# US082-SSC3240EVZ

Evaluation Board for High-End 24-Bit Sensor Signal Conditioner with Analog and Digital Output

## Introduction

This document provides quick-start instructions for the US082-SSC3240EVZ board, including setting up and programming the board.

***Important***: To ensure correct setup of the US082-SSC3240EVZ board, complete the steps in the order listed in Quick Start Procedure.

## Contents


**1. Board Information ..... 2**
- 1.1 Acquiring the Board ..... 2
- 1.2 Board Contents ..... 2
  - 1.2.1 Hardware Requirements ..... 3
  - 1.2.2 Software Requirements ..... 3

**2. Calibration Procedure ..... 3**

**3. Quick Start Procedure ..... 4**
- 3.1 Install e² Studio ..... 4
- 3.2 Kit Hardware Connection ..... 4
  - 3.2.1 Load Cell Base and Platform ..... 6

**4. Board Testing ..... 7**
- 4.1 Programming the Renesas Development Board ..... 7
- 4.2 Using RTT Viewer ..... 9

**5. References and Support ..... 11**

**6. Revision History ..... 12**



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# 1. Board Information

## 1.1 Acquiring the Board

Visit the US082-SSC3240EVZ product page for more information about the board and how to acquire the product.

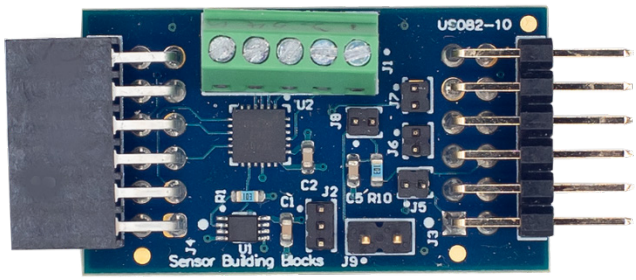


**Figure 1. US082-SSC3240EVZ Board**

| Part Number | Description |
|---|---|
| US082-SSC3240EVZ | High-End 24-Bit Sensor Signal Conditioner with Analog and Digital Output |

## 1.2 Board Contents

The US082-SSC3240EVZ board integrates the ZSSC3240, a high-precision sensor signal conditioning IC designed for amplification, digitization, and correction of resistive sensor signals including bridge, half-bridge, and single-element types like Pt100 and temperature diodes. The board offers 0V to1V or 0V to 5V absolute voltage output and VDD-ratiometric voltage output. It also supports 4mA to 20mA current-loop output and 0V to 10V absolute-voltage output.

