RX Family

Troubleshooting when Using Amazon Web Services

Introduction

This document describes problems that may arise when running the demo program described in the application note Visualizing and Controlling Sensor Information Using Amazon Web Services with RX65N Cloud Kit and FreeRTOS (R20AN0623) and presents solutions to those problems.

Operating Environment

The description in this application note are based on the following representative device. When using a different model, replace the model name with that of the device you are using.

Integrated development environment	e^2 studio 2021-04
Board	RX65N Cloud Kit
Toolchain	CC-RX Compiler v3.03
	GCC for Renesas RX 8.3.0.202004
Emulator	E2 Emulator Lite (on-board)

Related Document

RX65N Group: Visualizing and Controlling Sensor Information Using Amazon Web Services with RX65N Cloud Kit and FreeRTOS (R20AN0623)

Contents

Notes:
- AWS™ is a trademark of Amazon.com, Inc. or its affiliates.
  (https://aws.amazon.com/trademark-guidelines/)
- FreeRTOS™ is a trademark of Amazon Web Services, Inc. (https://freertos.org/copyright.html)
- GitHub® is a trademark of GitHub, Inc. (https://github.com/logos)
- Pmod is a trademark of Digilent Inc. (https://store.digilentinc.com/)

1. Troubleshooting

Problems that may arise when connecting to AWS and suggested solutions are summarized in the table below.

Table 1.1   Troubleshooting

No.	Category	Description of Problem	Solution	Reference[*1]
1	Build error	The following error occurs. Fatal error: r_simple_filesystem_on_ dataflash _if.h: No such file or directory	It is possible the file path may be too long. (If the path is longer than 256 characters, e^2 studio outputs an error at build time.) Move the Amazon-FreeRTOS project to a location with a shorter file path.	4.3 step 1
2		The following error occurs. F0553103: Option 'utf8' is not appropriate	The compiler version may be too old. Download the version of the compiler listed in the Software Configuration table. Refer to 1.1, Confirming the Compiler Version, for instructions on checking the version of the compiler.	2.2
3		The following error occurs. E0520008: Missing closing quote	The macros may have been entered incorrectly in aws_clientcredential.h. Confirm that the opening and closing quotes (" ") were not omitted when the macros were entered.	4.3 step 6
4	Debug error	Cannot connect to debugger.	The correct jumper setting for using the emulator may not have been made on the target board (bottom board). The ECN1 connector is not connected to the PC when the EJ2 pins are shorted with a jumper.	4.2
5			The ECN1 connector on the target board (bottom board) may not be connected to the PC. It is not possible to connect to the emulator if the ECN1 connector is not connected.	
6	Inability to connect to AWS	When the program is run, nothing is sent to the MQTT test client.	Confirm that the CN18 connector on the cloud option board (top board) is connected to the PC via a USB cable. If the USB cable is not connected, no power is supplied to the Wi-Fi module and communication is not possible.	4.2
7			Check to make sure that the settings in ${base_folder}\demos\include\aws_ clientcredential.h are correct.	4.3 step 6
8			Check to make sure that aws_clientcredential_key.h has been replaced.	4.3 step 9
9			The firewall settings may be blocking connections to AWS. Contact your network administrator for assistance.	—
10	Graph display in Kibana	A graph is displayed, but the values are all 0 and do not change.	The status of the shadow property **SensorDataUpdateOn** may be set to **UpdateOff**. Set the status to **UpdateOn**.	5.2

Note: 1. The figures appearing in this column refer to section numbers in the application note Visualizing and Controlling Sensor Information Using Amazon Web Services with RX65N Cloud Kit and FreeRTOS (R20AN0623).

