# QuickConnect Remote Debug

## Introduction

The Remote Debug feature in the Renesas QuickConnect Platform enables developers to debug embedded applications running on remote hardware boards hosted in the QCS Cloud infrastructure directly from a local web browser.

Unlike traditional debugging, which requires the developer to have physical access to a kit, the Remote Debug feature connects your QCS workspace to Renesas evaluation kits deployed in secure board farms worldwide. This connection allows seamless cloud-to-hardware debugging for global teams, universities, and developers.

**Table 1. Key Benefits**

| Feature | Description |
|---|---|
| Hardware Access Anywhere | Debug live hardware kits from anywhere using secure cloud connectivity. |
| No Physical Setup | No requirement to connect USB debuggers, cables locally because all the hardware resides in the QCS board farm. |
| True On-target Debugging | Unlike simulation, Remote Debug runs on real MCUs/MPUs ensuring accurate timing and peripheral behavior. |
| Secure Debug Sessions | Supports password-protected remote connections to ensure only authorized clients can access the hardware. |
| Multi-user Scalable Access | Access Renesas boards across multiple regions (US, EU, APAC) with dynamic allocation and release. |
| Seamless Integration with QCS Services | Fully compatible with Direct Debug and GitHub synchronization. |

**Table 2. Hardware Families Supported[1]**

| Product Family | Supported Devices |
|---|---|
| RA Family (ARM Cortex-M) | RA0, RA2, RA4, RA6, RA8 MCU series |

1. Before using the Remote Debug feature, clear the TZ boundaries using RFP.

## General Procedure for the Remote Debug Feature

1. The developer initiates a Remote Debug session from QCS Web IDE.
2. QCS authenticates the session and allocates a remote evaluation board from the nearest regional board farm
3. The QCS Debug Service establishes a secure GDB bridge between the developer environment and the remote target board.
4. The developer performs standard debugging tasks such as breakpoints, stepping, and variable inspection as though the hardware is connected locally.
5. After the end of a session, the QCS automatically releases the board and terminates the debug tunnel.

# Contents

# 1. Getting Started

## 1.1 Prerequisites

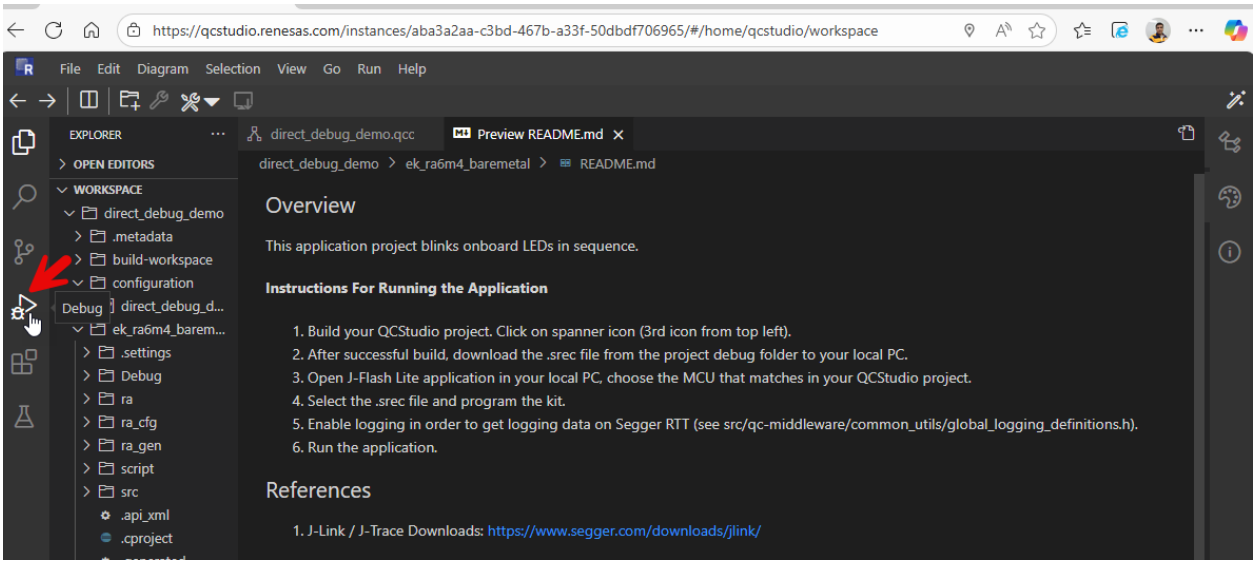
- Follow the QCS Platform user manual (*QuickConnect IoT Manual*) to create and build a QCS project.
- A stable internet connection.