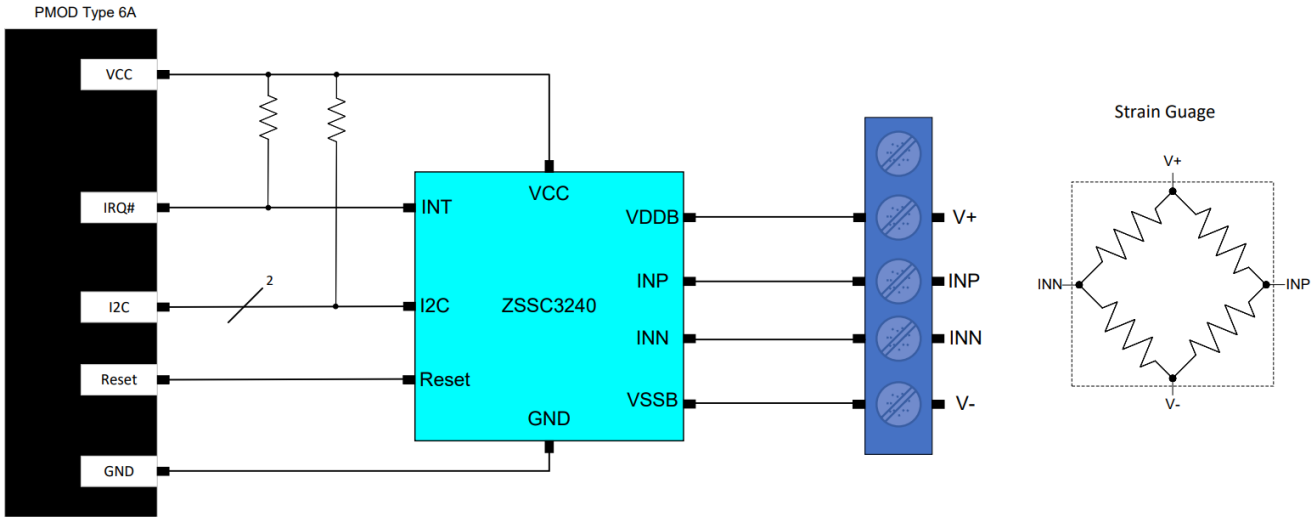


**Figure 2. US082-SSC3240EVZ Block Diagram**

### 1.2.1 Hardware Requirements

To setup and configure the US082-SSC3240EVZ board, the following hardware is recommended or required:

- EK-RA6M4
- USB micro-B cable (provided with the EK-RA6M4)
- PC running Windows 10/11 with at least one USB port
- Strain Gauge (1kg or greater)
- Strain Gauge platform
- Strain Gauge base
- Set of objects with known weights (for calibration)
- SSC Communication Board (for calibration)
- US082-SSCALINTRPEVZ (for calibration)
- US082-INTERPEVZ

### 1.2.2 Software Requirements

The following software is required or recommended:

- e2 Studio 2024-01 or later
  - RA Flexible Software Package (FSP) 5.0.0 or later
  - GCC Arm Embedded 13.2.1.arm-13-7
  - Sample code files (available on the US082-SSC3240EVZ product page)
- J-Link RTT Viewer
- ZSSC3240 Evaluation Software (available on the ZSSC3240 product page)

# 2. Calibration Procedure

Follow the calibration procedure steps in the ZSSC3240 Calibration Guide. For the best performance, use the load cell and known weights to calibrate the US082-SSC3240EVZ.

When calibrating the sensor, ensure the measured sensor range covers at least 70% of total sensor range.

Example calibration values used in this demo are listed below:

| Sensor Coefficients | Value | Temperature Coefficients | Value |
|---|---|---|---|
| Offset_S | 1100323 | Gain_T | 2097152 |
| Gain_S | 4029196 | - | - |
| SOT_S | -303 | - | - |

# 3. Quick Start Procedure

Complete the following quick-start procedure steps in the order listed.

## 3.1 Install e² Studio

Install the latest version of the e² Studio and the RA Flexible Software Package (FSP).

## 3.2 Kit Hardware Connection

Use the following steps to set up the kit's hardware connections.

1. Ensure that the MCU development kit has at least one Type 6A Pmod.
   a. For the EK-RA6M4, if no Type 6A Pmod is available, ensure that the kit can use the US082-INTERPEVZ interposer board. Insert the interposer into the MCU connector before adding any sensor boards.
2. Mount the J5, J6, and J7 jumpers on the US082-ZSSC3240EVZ.
3. Connect the strain-gauge wires as shown below. This demo uses a 1kg strain-gauge.

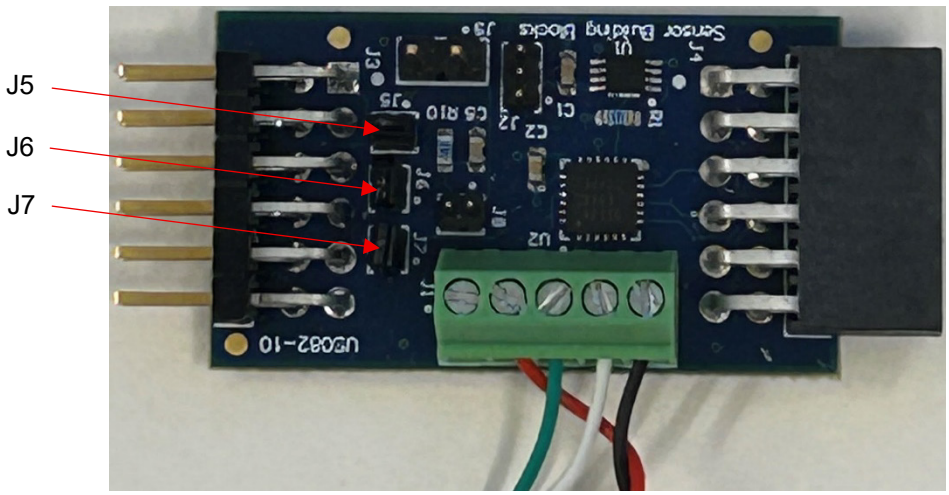


**Figure 3. Strain Gauge Connection**

| Strain-Gauge | US082-ZSSC3240EVZ |
|---|---|
| E+ (Red) | VDDB |
| A+ (Green) | INP |
| A- (White) | INN |
| E- (Black) | VSSB |

