VersaClock® 7 Single and Static Multi Config Setup using RICBox

This document provides the steps needed to understand Single and Static Multi Config setup on VersaClock 7 (VC7) using Renesas IC Toolbox (RICBox).

Contents

1.   Installation

Install the RICBox software "R_VersaClock7" package. Refer to the Renesas IC Toolbox Software Manual for more information on installing RICBox software for VC7.

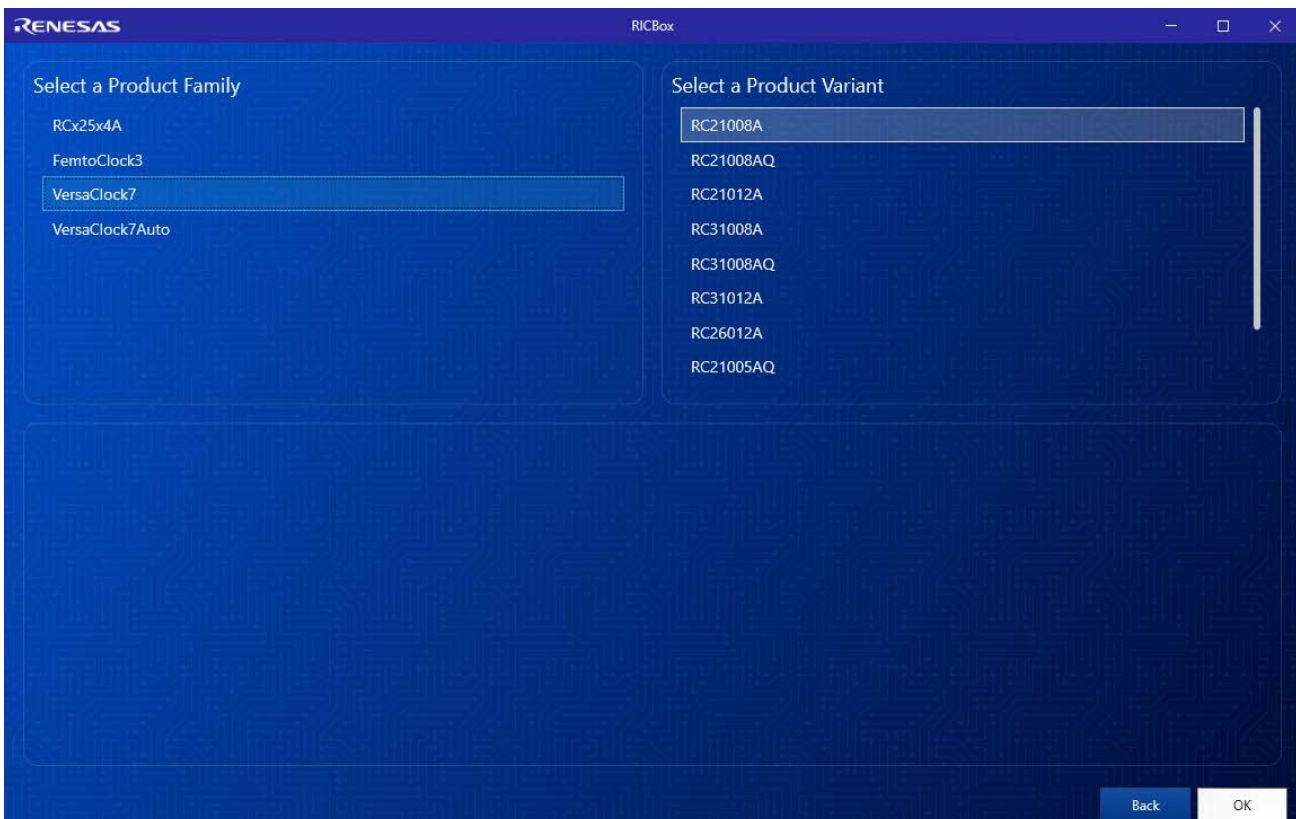## 2.   Creating and Loading Settings Files

RICBox settings files or .rbs files are used to save and distribute custom device configurations. Each settings file contains all of the register settings for a given device. This application note will focus on how to create a single configuration and how to add additional configurations. For more information regarding VC7 RICBox GUI and software, refer to the RICBox GUI Software for VersaClock 7 User Guide.

2.1   Creating a New Configuration

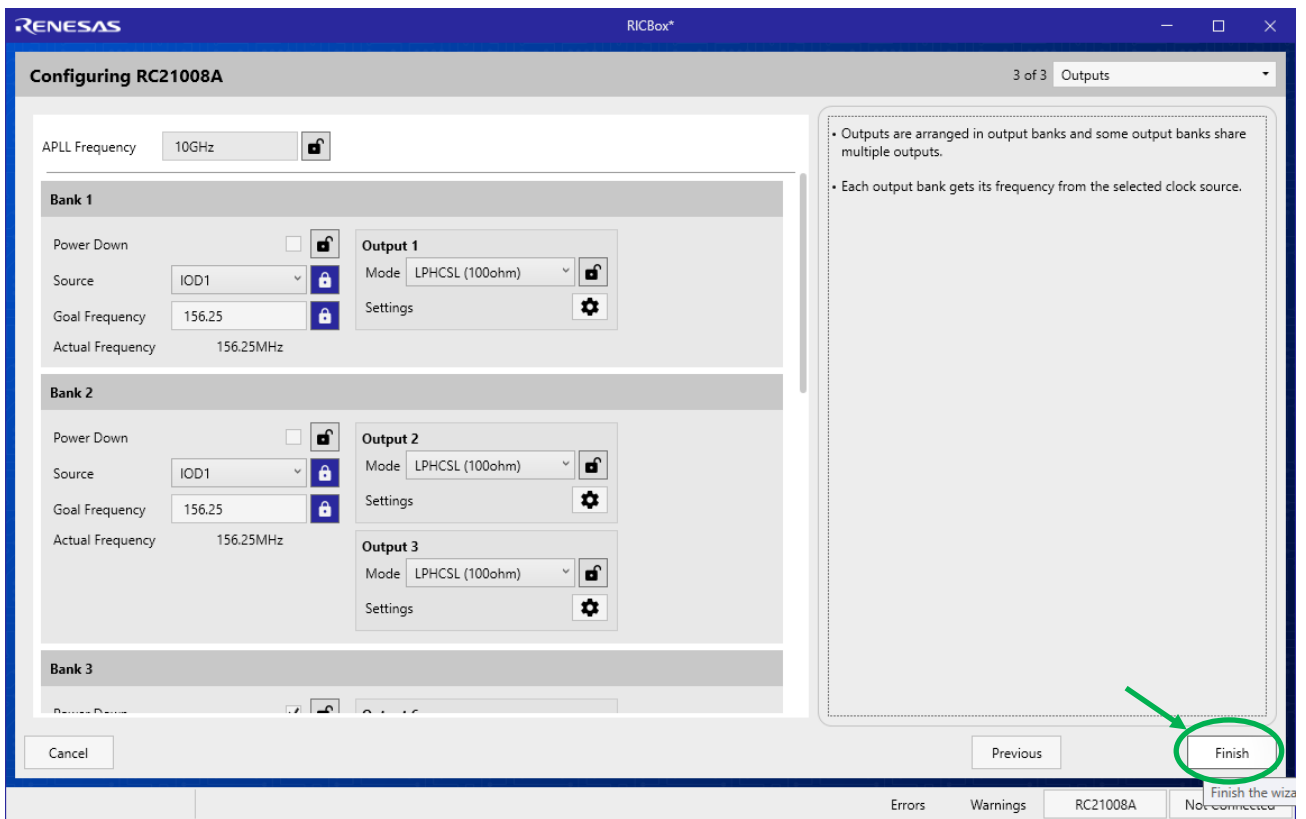To create a new configuration, open RICBox and click on the *Create new project* button.
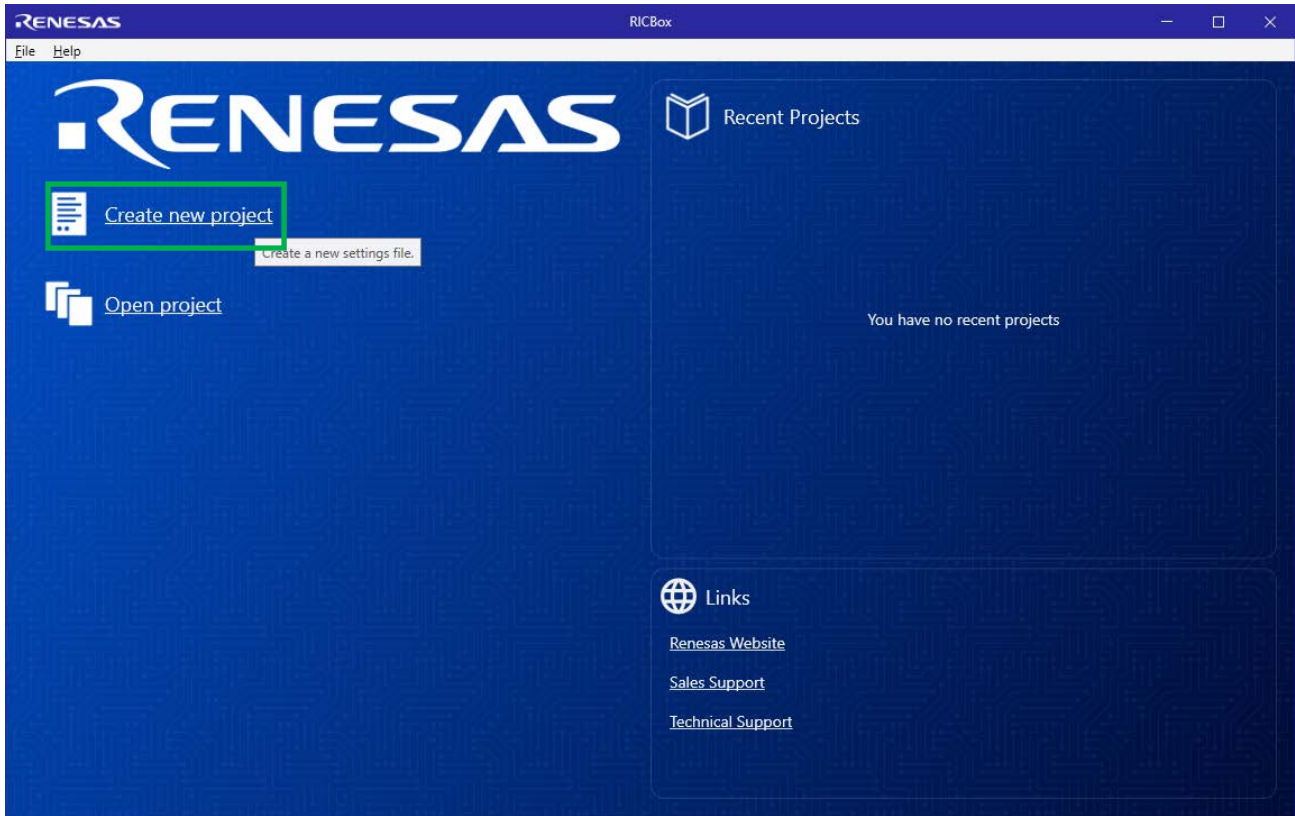
Select the VersaClock 7 product variant to be configured and click the *OK* button.
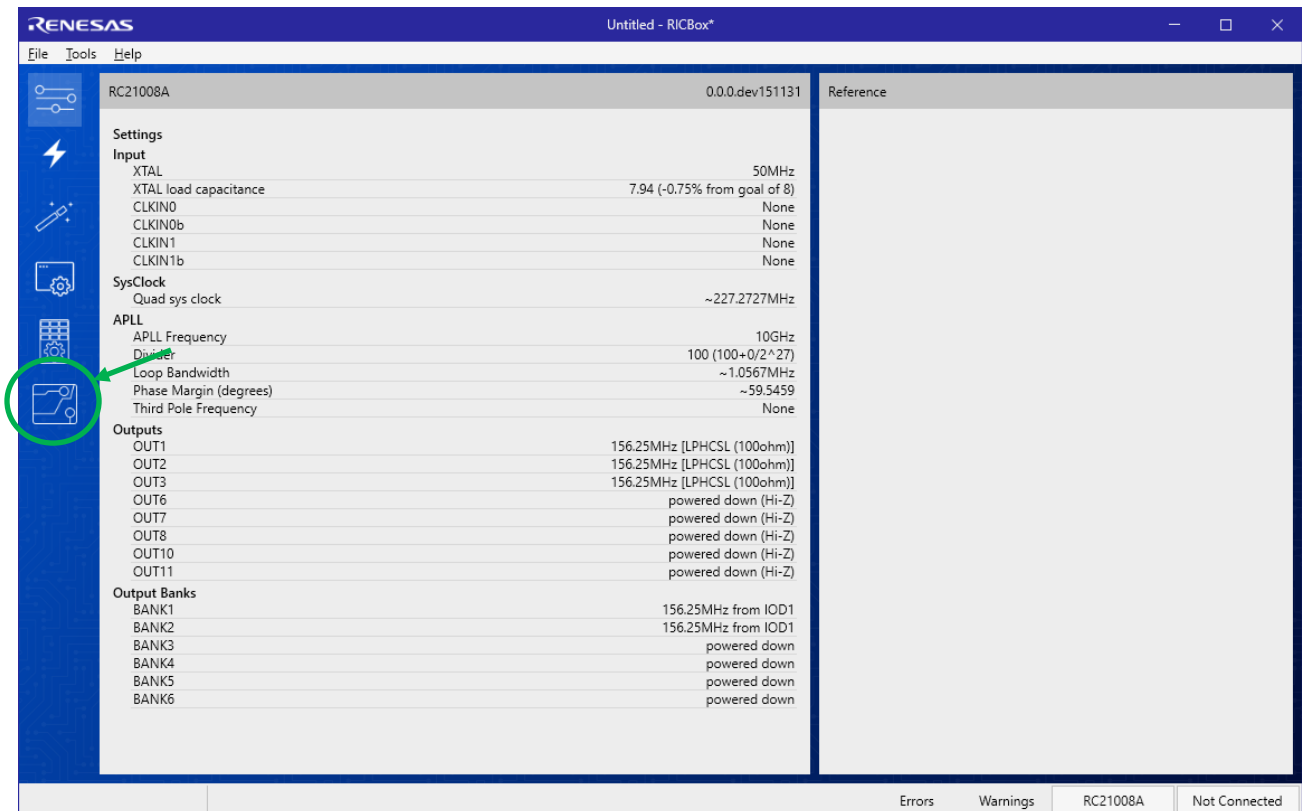
Use the wizard to configure VC7 to match the application. Click on the *Finish* button when done.

