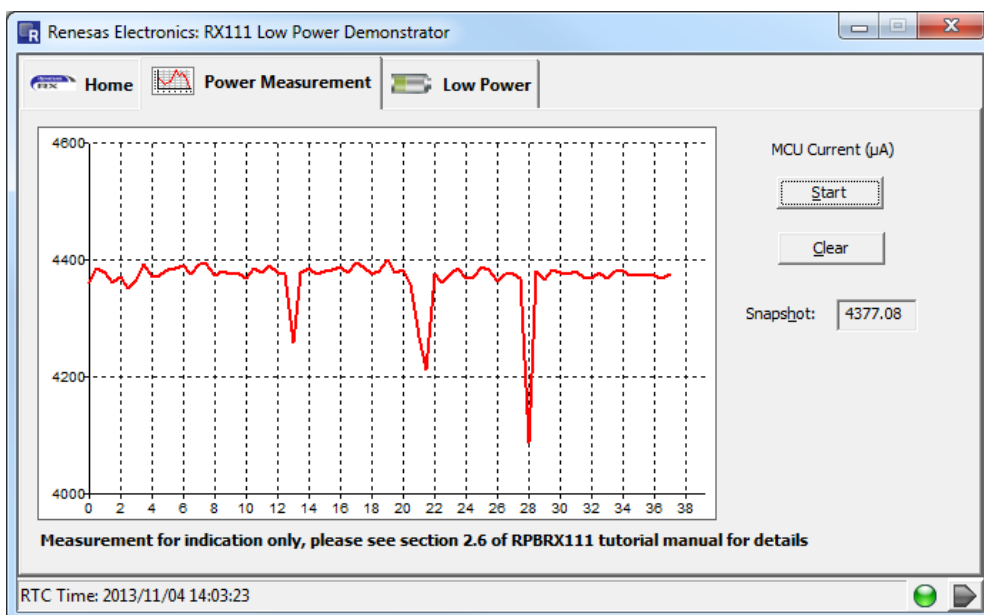


*Figure 6 - Power Measurement*

**12** Click the **Start** button to begin taking measurements. Data will appear on the graph, with time on the horizontal axis and current (in µA) on the vertical. The axis will scale automatically.

**13** Click on the **Low Power** tab. This tab provides controls to change the speed mode (and clock source) of the RX111 MCU, along with access to sleep modes.
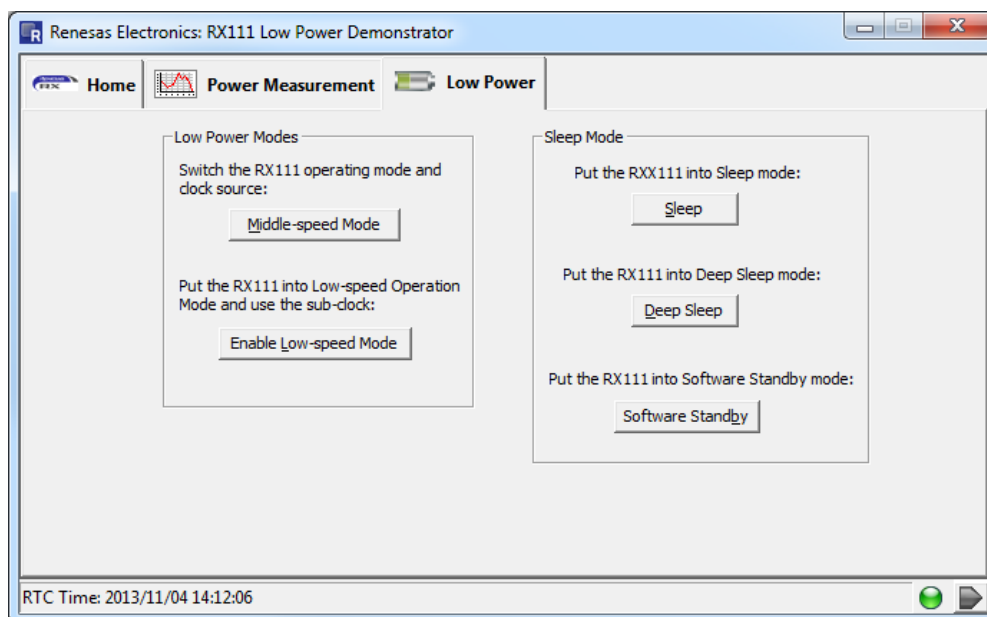


*Figure 7 - Low Power Modes*

- By default, the system clock uses the 12MHz crystal oscillator and the PLL circuit.

- In middle-speed mode the high-speed on-chip oscillator (HOCO) will be selected as the clock source and the crystal oscillator shut down.

- In low-speed mode the 32.768 kHz sub-clock will be selected as the clock source and all other clocks will be disabled.

  **Note:** When low-speed mode is selected, it is not possible to put the RX111 into any of the sleep modes.

**14** Switch back to the **Power Measurement** tab after changing clock source to observe the effect on the MCU current. It may be necessary to stop, clear, and restart the graph when using sleep modes, as the reduction in current is significant.

To run other example projects included in IAR Embedded Workbench, just click **Help>Information Center** to bring up the **IAR Information Center** again. Remember to read through the `Description.txt` for each project.

### *Run and debug the program with C-SPY Debugger

- Click the **Go** button on the IAR Embedded Workbench IDE toolbar to start the application.

- To explore the C-SPY debugging features or change the J-Link settings, choose the **View** and **J-Link** menu (see Figure 4).

- To stop C-SPY, click the **Break** button.

- To exit C-SPY, click the **Stop Debugging** button.

Please read the *C-SPY Debugging Guide* for more information.

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