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[Released on the Web]

Solution Toolkit

QE: Development Assistance Tool for Applications

# QE for Capacitive Touch[RA] V1.0.0: Development Assistance Tool for Capacitive Touch Sensor

## Outline

QE for Capacitive Touch[RA] V1.0.0 has been released on the web.

QE for Capacitive Touch[RA] is one of the solution toolkits designed to operate in e$^2$ studio development environment. For developers who design embedded system based on the RA family MCU using the Capacitive Touch Sensor, this solution tool can simplify the initial configuration and sensitivity tuning of the touch interface and help accelerate development.

This product is available free of charge.

## 1. Supported Devices

QE for Capacitive Touch[RA] supports the following RA family devices.

- RA family (MCUs with the Capacitive Touch Sensor only)
  - RA2A1, RA4M1, RA6M1, RA6M2, and RA6M3 groups

Note that before creating a touch interface configuration, you will first need to add a project for the RA family MCU and the Capacitive Touch Sensor-related FSP components. For details, see section 3.

## 2. Product Features

This solution tool has the following four features that can make it easy to develop applications using the Capacitive Touch Sensor.

(1) ‘Create Touch Interface Configuration’ function to design touch I/F layout and tune and optimize sensing parameters.

(2) ‘Tuning’ function to automatically perform the basic tuning process.

(3) ‘Show Sample Code’ function to show sample code that can be implemented to the layout of user’s Touch I/F.

(4) ‘Monitoring and Parameter Adjustment’ function to monitor input signals and adjust parameters in each testing environment.

(1) Create Touch Interface Configuration

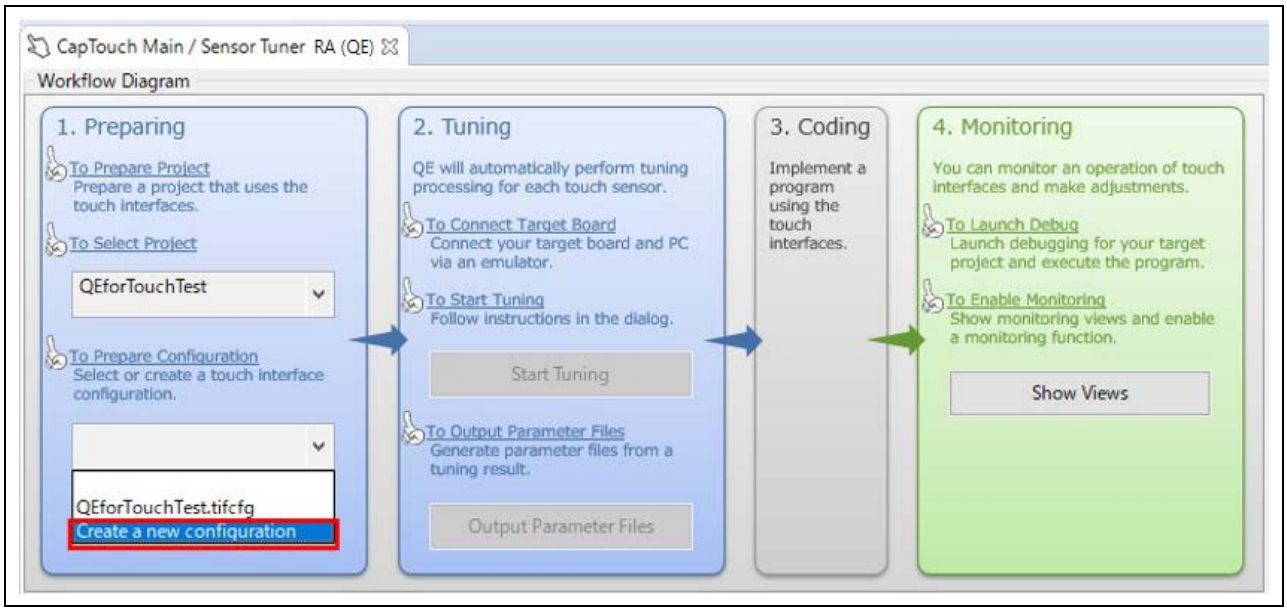


Figure 1 [CapTouch Main/Sensor Tuner RA (QE)] view

This simple GUI allows users to easily select capacitance types and add and setup touch interfaces to create a touch interface configuration. To use this feature, open the [Cap Touch Main/Sensor Tuner RA (QE)] view. In [1. Preparing], select the name of the project you created under [To Select Project]. Then, under [To Prepare Configuration], click [Create a new configuration].

