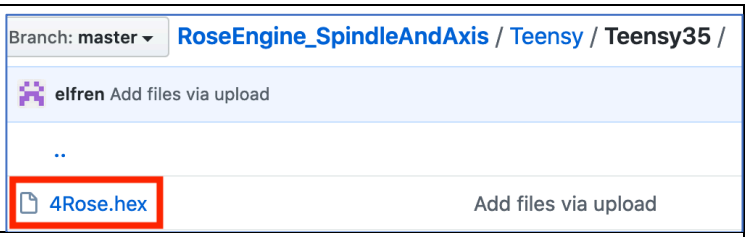
Step 1 – Get a copy of the Teensy program file

Download **4Rose.hex** to your computer.



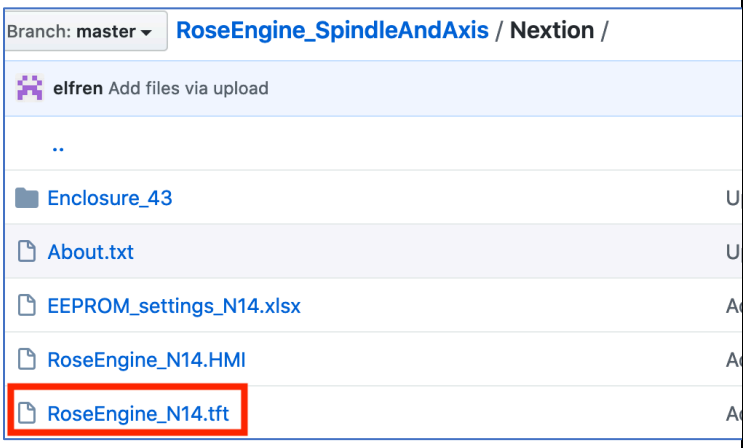
Step 2 – Get a copy of the Nextion configuration file

Download **RoseEngine_14.tft**, and put it in the root folder of a microSD card.

Notes:

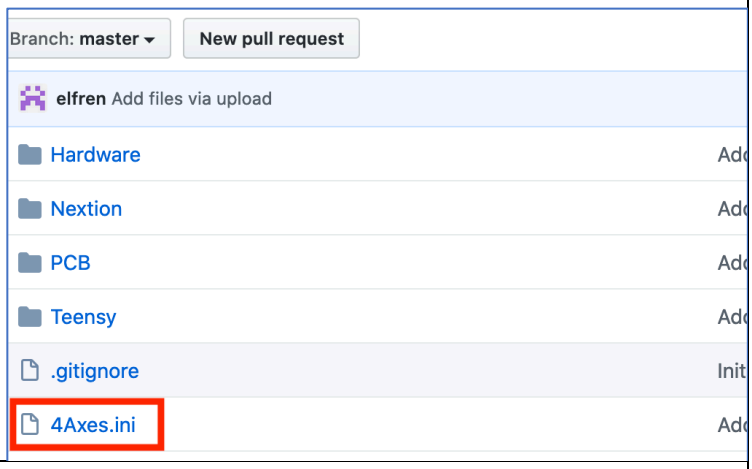
1. You can only have one file on this card which is a .TFT file. The upgrade will not work if there is a 2d one.

2. You need to check for hidden files on the microSD card. I found that hard to do on macOS (which created a hidden TFT file) and had to do this on a Raspberry Pi.

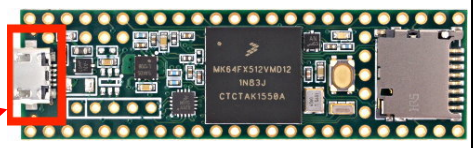


Step 3 – Get a copy of the 4Axes.ini settings file

Download **4Axes.ini**, and put it in the root of a second microSD card



Step 4 - Upgrade the Teensy



Step 4a

Connect the computer to the Teensy.

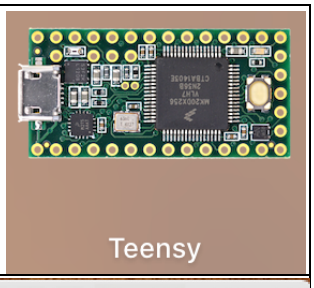
- The cable end connected to the Teensy uses a MicroUSB connector.
- The Teensy's jack is noted in the picture to the right.

Notes:

1. Be sure you have a good MicroUSB cable. Some are only used for charging a device (and they are usually longer). These will often not work.

