

## 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 <sup>2</sup> 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)

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## 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.<br>Fatal error:<br>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 <sup>2</sup> studio outputs an error at build time.)<br>Move the Amazon-FreeRTOS project to a location with a shorter file path.      | 4.3 step 1  |
| 2   |                             | The following error occurs.<br>F0553103: Option 'utf8' is not appropriate                                       | The compiler version may be too old.<br>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.<br>E0520008: Missing closing quote                                                  | The macros may have been entered incorrectly in aws_clientcredential.h.<br>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 <b>SensorDataUpdateOn</b> may be set to <b>UpdateOff</b> . Set the status to <b>UpdateOn</b> .                                                                                                  | 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).

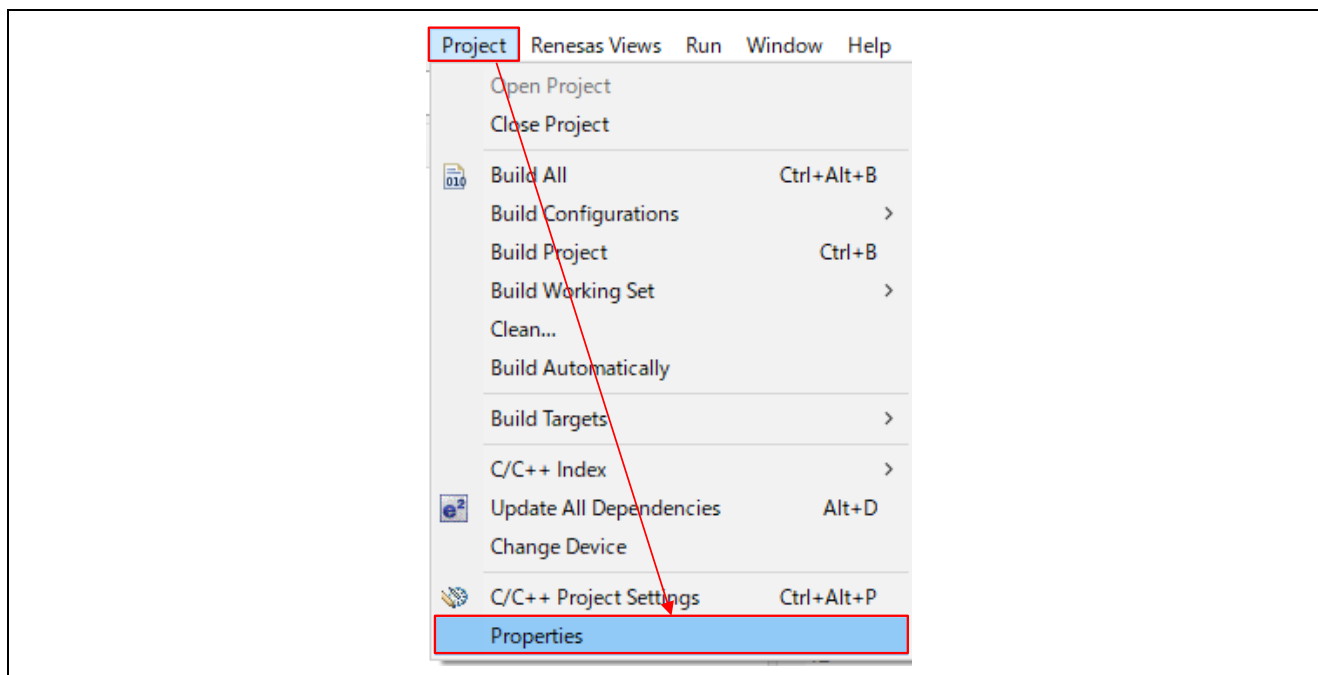


Figure 1.1 Project → Properties

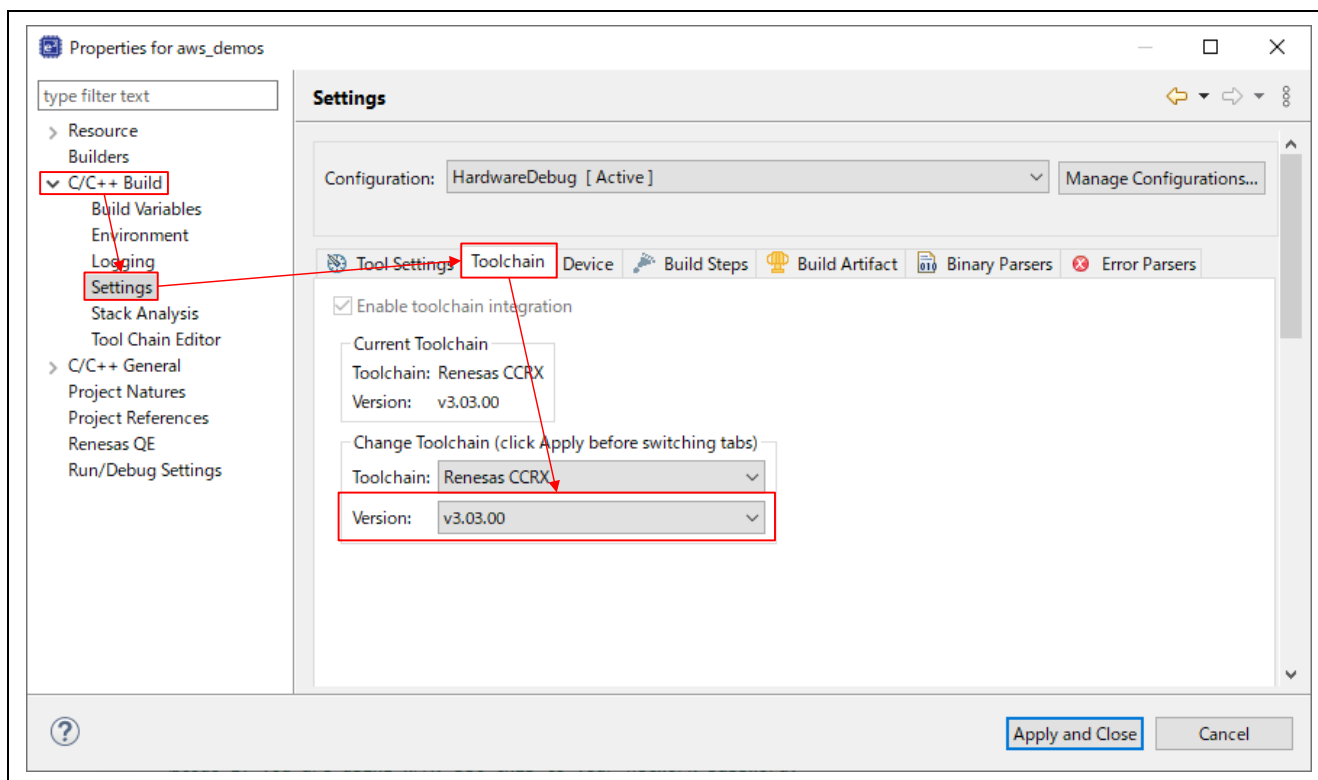
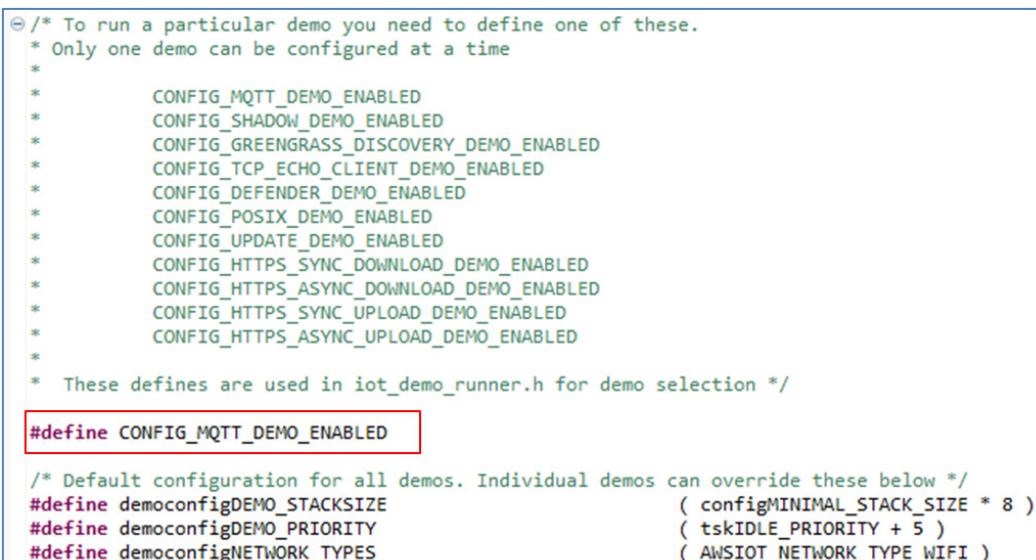


Figure 1.2 Confirming the Compiler Version

## 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\laws\_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\laws\_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.