## 1.2 Starting a Remote Debug Session

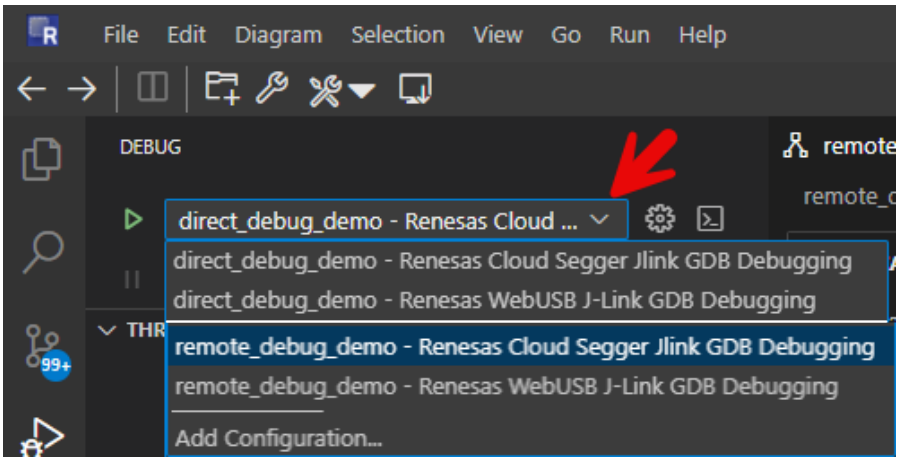
At this stage, the QCS project is created and built by following the instructions from the QCS Platform user manual, and it is ready to validate the application by connecting to Renesas-managed board farms deployed globally.

*Note*: To reuse a previously created QCS application project for remote debugging, manually rebuild the project for every new session.

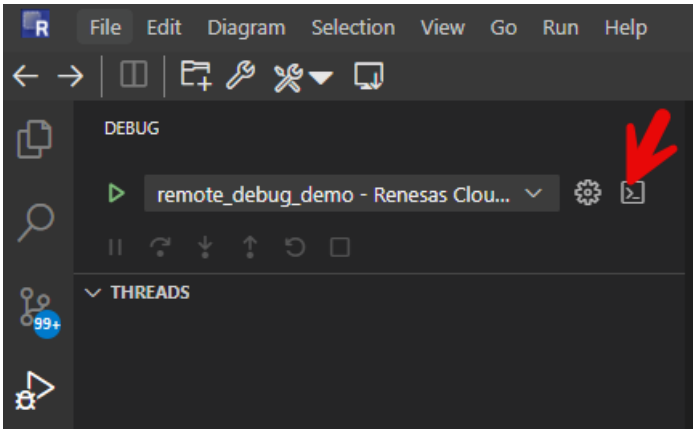
1. In the QCS workspace, when the QCS application is created and built, click the Debug View icon, as shown in the following screenshot.



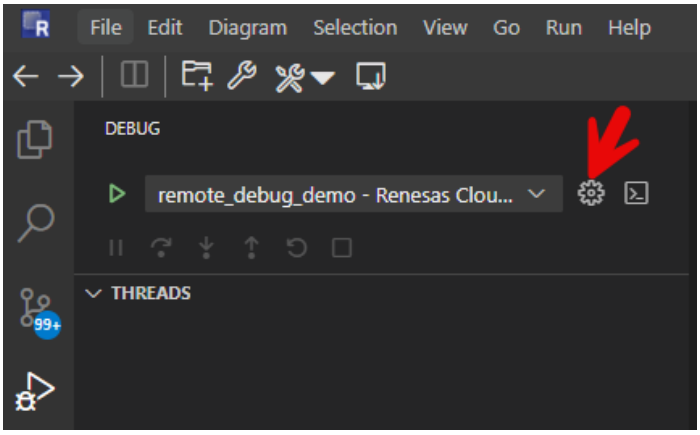

2. Click the dropdown menu from the Debug configuration window, as shown in the following screenshot, and select the **Renesas Cloud Segger J-Link GDB Debugging** option for the application.



