

VersaClock 7 EEPROM Conversion: Enabling the VC7 Evaluation Board for EEPROM Loading

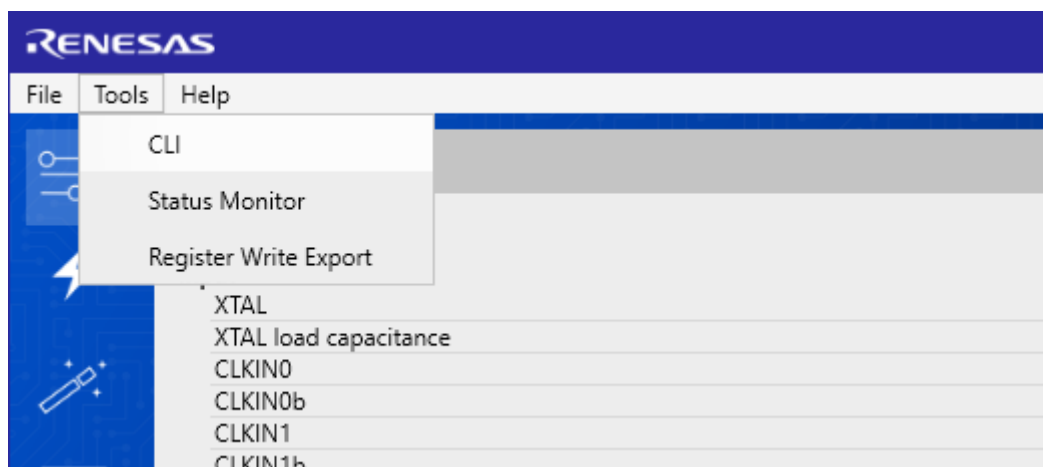
This document explains how to enable EEPROM loading on a VersaClock 7 (VC7) [RC31012](#), [RC31008](#), [RC21012](#), or [RC21008](#) evaluation board (EVB) using Renesas IC Toolbox (RICBox).

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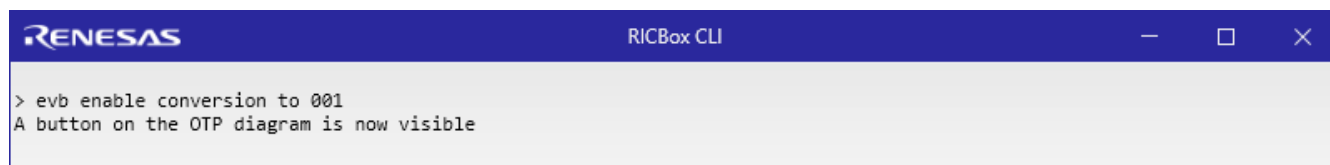
1. Using RICBox Command Line Interface (CLI)

With RICBox started, click Create new project and select the product variant that matches your evaluation board. During the setup wizard, click Finish. Start the CLI by navigating to the Tools menu in the upper left of part of RICBox and then click CLI.



In the CLI, type the following command,

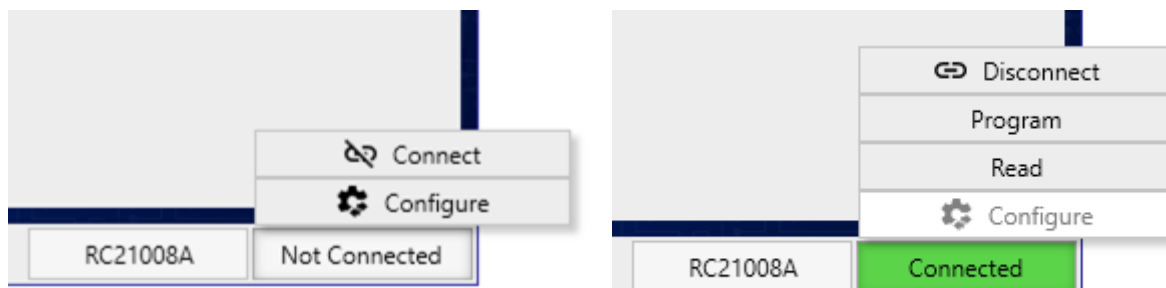
```
evb enable conversion to 001
```



Close the CLI window.