1.1   Confirming the Compiler Version

Select **Project** → **Properties** (see Figure 1.1), then click **C/C++ Build** → **Settings** → **Toolchain** to confirm the compiler version (see Figure 1.2).
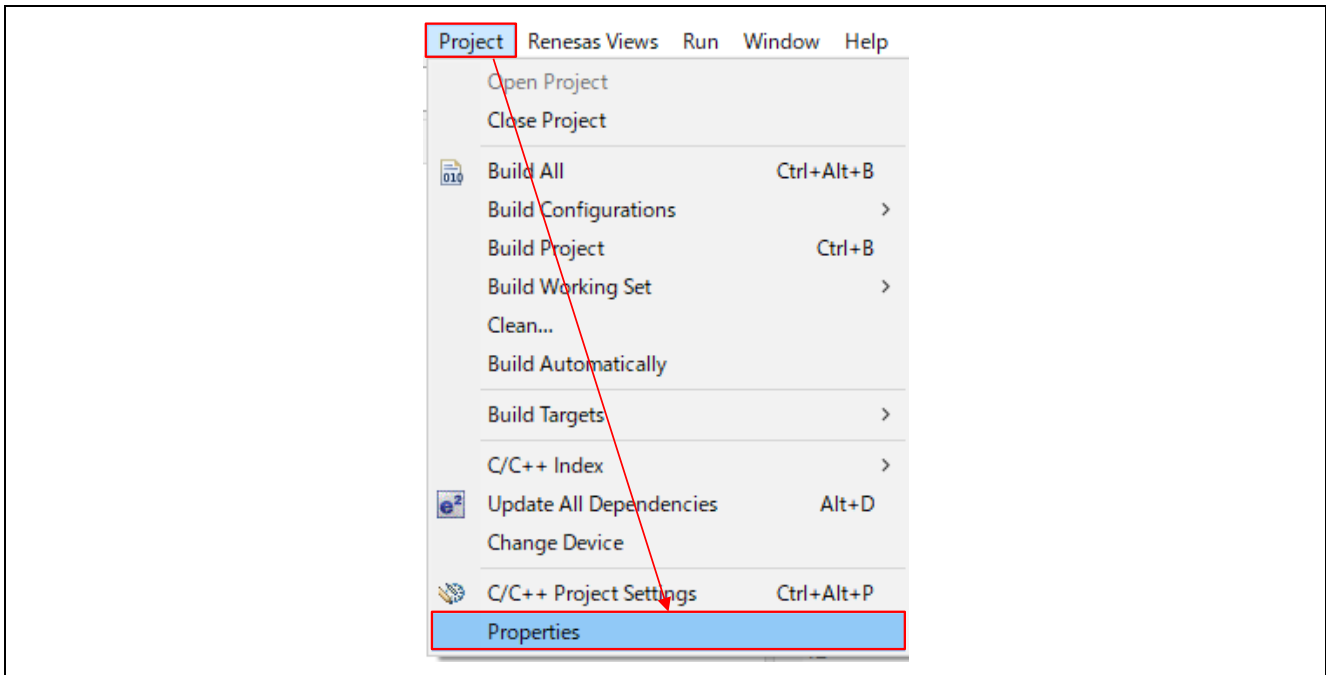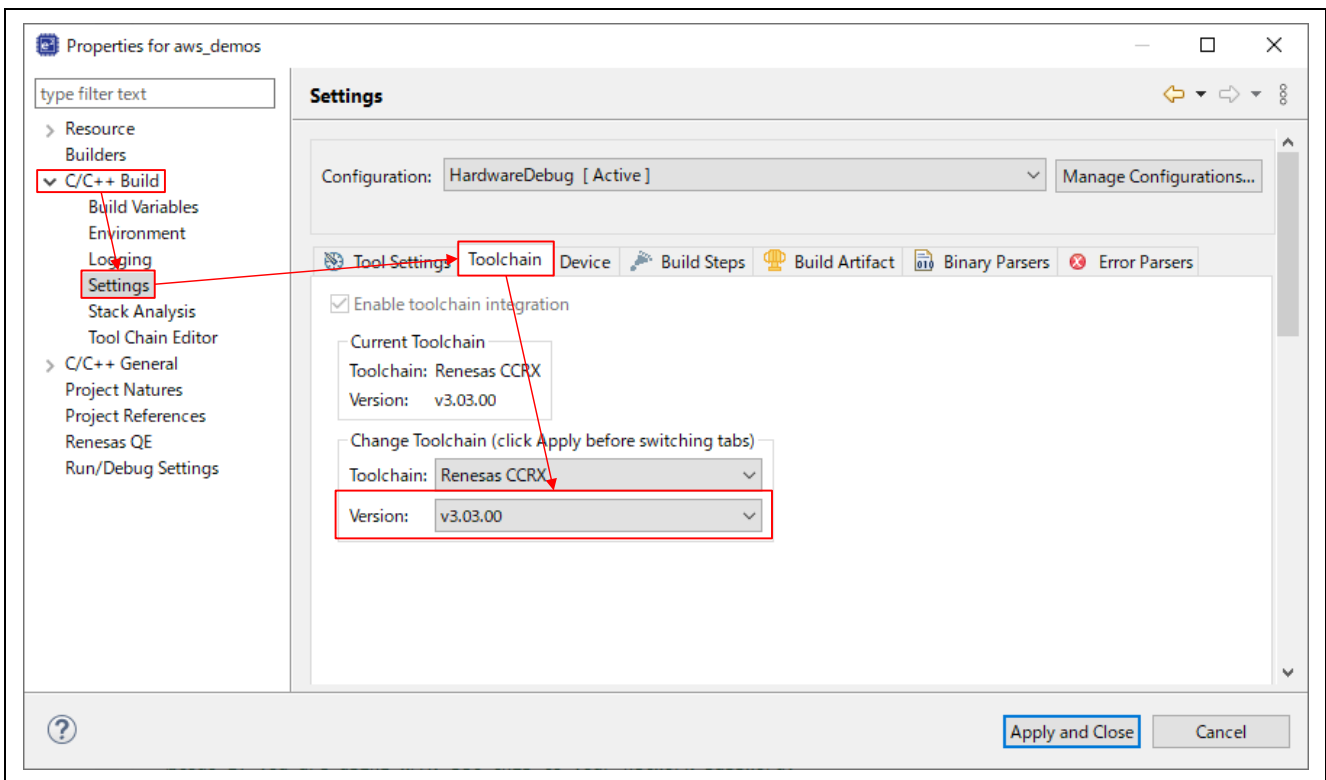

