


HACKING THE RIGOL MSO5000 - Dr Mefisto's Fully Automatic License Activator


This post exists because of the main rigol MSO5000 Post and specifically because of the python scripting method reverse engineered by Dr Mefisto (This is the VERSION 2 of the script)


<https://www.eevblog.com/forum/testgear/hacking-the-rigol-mso5000-series-oscilloscopes/2671/>


 **DrMefistoO**

Contributor

Posts: 12

Country: 




 Re: Hacking the Rigol MSO5000 series oscilloscopes

« Reply #2671 on: January 10, 2024, 11:41:13 am »

So, this is it! I was able to reverse-engineer and understand how the license keys check works. And I'm glad to present this **Fully automatic license activator**. Use it carefully. Trying to switch off your device during activation may brick it.

Usage:
python rigol_kg.py 192.168.1.1

 rigol_kg.py (10.55 kB - downloaded 481 times.)

« Last Edit: January 10, 2024, 11:43:33 am by DrMefistoO »

The following users thanked this post: thm_w, MegaVolt, mwbl100, std, NRS63, andyn

Also because SMAS laid out their path to activation in a very easy to understand way.

<https://www.eevblog.com/forum/testgear/hacking-the-rigol-mso5000-series-oscilloscopes/2840/>

and thanks to Seppletronics for working out the edited version of the file.

Simply put the Python Script Method Works. There's nothing to worry about.

SO LET'S GET STUCK INTO IT

- A WORD ON BRICKING YOUR SCOPE

1. You're probably not going to
2. IF YOU LOSE POWER during the FRAM copy process YES.. YOU'LL BRICK YOUR SCOPE
3. IF YOUR LOSE ETHERNET CONNECTION during the FRAM copy process... YES, YOU'LL BRICK YOUR SCOPE

Because the data stream cannot be interrupted until it gets to 100% (this only applies to the .. maybe 2mins that the FRAM is actually being written to)

If this method doesn't work for you, you can always revert back to the Patch Method if you wish.

STEP 1. Get Everything Together.

DOWNLOAD THE FOLLOWING

Rufus

<https://rufus.ie/en/>

Python

<https://www.python.org/downloads/>

THEN. GO TO MY MEGA CLOUD SERVER

<https://mega.nz/folder/A8cEgQRI#5FS0MrCurJi71T7VkrPgYQ>

Here you will find a few things that you'll need

1. Scope Firmware Version 1.3.2.2
 2. Scope Firmware Version 1.3.3.0
 3. rigol_kg2.py (Dr Mefisto's Licensing Script Version 2)
 4. rigol_kg2_3_00.py (If the other one doesn't work)
 5. rigol_kg2_KEY2.py (You'll only need this if you get... **ASSERTION ERROR**) But ...
YOU MUST TRY THE OTHER 2 FIRST.
 6. Obviously you have downloaded this PDF file
- Download all of those

OPTIONAL

- Downgrading to 1.3.2.2 Video (this video shows you how to get into the Pre Boot Menu)

IMPORTANT NOTE : READ CAREFULLY.

*****DO NOT SKIP THIS STEP*****

- THE SCRIPT YOU MUST DOWNLOAD WILL BE DICTATED BY THE MODEL OF SCOPE YOU HAVE ...

If you have MSO5072 / MSO5074 or MSO5000BND Installed

DOWNLOAD rigol_kg2.py

If you have MSO5102 / MSO5104 or MSO5000BND Installed

DOWNLOAD rigol_kg2_3_000.py

If you have MSO5204 / MSO5354 or MSO5000BND Installed

DOWNLOAD rigol_kg2_3_000.py

=====

RE: ASSERTION ERROR (ONLY APPLICABLE IF YOU GET THE ERROR)

If you have MSO5072 Installed and you receive ASSERTION ERROR

DOWNLOAD rigol_kg2_KEY2.py

=====

(if this doesn't work on MSO5200 or MSO5300 Let me know and I'll edit the script.)