3. Enable Single Config

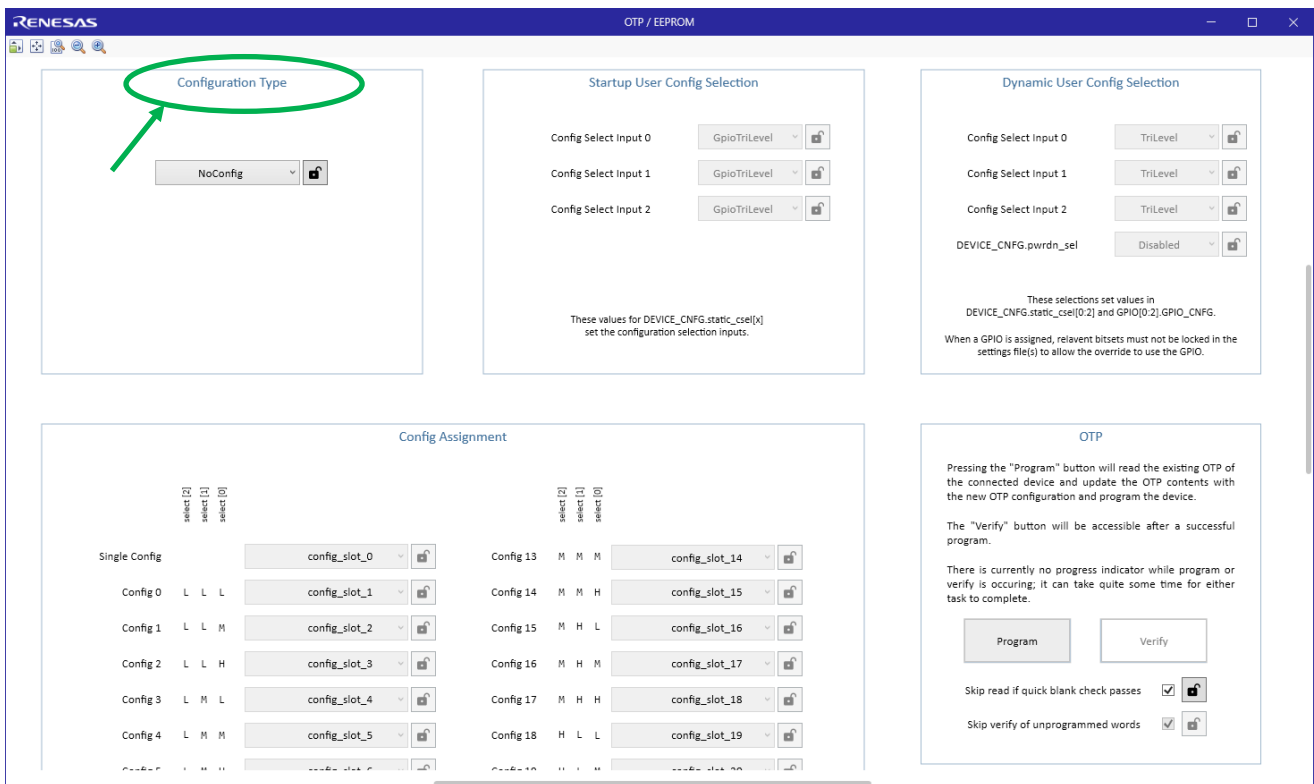Click on the block diagram icon to view the VC7 block diagram.