Figure 1.1   Project → Properties

Figure 1.2   Confirming the Compiler Version

2. Confirming the Connection to AWS

This section describes how to confirm that the settings entered as described in 4, Connecting to AWS, in Visualizing and Controlling Sensor Information Using Amazon Web Services with RX65N Cloud Kit and FreeRTOS, are appropriate.

1. Perform the steps described in 4, Connecting to AWS.

2. Change the **define** value in the following file to CONFIG_MQTT_DEMO_ENABLED.
   — ${base_folder}\vendors\renesas\boards\rx_mcu_boards\rx65n-cloudkit\aws_demos\config_files \aws_demo_config.h
   (When using CC-RX as the compiler)

   — ${base_folder}\vendors\renesas\boards\rx_mcu_boards\rx65n-cloudkit-gcc\aws_demos\config_files \aws_demo_config.h
   (When using GCC for Renesas RX as the compiler)

```
/* To run a particular demo you need to define one of these.
 * Only one demo can be configured at a time
 *
 *          CONFIG_MQTT_DEMO_ENABLED
 *          CONFIG_SHADOW_DEMO_ENABLED
 *          CONFIG_GREENGRASS_DISCOVERY_DEMO_ENABLED
 *          CONFIG_TCP_ECHO_CLIENT_DEMO_ENABLED
 *          CONFIG_DEFENDER_DEMO_ENABLED
 *          CONFIG_POSIX_DEMO_ENABLED
 *          CONFIG_UPDATE_DEMO_ENABLED
 *          CONFIG_HTTPS_SYNC_DOWNLOAD_DEMO_ENABLED
 *          CONFIG_HTTPS_ASYNC_DOWNLOAD_DEMO_ENABLED
 *          CONFIG_HTTPS_SYNC_UPLOAD_DEMO_ENABLED
 *          CONFIG_HTTPS_ASYNC_UPLOAD_DEMO_ENABLED
 *
 *  These defines are used in iot_demo_runner.h for demo selection */

#define CONFIG_MQTT_DEMO_ENABLED

/* Default configuration for all demos. Individual demos can override these below */
#define democonfigDEMO_STACKSIZE                ( configMINIMAL_STACK_SIZE * 8 )
#define democonfigDEMO_PRIORITY                 ( tskIDLE_PRIORITY + 5 )
#define democonfigNETWORK_TYPES                 ( AWSIOT_NETWORK_TYPE_WIFI )
```
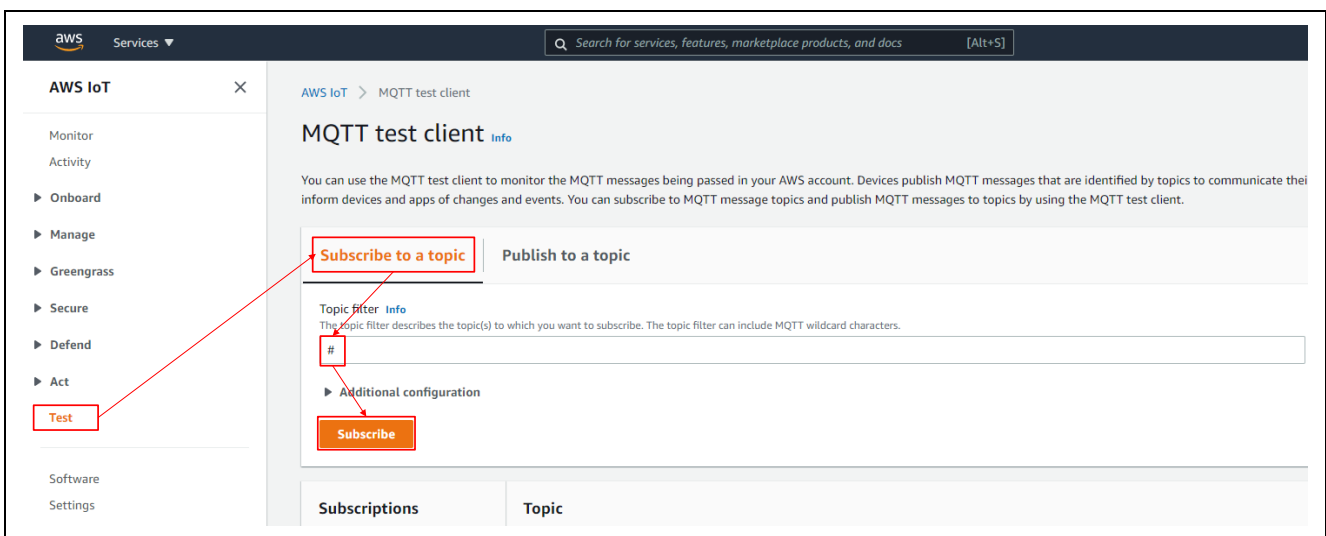
Figure 2.1   Changing the define Value