4. Plug the US082-SSC3240EVZ board into the US082-INTERPEVZ on the PMOD1 connector. Ensure all pins are properly aligned (see Figure 4).
5. Connect the EK-RA6M4 to the computer using the USB micro-B cable.

The kit is now ready to use.

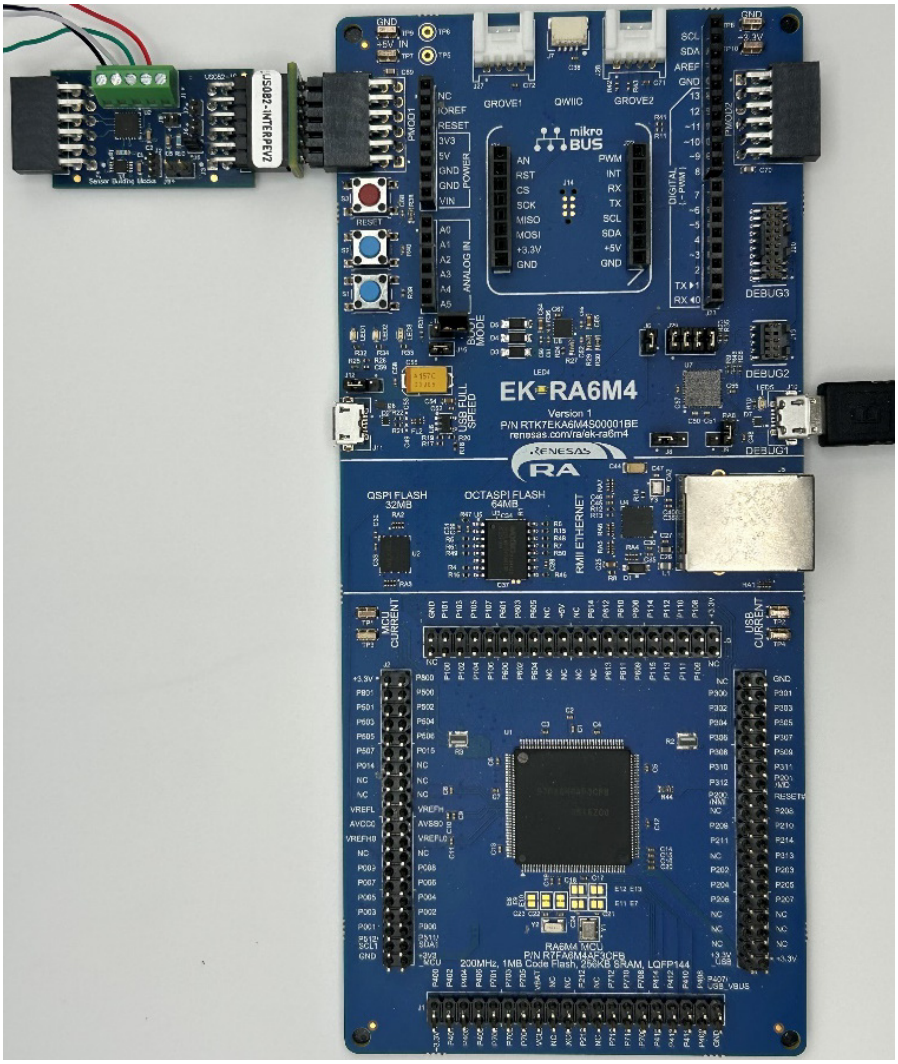


**Figure 4. US082-SSC3240EVZ with EK-RA6M4 MCU Kit**

### 3.2.1 Load Cell Base and Platform

If using the load cell base and platform, assemble the platform as follows:

