

# QE for Display[RX,RA] V3.2.0

## Release Note

Thank you very much for your interest in QE for Display[RX,RA] V3.2.0.

This document describes this product installation, restrictions and so on. Please read this document before using the product.

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## 1. About QE for Display[RX,RA]

### 1.1 Summary

QE for Display[RX,RA] is one of several Solution Toolkit which operate under the e<sup>2</sup> studio integrated development environment.

In the following embedded system development, this product allows for easy initial adjustment of display connection (display timing adjustment and image quality adjustment) and create GUI. This shortens the development period.

- Display GUI on LCD using Graphic LCD Controller (a display controller mounted on the RX family and RA family of MCUs) image display function, emWin GUI software package and Aeropoint GUI for RX.
- Display GUI on a serial-connected LCD using serial communication in the RX family and the emWin GUI software package.

### 1.2 New Functions

#### 1.2.1 RA8D1 is now supported

This product can now be used in a project for an RA8D1 device.

#### 1.2.2 Redesigned workflow view (main view)

The workflow view of the plug-in version has been redesigned. Depending on the display width of the view, you can use two different types of workflow view: one with detailed guides and a simple type with fewer guides. See section 3.1.9 for notes on the use of the new workflow view. See Chapter 4 for the differences between the old and new workflows.

### 1.3 Supported Environment

- Windows 10, Windows 11
- Renesas e<sup>2</sup> studio 2023-10 (or later)
  - \* If you are using a version of the e<sup>2</sup> studio earlier than 2023-10, please update it to 2023-10 or later.
  - \*The project used with this product requires the use of Smart Configurator.

### 1.4 Supported Microcontroller

#### ■ GLCDC Function

RX family

- RX600 Series RX65N groups\*, RX651 groups\*, RX66N groups  
(\* ROM capacity: 1.5 MB to 2 MB only)
- RX700 Series RX72M groups\*, RX72N groups  
(\* 100-pin is not supported.)

RA family

- RA6M Series RA6M3 groups
- RA8D Series RA8D1 groups

#### ■ Serial Connection Function

All RX family\*

(\*Only microcontrollers supported by Smart Configurator.)

### 1.5 Supported Software

- RX Firmware Integration Technology (FIT)

- Graphic LCD Controller Module: r\_glcdc\_rx V1.50 (or later)
- emWin v6.32 Module: r\_emwin\_rx V1.00 (V6.32.a.1.00) (or later)
- Aeropoint Module: r\_aeropoint\_rx V1.00 (or later)
- RA Flexible Software Package (FSP)
  - Graphic LCD Controller Module: r\_glcdc V5.1.0 (or later)
  - SEGGER emWin Module: SEGGER emWin V5.1.0 (or later)

## 1.6 Supported LCD Controller for Serial Connection

- ST7715
- ILI9341

## 1.7 Supported Evaluation Board

- GLCDC Function
  - Renesas Starter Kit+ for RX65N-2MB
  - Renesas Starter Kit+ for RX72N
  - RX65N Envision Kit
  - RX72N Envision Kit
  - EK-RA6M3G
  - EK-RA8D1
- Serial Connection Function
  - Renesas Starter Kit for RX130-512KB
  - Renesas Starter Kit for RX140
  - Renesas Starter Kit for RX231
  - Renesas Solution Starter Kit for RX23W
  - Renesas Starter Kit+ for RX64M
  - Renesas Starter Kit for RX660
  - Renesas Starter Kit+ for RX671
  - Renesas Starter Kit+ for RX71M
  - Target Board for RX130
  - Target Board for RX231
  - Target Board for RX23W
  - Target Board for RX23W module
  - Target Board for RX65N
  - Target Board for RX660
  - Target Board for RX671

The following LCD is connected to the evaluation board.

- Renesas Starter Kit / Renesas Solution Starter Kit: OKAYA - RH128128T-1X44WN-B2 (Included in Starter Kit.)
- Target Board: Kuongshun Electronic - MSP2807 (OEM products are also available.)

## 2. Installation and Uninstallation

### 2.1 Installing This Product

Use either of the following procedure to install this product.

#### 2.1.1 Install from the "Renesas Software Installer" menu of e2 studio

1. Start e<sup>2</sup> studio.
2. Select the [Renesas Views] – [Renesas Software Installer] menu of e<sup>2</sup> studio to open the [Renesas Software Installer] dialog box.
3. Select the [Renesas QE] and click the [Next>] button
4. Select the [QE for Display[RX,RA](v3.2.0)] check box, and click the [Finish] button.
5. Check that [Renesas QE for Display[RX,RA]] is selected in the [Install] dialog box, and click the [Next>] button.
6. Check that [Renesas QE for Display[RX,RA]] is selected as the target of installation, and click the [Next>] button.
7. After confirming the license agreements, if you agree to the license, select the [I accept the terms of the license agreements] radio button, and click the [Finish] button.
8. If the dialog of the trust certificate is displayed, check that certificate, and click the [OK] button to continue installation.
9. When prompted to restart e<sup>2</sup> studio, restart it.
10. Start this product from the [Renesas Views] - [Renesas QE] menu of e<sup>2</sup> studio. For details about how to use this product, see the [Help] menu of e<sup>2</sup> studio.

