

[Released on the Web]

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Rev.1.00

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Solution Toolkit

QE: Development Assistance Tool for Applications

QE for Capacitive Touch V1.0.0: Development Assistance Tool for Capacitive Touch Sensor

Outline

We have released QE for Capacitive Touch V1.0.0 on the web.

QE for Capacitive Touch is one of the solution toolkits that operate under e² studio integrated development environment. In developing embedded system using the capacitive touch sensor of RX family MCU, you can easily setup initial configurations of the touch interface as well as process the tuning of sensors, and reduce development time.

This product is available free of charge.

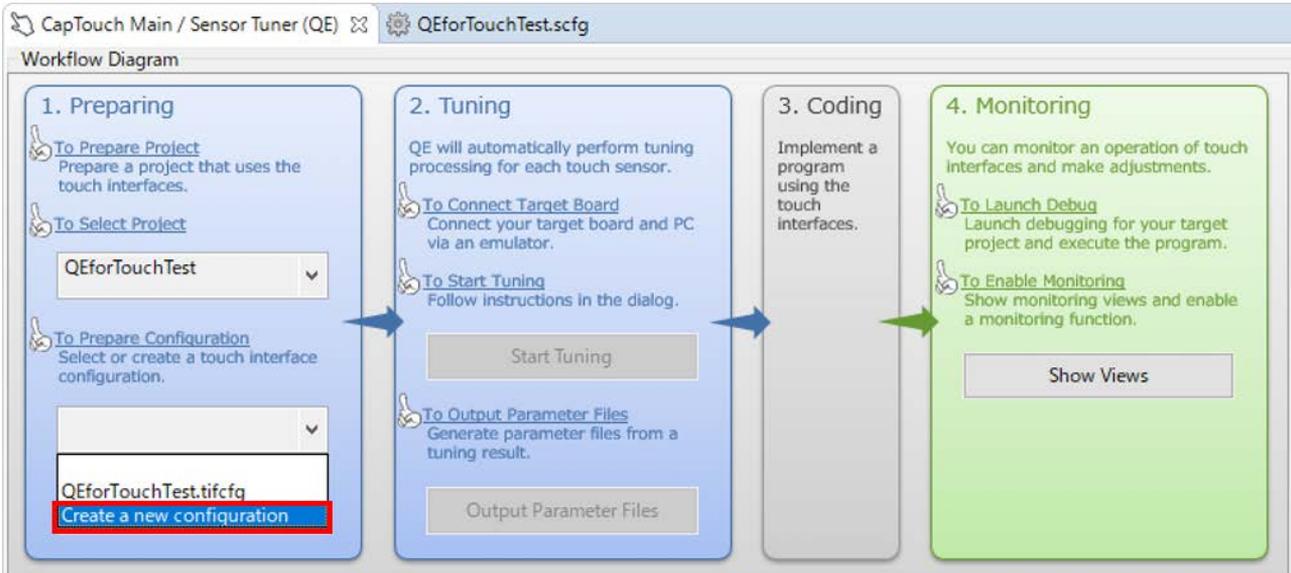
1. Features

The following three features enable you to develop applications easily using the capacitive touch sensor.