1. Attach the load cell to the base using M5 screws (see Figure 5).

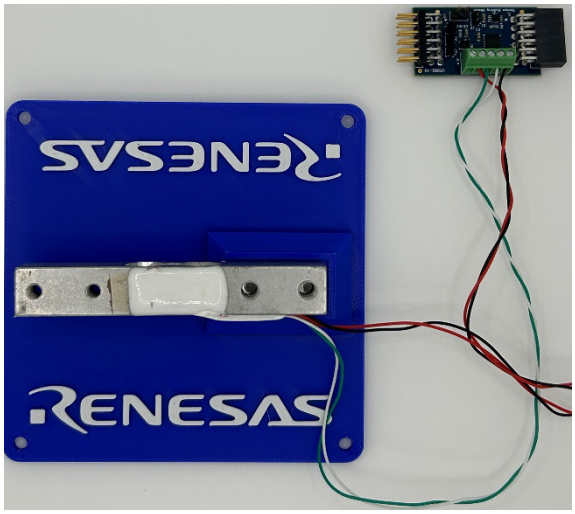


**Figure 5. Load Cell Base**

2. Next, attach the load cell to the scale platform using M4 screws, ensuring the arrow on the load cell is pointing down (see Figure 6).

**Figure 6. Load Cell Platform**

The load cell is now ready to use.