#### 2.1.2 Install using QE (zip file) downloaded from the Renesas website

1. Start e<sup>2</sup> studio.
2. From the [Help] menu, select [Install New Software...] to open the [Install] dialog box.
3. Click the [Add...] button to open the [Add Repository] dialog box.
4. Click the [Archive] button, select "RenesasQE\_Display\_RXRA\_V320.zip" in the opened dialog box, and click the [Open] button.
5. Click the [OK] button in the [Add Repository] dialog box.
6. Expand the [Renesas QE] item shown in the [Install] dialog box, select the [Renesas QE for Display[RX,RA]] check box, and then click the [Next>] button.  
\* If you check off the [Contact all update sites during install to find required software] checkbox, you can shorten the installation time.
7. Check that [Renesas QE for Display[RX,RA]] is selected as the target of installation, and click the [Next>] button.
8. After confirming the license agreements, if you agree to the license, select the [I accept the terms of the license agreements] radio button, and click the [Finish] button.
9. If the dialog of the trust certificate is displayed, check that certificate, and click the [OK] button to continue installation.
10. When prompted to restart e<sup>2</sup> studio, restart it.
11. Start this product from the [Renesas Views] - [Renesas QE] menu of e<sup>2</sup> studio. For details about how to use this product, see the [Help] menu of e<sup>2</sup> studio.

## 2.2 Updating This Product

If you have already installed this product, you can update it in the same way as the procedure for installation 2.1.2.

## 2.3 Uninstalling This Product

Use the following procedure to uninstall this product.

1. Start e<sup>2</sup> studio.
2. Select [Help -> About e<sup>2</sup> studio] to open the [About e<sup>2</sup> studio] dialog box.
3. Click the [Installation Details] button to open the [e<sup>2</sup> studio Installation Details] dialog box.
4. Select [Renesas QE for Display[RX,RA]] displayed on the [Installed Software] tabbed page and click the [Uninstall...] button to open the [Uninstall] dialog box.
5. Check the displayed information and click the [Finish] button.
6. When prompted to restart e<sup>2</sup> studio, restart it.

### 3. Notes / Restrictions

#### 3.1 Usage Considerations

##### 3.1.1 About additional installation of the RA family environment

If you wish to install the RA family environment additionally to your e<sup>2</sup> studio development environment, please uninstall this product once and install it again after the RA family environment installation is completed.

##### 3.1.2 About compatibility with the previous version of sample program

V2.0.0 or later is not compatible with the previous version (QE for Display[RX] V1.1.0 or below) of the sample program because V2.0.0 or later has many new items to set and macros to output to the header file. When updating to V2.0.0 or later, also update the Graphic LCD Controller Module (r\_glcdc\_rx) to V1.40 or later.

For your information, the relationship between the previous version of QE for Display[RX] and the Graphic LCD Controller Module is as follows.

- QE for Display[RX] V1.0.0 : r\_glcdc\_rx V1.00 - V1.30
- QE for Display[RX] V1.1.0 : r\_glcdc\_rx V1.30

##### 3.1.3 How to transfer the data of the previous version

To transfer the configuration data from the previous version, copy the configuration file from the workspace location below to the project-specific location.

- Storage location of the previous version's configuration data

<workspace>/metadata/.plugins/com.renesas.apltool.glcdc

- Storage location of the V2.0.0 or later configuration data

<project>/settings/.plugin/com.renesas.apltool.glcdc

##### 3.1.4 About the preset values of the evaluation board

When using the evaluation board, preset values are set for each setting item in QE for Display [RX, RA]. The preset values in the [Timing Adjustment] tab are set on the assumption that the PLL circuit frequency operates at 240MHz, so please set the PLL circuit frequency to 240MHz when using the evaluation board.

##### 3.1.5 Note on using the Aeropoint GUI (Library Setting)

When you use the RXv2 instruction set architecture on RX66N, RX72M, and RX72N, change the library set in the linker options to the following.

1. libcri\_AeropointLite\_RXv2\_CCRX.lib
2. libcri\_Atom\_Multiplayer\_RXv3\_CCRX.lib

##### 3.1.6 Note on starting display adjustment

If the debugger is disconnected during the debugger connection start process, the connection may fail when the debugger connection is started again. In this case, close QE for Display[RX,RA] view once and display it again.