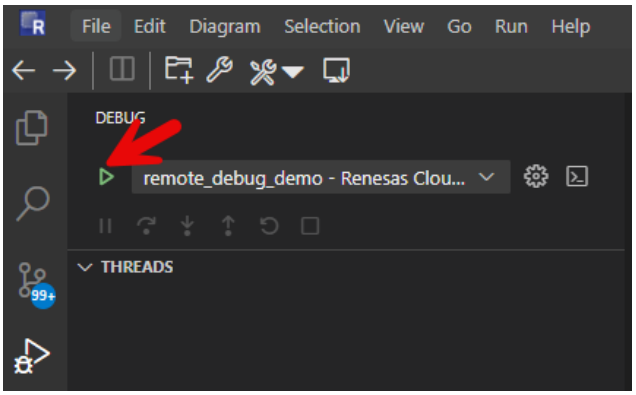
3. To open the Debug Console, click the icon highlighted in the following image. The debug console captures the debug logs during the remote debug session.




4. (Optional) To explore the `launch.json` file settings, click on the icon highlighted in the following screenshot.

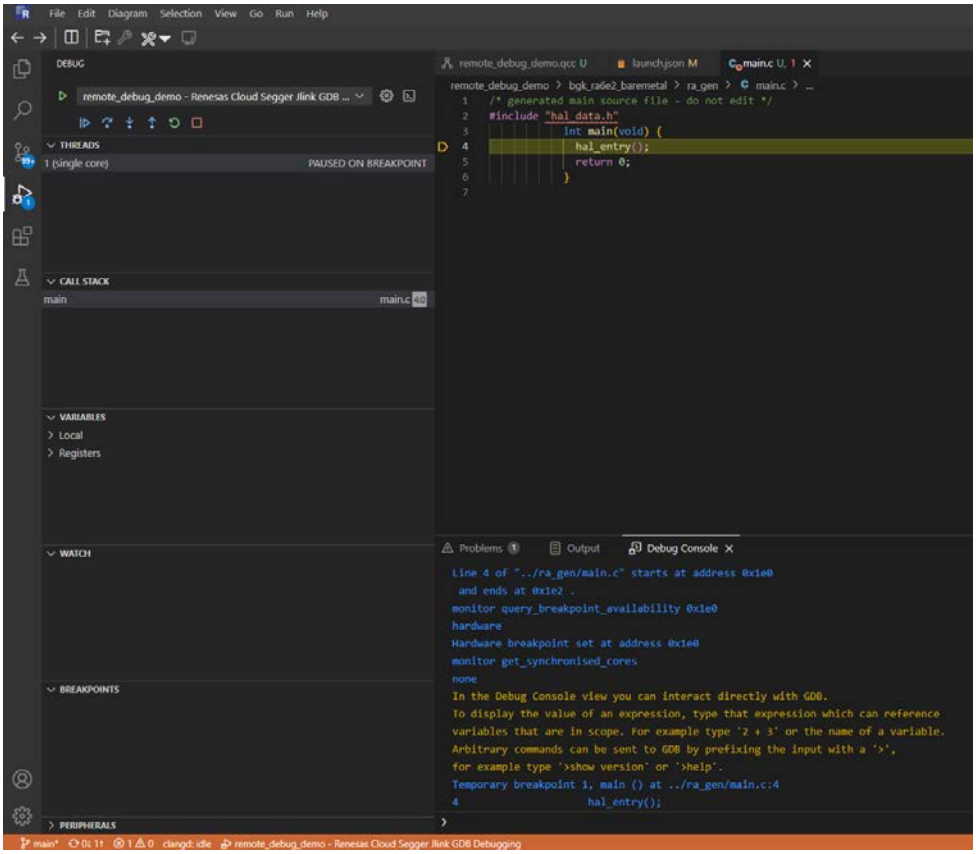



5. To launch the remote debug session, click on the icon highlighted in the following image.




*Note*: The QCS Platform automatically obtains the hardware combinations and location used in the project, and it locates the nearest available board farm the matches the project requirements. The process can take multiple seconds depending on the user location, board availability, and network bandwidth.