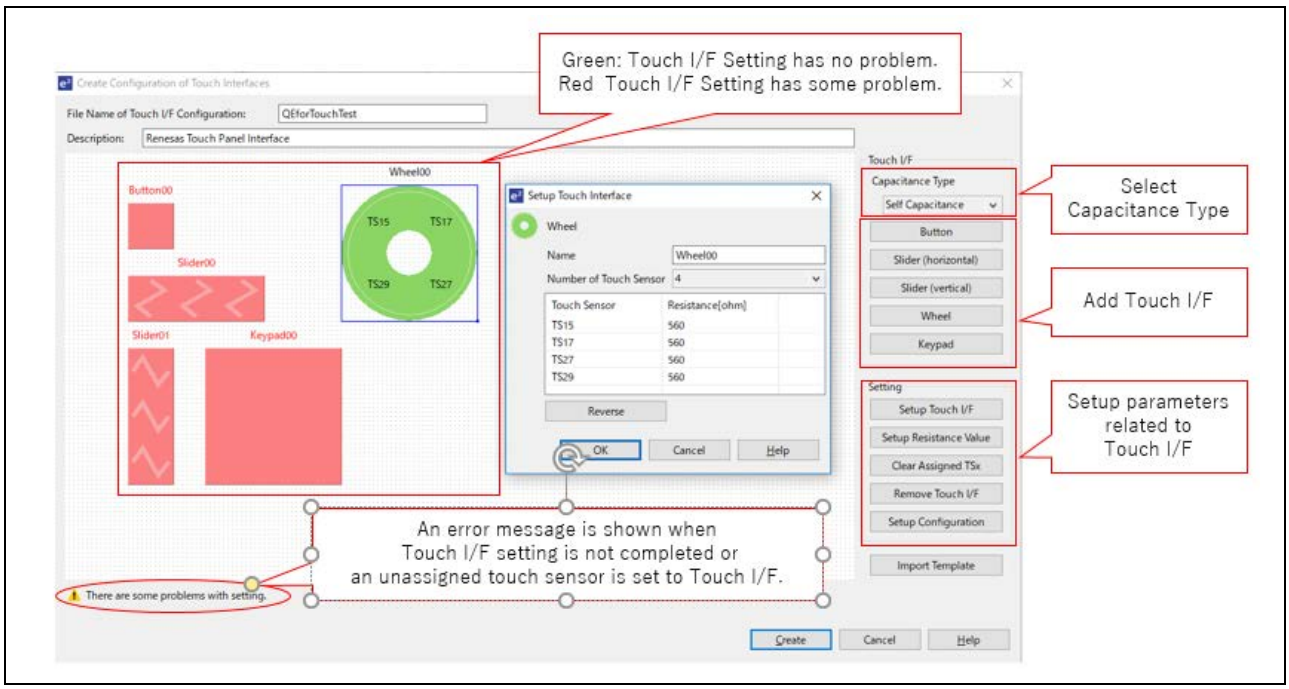


Figure 2 Touch I/F Configuration

There are four types of touch interfaces you can use, including buttons, sliders, wheels, and keypads. You can set up parameters for each touch interface via GUI.

Setting pin assignment for use with capacitive touch sensors can be done from e$^2$ studio in conjunction with Smart Configurator. You can assign pins simply by adding the pins that are assigned as capacitive touch sensor pins by Smart Configurator.

(2) Automatic Tuning

Once you have created a touch interface configuration, click the [Start Tuning] button in the [CapTouch Main/Sensor Tuner RA (QE)] view to begin the tuning function. QE will automatically start the tuning process for the Capacitive Touch Sensor after building and debugging the target project.
After downloading the executable binary file, you can complete the basic tuning within a few minutes by following the instructions in the pop-up messages. Once tuning is complete, generate parameter files by clicking the [Output Parameter Files] button under [To Output Parameter Files] and then add them to the project selected in [To Prepare Configuration] in [1. Preparing].