Step 4b

On the Computer, start the **Teensy Loader**. The icon looks like the one to the right.



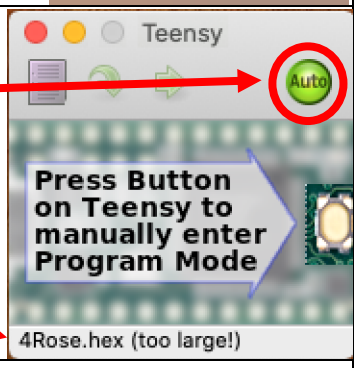
Note:

1. If you don't have the **Teensy Loader**, you can get it from https://www.pjrc.com/teensy/loader.html.

Step 4c

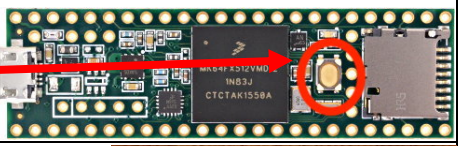
Be sure the system shows that the Teensy is connected. This is evident when the Auto button is illuminated green. As noted in step 4a above, if your USB cable is bad, this won't light.

The default for the CPU selected won't handle the whole 4Rose.hex file, so if you try to open it, you will get the message as shown here.



Step 4d

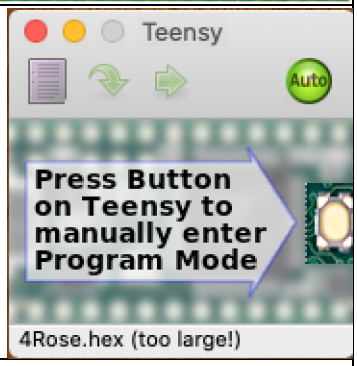
Press the button on the Teensy to load the get the Teensy loader to recognize which CPU you are using.



Step 4e

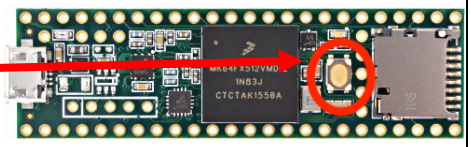
Back on the Computer, using the **Teensy Loader**, open **4Rose.hex**.

Once this is loaded, the bottom message will change to reflect the file size. (this picture was not updated).



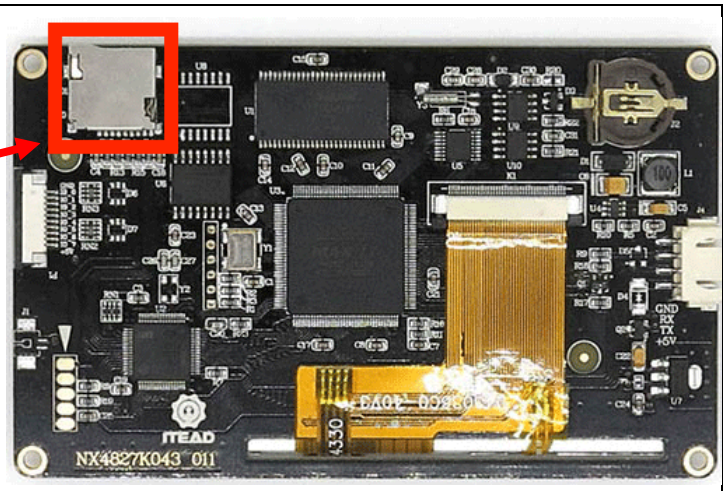
Step 4f

Press the button on the Teensy to load the program file.



Disconnect the computer from the Teensy, and then reboot the Teensy.

Step 5 – Upgrade the Nextion



Secure the microSD card which has the Nextion configuration file (from step 2).

Put this microSD card into the Nextion's microSD card slot.

Reboot the Teensy again.

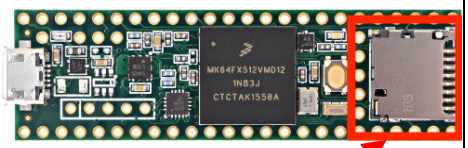
If this works as expected, it will read

> Check Data … 100%
> Updated Successed!

(guess that is a bad translation from Chinese).

After that message appear, remove the microSD card from the Nextion, and reboot the Teensy again.