Click on the *OTP / EEPROM* button.
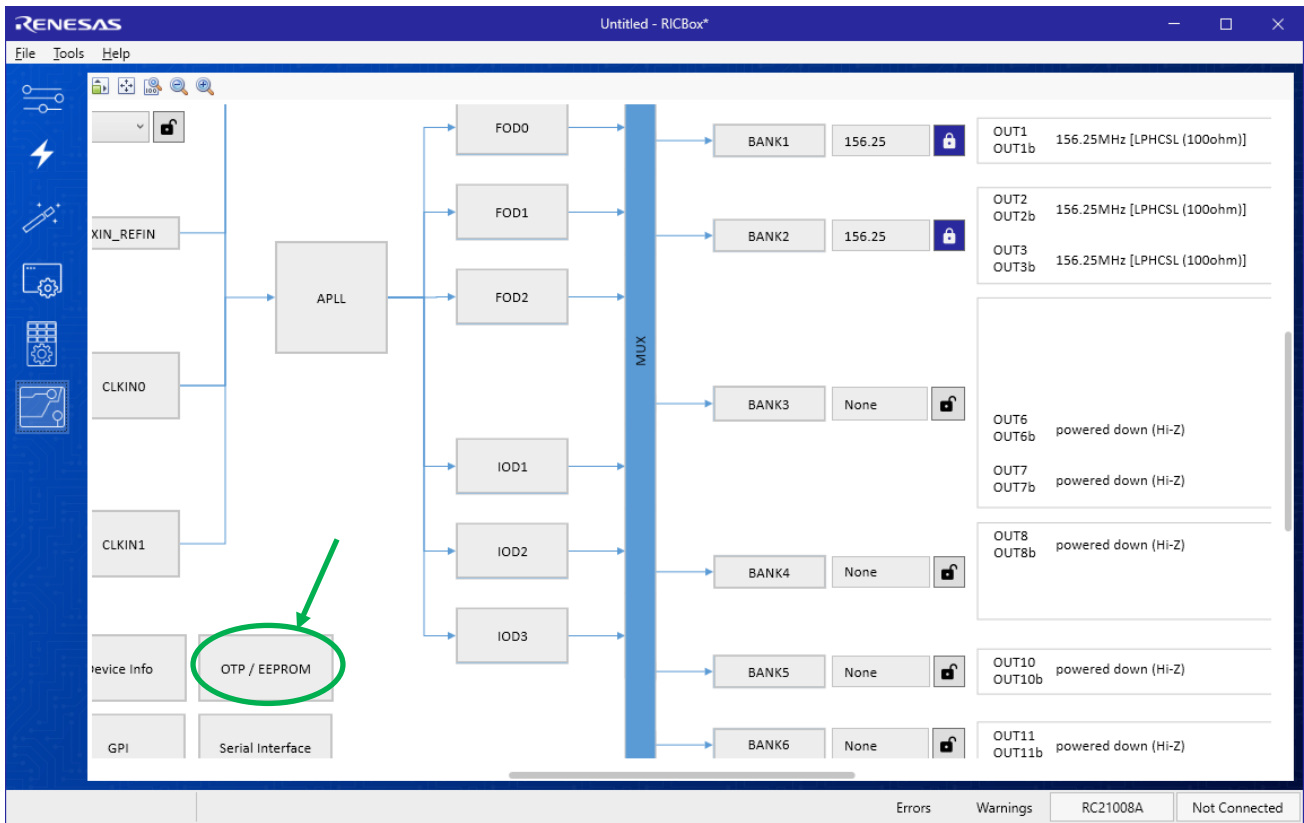
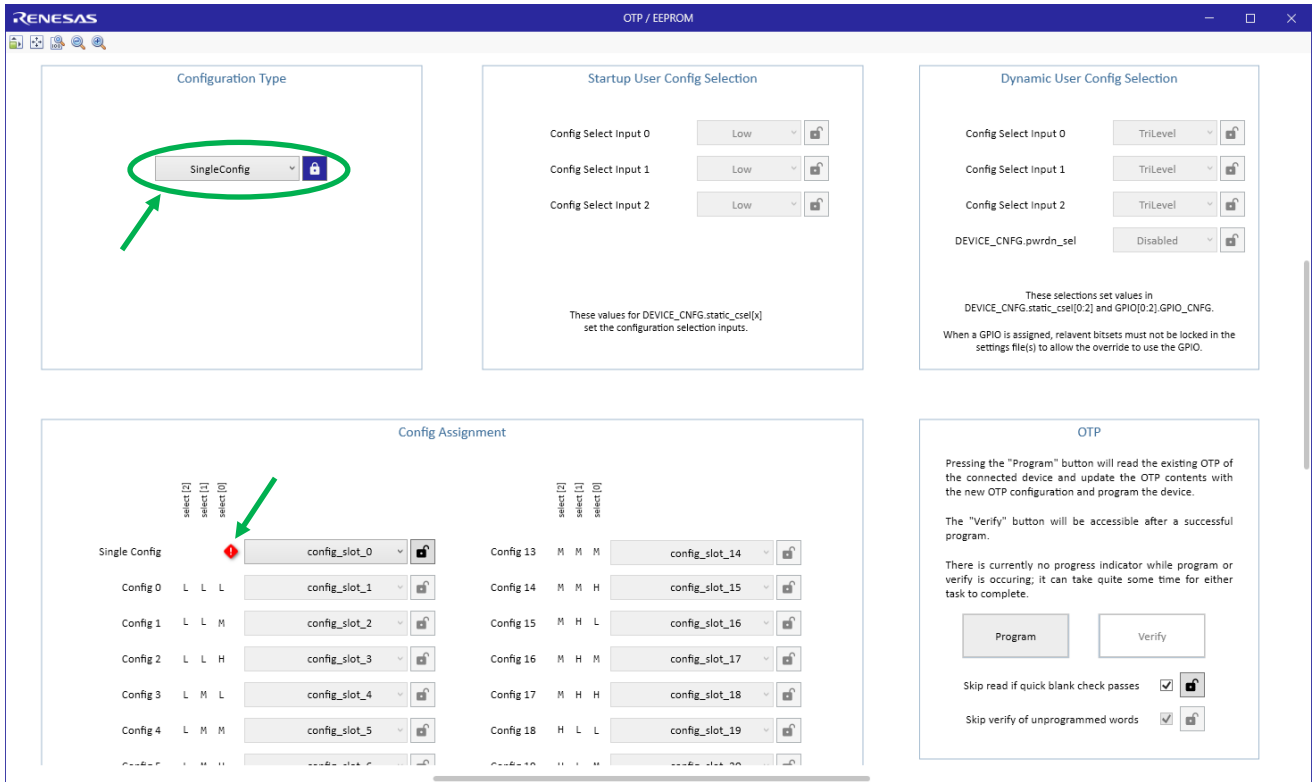
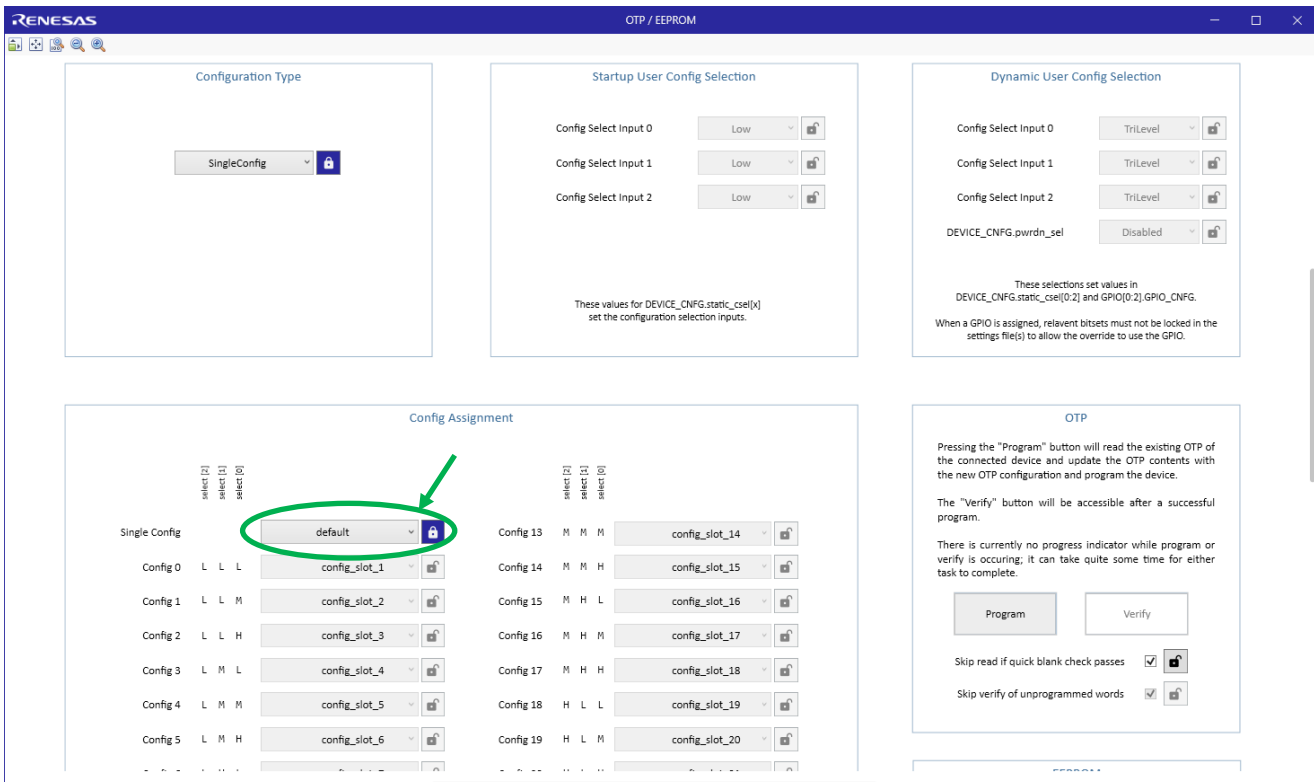In the sub-diagram window for OTP / EERPOM, scroll up until you can see the *Configuration Type* section.

Next, select "SingleConfig" from the pull-down menu. You will see that a red "error" icon is showing.

From the Single Config pull-down menu, select "default".

Scroll down to locate the "Filename to export EPROM as" box. Provide the full filename to export the EEPROM image. If only a filename is provided, then the EEPROM file will be saved in the RICBox install directory.

RBS files for each variant in Single Config mode can be downloaded from the [VersaClock Programmable Clocks](#) page.