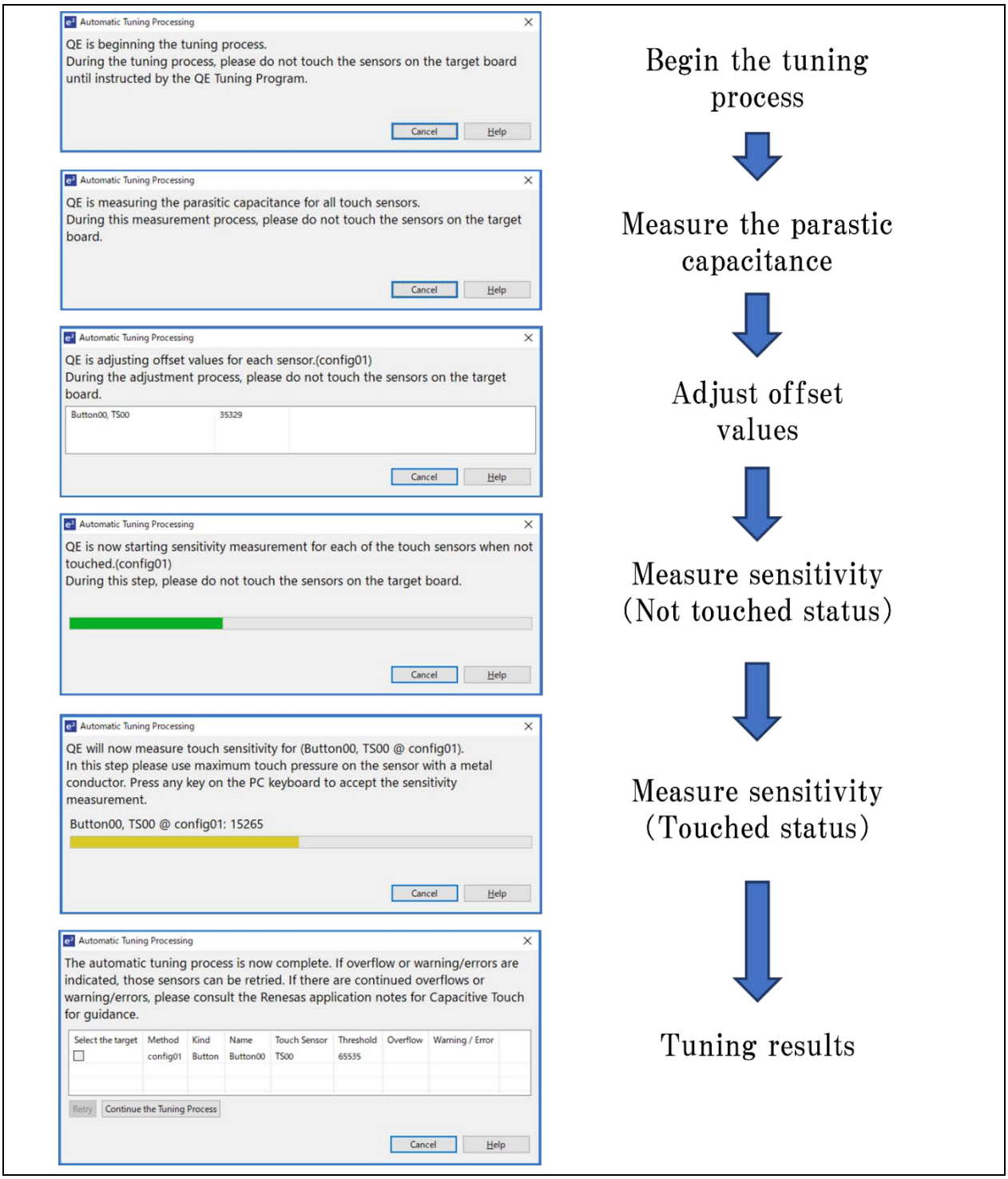


Figure 3 Initial Tuning Process

(3) Show Sample Code

A new feature is added to show sample code of the main() function according to the structure of user's Touch I/F. This enables users to easily use sample code for developing a program that uses the touch keys.