6. After a successful connection, the application project image is downloaded to the target kit, and the program halts at the main thread of the application. Finally, the debug console window captures the logs during the debug process.

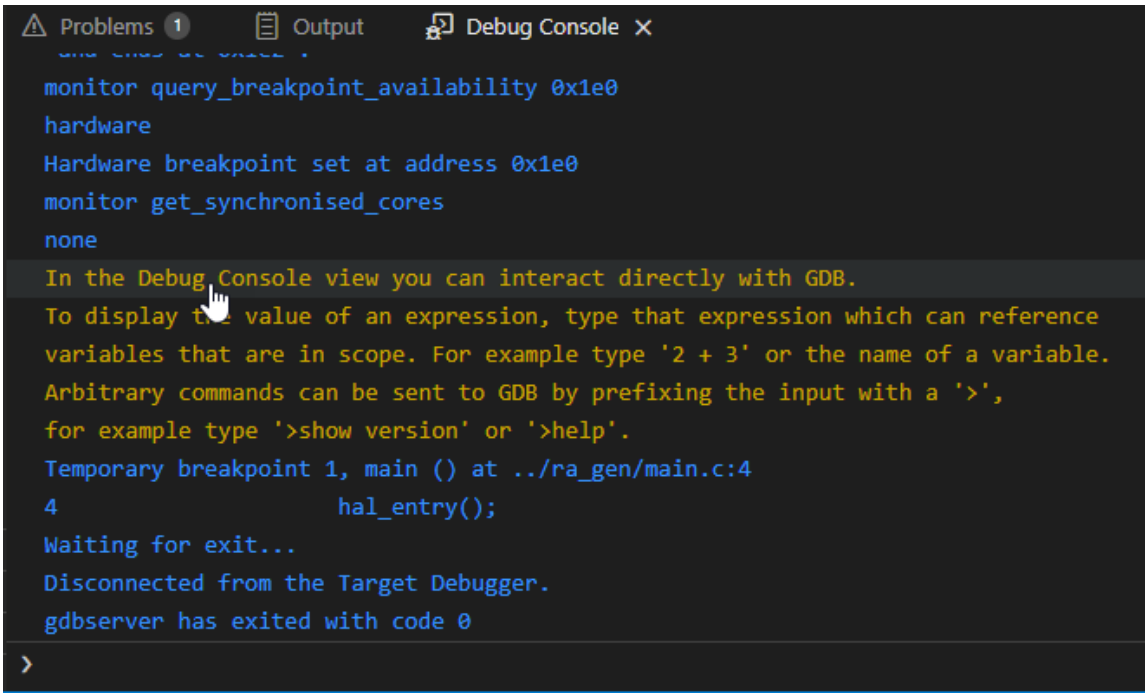



## 1.3 Common Debug Operations

| Action | Description | Shortcut |
|---|---|---|
| Continue | Resume program until the next breakpoint | - |
| Step over | Execute current line, skip into functions | - |
| Step into | Enter function on current line | - |
| Step out | Run until returning to the caller | - |
| Pause | Interrupt the program to inspect variables. | - |
| Watch variables | Add expressions in the Watch panel | - |
| Inspect registers | - | - |
| View call stack | Navigate the call hierarchy | - |

## 1.4 Session Termination

1. To end a session, click **Stop** from the **Debug** tab. QCS automatically completes the following:
   - Frees the boards
   - Closes the debug tunnel




*Note*: If you lose connection, the system automatically marks the board for release within 30 seconds.

# 2. Revision History

| Revision | Date | Description |
|---|---|---|
| 1.00 | Feb 10, 2026 | Initial release. |

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