# 4. Board Testing

## 4.1 Programming the Renesas Development Board

1. Open the sample project in e$^2$ studio.

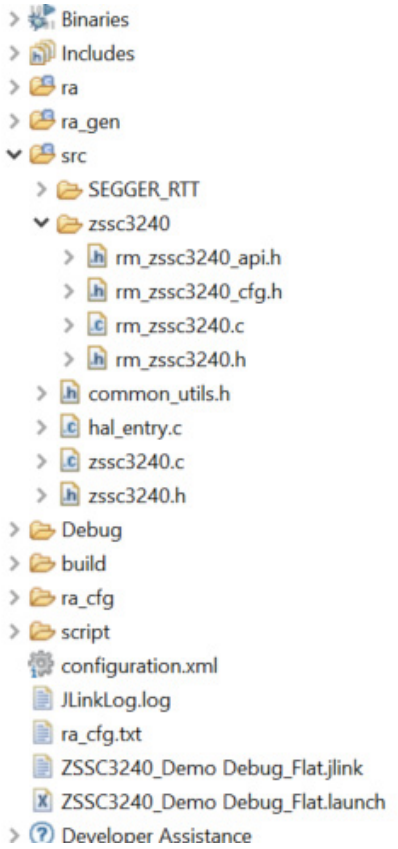


**Figure 7. ZSSC3240 Project Structure**

2. Click the Build icon.

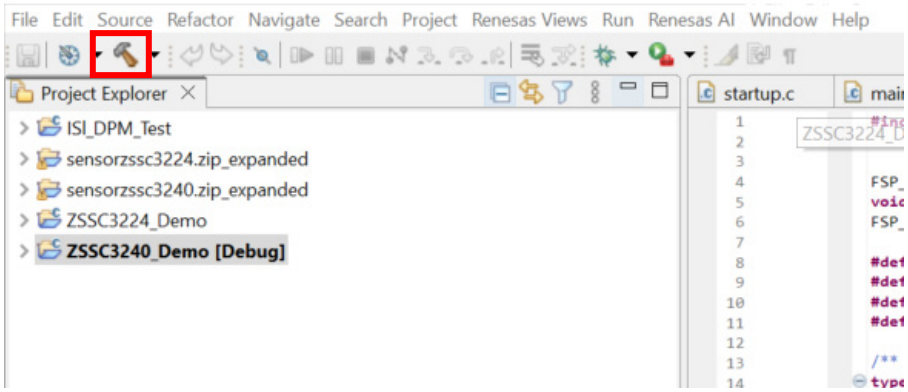


**Figure 8. Project Build**

3. From the menu bar, select **Run** → **Debug Configurations**.

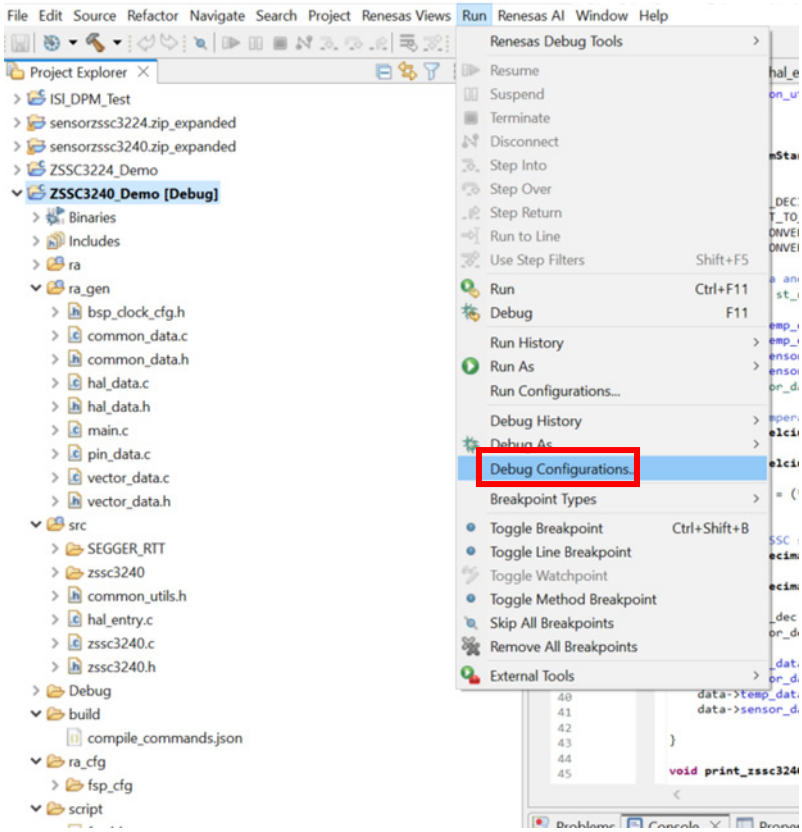


**Figure 9. Debug Configuration**

4. Select **Renesas GDB Hardware Debugging** → **ZSSC3240_Demo Debug_Flat** (see Figure 10).
5. Click the **Debug** button.

