

Programming an EEPROM from a Command Terminal with RICBox

This document discusses how to use the [RICBox](#) virtual Python environment for EEPROM programming using FemtoClock 3 (FC3), FemtoClock 3-Wireless (FC3W), and VersaClock 8 (VC8) devices.

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1. Overview

RICBox harnesses a Python virtual environment for each individual device plugin. The environments are stored locally in the “\AppData\Roaming\RICBox\venvs\” directory after a plugin has been used in RICBox for the first time.

The virtual Python environments can be activated and used from a command terminal application. When the environment is active, users can run Python scripts to interact with device drivers and run preinstalled Python-based applications.

RICBox is installed with a tool called “rbeeprom” that can interface with a connected EEPROM device using FTDI, AARDVARK, or Devasys drivers.

2. Activating a Device Virtual Environment

1. Open a command terminal in Windows®.

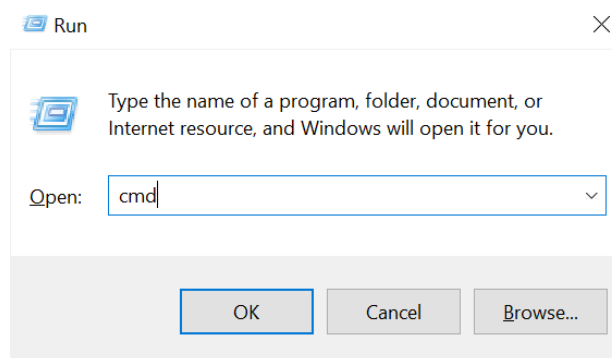


Figure 1. Opening Windows CMD

2. Navigate to the directory containing the installed plugin Python environment:

"C:\Users\<username>\AppData\Roaming\RICBox"

```
C:\Users\username>cd C:\Users\username\AppData\Roaming\RICBox

C:\Users\username\AppData\Roaming\RICBox>dir
Volume in drive C is Windows
Volume Serial Number is 325D-B97F

Directory of C:\Users\username\AppData\Roaming\RICBox

07/13/2023  05:06 PM    <DIR>          .
07/13/2023  05:06 PM    <DIR>          ..
07/13/2023  09:42 AM    <DIR>          logs
06/20/2023  12:14 PM             28,672 packages.db
04/25/2023  06:58 PM    <DIR>          plugins
07/13/2023  05:04 PM             601 settings.json
04/13/2023  09:59 AM    <DIR>          tmp
06/20/2023  12:06 PM    <DIR>          venvs
                2 File(s)              29,273 bytes
                6 Dir(s)  58,134,704,128 bytes free

C:\Users\username\AppData\Roaming\RICBox>
```

Figure 2. Navigating to RICBox Stored Python Files

3. Open the "venvs" directory and navigate to the device that you are programming.

```
C:\Users\username\AppData\Roaming\RICBox\venvs>dir
Volume in drive C is Windows
Volume Serial Number is 325D-B97F

Directory of C:\Users\username\AppData\Roaming\RICBox\venvs

06/20/2023  12:06 PM    <DIR>          .
06/20/2023  12:06 PM    <DIR>          ..
04/17/2023  02:56 PM    <DIR>          FemtoClock2-x64
06/20/2023  12:06 PM    <DIR>          FemtoClock3-x64
04/18/2023  01:45 PM    <DIR>          ProXo2-x64
04/25/2023  06:58 PM    <DIR>          VersaClock7-x64
                0 File(s)              0 bytes
                6 Dir(s)  58,128,277,504 bytes free
```

Figure 3. Open the venvs folder

4. Open the scripts directory and type "activate". When the environment is activated, the device name is displayed on the left in parentheses.

```
C:\Users\username\AppData\Roaming\RICBox\venvs>cd FemtoClock3-x64\Scripts
```

Figure 4. Opening the Scripts Folder

```
C:\Users\username\AppData\Roaming\RICBox\venvs\FemtoClock3-x64\Scripts>activate
(FemtoClock3-x64) C:\Users\username\AppData\Roaming\RICBox\venvs\FemtoClock3-x64\Scripts>
```

