RAA271005 GUI Software

Introduction

The RAA271005 Graphic User Interface (GUI) is a comprehensive interface that configures and monitors the Buck and LDO regulators. It allows users to adjust voltage and frequency settings, and test different configurations. This manual provides instructions on how to use real-time performance features by the GUI application to communicate with the RAA271005 device to monitor key parameters.

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1. System Requirements

The following list shows the minimum system requirements for the RAA271005 GUI software program:

- PC with Intel i5 - 2.60GHz CPU or better
- Windows 10 or higher
- 82MB of free hard-disk space
- USB port

To communicate between the system and GUI application, a USB to I^2C/SPI communication dongle (ISLUSBMINIEVAL1Z) is required. The Renesas GUI supports this tool across all operating systems.

2. Installation Guide

Execute `setup_RAA271005_Customer_GUI_C0.0.0.4.exe` and follow the instructions for the software installation.

3. User Interface Overview

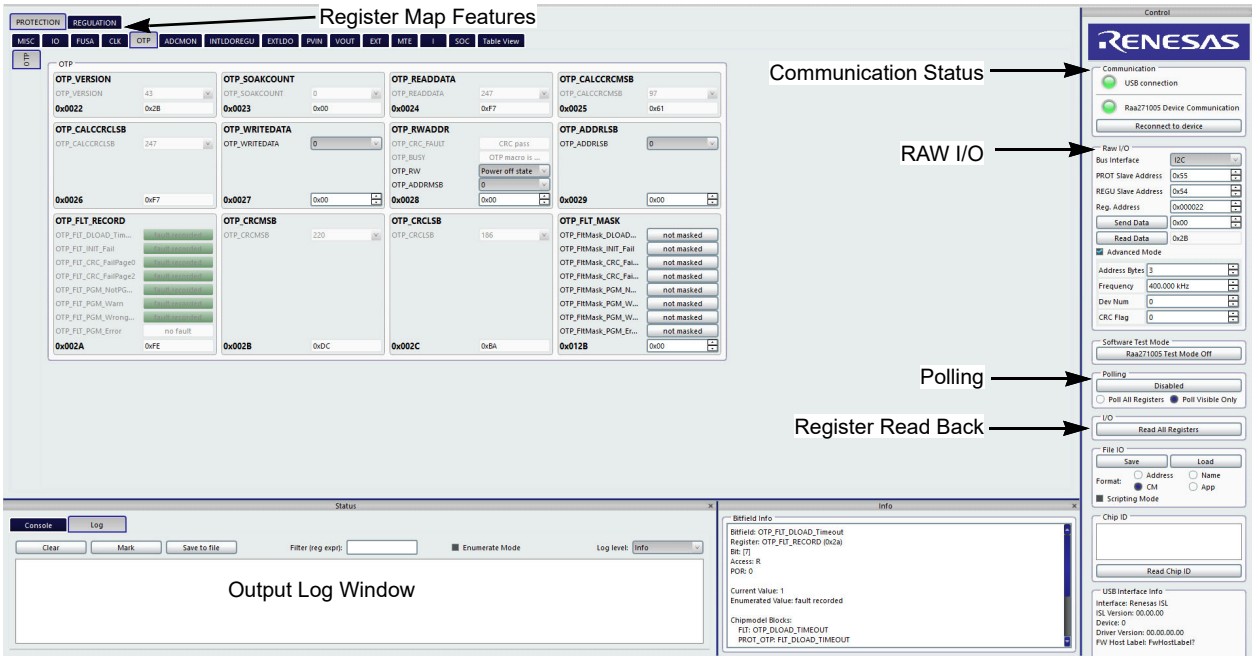

Figure 1. GUI Interface Application

- Register Map Features – The GUI is divided into two sections, regulation and protection. The regulation side of the PMIC is responsible for power management functions and delivers stable power to all outputs while the protection side monitors internal signals for faults. The registers are sorted by categorical titles with each register displaying its corresponding register field bit names.
- Communication Status – To confirm that the USB dongle and device are properly connected, both status indicators should display green. If either of the status indicators depicts a red state as depicted in Figure 3, this indicates that communication between the USB dongle and device has not been established correctly. In this case, check the configuration and connection to resolve the issue. Ensure that the correct slave address for regulation and protection has been selected according to the OTP settings.

  In Figure 2, the indicators depict that no connection has been detected.