3. Select **Project → Build All**, and confirm that **0 errors** is displayed.
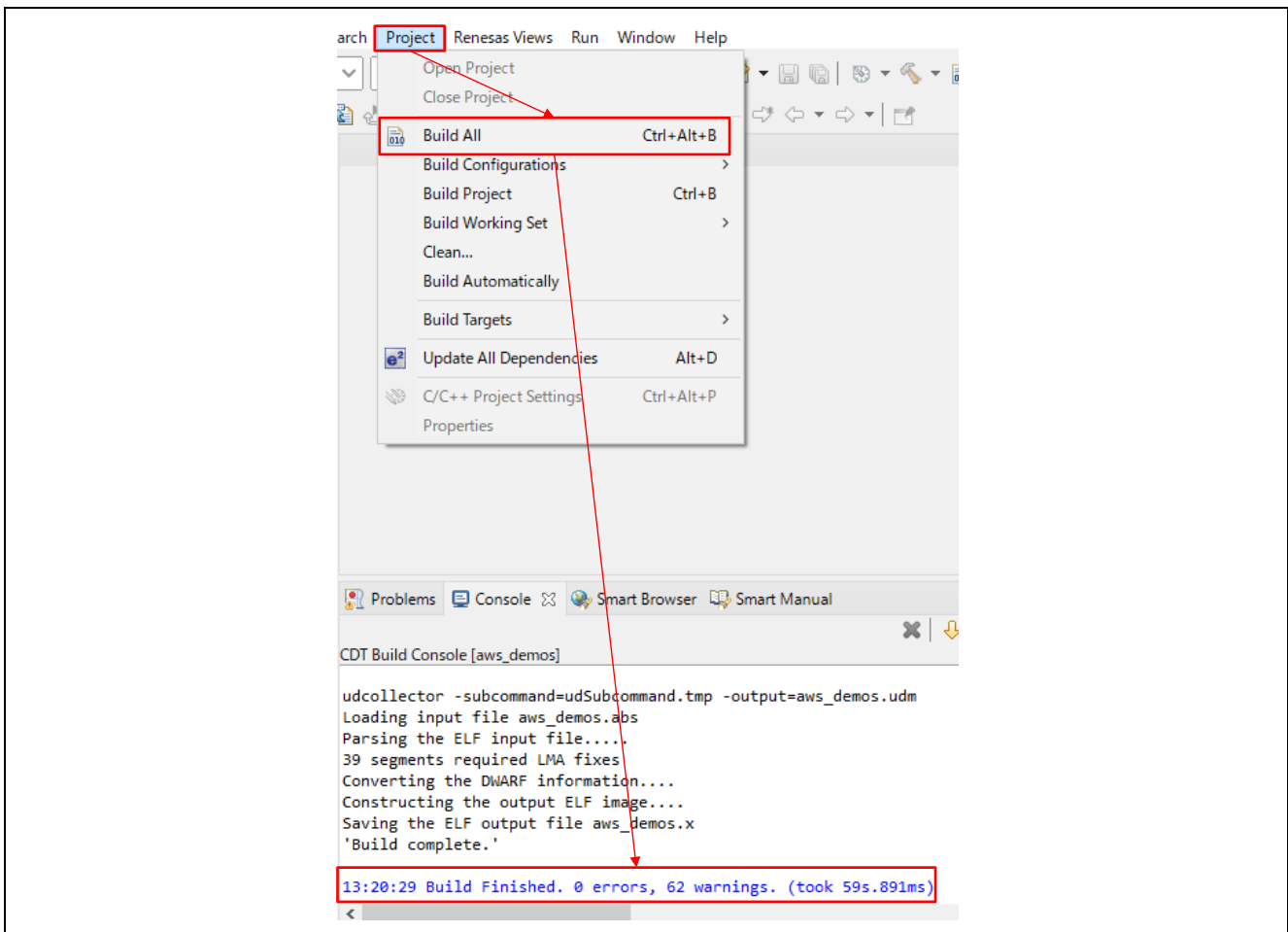
Figure 2.2   Select Project → Build All → 0 errors

4. On the AWS Management Console select **Services → All services → IoT → IoT Core**, then click **Test → Subscribe to a topic**, enter **#** in the topic filter field, and click the **Subscribe** button.