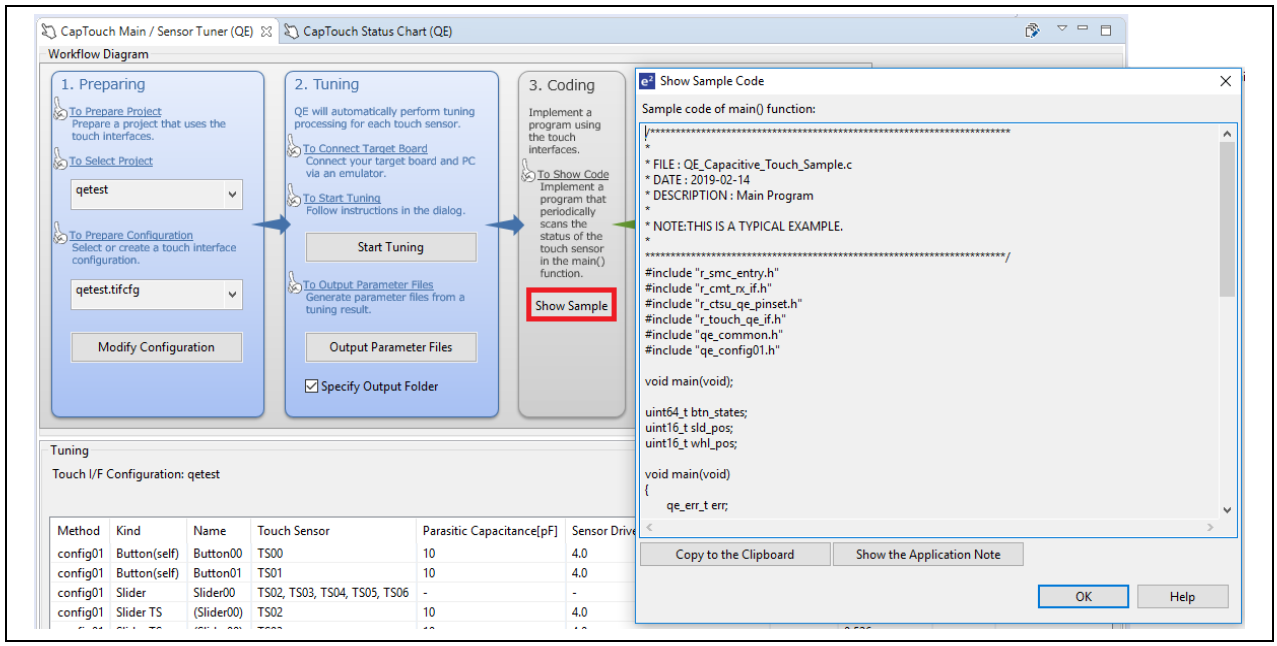


Figure 4 Show Sample Code

(4) Monitoring and Parameter Adjustment

After the tuning, press the [Show Views] in [4. Monitoring] to switch to the monitoring panel as shown below. In this view, you can check the tuning results, such as count values and recognition status of touch input. You can also adjust the parameters in real-time and immediately display the results, which might be useful in cases such as where your hands are damp or statically charged.