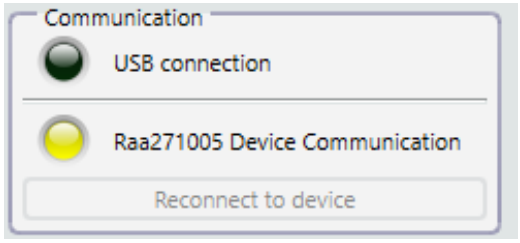

Figure 2. No Communication Status Detected

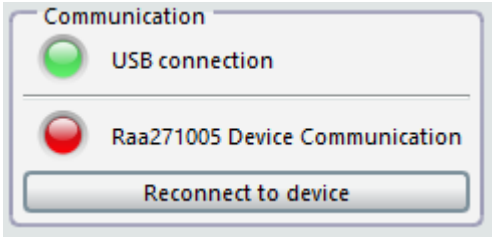

Figure 3. Communication Status Setup Issue

- RAW I/O – The RAW I/O enables users to configure communication protocol settings. The bus interface includes options for selecting either I²C or SPI protocol, allowing the GUI to adapt accordingly. Individual register addresses can also be accessed by entering the corresponding slave address, which can be used for either regulation or protection features. In addition, the advance mode options allow users to customize settings by adjusting the clock frequency and toggling CRC (Cyclic Redundancy Check).

  Note: When using the RAW I/O read or write regulation setting, an offset of 0x10000 must be added to the register address. Not doing so, causes the command to communicate with the protection side setting. The number of address bytes must also be set to 3. Figure 4 shows a setup on how to configure a regulation register address.

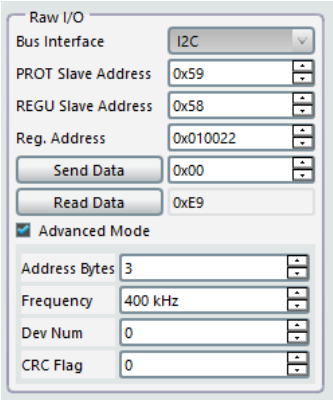

Figure 4. RAW I/O Configuration

- Polling – The polling feature enables users to observe register settings in real-time metrics. If selected, registers are continuously read and are displayed in the output window log.
- Register Read Back – This option enables all registers to be read and updated. *Note*: If this option is selected, any modifications made to individual registers within the register map revert to the default OTP (One-Time Programmable) settings.
- Output Log Window – This section displays the activity within the GUI, providing a log of interactions. It can sort and review through register readback history, allowing users to track and analyze register data. The feature also offers debug capability, as it helps identify issues within setup and operation.

4. Configuring and Using the Control Menu

The following steps must be taken to ensure proper communication of the RAA271005, which shows the status indicators are green within the GUI application.

Example setup for I²C protocol:

1. Supply 5V to VIN.
2. Connect dongle to J69 (located at top right corner of board).
3. Configure jumpers for SCL (IO1) and SDA (IO2); Jumpers must also be added at J60 and J61 to ensure proper communication with GUI application.

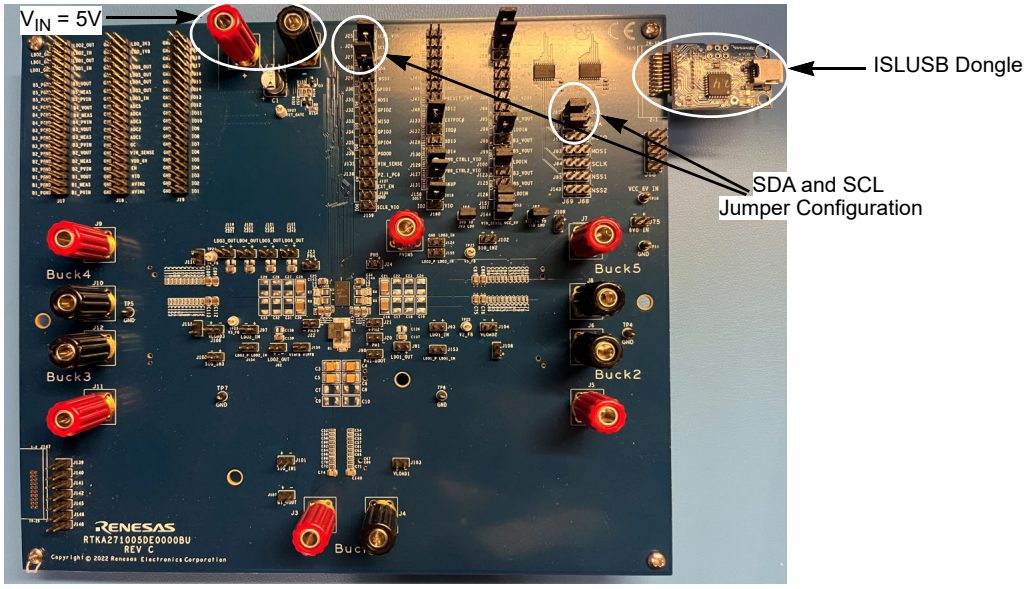

Figure 5. RAA271005 Evaluation Board Setup

5. Configuring and Using the Register Window

The register window provides a full display of the register map, allowing users to manipulate individual bits within a register. The registers of both protection and regulation settings are sorted by categories for convenient navigation. Figure 6 shows the different category tabs with each containing specific registers.