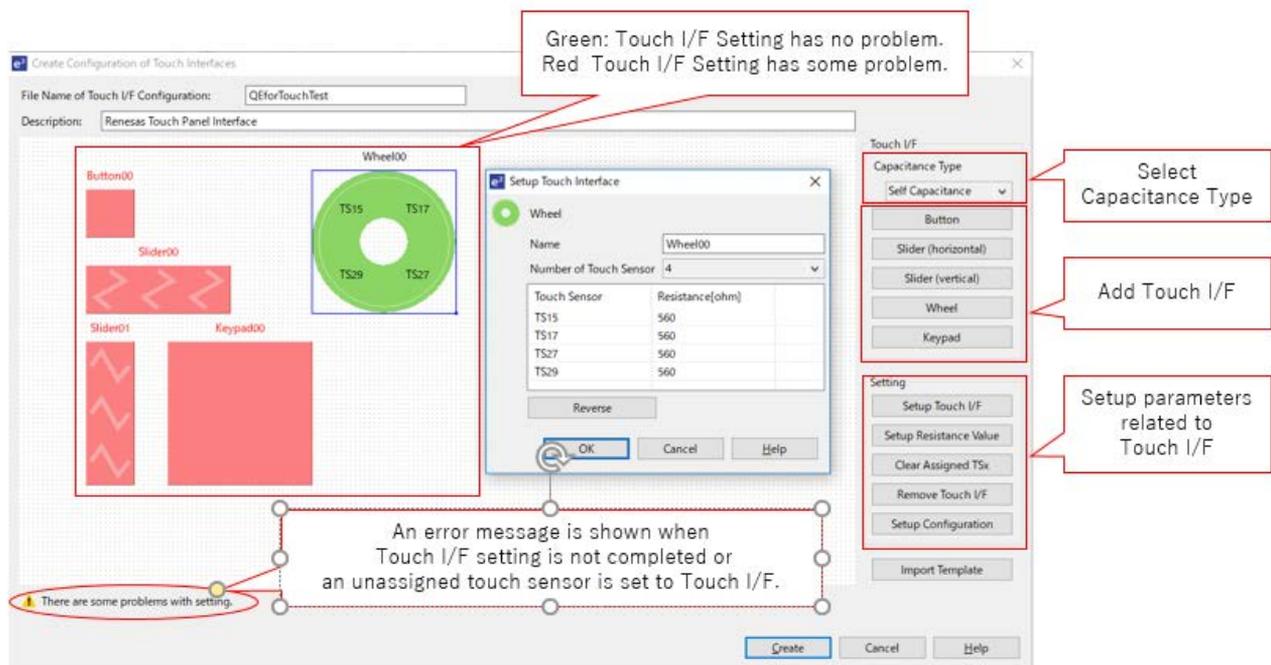
- (1) "Create Touch Interface Configuration Function" to setup the arrangement of touch interface and mapping of the capacitive touch sensor.
- (2) "Tuning Function" to automatically perform basic tuning processing.
- (3) "Monitoring and Parameter Adjustment Function" to perform monitoring of input signals in each testing environment and adjust parameters.

Before creating a touch interface configuration, you need to create a project for the RX family MCU and add FIT modules related to the capacitive touch sensor. For details, refer to the followings.

(1) Create Touch Interface Configuration Function



When creating a touch interface configuration, you can easily select the capacitance types and add/select a touch interface on GUI. To use this feature, open the CapTouch Main/Sensor Tuner(QE) view. In [1. Preparing] → [To Select Project], select the project you created, and under [To Prepare Configuration], select [Create a new configuration].



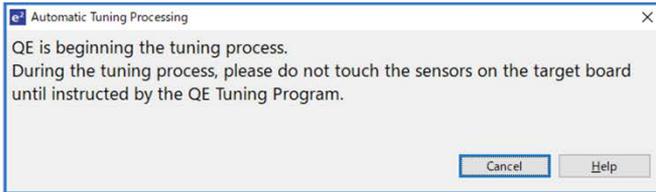
There are four types of touch interface you can select: button, slider, wheel, and keypad. Configuration of capacitive touch sensor for each touch interface can be setup on the GUI.

Pin assignment to the capacitive touch sensor operates in linkage with Smart Configurator. You can easily setup pin assignment simply by adding the pins assigned to capacitive touch sensor beforehand using Smart Configurator.

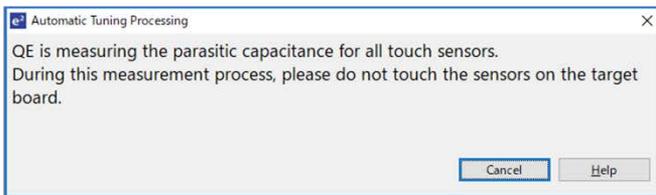
(2) Tuning function

After creating the interface configuration, open CapTouch Main/Sensor Tuner (QE) view and click [Start Tuning] to run the tuning function. QE will perform tuning processing automatically for capacitive touch sensors after completing build and debugging for a project.