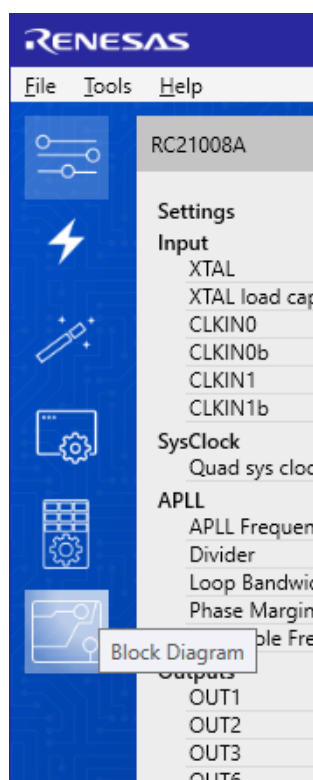
2. Connecting to the Evaluation Board

In the lower right of RICBox GUI, click on the “Not Connected” button. When the button expands, click “Connect” to connect to the VC7 on the evaluation board. The “Not Connected” button will turn into a green “Connected” button.



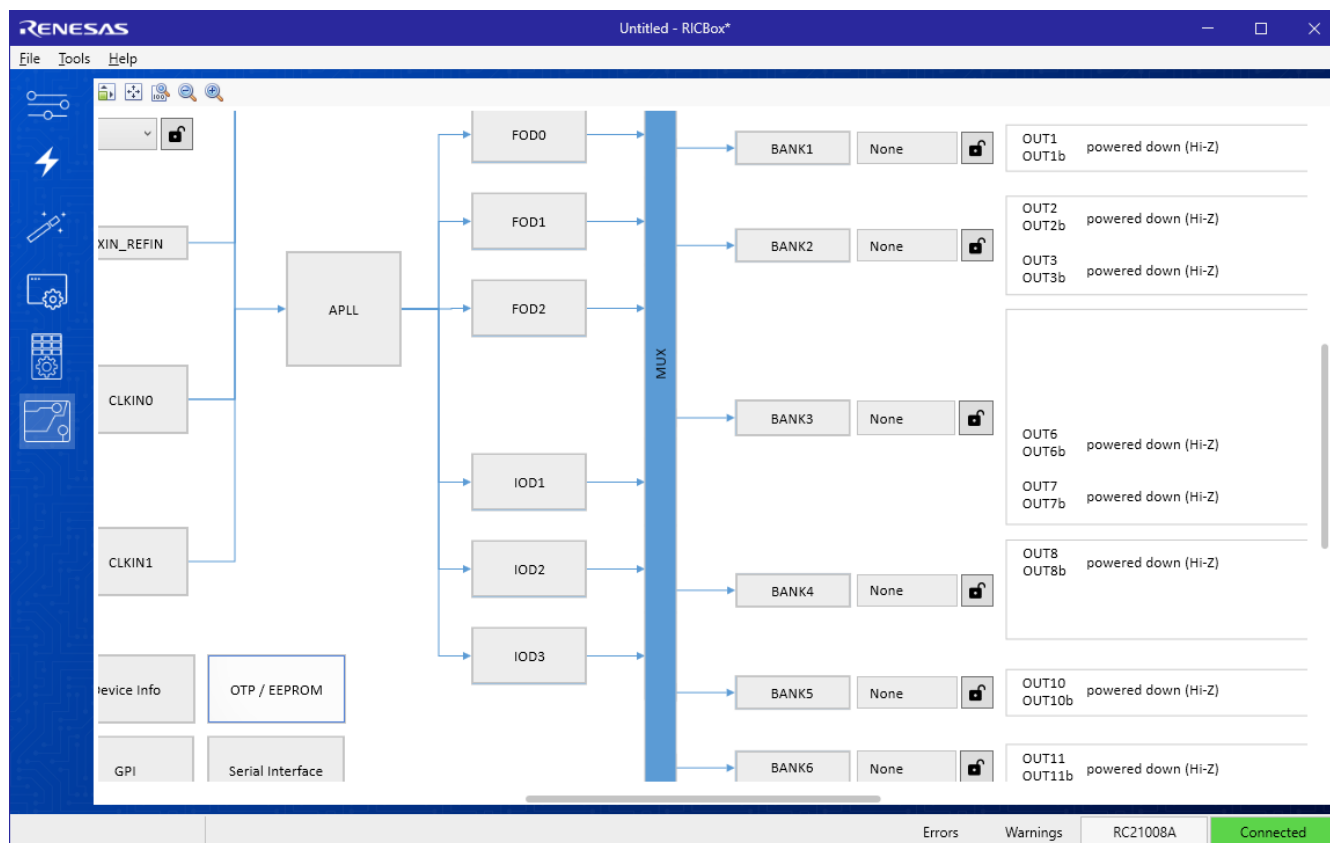
3. Accessing the OTP/EEPROM