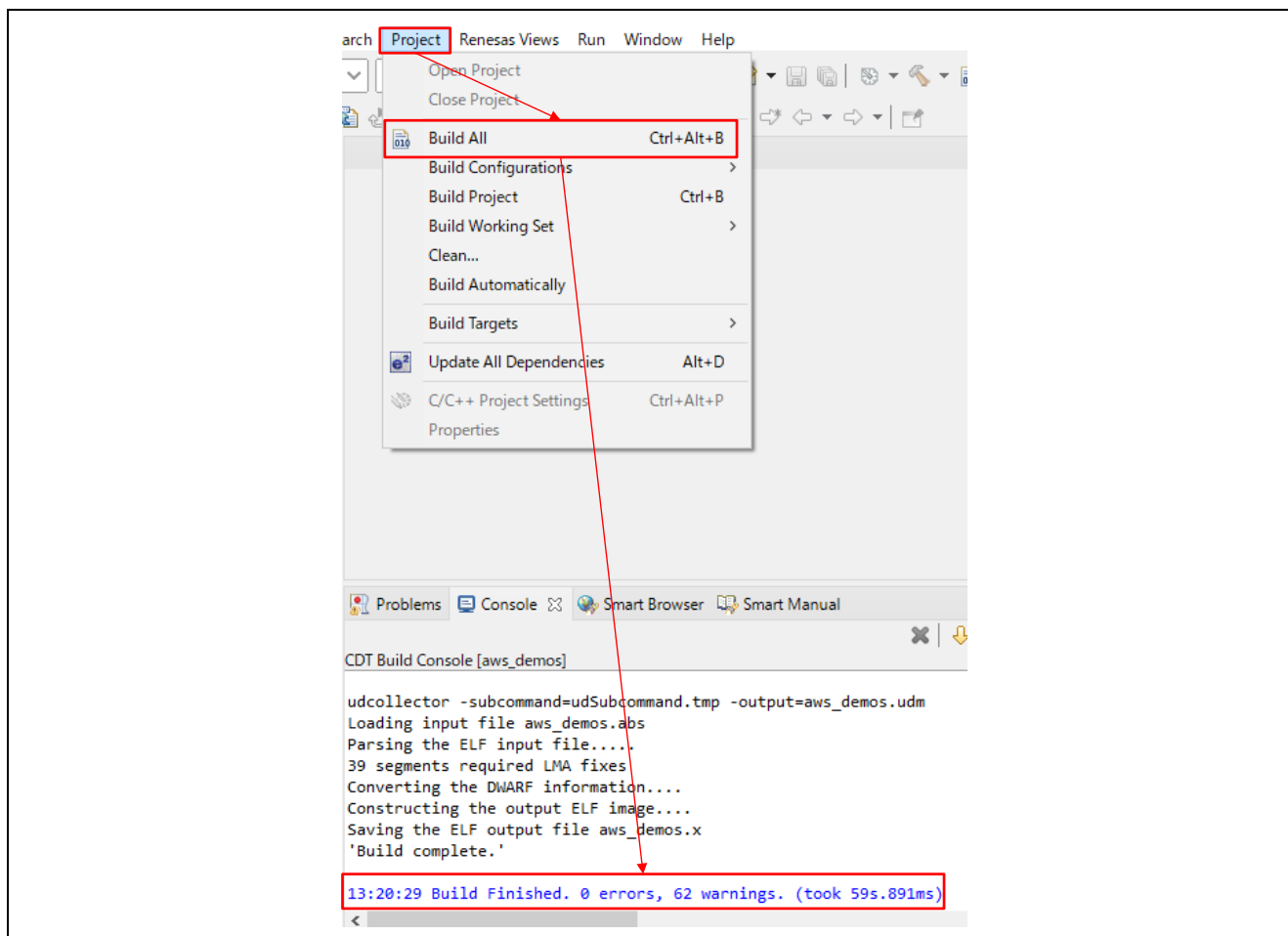


Figure 2.2 Select Project → Build All → 0 errors

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.