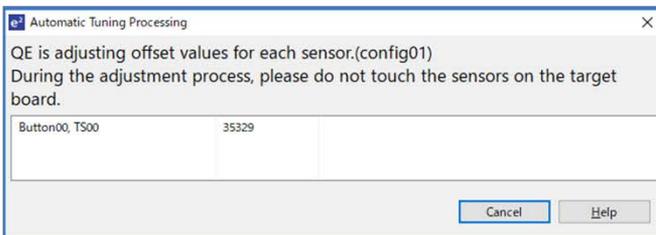
Once the executable binary files are downloaded, messages such as these in the images below are displayed. You can complete basis tuning within a few minutes by following these instructions to operate the capacitive touch device (ex. Renesas RX130 Capacitive Touch Key Evaluation System, Touch Application Board). When tuning is complete, go to [To Output Parameter Files] and click on [Output Parameter Files] to generate parameter files, and add them to the project you selected in [To Select Project] under [1. Preparing.]



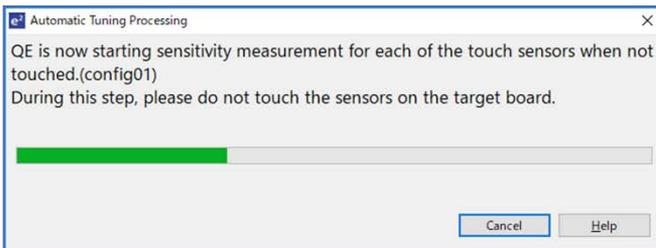
Begin the tuning process



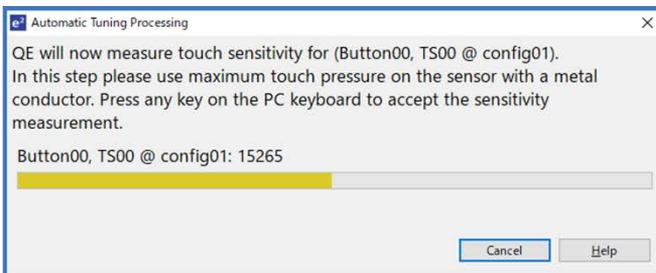
Measure the parastic capacitance



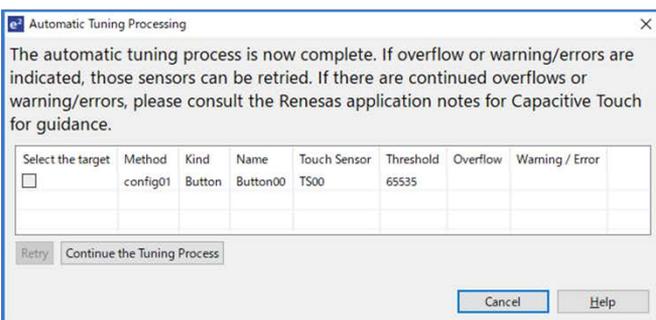
Adjust offset values



Measure sensitivity (Not touched status)



Measure sensitivity (Touched status)



Tuning results

(3) Monitoring and parameter adjustment function

Once the tuning is done, go to [4. Monitoring] and press [Show Views] to switch monitoring layout to check the tuning results as in the image below. This screen shows the graph for count values and recognition status of touch input. In addition, you can adjust and apply the parameters in real-time and display the result instantly, which makes QE more useful for finding a tuning parameter, in cases, for example, where your hands are damp or statically charged.

The screenshot displays the Renesas QE software interface for touch monitoring. It features a hardware diagram on the left with callouts for 'Slider00', 'Button01', and 'Button'. A central graph shows 'Count Value' over time, with a red line representing the signal and a green horizontal line for the 'Reference Value' (16489) and a blue horizontal line for the 'Threshold' (3030). A table on the right lists various parameters for adjustment, such as 'Enable Drift Correction' (true), 'Drift Correction Interval' (255), and 'Touch Threshold' (3030). A console window at the bottom shows the target connection status.