On the left side of the RICBox GUI, click the Block Diagram button to view the main block diagram of the VC7.

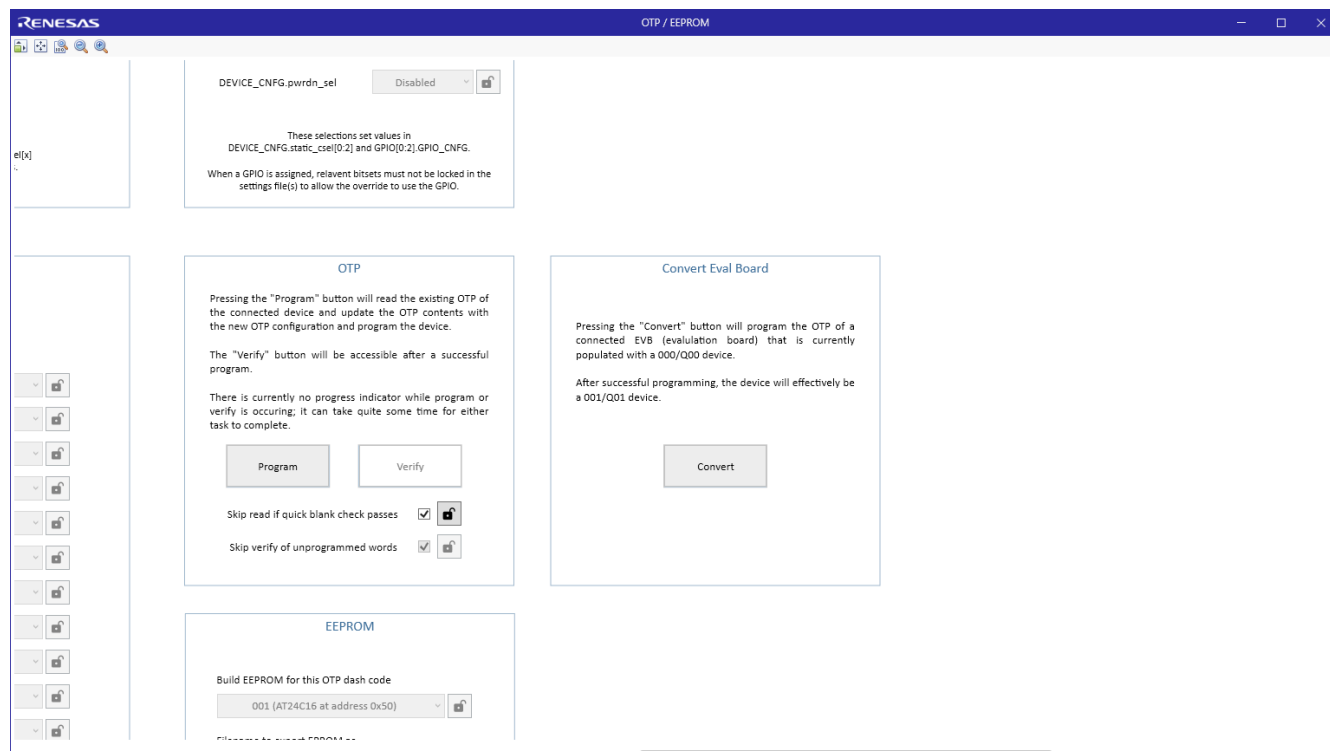


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In the block diagram, click on the “OTP/EEPROM” button to bring up the OTP/EEPROM sub-diagram.



In the sub-diagram, scroll to the right to find the hidden “Convert” button.