##### 3.1.7 Note on display adjustment (when using MIPI DSI)

When using MIPI DSI, real time tuning of the "TCON/LCD setting", "Timing adjustment", "Graphic layer setting" in the "LCD display adjustment" are not supported.

Follow below instruction to adjust these settings.

1. Change parameters in the "FSP Visualization" view.
2. Press the "Generate Project Content" button in FSP Configuration to generate source code.
3. Build and debug the project. Check the displayed LCD image.

### 3.1.8 Notes on parameter setting (when using RA family)

The maximum values of the following parameters differ between QE and FSP; if the maximum value is set in QE, it cannot be reflected in FSP.

- QE : HTP (Max 2048) -> FSP : Horizontal total cycles (Max 2047)
- QE : VTP (Max 2048) -> FSP : Vertical total lines (Max 2047)
- QE : VDP (Max 2044) -> FSP : Vertical active video lines (Max 2043)

### 3.1.9 Note on LCD Workflow RX,RA (QE) view

1. If you press the "Maximize"/"Restore" button in the e2 studio window while playing a tutorial video with the video window maximized, you will not be able to maximize the video window again.

[Workaround]

Close and re-open the LCD Workflow RX,RA (QE) view

2. The workflow cannot be opened if WebView2 Runtime is not installed on your PC.

[Workaround]

Download and install WebView2 (x64 version) from the Microsoft web page.( FAQ:[3000670](#))

## 3.2 Functional Restrictions

There is no restriction in QE for Display[RX,RA] V3.2.0.



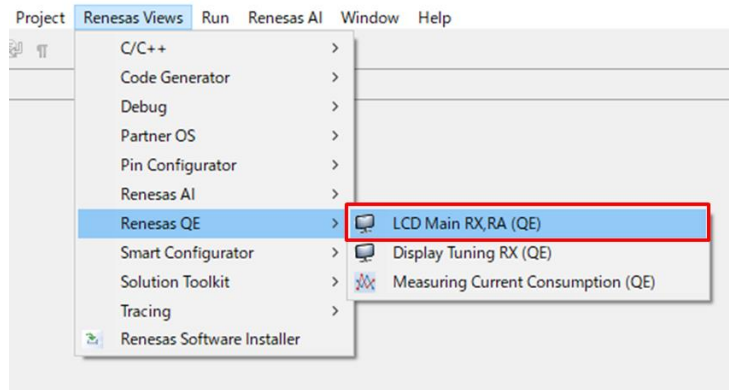
## 4. Old and New Workflow Comparison

The workflow view has been redesigned in QE for Display[RX,RA] V3.2.0. The differences between the old and new workflows are described below.

### 4.1 How to open the workflow

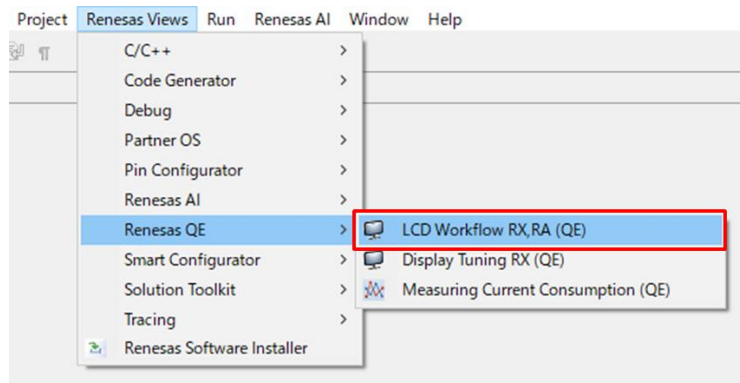
#### ■ Old Workflow

Open the workflow view from the "Renesas Views" - "Renesas QE" - "LCD Main RX,RA (QE)" menu.