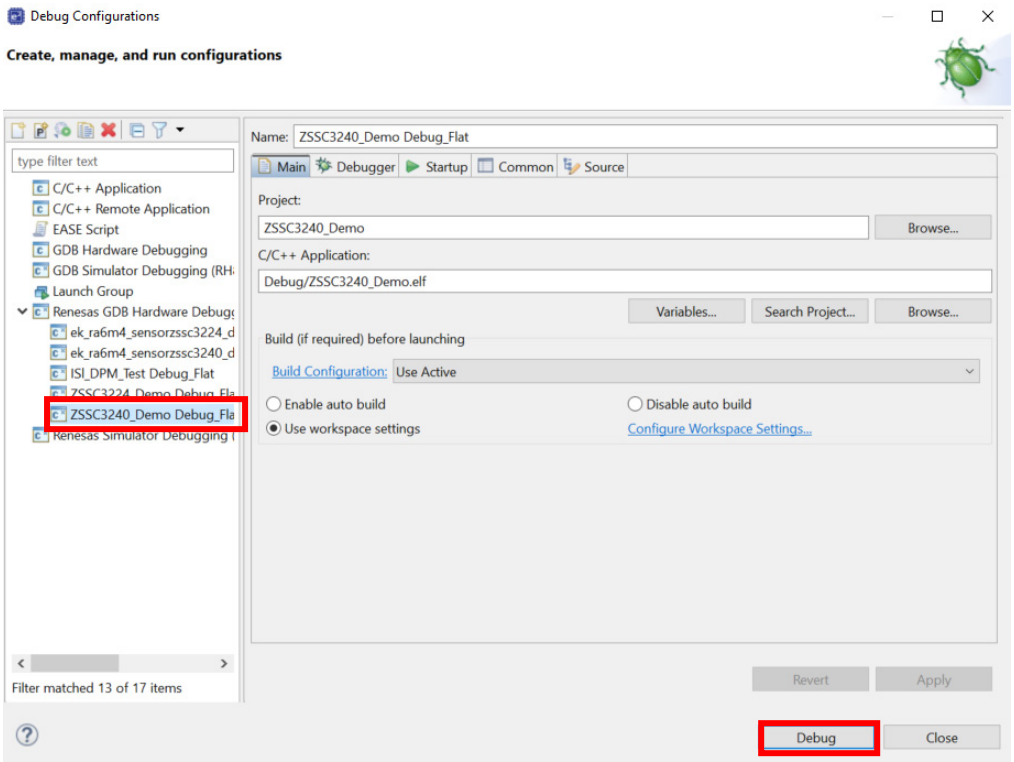


**Figure 10. Start Debug Mode**

6. Click the **Play** button to run the code.

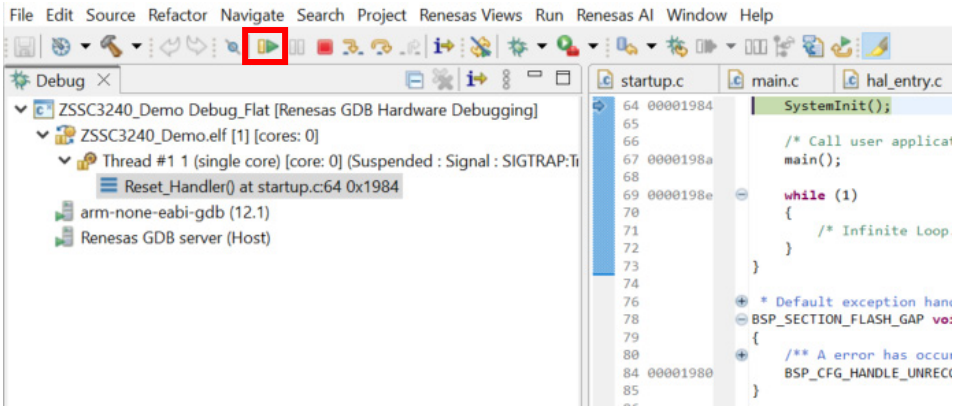


**Figure 11. Running the Code**

## 4.2 Using RTT Viewer

1. Close e$^2$ studio.
2. Open the J-Link RTT Viewer (see Figure 12).
3. Press **S3** on the EK-RA6M4.
4. Click **File** → **Connect**.