Figure 2.3   Subscribing to a Topic

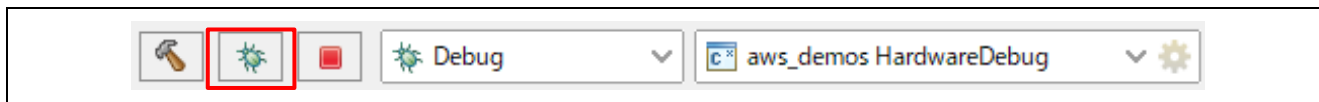5. Click the Debug icon in the upper left corner of the e^2 studio window.

Figure 2.4   Debug

6. A message appears asking you to confirm that you wish to switch to the Debug perspective; click the **Switch** button.
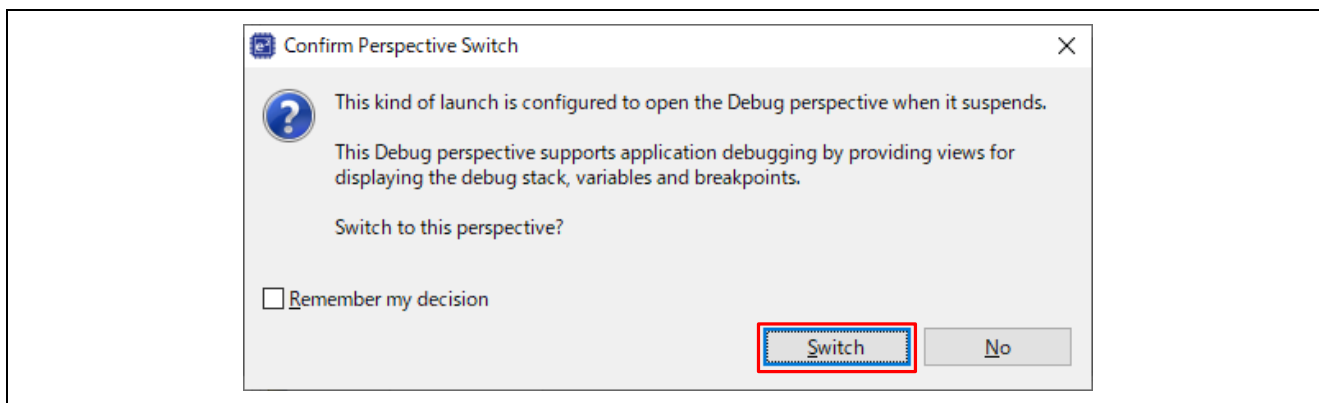

Figure 2.5   Perspective Switch Confirmation

7. Click the **Resume** icon. After a short time execution pauses at the main function; click the Resume icon again.
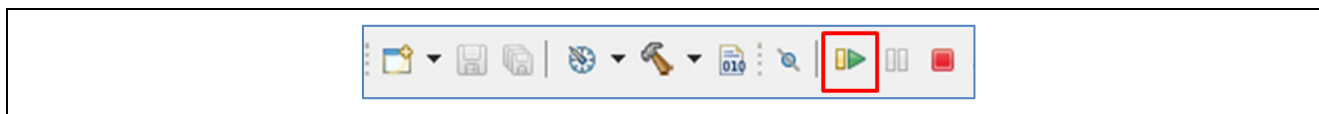

Figure 2.6   Running the Demo Program

8. Confirm that a "Hello world" message is generated by the MQTT test client.

Figure 2.7   Confirming with MQTT Test Client

9. Change the **define** value changed in step 3 back to CONFIG_UPDATE_DEMO_ENABLED, and build the project. (If you omit this step, the demo program using the shadow and Elasticsearch functions will not run.)