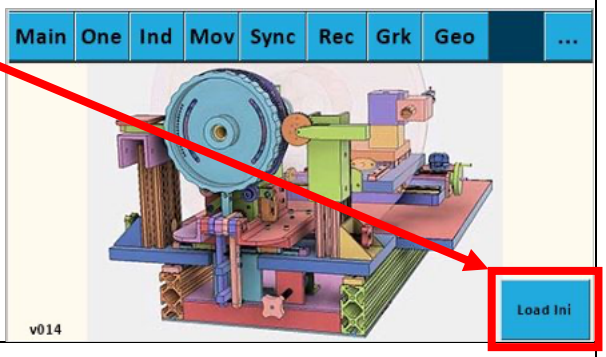
Step 6 - Load the .ini file



Secure the microSD card which has the 4Axes.ini settings file (from step 3).

Put this microSD card into the Teensy's microSD card slot.

Start the system and click the **Load ini** button.



The Load ini button will turn green, and then it will take off.

Once completed, a message will appear saying

> Done – Restart may be needed.

Reboot the system one last time.

Step 7 – Verify the Settings

It's a good practice to verify all of the settings once you've completed the steps.

1. Touch the Config button on each page and verify the Teensy column is populated with the same numbers as the Nextion column. Repeat for each axis on each page.
2. Next verify the Preferences are correct for the Spindle, Axes, Limits, and Returns.
3. Select the Main page, then the '...' (Preferences) page. Select the More page. Touch EEPROM. Repeat for each page and axis on the page. This will show all of the settings for the selected page.

A copy of the settings file (4Axes.ini) is on the following sheets.