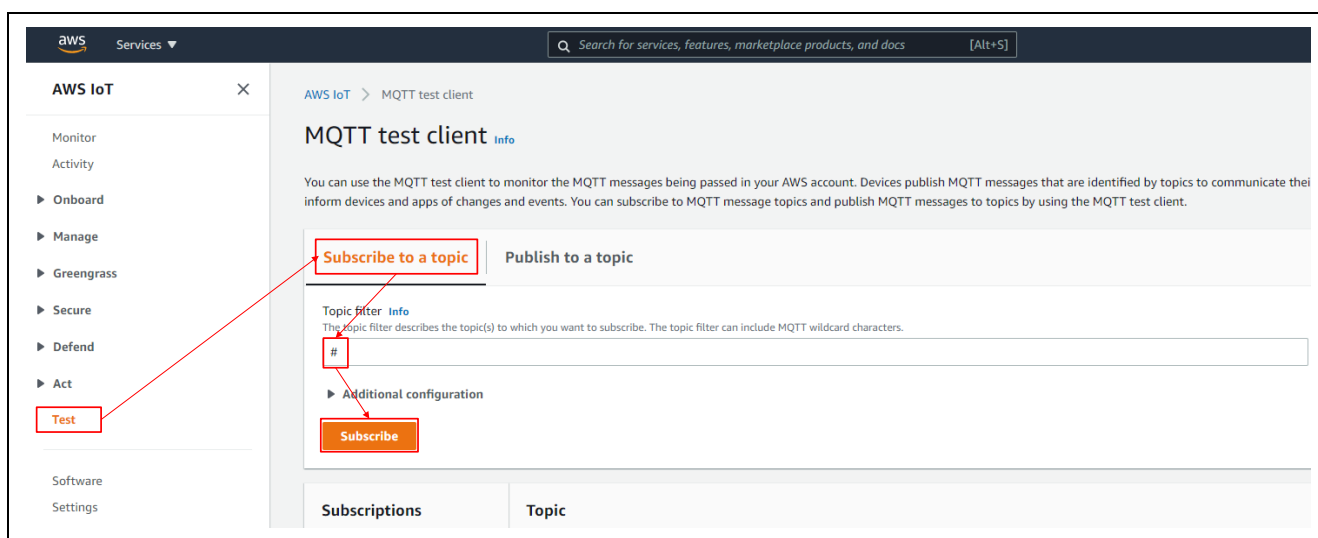


Figure 2.3 Subscribing to a Topic

5. Click the Debug icon in the upper left corner of the e<sup>2</sup> studio window.

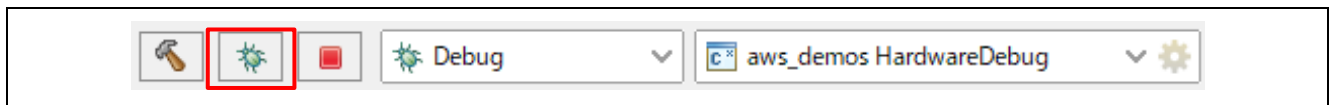


Figure 2.4 Debug

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

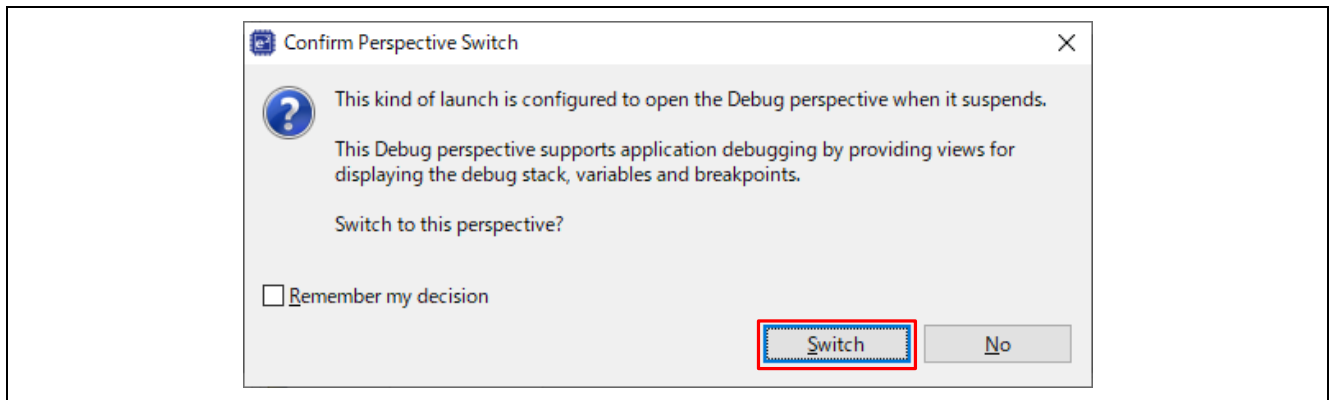


Figure 2.5 Perspective Switch Confirmation

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

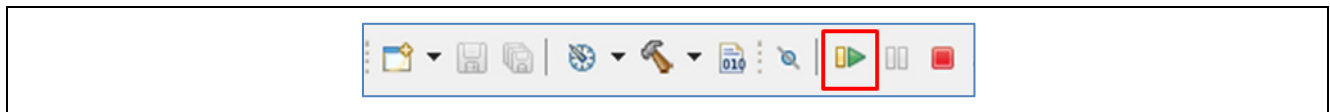