Item	Value
Enable Drift Correction	<input checked="" type="checkbox"/> true
Drift Correction Interval	255
Enable Long Touch Cancel	<input type="checkbox"/> false
Long Touch Cancel Cycle	200
Enable Positive Noise Filter	<input checked="" type="checkbox"/> true
Positive Noise Filter Cycle	3
Enable Negative Noise Filter	<input checked="" type="checkbox"/> true
Negative Noise Filter Cycle	3
Touch Threshold	3030
Hysteresis	151

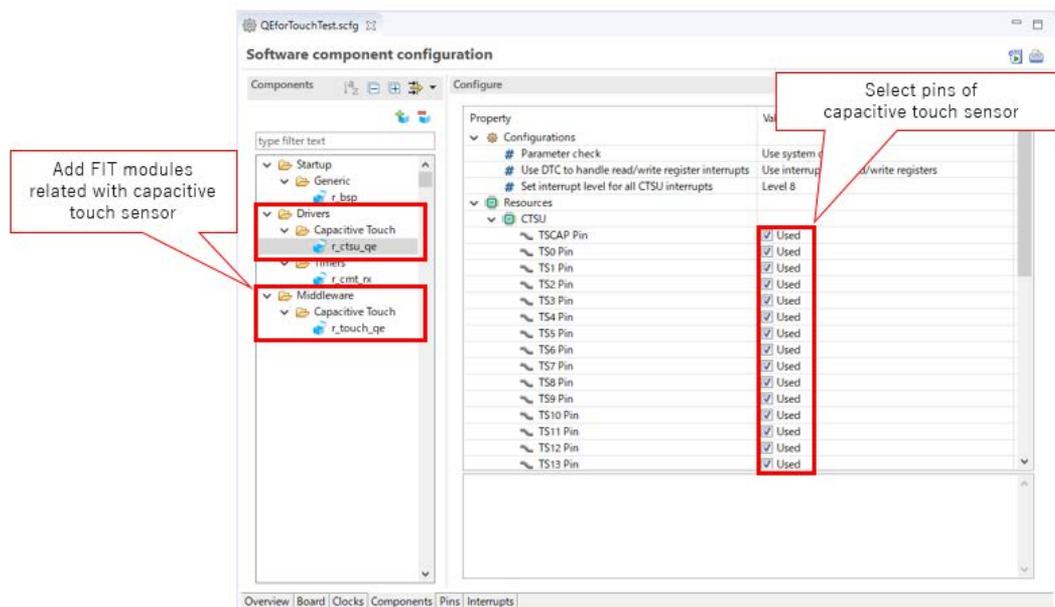
2. Supported MCUs

- RX family (only MCUs with capacitive touch sensor)
 - RX100 group: RX113, RX130
 - RX200 group: RX230, RX231

3. Support for FIT Modules

- Support has been added to the following FIT modules for RX family:
 - CTSU Drivers “r_ctsu_qe” V1.00
 - Touch Middleware “r_touch_qe” V1.00

When creating a project for RX Family MCU with capacitive touch sensor, you can easily setup the pin assignment for your capacitive touch sensor by adding the FIT Module related to the capacitive touch sensor, and checking the box to use "Smart Configurator" to start the program



FIT module can be downloaded from [Add Component] dialog box of the Smart Configurator. For details about Smart Configurator, refer to the URL below:

<https://www.renesas.com/smart-configurator>

4. Operating Environment

- e² studio integrated development environment V7.0.0 and later versions

5. Obtaining the Program

Download the installer for QE for Capacitive Touch V1.0.0 from the following URL:

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

6. Installation

The installation procedures are as follows:.

- (1) Activate e² studio.
- (2) Select [Help] → [Install New Software...] menu to open the [Install] dialog box.
- (3) Click [Add (A)...] button to open the [Add Repository] dialog box.
- (4) Click [Archive (A)...] button, select the installation file (zip file) in the opened file selection dialog box, and click on the [Open (O)] button.
- (5) Click on [OK] button in the [Add Repository] dialog box.
- (6) Expand the [Renesas QE] item in the [Install] dialog box, tick in the [Renesas QE for Capacitive Touch] check box, and click on the [Next (N)>] button.
- (7) Confirm that the installation target is correct, and click [Next (N)>].
- (8) After checking the license, select the [I agree to the terms of use (A)] radio button, and click on the [End (F)] button.
- (9) When the dialog box for selecting a trusted certificate appears, check the displayed certificate, and click on [OK] to continue installation.
- (10) Restart e² studio following the instructions on screen.
- (11) Start this product from the [Renesas Views] - [Renesas QE] menu of e² studio.
For more about how to use this product, see the QE item from the [Help] menu of e² studio.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Nov. 01, 2018	-	First edition issued

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■Inquiry

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