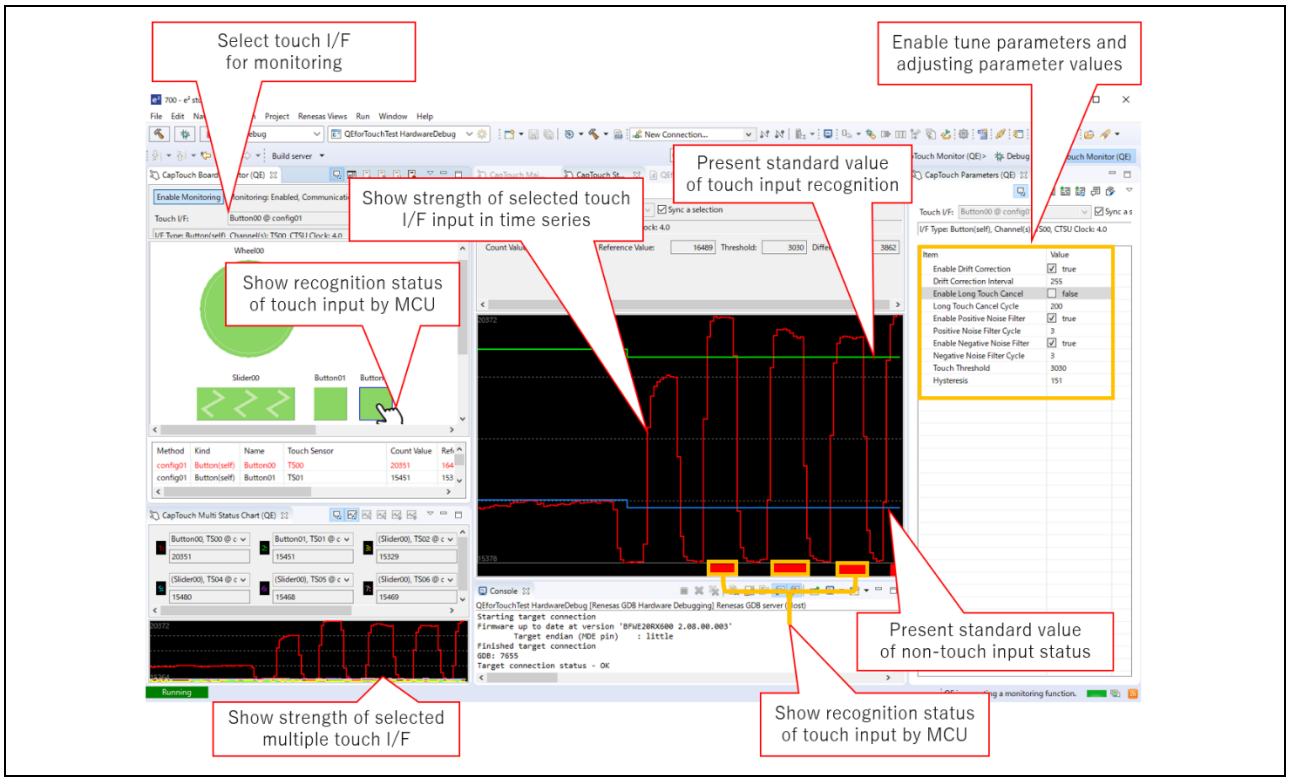


Figure 5 Monitoring and Parameter Adjustment

## 3. Supported FSP Components

- The following FSP components for RA family are supported.
  - Capacitive Touch Sensing Unit “r_ctsu”
  - Touch “rm_touch”

Add the FSP components related to the Capacitive Touch Sensor and generate project content for the RA family MCU that has the Capacitive Touch Sensor function. Then, run the pins configuration function. In this mode, you can easily set up stack configuration (such as pin assignment for use with capacitive touch sensor pins or Hardware Abstraction Layer (HAL)).

