Quick Start Guide

RA6M3 Group

Graphics Evaluation Kit for RA6M3 Microcontroller Group
EK-RA6M3G
Quick Start Guide

Renesas RA Family
RA6 Series

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This Evaluation Kit is only intended for use in a laboratory environment under ambient temperature and humidity conditions. A safe separation distance should be used between this and any sensitive equipment. Its use outside the laboratory, classroom, study area, or similar such area invalidates conformity with the protection requirements of the Electromagnetic Compatibility Directive and could lead to prosecution.

The product generates, uses, and can radiate radio frequency energy and may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, which can be determined by turning the equipment off or on, you are encouraged to try to correct the interference by one or more of the following measures:

• Ensure attached cables do not lie across the equipment.

• Reorient the receiving antenna.

• Increase the distance between the equipment and the receiver.

• Connect the equipment into an outlet on a circuit different from that which the receiver is connected.

• Power down the equipment when not in use.

• Consult the dealer or an experienced radio/TV technician for help.

Note: It is recommended that wherever possible shielded interface cables are used.

The product is potentially susceptible to certain EMC phenomena. To mitigate against them it is recommended that the following measures be undertaken:

• The user is advised that mobile phones should not be used within 10 m of the product when in use.

• The user is advised to take ESD precautions when handling the equipment.

The Evaluation Kit does not represent an ideal reference design for an end product and does not fulfill the regulatory standards for an end product.

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Renesas RA Family

EK-RA6M3G

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1. Introduction

This Quick Start Guide (QSG) provides:

- An overview of the Quick Start example project that the EK-RA6M3G kit comes pre-programmed with.
- Instructions for running the Quick Start example project.

1.1 Assumptions and Advisory Notes

1. Prior to running the Quick Start example project on the EK-RA6M3 board, default jumper settings must be used. Refer to the EK-RA6M3G user's manual for the default jumper settings.
2. The screen shots provided throughout this document are for reference. The actual screen content may differ depending on the version of the software used.

2. Kit Contents

The following components are included in the kit:

1. EK-RA6M3 board
2. Graphics Expansion Board
3. Micro USB device cable (type-A male to micro-B male)
4. Micro USB host cable (type-A female to micro-B male)
5. Ethernet patch cable