Click on the Convert button to enable the VC7 to load from EEPROM.

4. Generating an EEPROM File

Use RICBox to create your config and save the Project. When ready, click on the “OTP/EEPROM” button to open the sub-diagram. Use the scroll bars to adjust the GUI so the “Configuration Type” section is visible. For the following example, a single config is created. In the “Configuration Type” section, choose “SingleConfig”.

Configuration Type

SingleConfig

Startup User Config Selection

Config Select Input 0: Low

Config Select Input 1: Low

Config Select Input 2: Low

These values for DEVICE_CFG.static_csel[x] set the configuration selection inputs.

Dynamic User Config Selection

Config Select Input 0: TriLevel

Config Select Input 1: TriLevel

Config Select Input 2: TriLevel

DEVICE_CFG.pwrdrn_sel: Disabled

These selections set values in DEVICE_CFG.static_csel[0:2] and GPIO[0:2].GPIO_CFG. When a GPIO is assigned, relevant bits must not be locked in the settings file(s) to allow the override to use the GPIO.

Config Assignment

SELECT [2]	SELECT [1]	SELECT [0]	Config
			Single Config
L	L	L	Config 0
L	L	M	Config 1
L	L	H	Config 2
L	M	L	Config 3
L	M	M	Config 4
M	M	M	Config 13
M	M	H	Config 14
M	H	L	Config 15
M	H	M	Config 16
M	H	H	Config 17
H	L	L	Config 18

OTP

Pressing the "Program" button will read the existing OTP of the connected device and update the OTP contents with the new OTP configuration and program the device.

The "Verify" button will be accessible after a successful program.

There is currently no progress indicator while program or verify is occurring; it can take quite some time for either task to complete.

Program

Verify

Skip read if quick blank check passes: ☒

Skip verify of unprogrammed words: ☒

Notice the red error marker for “Single Config”. Click on the pull-down box and select the “default” config.

Configuration Type

SingleConfig

Startup User Config Selection

Config Select Input 0: Low

Config Select Input 1: Low

Config Select Input 2: Low

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Dynamic User Config Selection

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M	M	M	Config 13
M	M	H	Config 14
M	H	L	Config 15
M	H	M	Config 16
M	H	H	Config 17
H	L	L	Config 18