Figure 5. Activating the Virtual Environment

3. RBEEPROM

When the environment is activated, the EEPROM programming utility can be run by typing “rbeeprom --help”. I2C_ADDR refers to the i2c address of the programmed EEPROM. When the -address argument is not passed then the address 0x50 will be assumed. The arguments -channel and -port are dependent on the serial controller being used (e.g., FTDI).

```
(FemtoClock3-x64) C:\Users\username\AppData\Roaming\RICBox\venvs\FemtoClock3-x64\Scripts>rbeeprom --help
usage: rbeeprom [-h] {erase,blank,dump,program,verify,save} ...

I2C EEPROM programming utility

optional arguments:
  -h, --help            show this help message and exit

commands:
  {erase,blank,dump,program,verify,save}

usage: rbeeprom program [-h] [-address I2C_ADDR] [-interface {ftdi,aardvark,devasys}] [-channel PORT] [-port PORT]
                        [-verify]
                        {AT24C04,AT24C08,AT24C16,AT24C32,AT24C64,AT24C128,AT24C256,AT24C512,AT24C1024,AT24C1025,24LC64}
                        filename

usage: rbeeprom verify [-h] [-address I2C_ADDR] [-interface {ftdi,aardvark,devasys}] [-channel PORT] [-port PORT]
                        {AT24C04,AT24C08,AT24C16,AT24C32,AT24C64,AT24C128,AT24C256,AT24C512,AT24C1024,AT24C1025,24LC64}
                        filename

usage: rbeeprom save [-h] [-address I2C_ADDR] [-interface {ftdi,aardvark,devasys}] [-channel PORT] [-port PORT]
                        {AT24C04,AT24C08,AT24C16,AT24C32,AT24C64,AT24C128,AT24C256,AT24C512,AT24C1024,AT24C1025,24LC64}
                        filename

usage: rbeeprom erase [-h] [-address I2C_ADDR] [-interface {ftdi,aardvark,devasys}] [-channel PORT] [-port PORT]
                        [-fill FILL]
                        {AT24C04,AT24C08,AT24C16,AT24C32,AT24C64,AT24C128,AT24C256,AT24C512,AT24C1024,AT24C1025,24LC64}

usage: rbeeprom blank [-h] [-address I2C_ADDR] [-interface {ftdi,aardvark,devasys}] [-channel PORT] [-port PORT]
                        [-fill FILL]
                        {AT24C04,AT24C08,AT24C16,AT24C32,AT24C64,AT24C128,AT24C256,AT24C512,AT24C1024,AT24C1025,24LC64}

usage: rbeeprom dump [-h] [-address I2C_ADDR] [-interface {ftdi,aardvark,devasys}] [-channel PORT] [-port PORT]
                        {AT24C04,AT24C08,AT24C16,AT24C32,AT24C64,AT24C128,AT24C256,AT24C512,AT24C1024,AT24C1025,24LC64}
```

Figure 6. RBEEPROM Help Description

Note: If an EEPROM part number is not listed then contact Renesas support to have it added. Use the EEPROM part number that best resembles the compatible EEPROM of the device being tested.

Examples:

If connected to a Renesas EVB with FTDI, use the following commands to program, erase, and dump EEPROM contents of a 24LC64 EEPROM.

1. “rbeeprom erase 24LC64”

```
(FemtoClock3-x64) C:\Users\username\AppData\Roaming\RICBox\venvs\FemtoClock3-x64\Scripts>rbeeprom erase 24LC64
establishing connection to I2C adapter...
connected
erasing...
progress: 100%
```

Figure 7. Erasing 24LC64 EEPROM

2. “rbeeprom dump 24LC64”

```
(FemtoClock3-x64) C:\Users\A5117237\AppData\Roaming\RICBox\venvs\FemtoClock3-x64\Scripts>rbeeprom dump 24LC64
establishing connection to I2C adapter...
connected
reading...
progress: 100%
0000 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0010 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0020 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0030 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0040 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0050 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0060 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0070 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0080 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
0090 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
00A0 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
00B0 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
00C0 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
00D0 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
00E0 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
00F0 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF | .....|
```

Figure 8. EEPROM Read Dump

3. rbeeprom program “24LC64”

```
(FemtoClock3-x64) C:\Users\username\AppData\Roaming\RICBox\venvs\FemtoClock3-x64\Scripts>rbeeprom program 24LC64 "C:\Users\username\Desktop\test.rbs"
```

Figure 9. Program 24LC64 EEPROM

Note: For connections other than FTDI on a Renesas EVB, use the connection interface options when sending commands. This process supports Aardvard, Devasys, and FTDI interfaces.

4. Revision History

Revision	Date	Description
1.00	Nov 1, 2024	Initial release.