4.   Enable Static Multi Config

Before navigating to the OTP / EEPROM, more configs will need to be created. In the lower right of the GUI and to the left of the "Not Connected" button, click the button that is displaying the VC7 product.
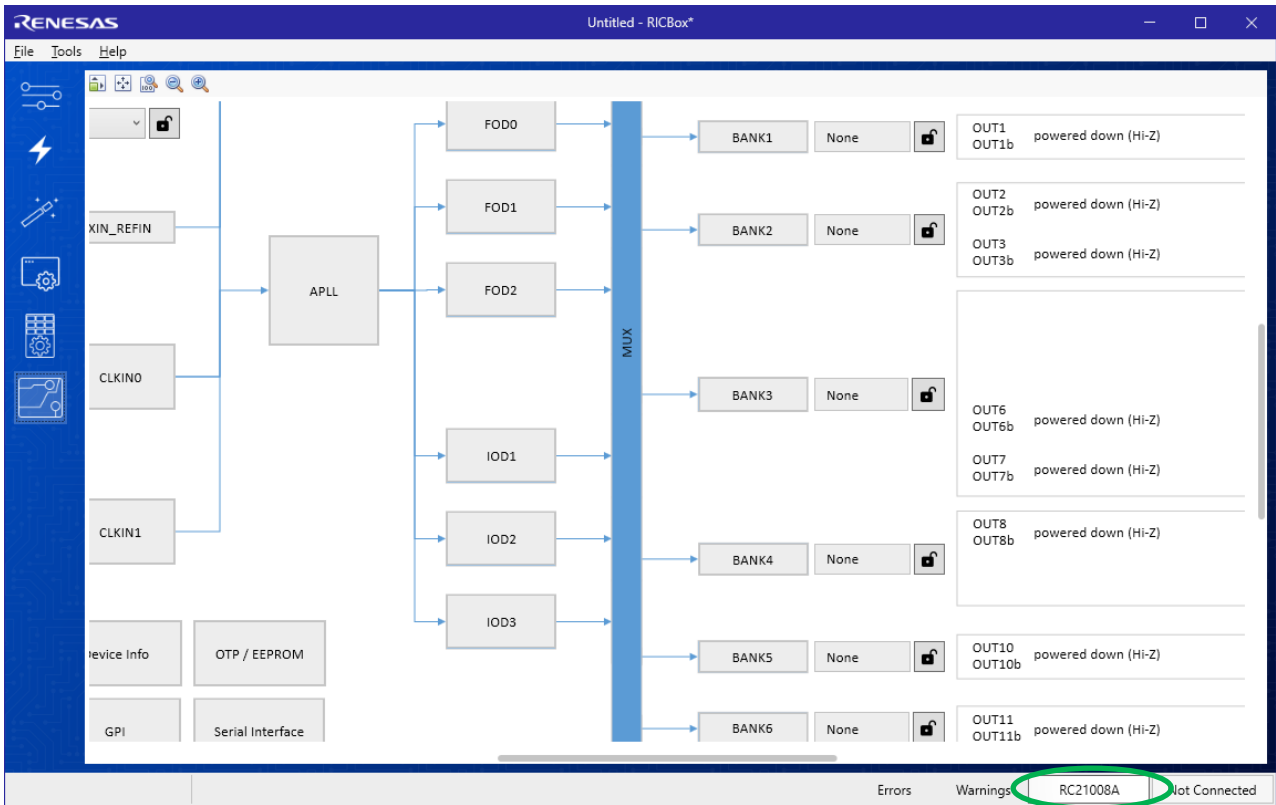
In the lower right corner of the pop-up menu, click on the gear icon to manage configs.
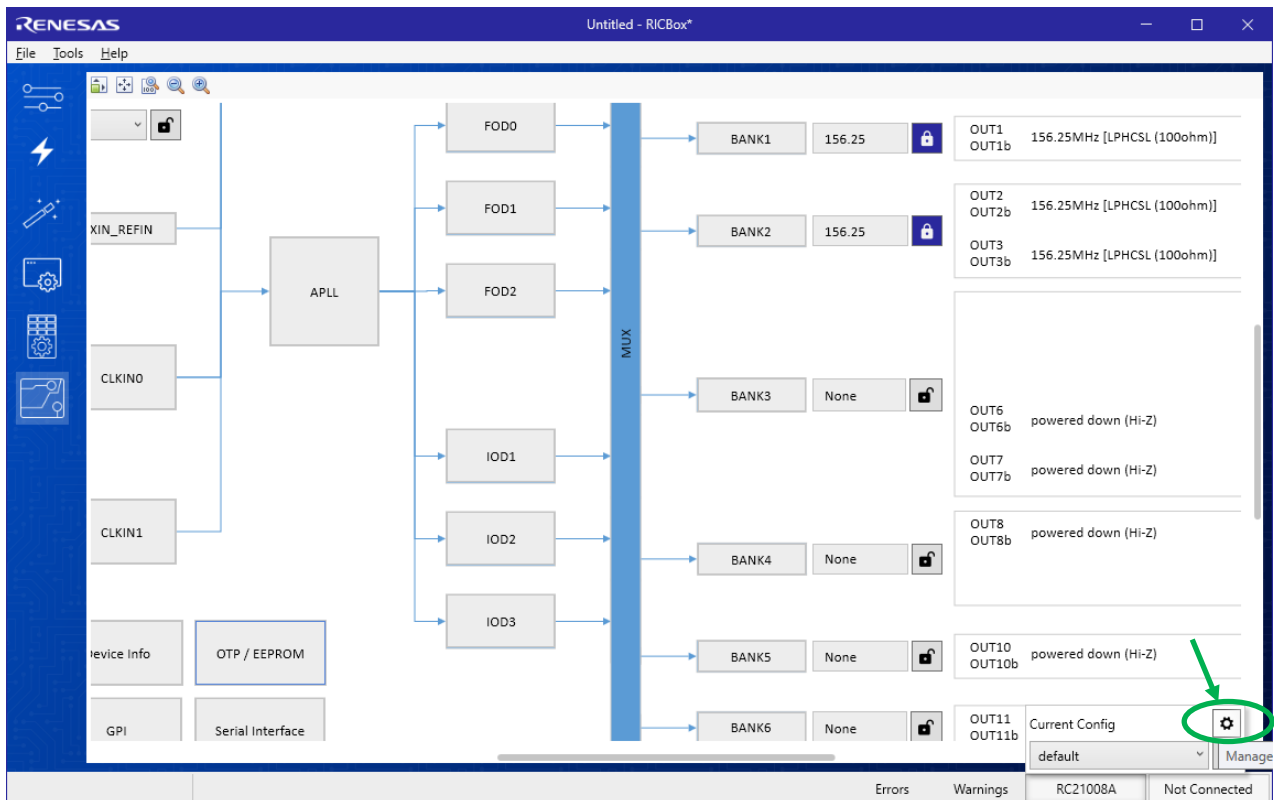
In the Configurations sub-window, configs can be renamed and more configs can be added. For this example, "default" config will be renamed to "config0". Click inside the box, delete "default", and then type in the new name, "config0".