NOTE :

if you have downloaded "rigol_kg2.py" your command will look like this

python rigol_kg2.py -i 10.1.1.140

if you have downloaded "rigol_kg2_3_000.py" your command will look like this

python rigol_kg2_3_000.py -i 10.1.1.140

if you have downloaded "rigol_kg2_KEY2.py" your command will look like this

python rigol_kg2_KEY2.py -i 10.1.1.140

STEP 2.

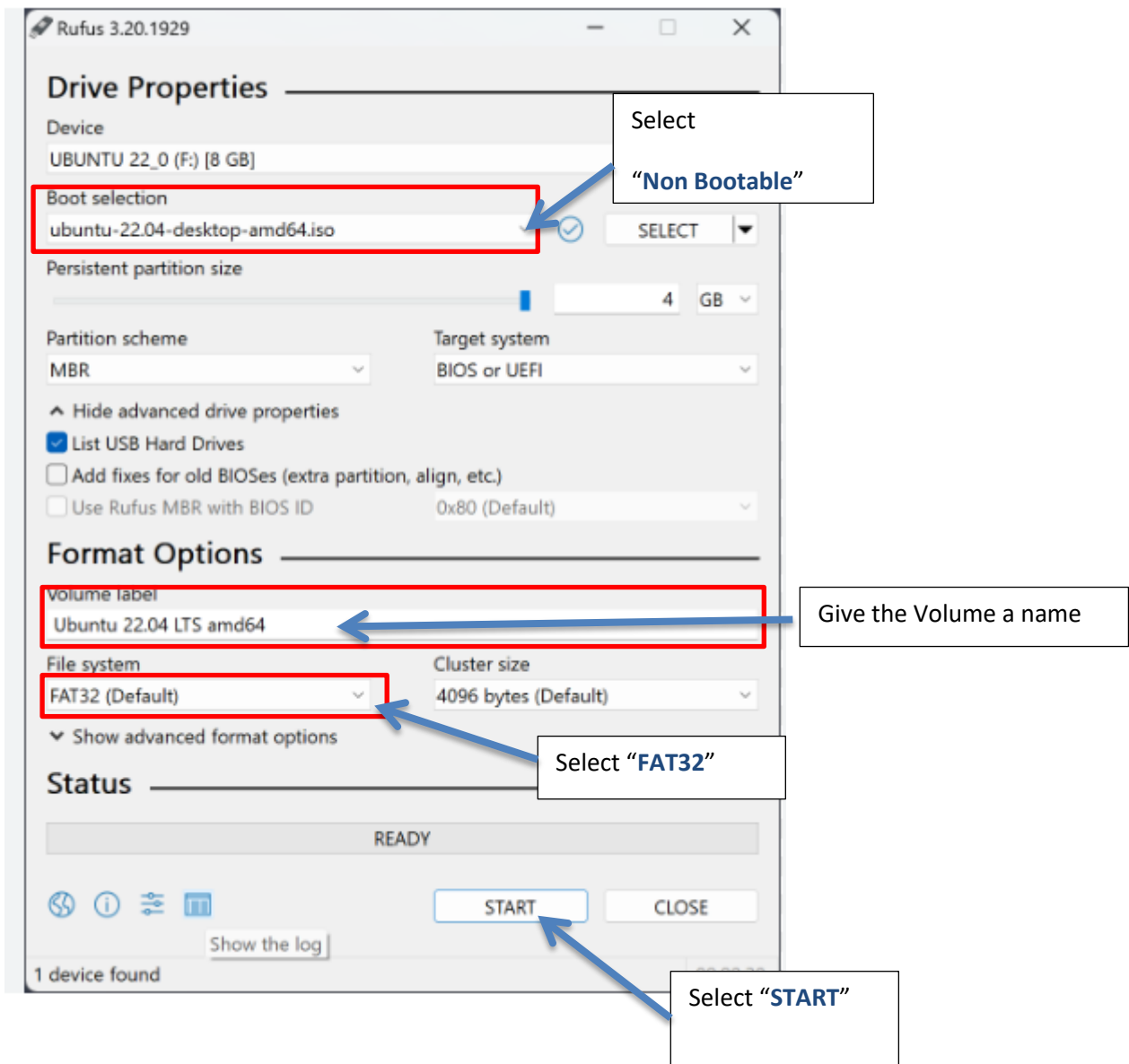
GET A U.S.B. STICK

It must be a maximum of 16GB and Formatted to FAT32 File System. (Min. Size of 2GB)

STEP 3.