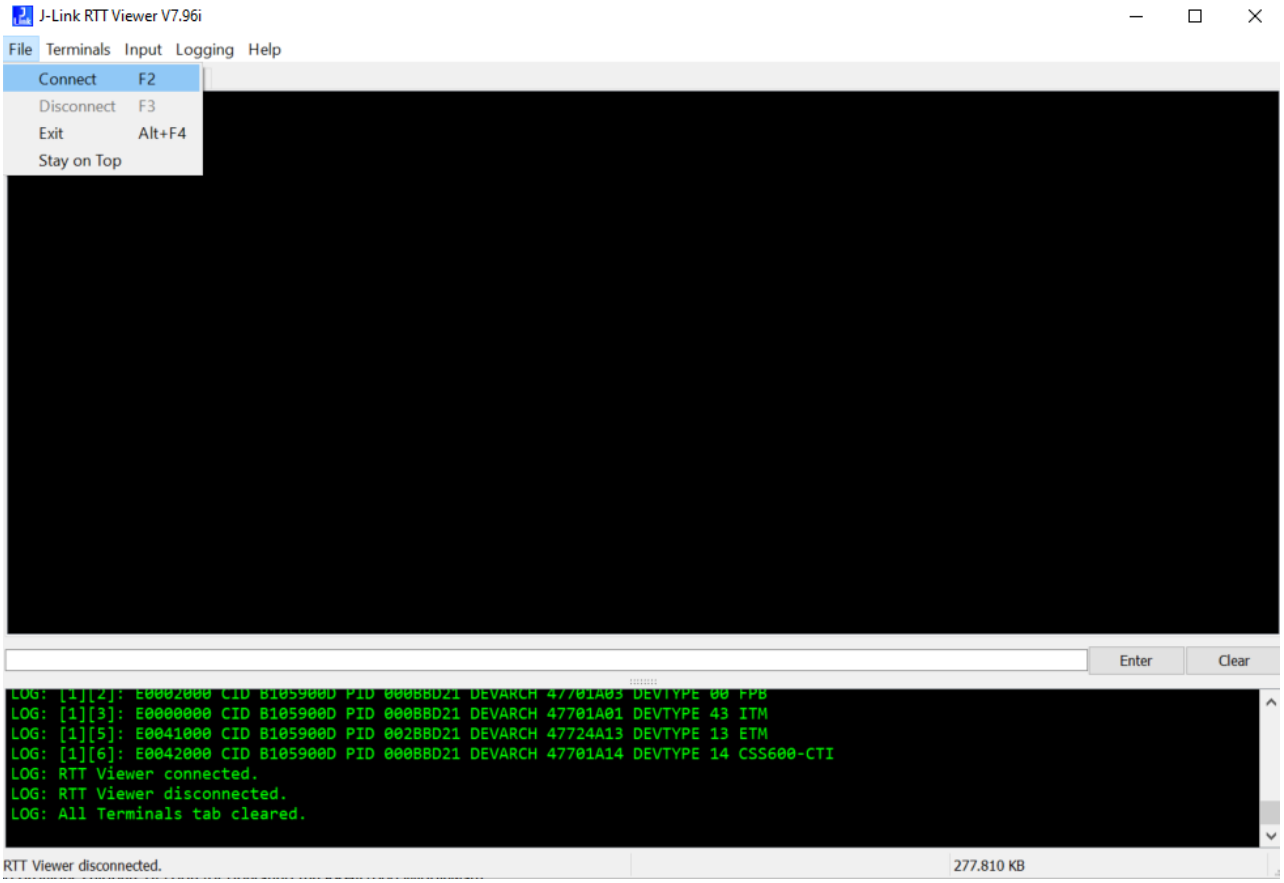


**Figure 12. RTT Viewer**

5. Ensure your configuration matches the configuration shown in Figure 13.
   a. Search Range: 0x20000000 0x8000
6. Click **OK**.