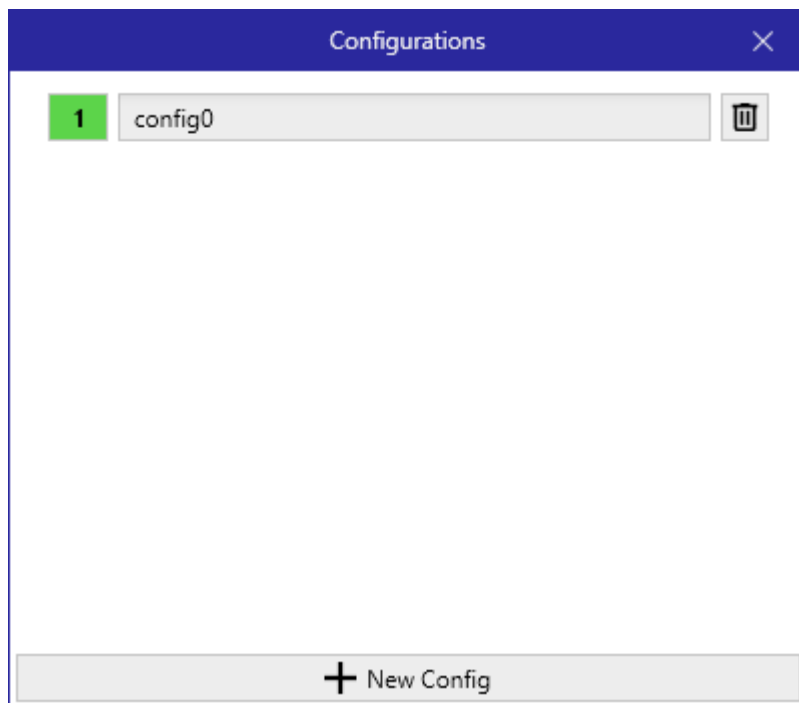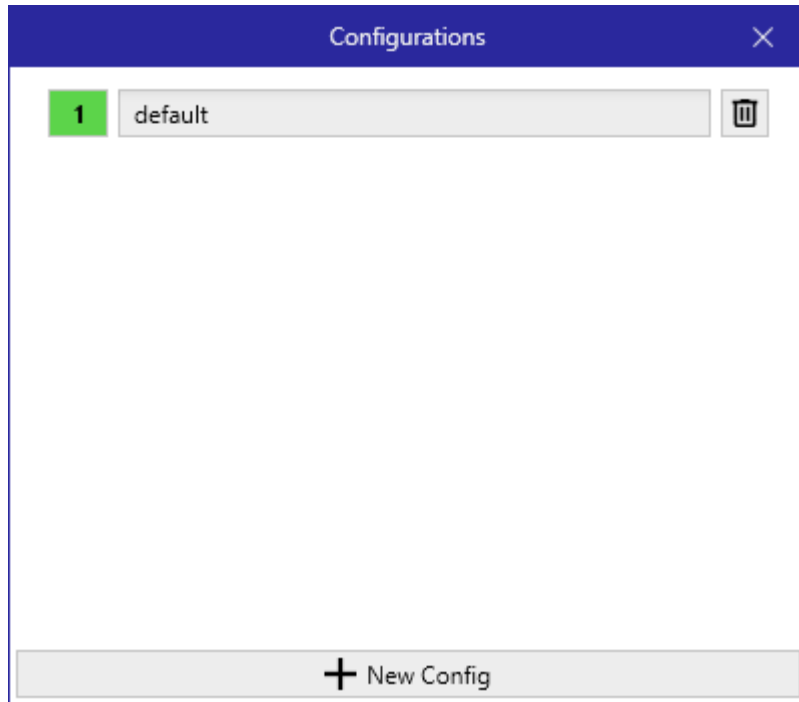
Click the "*New Config*" button to add a new config. For this example, 2 more configs will be added.
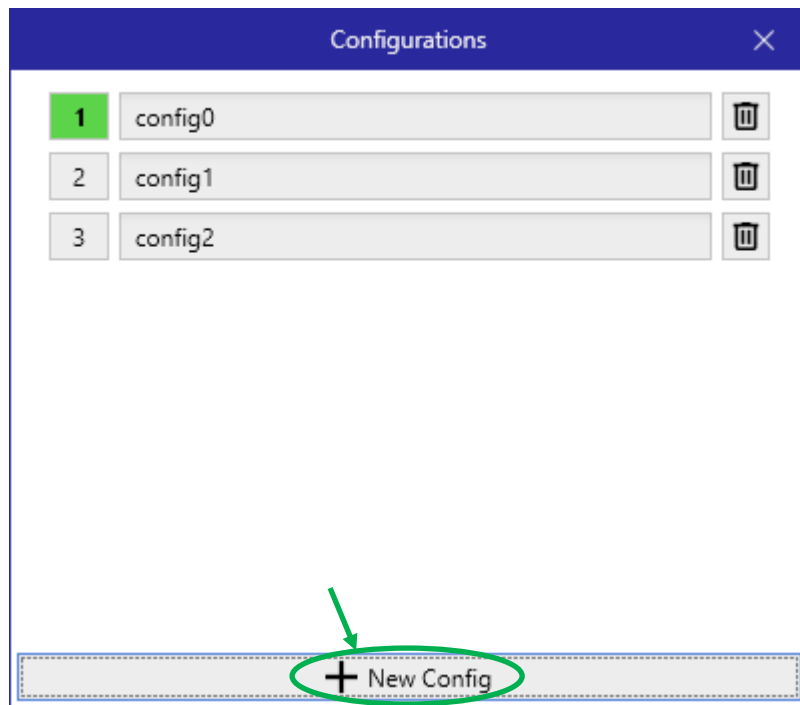
The green box on the config number identifies the config that is active in the block diagram.
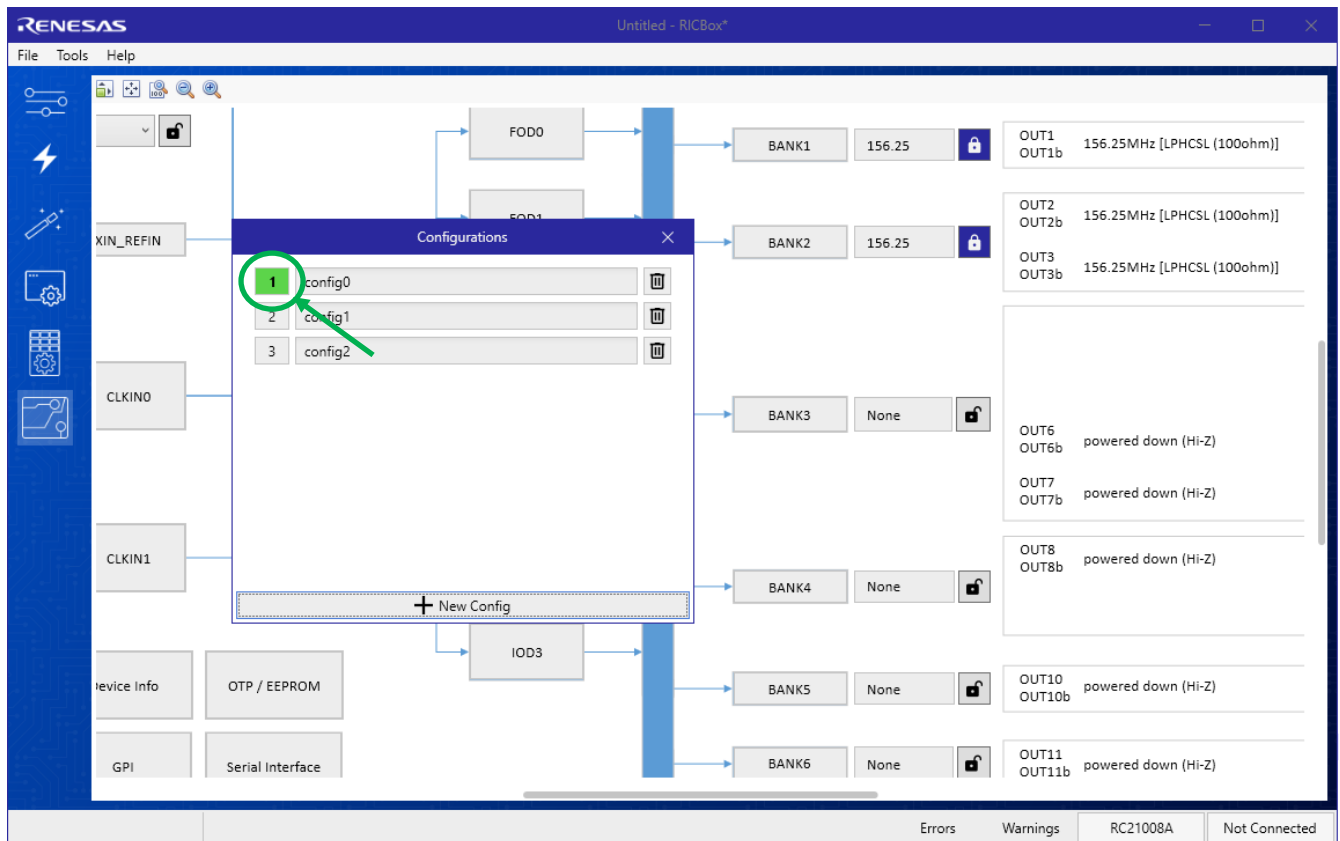
Click on the "2" to make changes and configure "config1" to meet the application needs. Do the same for "config2".
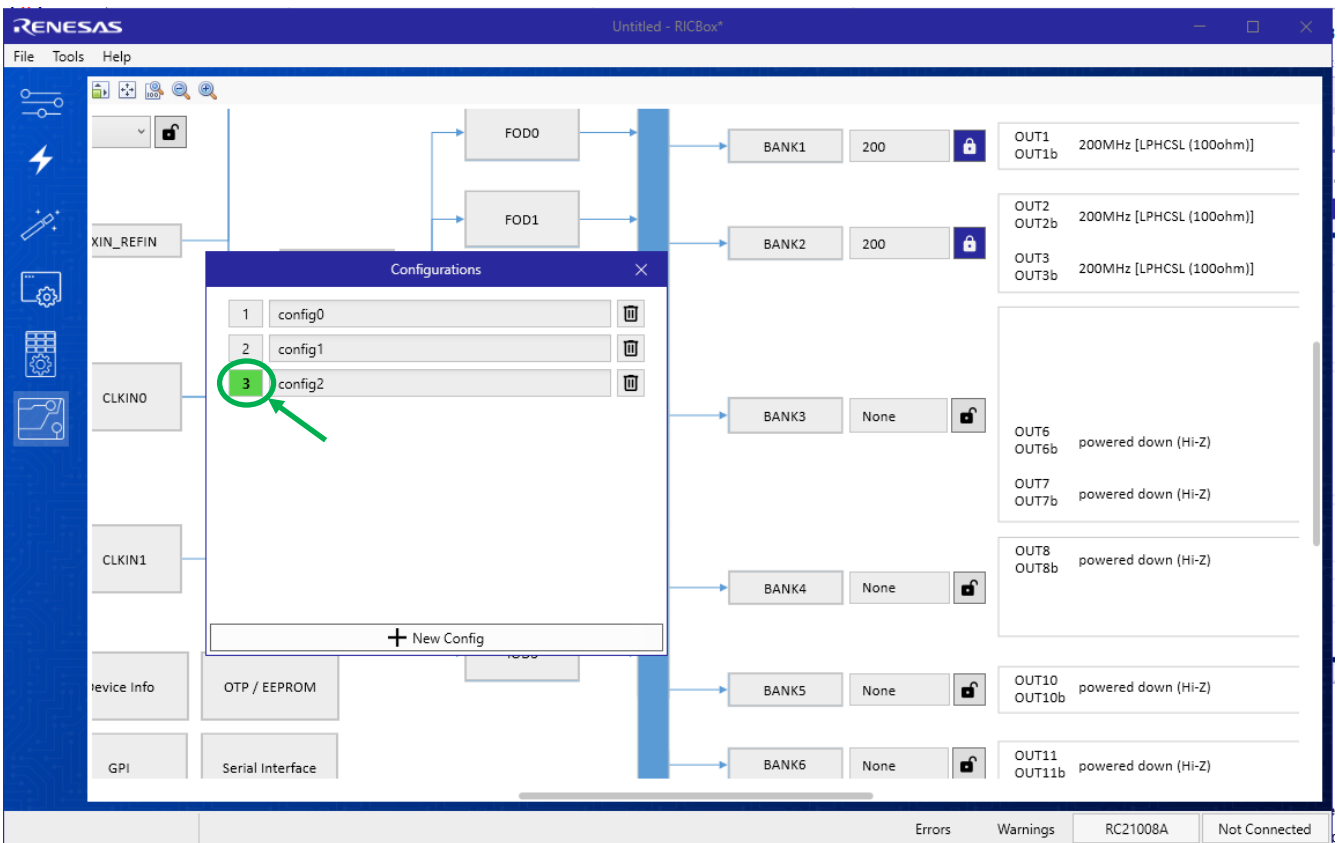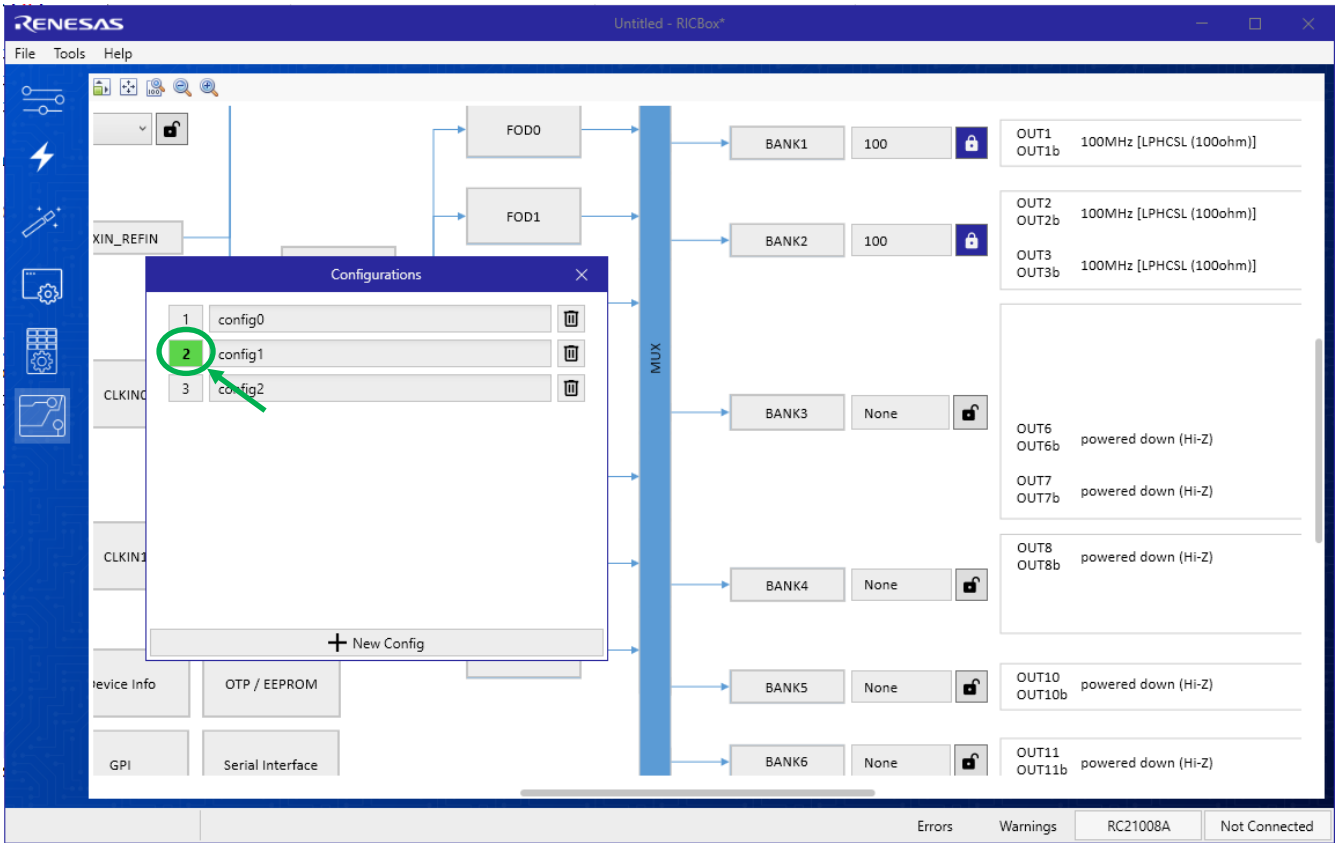
Configs can also be selected from the "Current Config" pull-down menu.
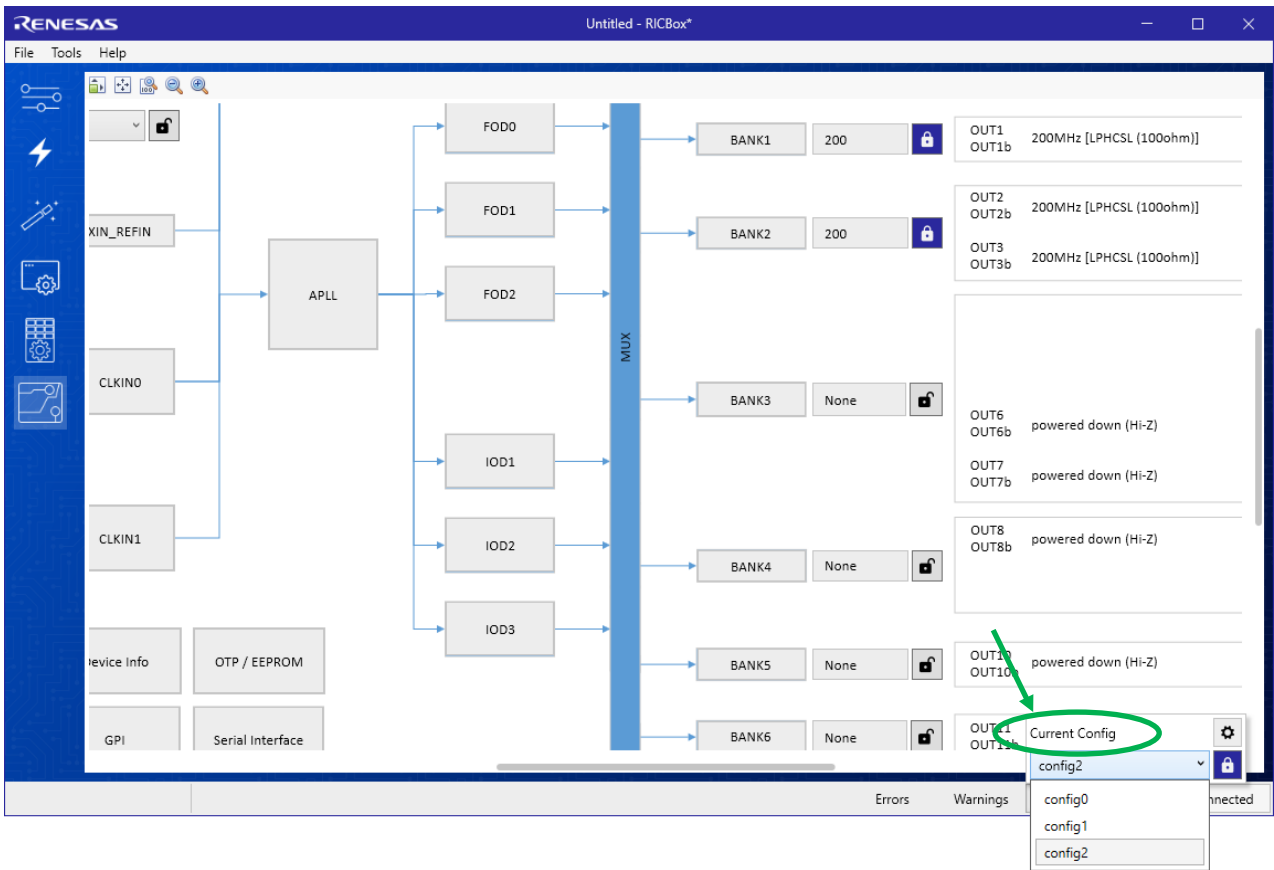