FORMATTING THE U.S.B. STICK

- You can use Windows Formatting Tool
- You can also use a more secure method by downloading RUFUS in the supplied link.
- Install and run Rufus and this window will show up



STEP 4.

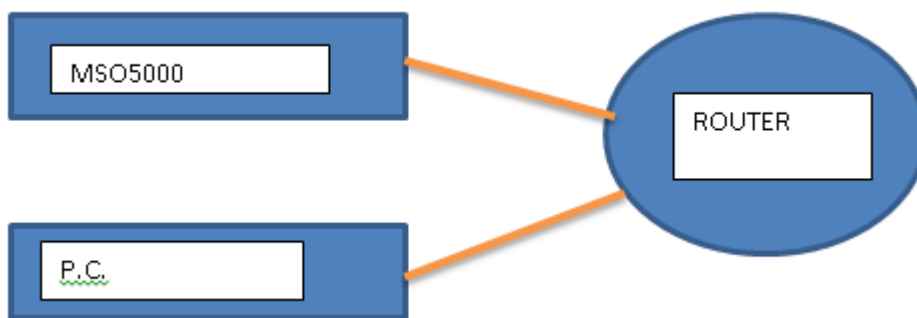
SETTING UP THE NETWORK.

There needs to be 3 basic components to your network

- Your P.C.
- Your Router
- Your Rigol MSO5000

DO NOT GET CREATIVE, OTHERS HAVE AND IT HAS FAILED!

The MSO5000 should be connected to your router via Ethernet Cable and your P.C. should be connected to your router via Ethernet Cable. Like this

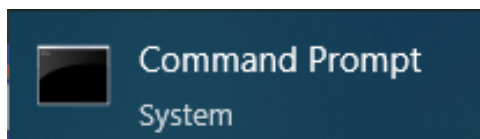


STEP 5.

CHECKING NETWORK COMMUNICATION.

Let's now test if the PC and MSO5000 Can actually speak to each other.

- Open cmd.exe



- Or PowerShell



- Enter the following Command
Ipconfig
- Press Enter

```

Administrator: Command Prompt

Microsoft Windows [Version 10.0.19045.4291]
(c) Microsoft Corporation. All rights reserved.

C:\Users\M[REDACTED]>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::c0ee:72bc:1285:3514%6
    IPv4 Address. . . . . : 10.1.1.119
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.1.1.1

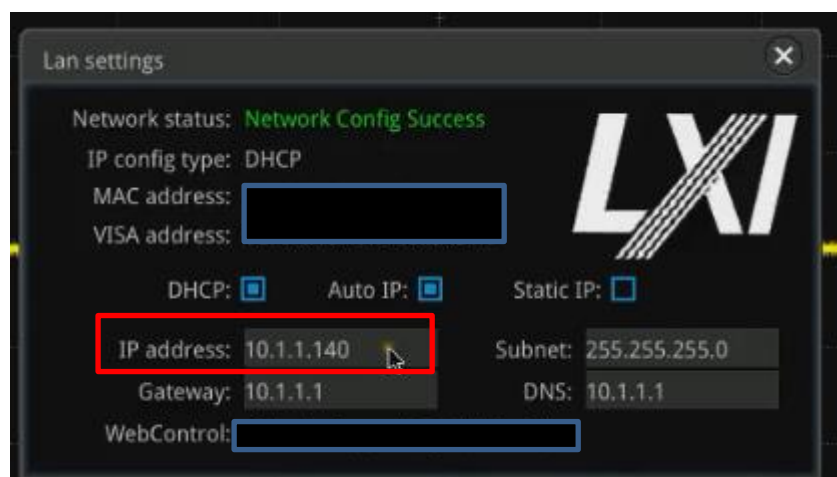
C:\Users\M[REDACTED]>

```

In this scenario

- My Router (Default Gateway IP Address) is 10.1.1.1
- MY PC's (IPv4 Address) is 10.1.1.119

Now go to your MSO5000 into UTILITY / IO / LAN



- Make sure DHCP is selected
- Make sure AUTO IP is selected
- Take note of the IP Address of the scope (10.1.1.140) in this case
- Ensure the Default Gateway is the same as in command prompt
- Ensure the Subnet Mask is the same as in command prompt as well.