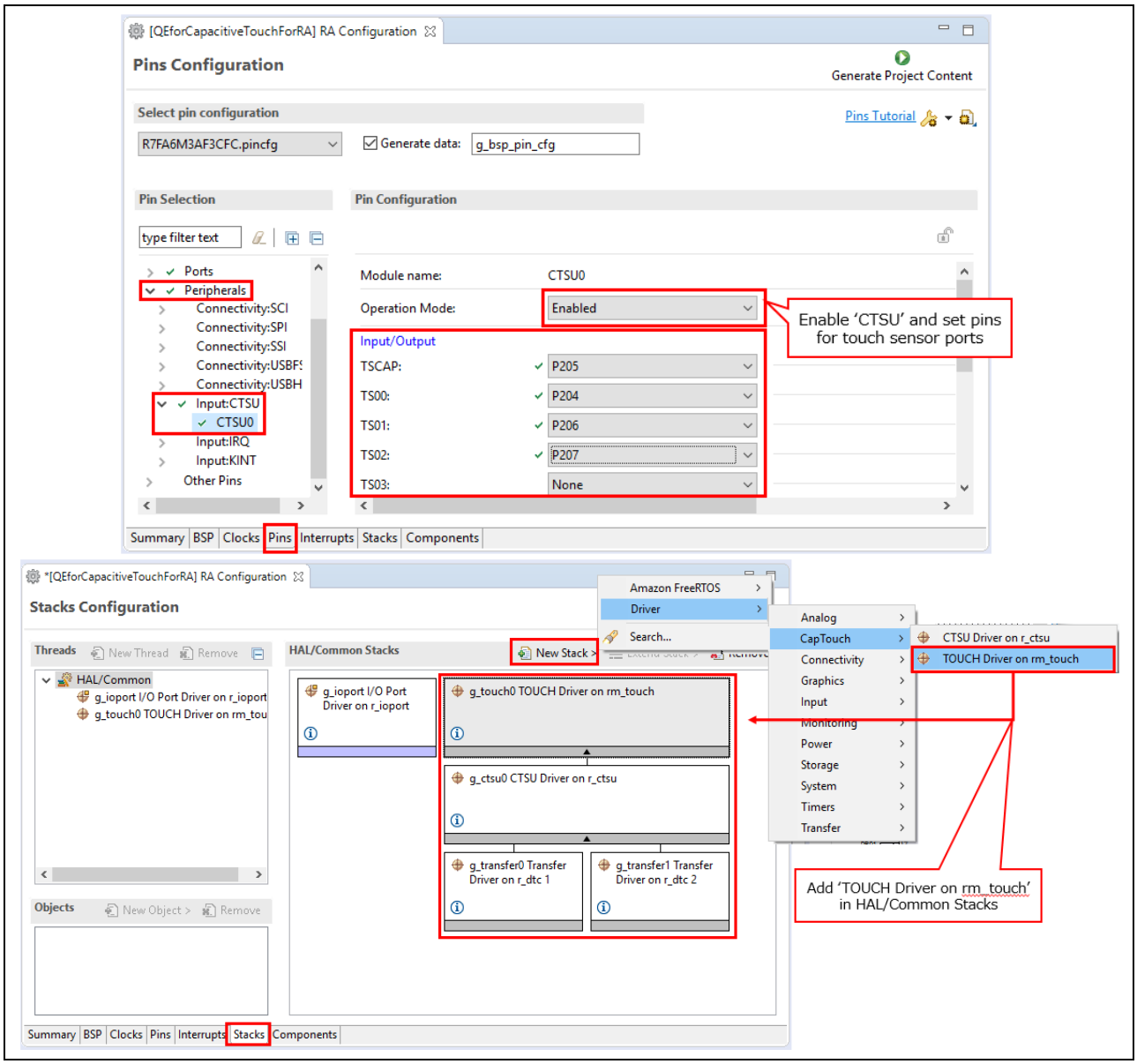


Figure 6 Adding FSP Components and Pin Setting

For details about the FPS components, see the QE for Capacitive Touch[RA] release note. (Scheduled to be released on October 8.)

https://www.renesas.com/search/keyword-search.html#genre=document&q=r20ut4630

## 4. Operating Environment

- e$^2$ studio integrated development environment V7.6.0 or later

See ‘e$^2$ studio User's Manual: Getting Started Guide for V7.0’ for instructions on how to install e$^2$ studio.

https://www.renesas.com/search/keyword-search.html#genre=document&q=r20ut4374

## 5. Obtaining the Product

Download the installer for QE for Capacitive Touch[RA] V1.0.0 from the URL below.

(The installer will be available from October 8.)

https://www.renesas.com/qe-capacitive-touch

## 6. Installation

The installation process is shown below.

(1) Activate e$^2$ studio.

(2) Click [Help], and then click the [Install New Software...] menu to open the [Install] dialog box.

(3) Click the [Add (A)...] button to open the [Add Repository] dialog box.

(4) Click the [Archive (A)...] button, select the installation file (zip file) in the opened file selection dialog box, and then click the [Open (O)] 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 check box for [Renesas QE for Capacitive Touch[RA]] , and then click the [Next (N)>] button.

(7) Confirm that the installation target is correct, and then click the [Next (N)>] button.

(8) After checking the license, select the [I agree to the terms of use (A)] radio button, and then click the [End (F)] button.

(9) When the dialog box for selecting a trusted certificate appears, check the displayed certificate, and then click the [OK] button to continue installation.

(10) Restart e$^2$ studio according to the instructions on the screen.

(11) Start this product from the [Renesas Views] - [Renesas QE] menu of e$^2$ studio.

(12) For instructions on how to use this product, see the QE items in the [Help] menu of e$^2$ studio.

## Revision History

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| 1.00 | Oct.01.19 | - | First edition issued |
| | | | |

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