Once all configs have been created, click the *OTP / EEPROM* button. In the OTP/EEPROM window, scroll up until you can see the Configuration Type section. Currently, "Single Config" is selected for the Configuration Type. In the "Config Assignment > Single Config" section, the config name of "default" was previously displayed. Note "config0" is now displayed as the first config name was updated.
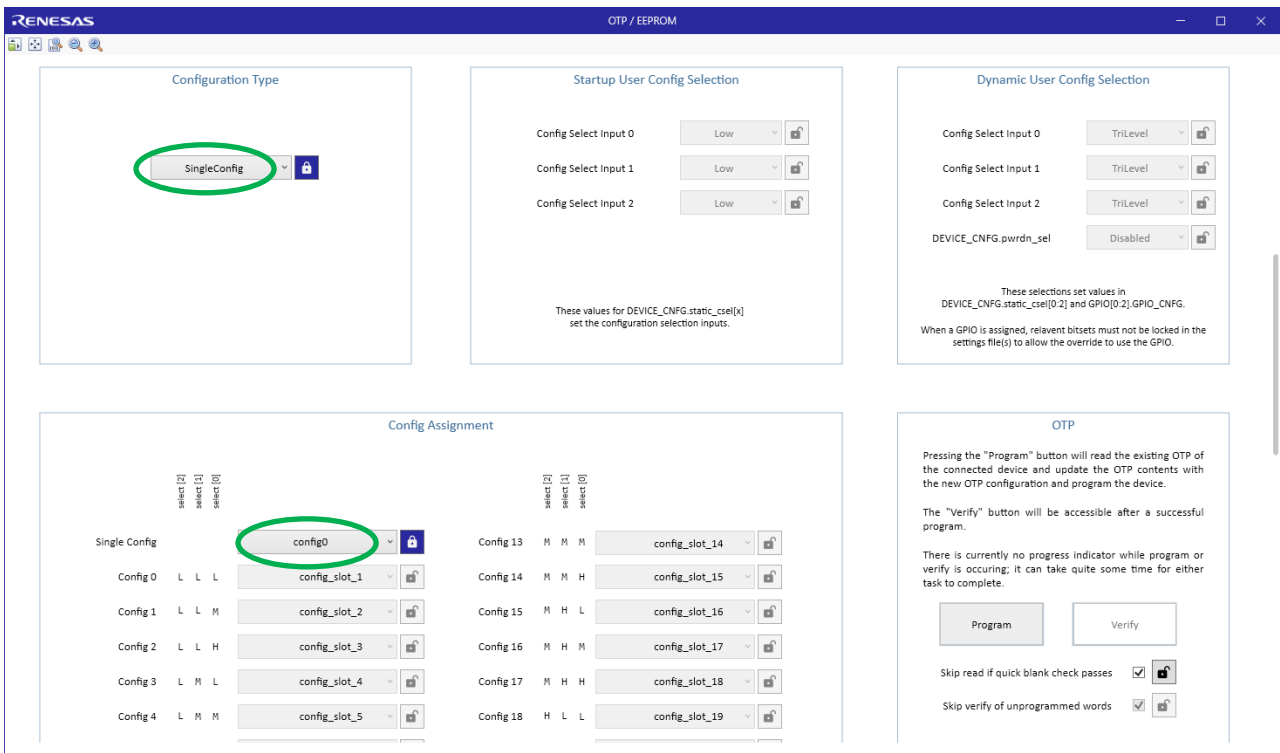
To switch over to "StaticMultiConfig", the Single Config selection must be cleared. This can be accomplished by clicking the blue lock icon. This will unlock the field back to default which is no config.