Now to test the communication to your router, type in :

- Enter the following Command
ping 10.1.1.1 -t
- Press Enter

The response should be similar to this

```
Pinging 10.1.1.1 with 32 bytes of data:  
Reply from 10.1.1.1: bytes=32 time<1ms TTL=64  
Reply from 10.1.1.1: bytes=32 time<1ms TTL=64  
Reply from 10.1.1.1: bytes=32 time<1ms TTL=64  
Reply from 10.1.1.1: bytes=32 time<1ms TTL=64
```

The way to stop the ping is to press CTRL+C

This means...

Your computer sent and ICMP (Communication) Request to the router

To find the I.P. Address 10.1.1.1

The router found it and had an ACK (Reply) from 10.1.1.1

32bytes of data were used to execute this task

The time taken for the round trip was less than 1ms

And the TTL (Time to Live) is 64 Hops, (if it took longer a TIMEOUT would have occurred)

Now repeat the same test for your scopes I.P. Address

- Enter the following Command
ping 10.1.1.140 -t
- Press Enter

If you get a successful ping test, ... Proceed, if not, troubleshoot the network.

STEP 6.

BACKING UP YOUR SCOPE **IMPORTANT .**

Now it's important to know which file to copy first. TO DO THIS

- Go to the Firmware download files and find the zip file labelled "UPGRADING TO 350MHz (1.3.2.2)"
- After you extract the zip file you will see the following folders
WE WILL NOT BE USING "STEP 3. Patch the Firmware" ... Ignore it.

Step 1. Backup

Step 2. GEL File - Scope Firmware

Step 3. Patch the Firmware

++++ READ THIS FIRST +++.txt

MSO5000 UPGRADE INSTRUCTIONS.docx

- Go to STEP 1 – BACKUP

1a. Backup Script

1b. NAND Script

++++ READ THIS FIRST +++.txt

Open 1a Backup Script

BACKUP DUMP

++++ READ THIS FIRST +++.txt

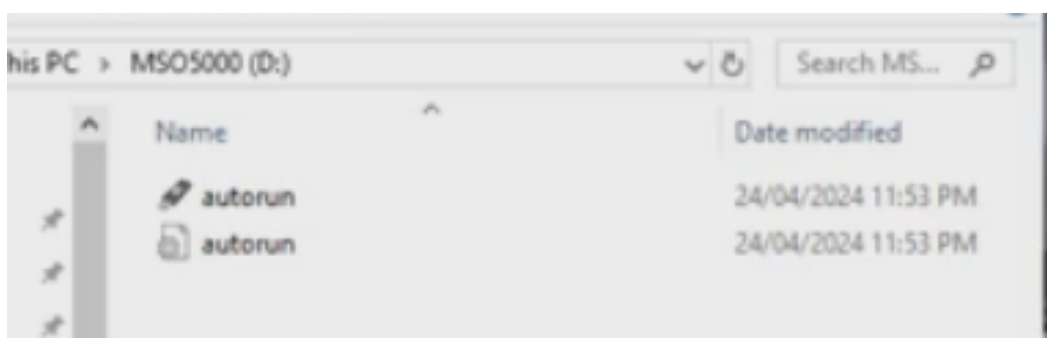
DS5000Update.GEL

readme.txt

STEP 7.

COPY THE BACKUP SCRIPT GEL FILE TO U.S.B.