Figure 2.6 Running the Demo Program

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

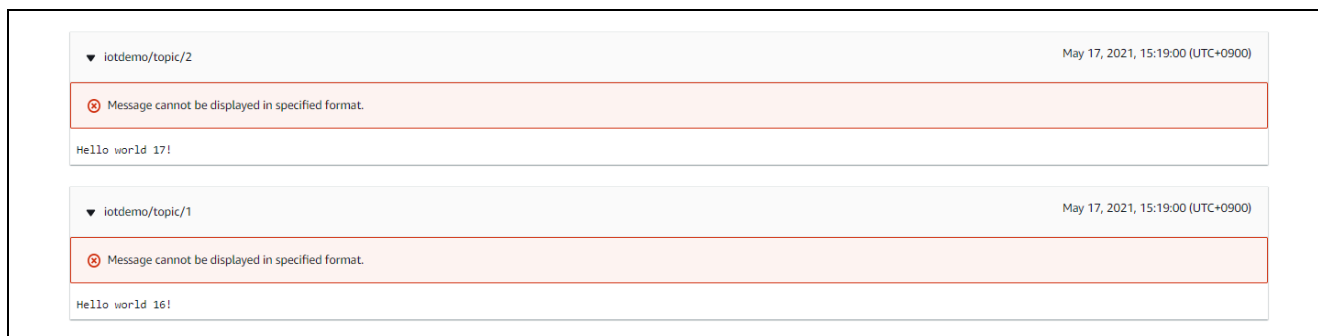


Figure 2.7 Confirming with MQTT Test Client

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.)

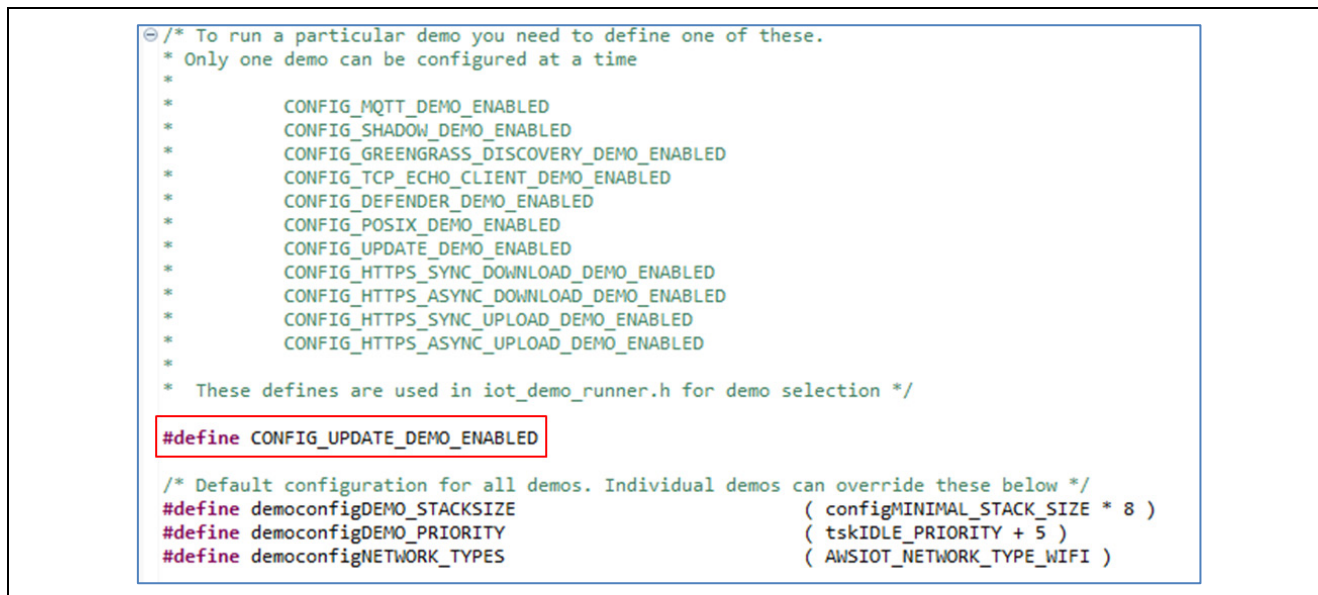


Figure 2.8 Restoring the define Value for the Demo Program

**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.

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