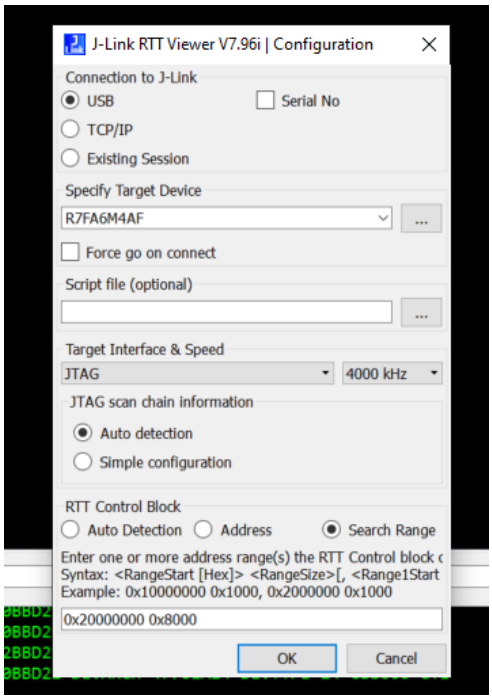


**Figure 13. RTT Viewer Options**

7. You should see the following output in the “All Terminals” tab.

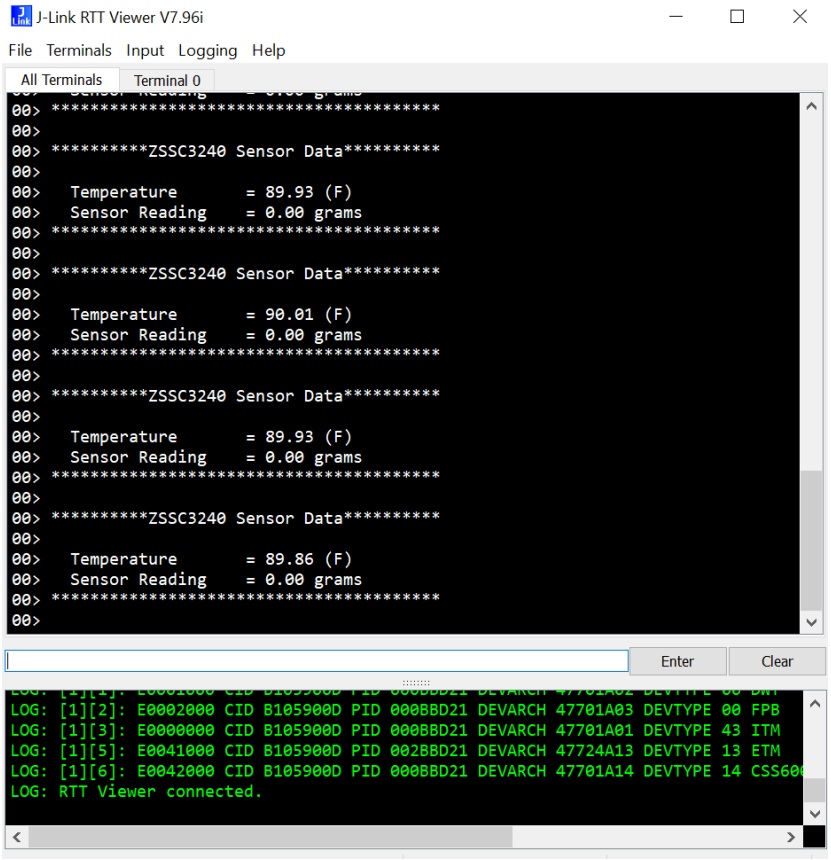


**Figure 14. Demo Output**

8. Add weight to the scale and the weight in grams is displayed in the terminal.

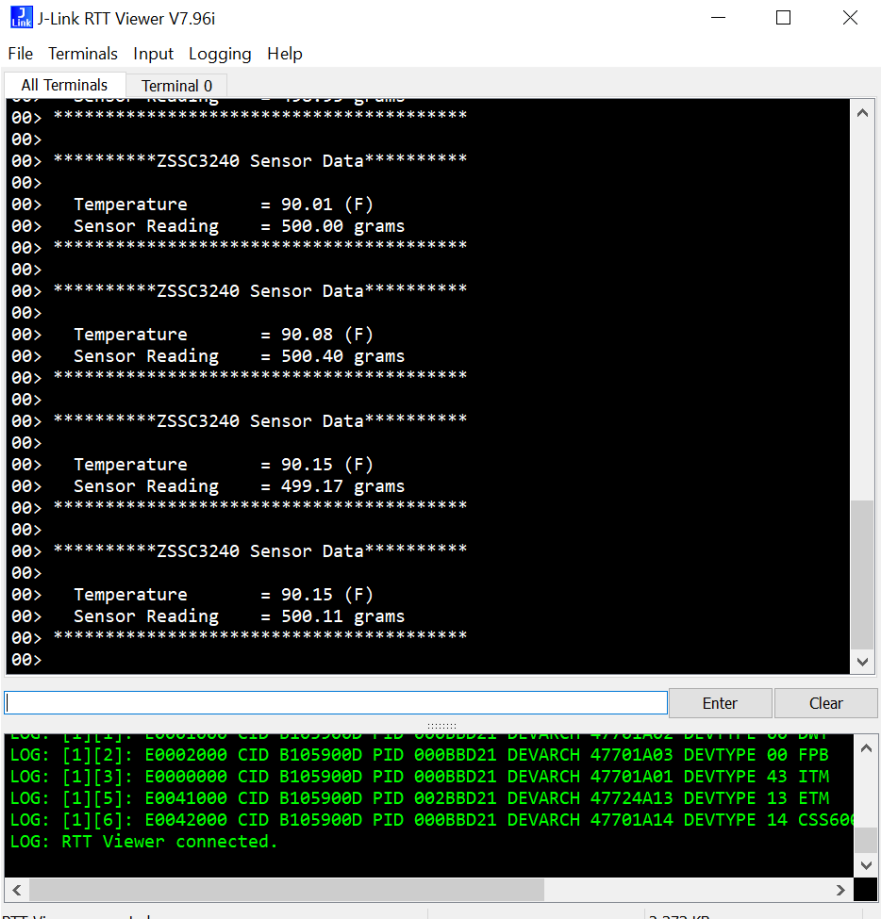


**Figure 15. Sensor Output with 500g Weight**

# 5. References and Support

- e² studio webpage
- ZSSC3240 product page
- RA Product Information
- RA Product Support Forum
- RA Flexible Software Package (FSP)
- Renesas Support

# 6. Revision History

| Revision | Date | Description |
|---|---|---|
| 1.00 | Jul 3, 2025 | Initial release. |