- Copy ONLY this file to your USB Stick, that will currently look like this (if you used Rufus.)
- Those RUFUS files can stay there, But copy the .GEL File into this ROOT directory

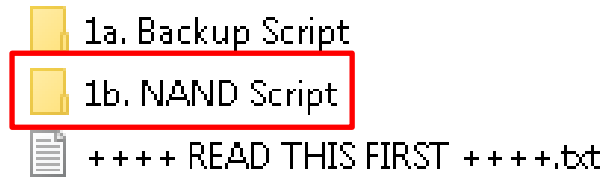


- Now SAFELY EJECT the U.S.B. Stick from your P.C.
- Insert it into the U.S.B Port of your Oscilloscope
- Wait for the U.S.B. Stick to detect
- Then go to UTILITY / SYSTEM / HELP / LOCAL UPGRADE
- Press OK
- Wait for the backup to finish
- Then Remove the U.S.B Stick from the MSO5000 and Insert it into your P.C. again.

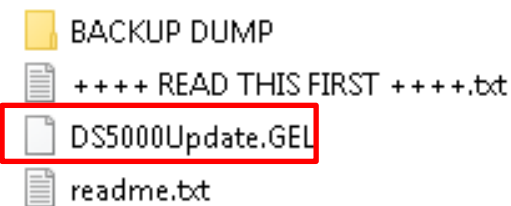
- Delete only the GEL File
- Copy all other NEW Files into the BACKUP DUMP folder
- Now go back to this location

STEP 8.

COPY THE NAND SCRIPT GEL FILE TO U.S.B.



Open 1b NAND Script



Same as before.. copy this file to the U.S.B. Stick

Run the Local Upgrade

Wait for it to finish

Delete only the GEL file

Then Copy all NEW files to the BACKUP DUMP folder

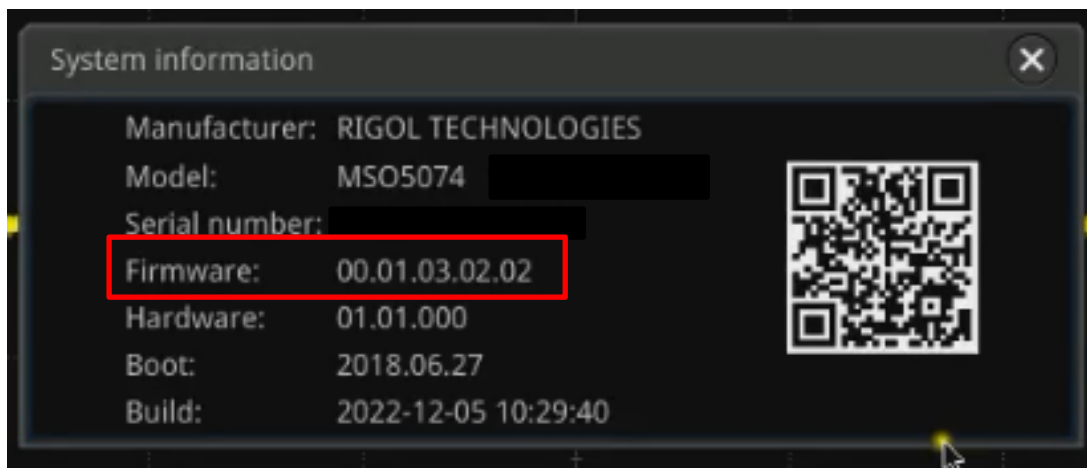
Your backup is now completed

STEP 9.

COPY THE UPGRADE FILE TO U.S.B. .

Now it's important to know which file to copy first. TO DO THIS PROPERLY YOUR SCOPE NEEDS TO BE ON **FIRMWARE VERSION 1.3.2.2** SO...

- Check the Firmware Version of your scope by Going to UTILITY / SYSTEM / HELP / ABOUT



If you are on 00.01.03.02.02 (1.3.2.2) then you don't need to put a file on your U.S.B Stick just yet.