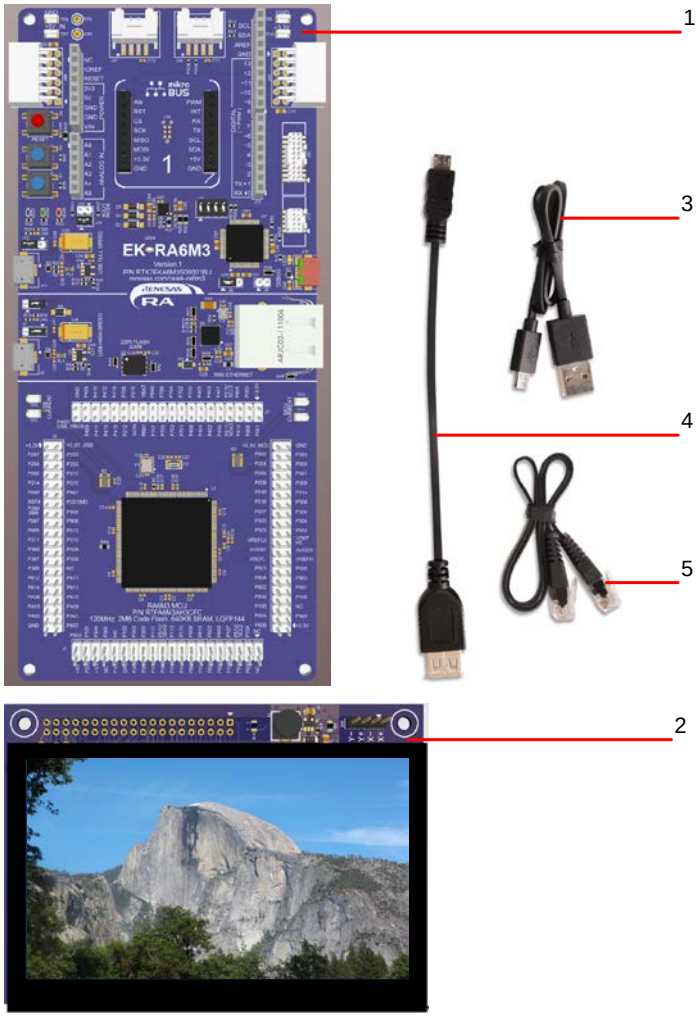


Figure 1. EK-RA6M3G Kit Contents

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3. Overview of the Quick Start Example Project

The Quick Start example project demonstrates the graphics manipulation capabilities of the integrated Graphics LCD Controller and JPEG Decoder modules of the RA6M3 MCU Group using a HMI developed using emWin, the embedded GUI from SEGGER.

emWin uses the drawing engine (Dave2D) of the RA6M3 to perform operations such as drawing bitmaps, anti-aliased shapes, and filling rectangular areas. emWin also routes JPEG decoding using the integrated JPEG Decoder to allow for fast drawing of JPEGs, emWin movie files (EMFs), and AVIs.

The example project HMI consists of four screens. The user can switch between each screen by swiping left/right or pressing one of the navigation buttons.