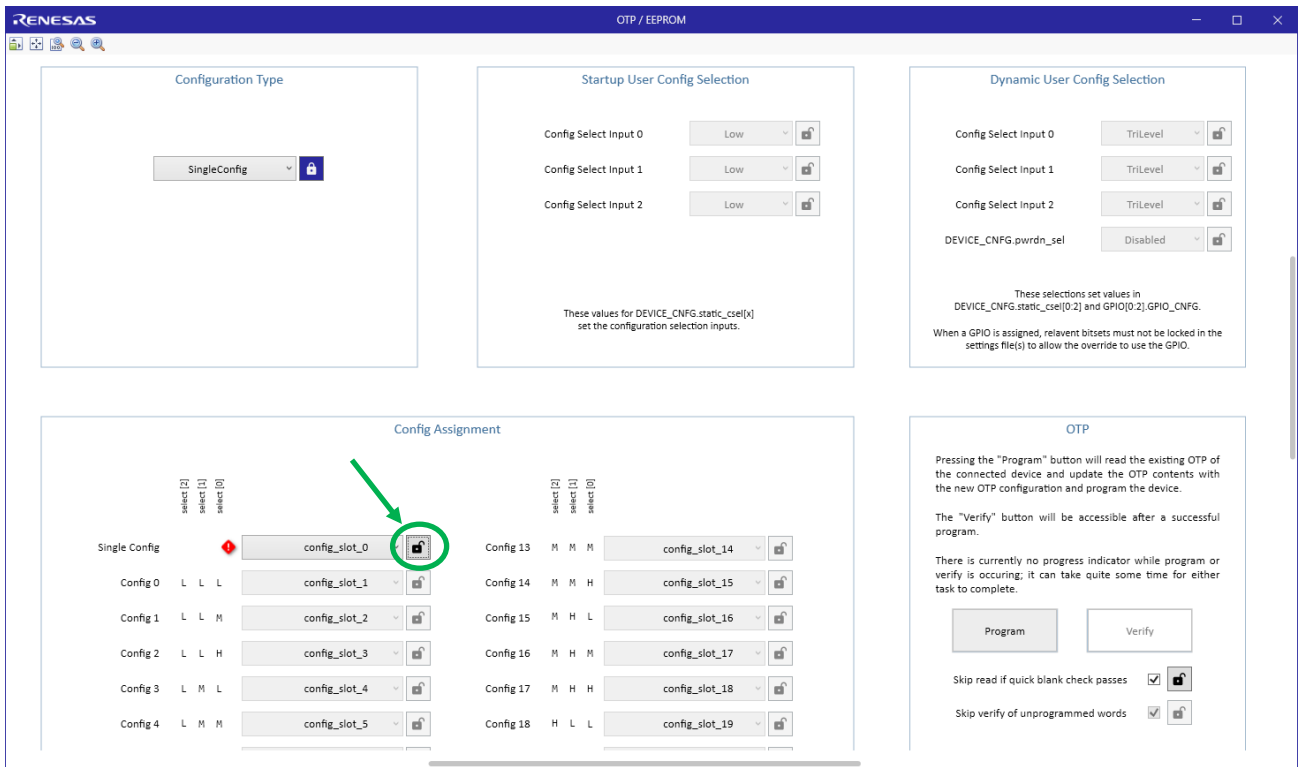In the Configuration Type section, choose "StaticMultiConfig" from the pull-down menu. The "Startup User Config Selection" area is now enabled. By default, all Config Select input are set to "GpioTri Level". Tri Level refers to VDDD for High, VDDD/2 for Mid, and 0 for L. With 3 CSEL bits, there can be a total of 3 x 3 x 3 different configs. As a result, all config slots must be given a config.
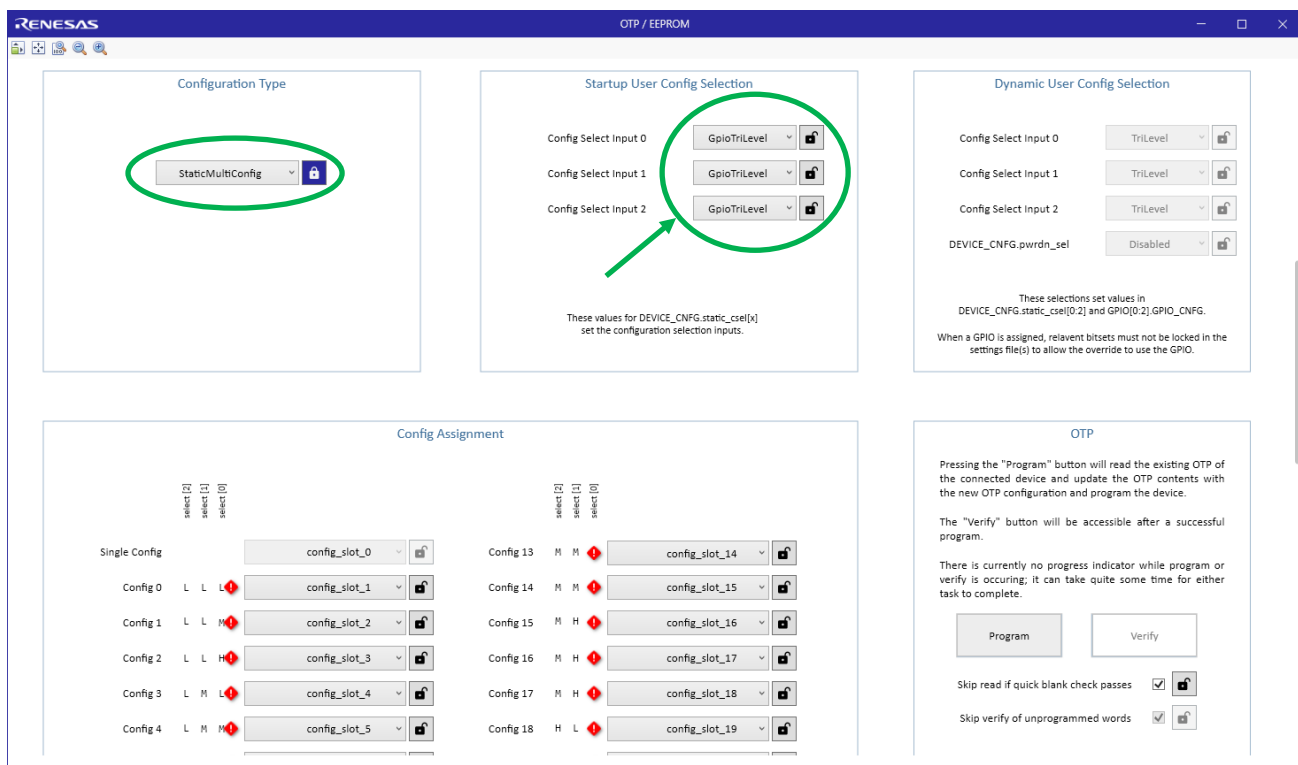
Forcing a CSEL to Low, Mid, or High will ignore the voltage state of the pin at power on. For this example, Config Select Input 1 and 2 will be set to "Low". Now only the first 3 slots need defining as these 3 slots have CSEL2 and CSEL1 set to L. Even though CSEL are set to L, they can still have other functions assigned.