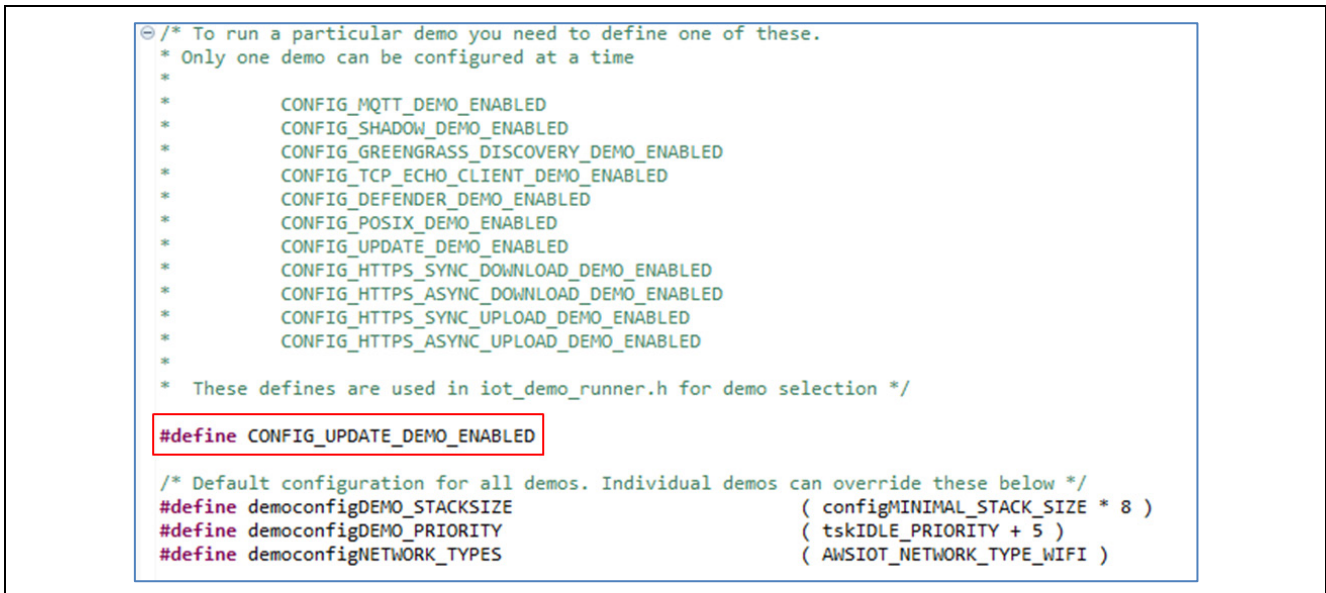

Figure 2.8   Restoring the define Value for the Demo Program

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Jun. 23, 2021	—	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.

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.

2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.

3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.

4. You shall be responsible for determining what licenses are required from any third parties, and obtaining such licenses for the lawful import, export, manufacture, sales, utilization, distribution or other disposal of any products incorporating Renesas Electronics products, if required.

5. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.

6. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.

    "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.

    "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

    Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.

7. No semiconductor product is absolutely secure. Notwithstanding any security measures or features that may be implemented in Renesas Electronics hardware or software products, Renesas Electronics shall have absolutely no liability arising out of any vulnerability or security breach, including but not limited to any unauthorized access to or use of a Renesas Electronics product or a system that uses a Renesas Electronics product. RENESAS ELECTRONICS DOES NOT WARRANT OR GUARANTEE THAT RENESAS ELECTRONICS PRODUCTS, OR ANY SYSTEMS CREATED USING RENESAS ELECTRONICS PRODUCTS WILL BE INVULNERABLE OR FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION ("Vulnerability Issues"). RENESAS ELECTRONICS DISCLAIMS ANY AND ALL RESPONSIBILITY OR LIABILITY ARISING FROM OR RELATED TO ANY VULNERABILITY ISSUES. FURTHERMORE, TO THE EXTENT PERMITTED BY APPLICABLE LAW, RENESAS ELECTRONICS DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT AND ANY RELATED OR ACCOMPANYING SOFTWARE OR HARDWARE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.

8. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.

9. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.

10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.

11. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.

12. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.

13. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.

14. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.

(Note1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.

(Note2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

(Rev.5.0-1 October 2020)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan

www.renesas.com

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

Contact information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit: www.renesas.com/contact/.