3.1 Quick Start Example Project Flow

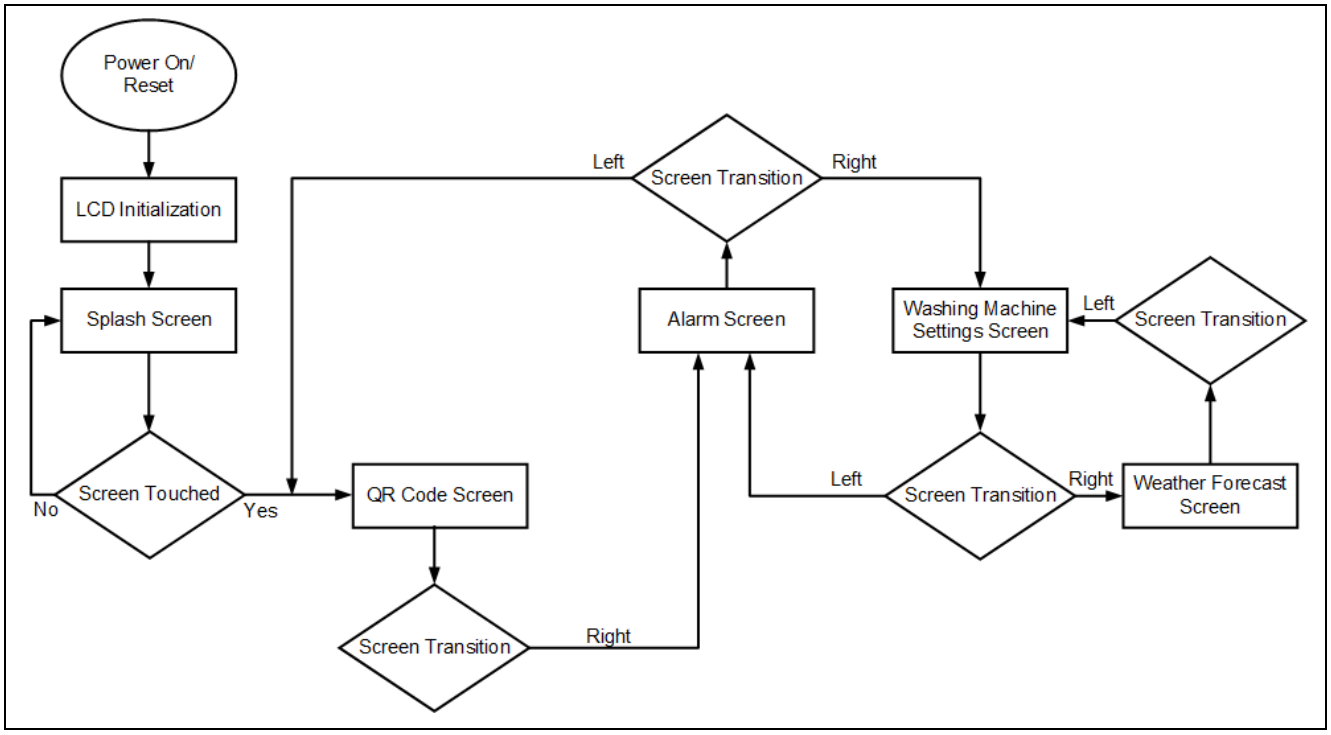


Figure 2. Quick Start Example Project Flow

4. Running the Quick Start Example Project

This section lists the requirements and instructions to power up the EK-RA6M3G kit and run the Quick Start example project.

Hardware Requirements

- EK-RA6M3 board
- Graphics Expansion Board
- Micro USB device cable
- A 5 V power source with a USB port

4.1 Connecting and Powering Up the EK-RA6M3G Kit

1. Connect the Graphics Expansion Board to the graphics expansion port (J1) of the EK-RA6M3 board. Make sure to align the arrows printed on the back of each of the two boards.
2. Connect the micro USB end of the micro USB device cable to any one of the micro USB ports (J6, J10, or J11) of the EK-RA6M3 board.
3. Connect the other end of this cable to the USB port of the 5 V power supply. The power LED (LED4) on the EK-RA6M3 board will light up white, indicating that the EK-RA6M3 board is powered on.

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4.2 Running the Quick Start Example Project

To run the Quick Start example project, use the following instructions:

1. On power up or RESET, the Quick Start example project programmed on the EK-RA6M3 board will begin to execute first showing a splash screen with pictures followed by welcome text.



Figure 3. Splash Screen with Pictures

2. Once the welcome text appears, touch the LCD screen to go to the QR code screen.

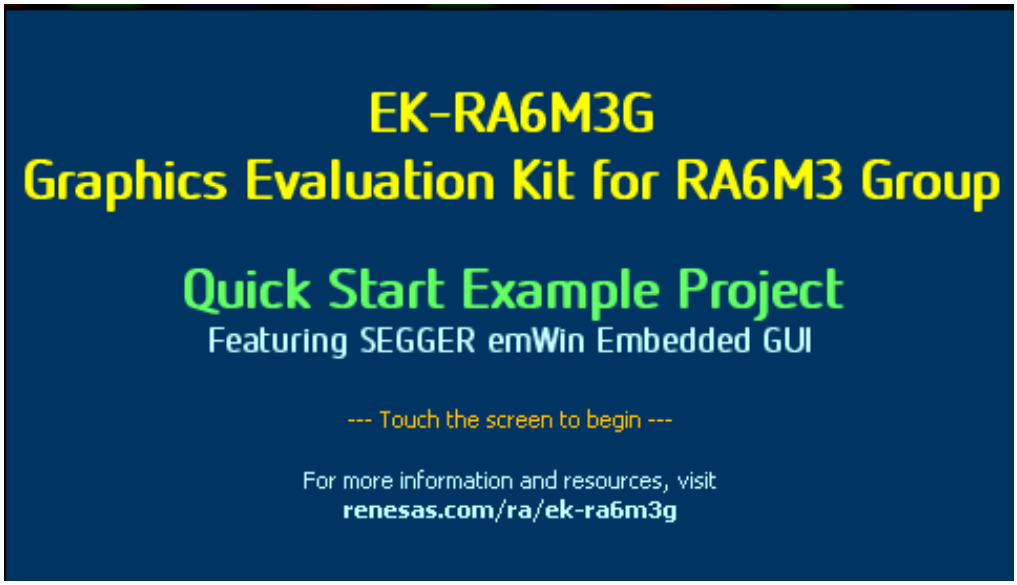


Figure 4. Splash Screen with Welcome Text

3. The QR code screen shows the two QR codes generated on runtime with emWin. These codes can be scanned with a QR code reader such as a cell phone with a QR code scanner app. The QR codes point to Renesas and SEGGER's websites**.**

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Figure 5. QR Code Screen

4. Swipe towards left (or press the navigation arrow on the top right corner of the screen) to navigate to the alarm screen.