In the example shown in Figure 6, register 0x0022 (IO_MODECTRL_REGU) and 0x0023 (IO_MODECTRL2_REGU) depicts the output states of the regulators. The green status of register field bits represents a high state while gray status depicts low state.

In register 0x0022, only Buck4 is disabled out of the Buck regulators. While LDO1-3 regulators are disabled in register 0x0023. To disable other regulators, click on the regulator status, which updates the register data in real time.

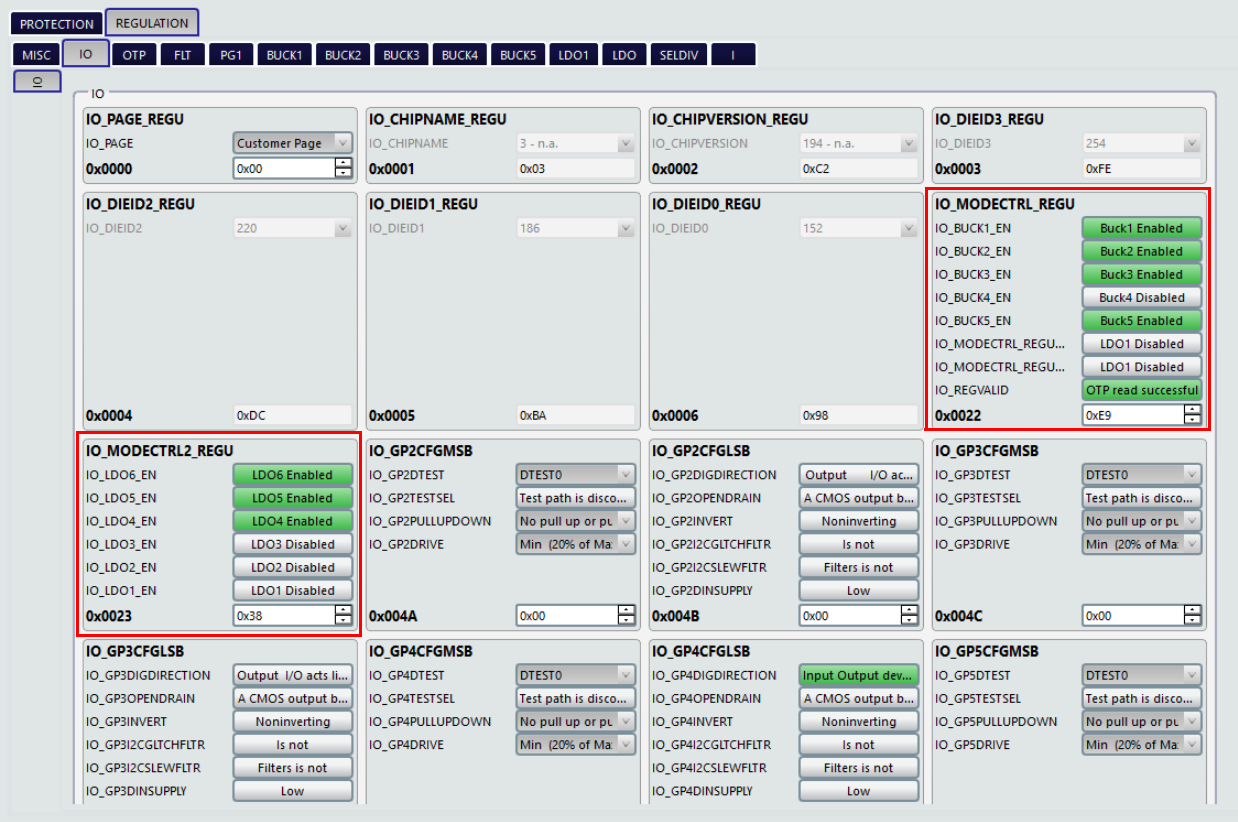

Figure 6. Buck and LDO Regulator Output State

6. Revision History

Revision	Date	Description
1.00	Mar 7, 2025	Initial release.

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