For each enabled pull-down box, select a config.

Configs may go into any slot. Also, any given config should have a more descriptive name. For example, "config0" could become "3 x 156.25MHz".
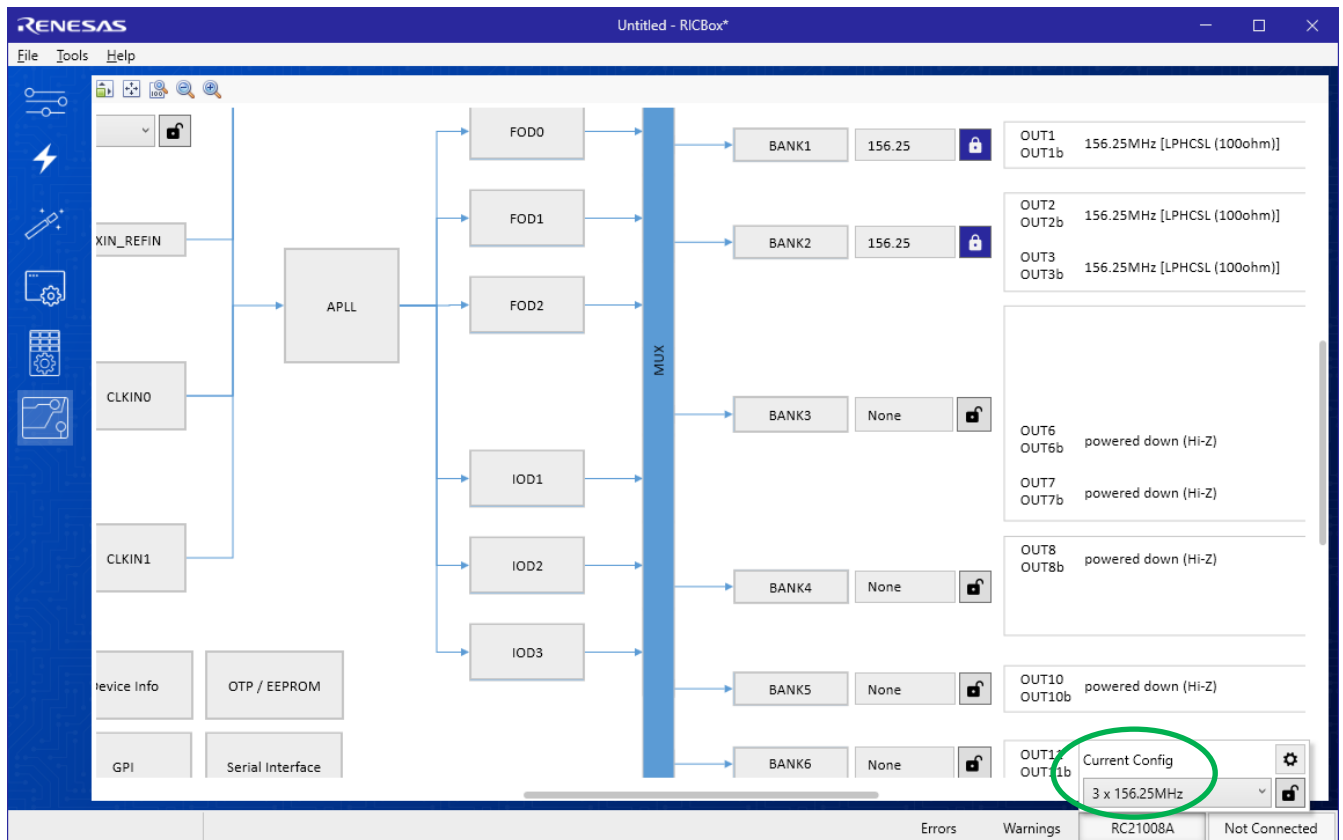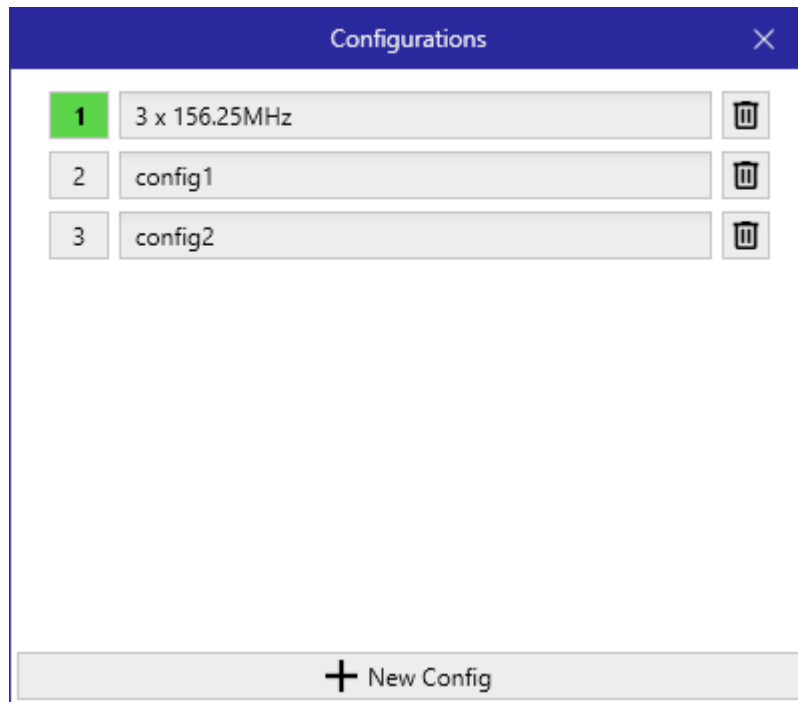
Config name updates are automatic.
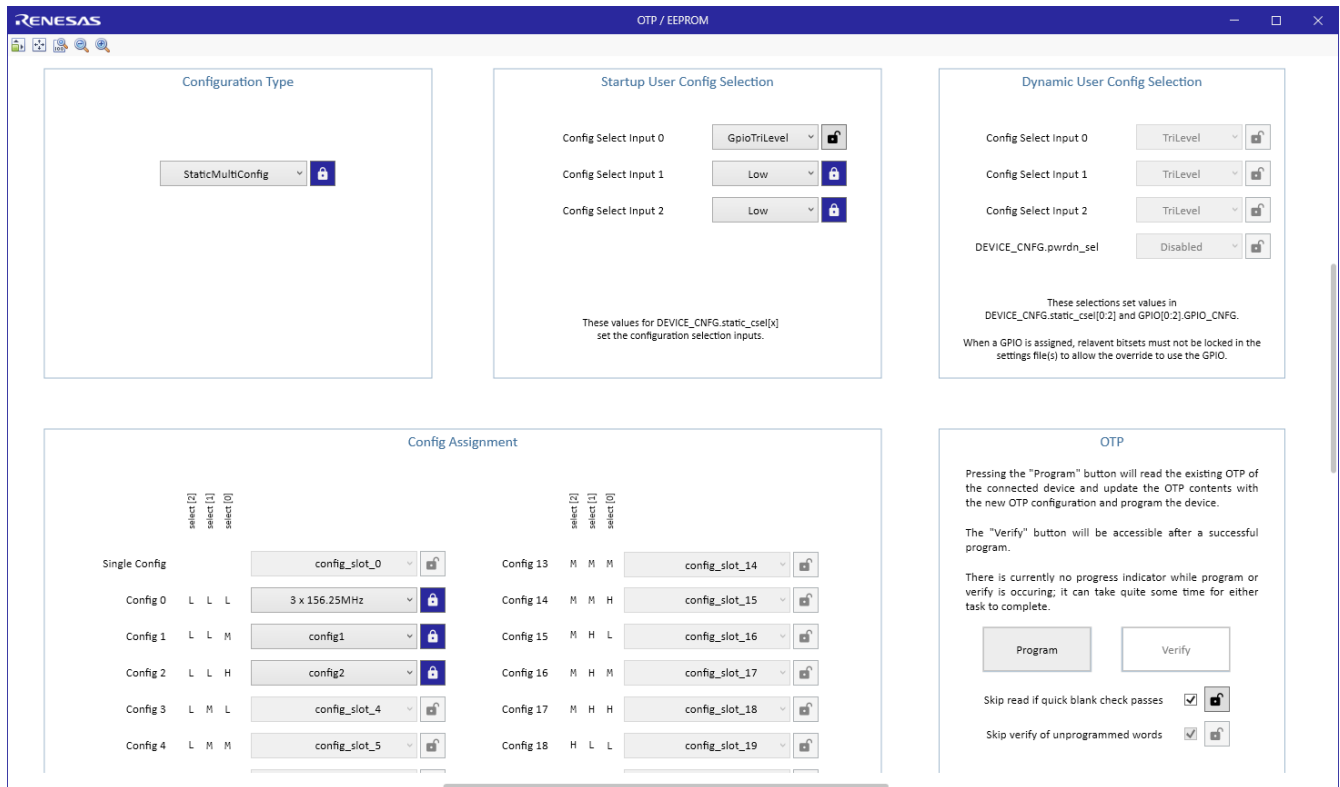
5. Static vs Dynamic Config Selection

For static multi config selection, the voltage state of GPIO0–2 is latched at power up. Then, the corresponding OTP slot is loaded, at which point GPIO0–2 can take on another function. In dynamic multi config selection, GPIO0–2 is dedicated full time to loading the selected OTP config slot. One use of dynamic multi config selection would be to have a config where all outputs are set to LPHCSL at 100MHz. That config can then be copied to another config where SSC is turned on. In dynamic config slot 0, the non-SSC config can be set. In config slot 1, the SSC can be set. With this setup, the GPIO0 can be used to turn on/off SSC. With static multi config selection, the same function can be achieved if another GPIO is set up as a PWRGD/Restart#. By toggling the PWRGD/Restart# function, the state of GPIO0–2 will be relatched. The downside is the extra step required to toggle the PWRGD/Restart#.

Only in dynamic multi config selection is low power mode supported. One of the GPIO0–2 can be set up as the PWRGD/PWRDN# function. When the selected GPIO is held low, the low power config is loaded. When released, the normal power config is loaded. More detail can be found in the Dynamic Multi Config selection applications note.

6. Revision History

Revision	Date	Description
1.00	Mar 8, 2023	Initial release.