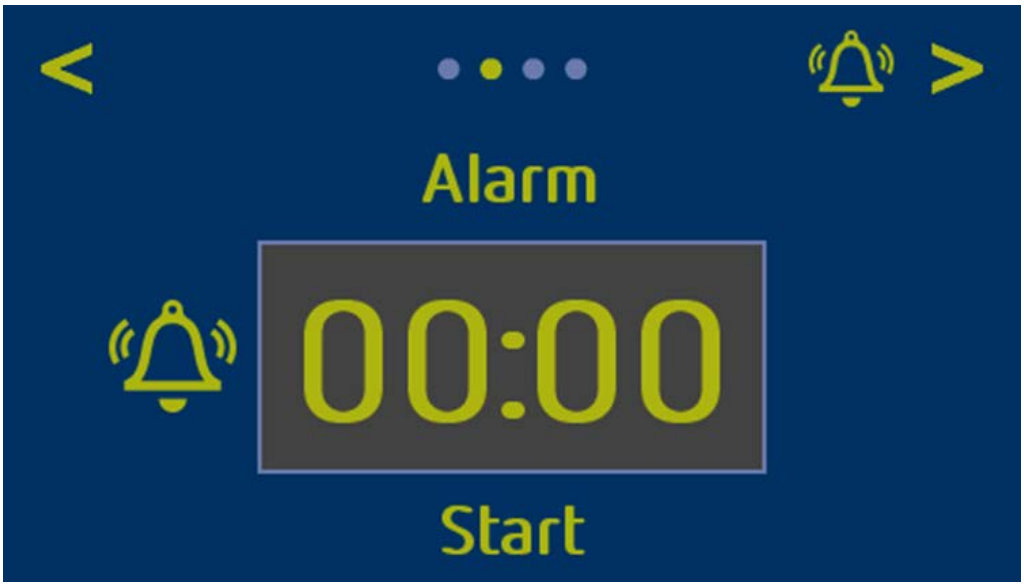


Figure 6. Clock Screen

5. The alarm screen shows a simple alarm clock that can be set by swiping the numbers up or down and started by pressing the **Start** button. The timer will start to count down, even if the screen is not the current screen. Once it reaches zero, a small bell will show up in the top right corner. Pressing this bell will reset the alarm.

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6. Swipe towards left (or press the navigation arrow on the top right corner of the screen) to navigate to the washing machine interface. Or swipe towards right (or press the navigation arrow on the top left corner of the screen) to navigate back to the alarm screen.