#### ■ New Workflow

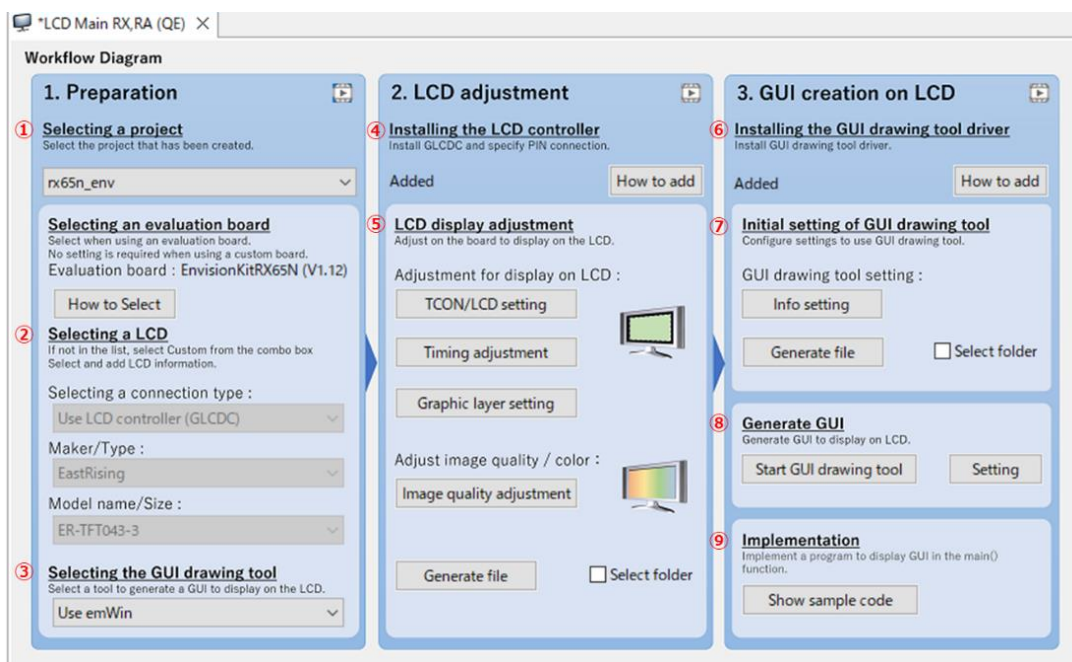
Open the workflow view from the "Renesas Views" – "Renesas QE" – "LCD Workflow RX,RA (QE)" menu.



### 4.2 How to perform the steps

#### ■ Old Workflow

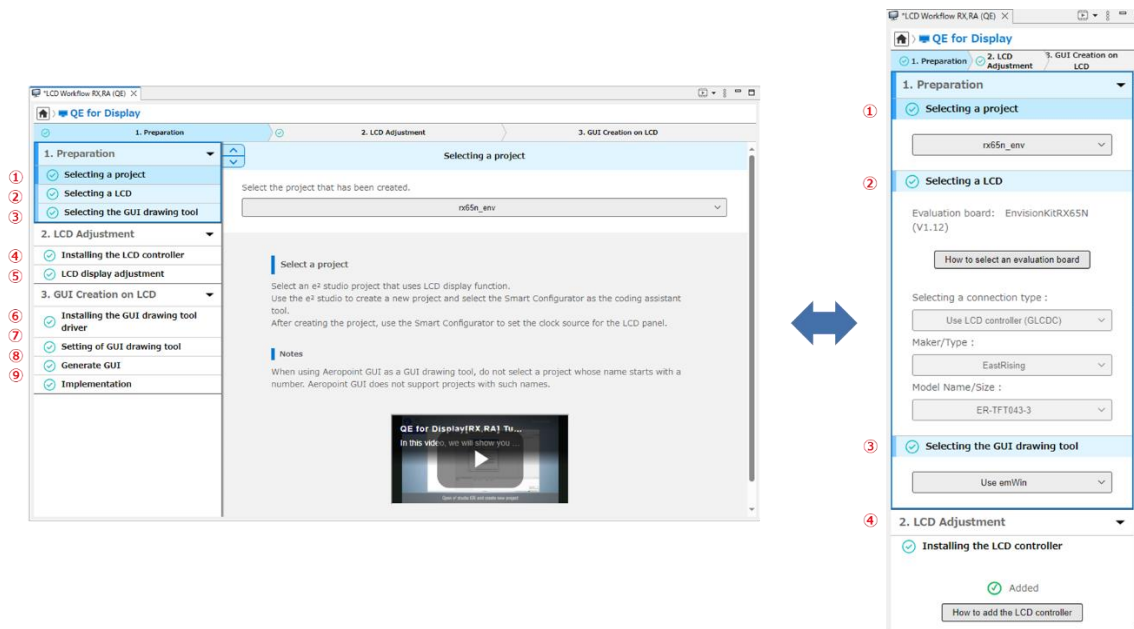
All setting items are displayed. Steps are performed from left to right in the workflow.



■ New Workflow

- Guide style  
Click each menu on the left to display the setting items. Steps are performed from top to bottom in the menu.
- Simple style  
All setting items are displayed. Steps are performed from top to bottom in the workflow.

\* The setting items for both styles are the same as for the old workflow.



4.3 Others

1. Projects created with previous versions of QE for Display[RX,RA] (V3.1.1 or earlier) can be used without modification.

**Revision History**

| Rev. | Date      | Description |                       |
|------|-----------|-------------|-----------------------|
|      |           | Page        | Summary               |
| 1.00 | Dec.12.23 | -           | First edition issued. |
|      |           |             |                       |

# 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. 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.

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(Rev.5.0-1 October 2020)

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