OTP

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Program

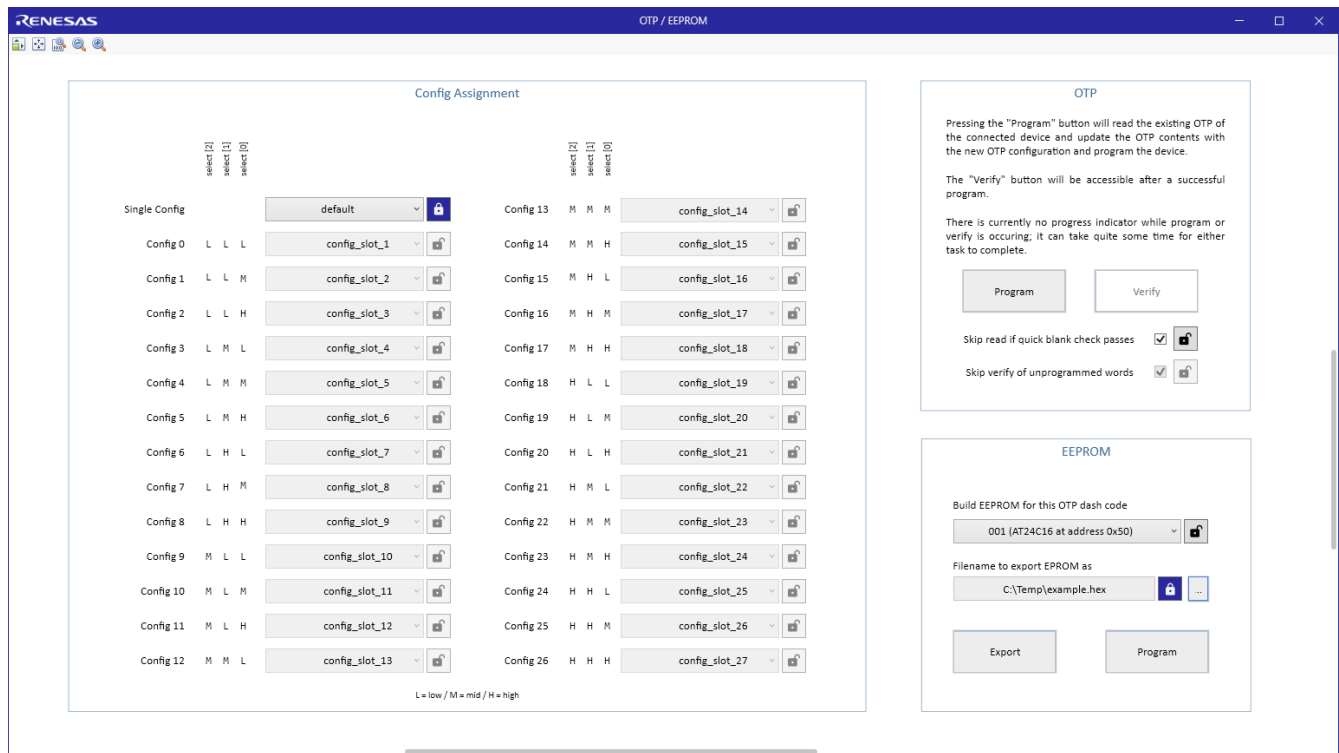
Verify

Skip read if quick blank check passes: ☒

Skip verify of unprogrammed words: ☒

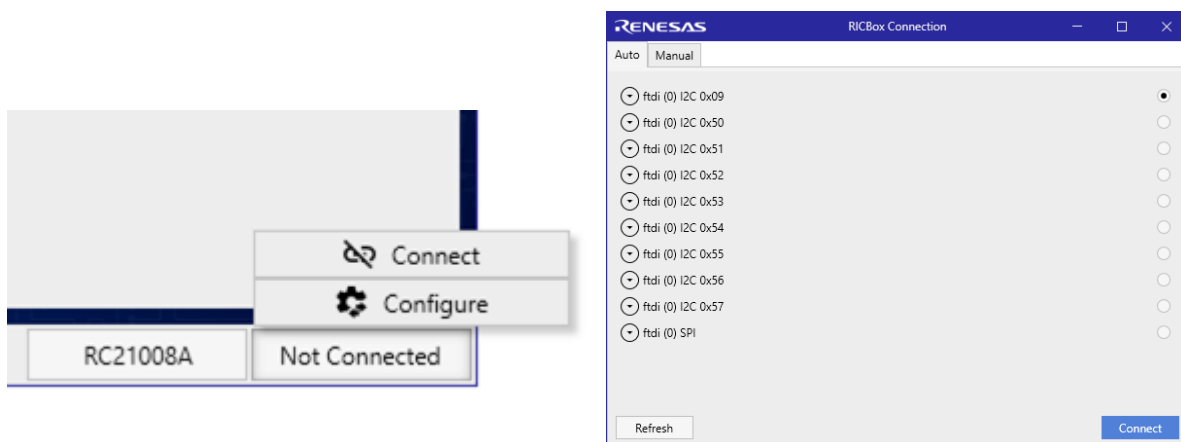
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Re-adjust the GUI again to see the EEPROM section. Click on “...” to determine a save location for the EEPROM hex file or type out the full path.



Move the OTP/EEPROM window aside and save the project again.

When ready, use RICBox to scan the devices on the I²C bus. On the main RICBox GUI, check to see if you are connected to the VC7. If connected, go ahead and disconnect. Push the “Not Connected” button and then “Configure”. Push “Refresh” to re-scan the I²C bus.



If the EEPROM is detected, then you are ready to program. Refer to the EEPROM user's manual about which jumpers to set to add the EEPROM to the I²C bus.

Click on the Connect button. Go back to the OTP/EEPROM GUI. Click on the Program button to program the EEPROM device. After programming, remove the jumpers to take the FTDI controller off the I²C bus.

Unplug/Plug the USB-C cable to power cycle. The config programmed into the EEPROM should now load. With this conversion, only the AT24C16 EEPROM chip is supported.

5. Revision History

Revision	Date	Description
1.00	Sep 21, 2023	Initial release.

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