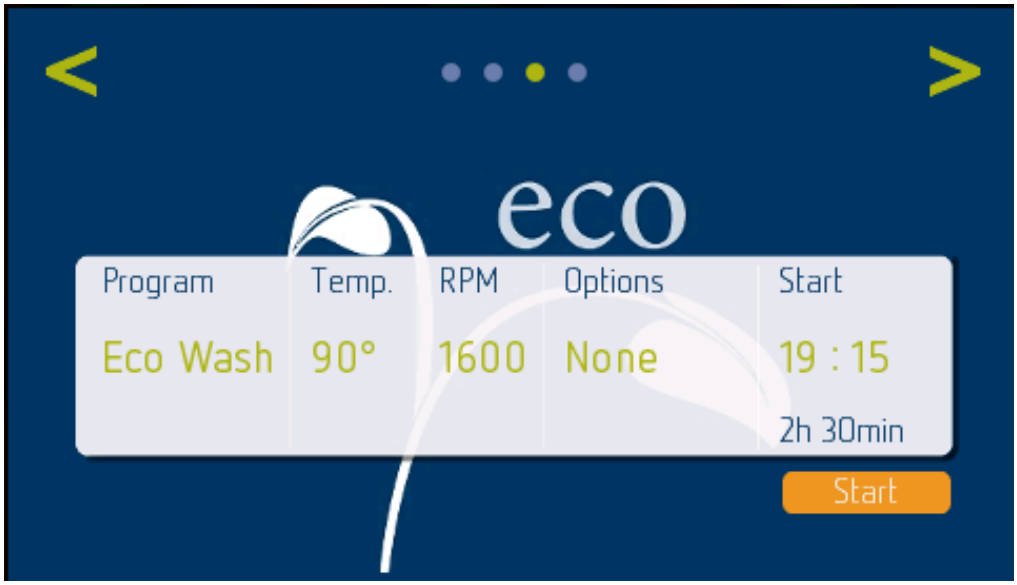


Figure 7. Washing Machine Interface Screen

7. The washing machine interface provides options to select different programs, temperatures, options, and so forth. It makes use of the JPEG decoder to display the images in the background. This can help save memory for example, by comparing a JPEG image with a size of ~28 KB to a raw 16-bpp image with a size of ~200 KB.
8. Swipe towards left (or press the navigation arrow on the top right corner of the screen) to navigate to the weather forecast screen. Or swipe towards right (or press the navigation arrow on the top left corner of the screen) to navigate back to the washing machine interface screen.

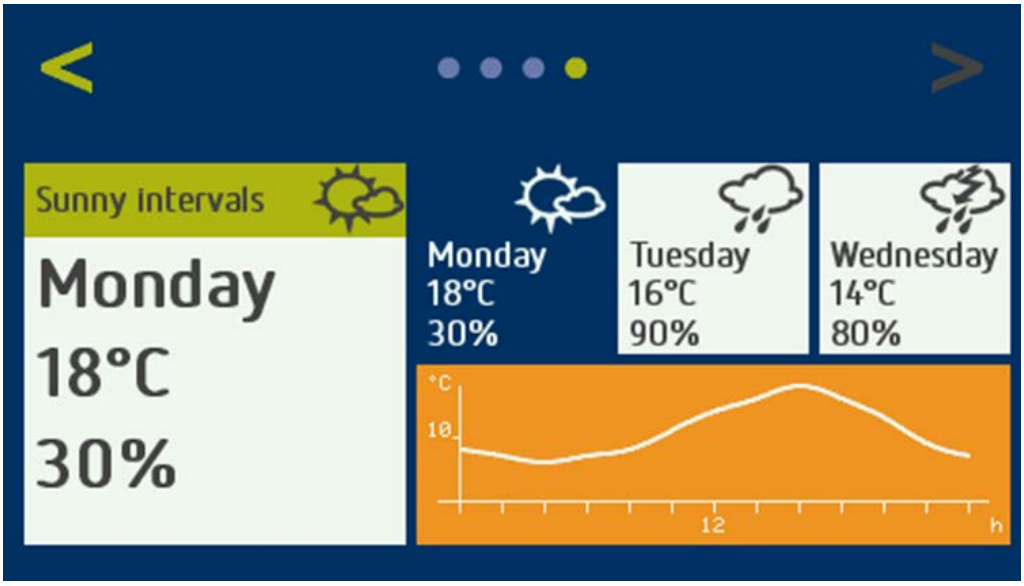


Figure 8. Weather Forecast Screen

9. The weather screen shows a weather forecast interface. It uses alpha bitmaps which can be drawn in any color. It also shows 2D splines drawn using emWin.

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5. Next Steps

1 To learn more about the EK-RA6M3G kit, refer to the EK-RA6M3G user's manual and design package available in the Documents and Download tabs respectively of the EK-RA6M3G webpage at renesas.com/ra/ek-ra6m3g.