Config file settings

```
;===================================
[Setup]
;===================================
        BoardType=4
        Microsteps_Spindle=32
        StepsPer360_Spindle=200
        GearRatio_Spindle=9
        Polarity_Spindle=1

;Z Axis
        Microsteps_Z=32
        StepsPer360_Z=200
        DistancePer360_Z=.02
        Polarity_Z=1

;X Axis
        Microsteps_X=32
        StepsPer360_X=200
        DistancePer360_X=.02
        Polarity_X=1

;B Axis
        Microsteps_B=32
        StepsPer360_B=200
        GearRatio_B=150
        Polarity_B=1
        DistancePer360_B=1.02
        RadialOrLineal=0
        BRadius=5

;===================================
[Limits]
;===================================
;Limit Switches
        Min_Z=34
        Max_Z=35
        Min_X=36
        Max_X=37
        Min_B=38
        Max_B=39

;===================================
[Returns]
;===================================
;Return
        MaxSpeed_Spindle=15011
        Accel_Spindle=15012

        MaxSpeed_Axis_Z=15013
        Accel_Axis_Z=15014

        MaxSpeed_Axis_X=15015
        Accel_Axis_X=15016

        MaxSpeed_Axis_B=15017
        Accel_Axis_B=15018
```

```
;===================================
[Main]
;===================================
;Axis Ids:
;----------------
;Z=0
;X=1
;B=2
;Spindle=3

;----------------
        AxisId=0
;Spindle
        MaxSpeed_Spindle=15000
        Accel_Spindle=15001
        SpeedPercentage_Spindle=30

;Z Axis
        MaxSpeed_Z=4001
        Accel_Z=5002
        SpeedPercentage_Z=53

;X Axis
        MaxSpeed_X=4000
        Accel_X=5005
        SpeedPercentage_X=10

;B Axis
        MaxSpeed_B=5007
        Accel_B=5008
        SpeedPercentage_B=59

;===================================
[One]
;===================================
        AxisId=3
;Spindle
        MaxSpeed_Spindle=25060
        Accel_Spindle=20061
        SpeedPercentage_Spindle=61
;Z Axis
        MaxSpeed_Z=5062
        Accel_Z=5063
        SpeedPercentage_Z=64
;X Axis
        MaxSpeed_X=5065
        Accel_X=5066
        SpeedPercentage_X=67
;B Axis
        MaxSpeed_B=5068
        Accel_B=5069
        SpeedPercentage_B=70
```

```
;===================================
[Ind]
;===================================
        IndexId=1
        MaxSpeed_Spindle=5070
        Accel_Spindle=5071
        SpeedPercentage_Spindle=72
;----------------
;Division:0  Degrees:2
;Fixed:0  File:1
;----------------
;Index 1
        DivisionsOrDegrees_1=2
        FixedOrFile_1=0
        Size_1=1.875
;Index 2
        DivisionsOrDegrees_2=2
        FixedOrFile_2=0
        Size_2=24.375
;Index 3
        DivisionsOrDegrees_3=2
        FixedOrFile_3=0
        Size_3=90

;===================================
[Mov]
;===================================
        AxisId=0
;Z Axis
        MaxSpeed_Z=5080
        Accel_Z=5081
        SpeedPercentage_Z=82
        Distance_Z=3

;X Axis
        MaxSpeed_X=5083
        Accel_X=5084
        SpeedPercentage_X=85
        Distance_X=5.75

;B Axis
        MaxSpeed_B=5086
        Accel_B=5087
        SpeedPercentage_B=88
        Distance_B=5.78
```

```
;===================================
[BE]
;===================================
        AxisId=0
;Spindle
        MaxSpeed_Spindle=5090
        Accel_Spindle=5091
        SpeedPercentage_Spindle=92

;Z Axis
        MaxSpeed_Z=5093
        Accel_Z=5094
        SpeedPercentage_Z=95

;X Axis
        MaxSpeed_X=5096
        Accel_X=5097
        SpeedPercentage_X=98

;B Axis
        MaxSpeed_B=5099
        Accel_B=5100
        SpeedPercentage_B=50

;===================================
[Sync]
;===================================
        AxisId=0
        HelixType=0
        Revolutions=.3
        Distance=10
;Spindle
        MaxSpeed_Spindle=5040
        Accel_Spindle=5041
        SpeedPercentage_Spindle=42

;Z Axis
        MaxSpeed_Z=5043
        Accel_Z=5044
        SpeedPercentage_Z=45

;X Axis
        MaxSpeed_X=5046
        Accel_X=5047
        SpeedPercentage_X=48

;B Axis
        MaxSpeed_B=5048
        Accel_B=5049
        SpeedPercentage_B=49
```

```
;===================================
[Rec]
;===================================
        AxisId=0
        RadialOrAxial=0
;Spindle
        MaxSpeed_Spindle=5030
        Accel_Spindle=5031
        SpeedPercentage_Spindle=32

;Z Axis
        MaxSpeed_Z=5033
        Accel_Z=5034
        SpeedPercentage_Z=35

;X Axis
        MaxSpeed_X=5036
        Accel_X=5037
        SpeedPercentage_X=38

;B Axis
        MaxSpeed_B=5039
        Accel_B=5040
        SpeedPercentage_B=39

;Radial
        Radial_Waves=5
        Radial_Spindle_Amplitude=20
        Radial_Axis_Distance=5

;Axial
        Axial_Waves=4
        Axial_Spindle_Degrees=25
        Axial_Axis_Amplitude=7
```

```
;===================================
[Grk]
;===================================
        AxisId=0
        FileOrPattern=0
;Spindle
        MaxSpeed_Spindle=5020
        Accel_Spindle=5021
        SpeedPercentage_Spindle=22

;Z Axis
        MaxSpeed_Z=5023
        Accel_Z=5024
        SpeedPercentage_Z=25

;X Axis
        MaxSpeed_X=5026
        Accel_X=5027
        SpeedPercentage_X=28

;B Axis
        MaxSpeed_B=5028
        Accel_B=5029
        SpeedPercentage_B=29

;Pattern page
        RadialOrAxial_Pattern=0
;4a: 2 4b: 3 3a: 6 3b: 7 2a: 4 2b: 5
        PatternType=4
        Pattern_PatternsPer360=8
        Pattern_PatternCount=1
        Pattern_SegmentLength=1

;File page
        RadialOrAxial_File=0
        File_PatternsPer360=7
        File_PatternCount=1
        File_SegmentLength=1

;Segments: 2  Actual: 3
        File_SegmentsOrActual=2
```

```
;==================================
[Geo]
;==================================
        AxisId=0
        RadialOrAxial=0
        Rose_n=7
        Rose_d=5

;Spindle
        MaxSpeed_Spindle=5010
        Accel_Spindle=5011
        SpeedPercentage_Spindle=12

;Z Axis
        MaxSpeed_Z=5013
        Accel_Z=5014
        SpeedPercentage_Z=15
        RadialAmplitude_Z=2
        AxialAmplitude_Z=2.5

;X Axis
        MaxSpeed_X=5016
        Accel_X=5017
        SpeedPercentage_X=18
        RadialAmplitude_X=2
        AxialAmplitude_X=2.5

;B Axis
        MaxSpeed_B=5018
        Accel_B=5019
        SpeedPercentage_B=19
        RadialAmplitude_B=3
        AxialAmplitude_B=3.5
```