2. Renesas provides several example projects that demonstrate different capabilities of the RA MCUs. These example projects can serve as a good starting point for users to develop custom applications. Example projects (source code and project files) for EK-RA6M3G kit are available in the EK-RA6M3G-Example Projects Bundle. The example projects bundle is available in the Downloads tab of EK-RA6M3G webpage.
   - Download and extract the example projects bundle (`xxxxxxxxxxxxxxx-ek-ra6m3g-exampleprojects.zip`) to a local directory on the host PC.
   - Refer to the list of all example projects (`xxxxxxxxxxxxxxx-ek-ra6m3g-exampleprojects.pdf`) available inside the example projects bundle.
   - Browse to the desired example project (for example: adc_ek_ra6m3g_ep) in the example projects bundle (xxxxxxxxxxxxxxx -ek-ra6m3g-exampleprojects\ek_ra6m3g\adc\adc_ek_ra6m3g_ep)
   - For help on using example projects, refer to `Example Project Usage Guide.pdf` in the RA Example Repository on GitHub at github.com/renesas/ra-fsp-examples/tree/master/example_projects. The archived versions of the source code of the example projects are available the example project repository.

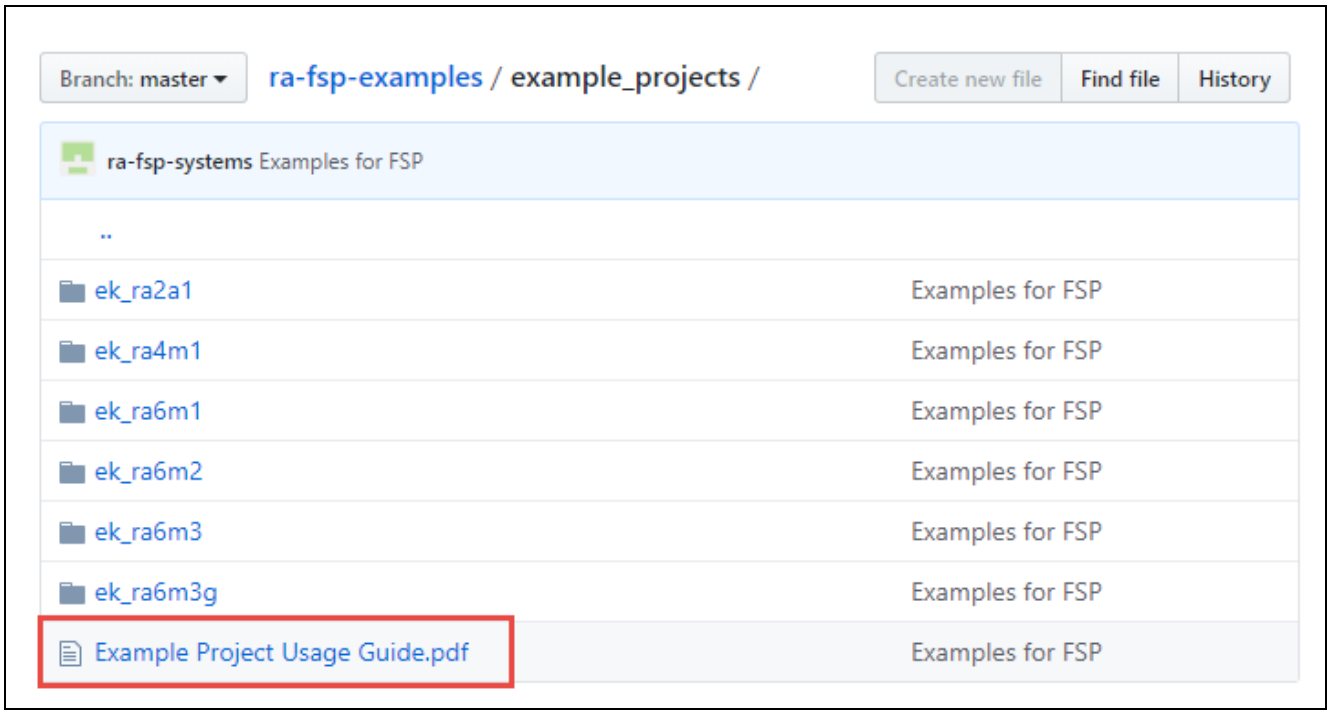


Figure 25. Example Project Directory Contents

3. The source code of the Quick Start example project is provided by SEGGER at segger.com/renesas-ek-ra6m3g/. A few additional demo binary files are also provided by SEGGER, some of which are briefly described as follows.

Movie Demo displays an emWin Movie File (EMF) using the JPEG decoder to decode individual images of the movie file. The decoded images are drawn with the drawing engine (Dave2D). The values in the top left corner indicate the Frames Per Second (FPS) and the time required to decode and draw a single image. The movie files' desired FPS is 25.

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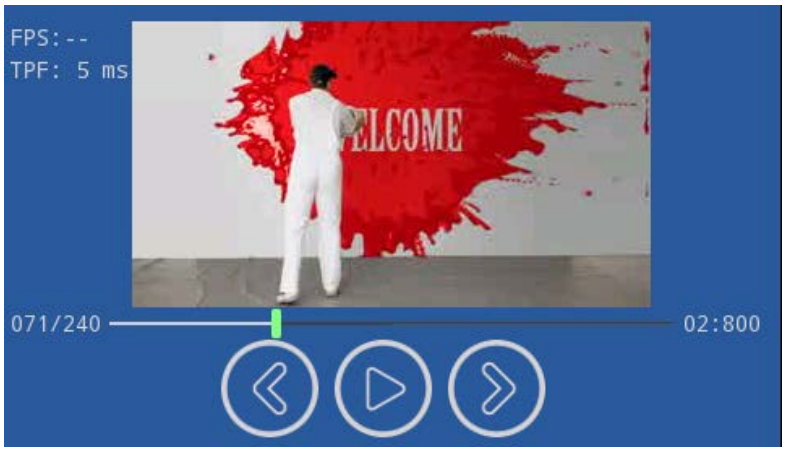


Figure 9. Movie Demo

Weather Forecast Demo displays a more sophisticated Weather Forecast example than the one from the Quick Start example. The images are drawn with drawing engine Dave2D.



Figure 10. Weather Forecast Demo

4. To learn how to create a new e^2 studio project from scratch, refer to *Chapter 2 Starting Development* in the FSP User Manual (renesas.com/ra/fsp). To learn how to use e^2 studio, refer to the User Manual provided on the e^2 studio webpage (renesas.com/software-tool/e-studio).

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6. Website and Support

Visit the following URLs to learn about the kit and the RA family of microcontrollers, download tools and documentation, and get support.

EK-RA6M3G Resources	renesas.com/ra/ek-ra6m3g
RA Product Information	renesas.com/ra
RA Product Support Forum	renesas.com/ra/forum
Renesas Support	renesas.com/support

Provide Feedback/ Request a Feature

Renesas aims to provide the best microcontroller kit experience to help jumpstart customer innovation with RA family of microcontrollers and take products to market faster. The Renesas RA microcontroller kits have been designed with a lot of attention-to-detail and customer-centric thinking at every aspect of design. Renesas aims to exceed customer expectations.

Renesas looks forward to hearing your feedback and knowing how we can enhance your experience. Please share your feedback at renesas.com/ra/kitfeedback.

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Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Oct.16.19	—	Initial release
1.01	Nov.18.19	—	Updated section 5, Next Steps.
1.02	Jun.12.20	10	Updated Example Project information
1.03	Oct.13.21	11, 12	Added step 4 to section 5, Next Steps and the **Provide Feedback/ Request a Feature** information to section 6, Website and Support.

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