If you are on 1.3.3.0 or any other version other than 1.3.2.2 You will need to copy the Firmware upgrade GEL file for 1.3.2.2 to your U.S.B. Stick

- Go to this location

- Step 1. Backup
- Step 2. GEL File - Scope Firmware
- Step 3. Patch the Firmware
- ++++ READ THIS FIRST +++.txt
- MSO5000 UPGRADE INSTRUCTIONS.docx

- Open STEP 2 – GEL FILE – SCOPE FIRMWARE
- (Ensure this is the 1.3.2.2 folder that you have opened)

- ++++ READ THIS FIRST +++.txt
- DS5000Update.GEL
- MSO5000 Release Notes.txt
- MSO5000 Upgrade Instructions.txt

- Copy ONLY the DS5000Update.GEL file to your USB Stick (Delete all other files other than the Rufus Auto Run Files)
- BEFORE YOU DO THE DOWNGRADE OR UPGRADE, READ THIS...
- If your scope is on Version 1.3.2.2 and has no upgraded software options you can skip this step, but, it doesn't hurt if you do it in any case.
- If your scope is on Version 1.3.3.0 and has no upgraded software options You're ready to go
- If your scope is on Version 1.3.2.2 and has upgraded software on it you will need to uninstall those options
- If your scope is on Version 1.3.3.0 and has upgraded software on it you'll need to uninstall it.

- IF YOUR SCOPE HAS BEEN UPGRADED WITH OPTIONS THROUGH THE PATCH VERSION.

You DO NOT need to Uninstall them as you will lose them through the downgrade.

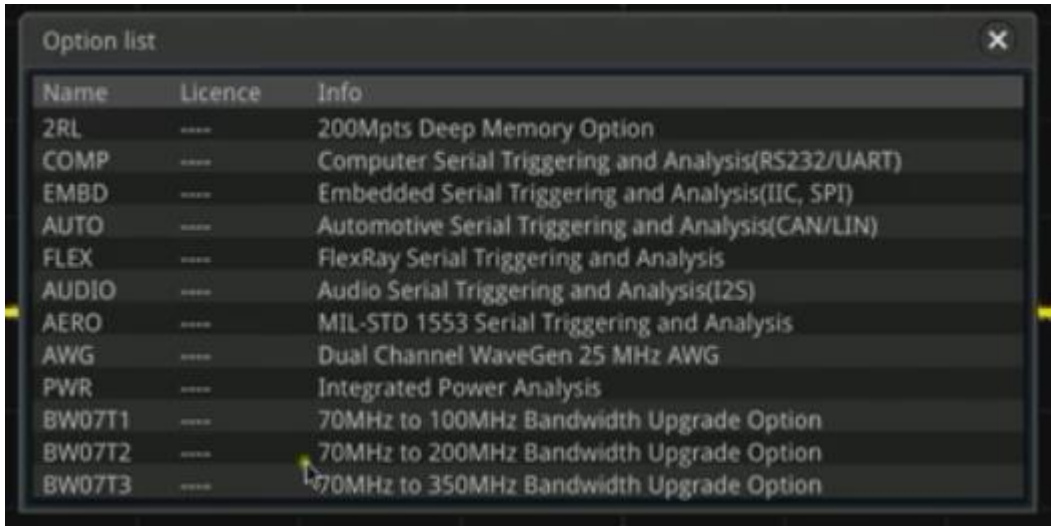
STEP 10.

CHECKING THE INSTALLED SOFTWARE OPTIONS/BUNDLES .

To Check what software options you currently have , go to

UTILITY / SYSTEM / HELP / OPTIONS LIST

IF IT LOOKS LIKE THIS



It Means... you have NO OPTIONS INSTALLED

If it says FOREVER under Licence then you do have those options installed.

If the options were installed via the patching method you don't need to uninstall them as Patching does not survive a firmware upgrade or downgrade so you can just proceed to the next step..

If you have options in the scope that you have paid for or... You tried the Python script and it didn't work you have 2 options here. You can TECHNICALLY leave the installed software there. Or if it doesn't work, you can use the script to uninstall the options (I'll show you later how to do this)

STEP 11.

DOWNGRADING TO VERSION 1.3.2.2

Now That you have your U.S.B. and it has the 1.3.2.2 GEL file on it,

1. Turn the scope OFF
2. Insert the U.S.B. Stick into the scope's U.S.B. Port
3. Before you turn the scope on you need to know how to enter the PRE BOOT Menu.
(You press the Power button, then REPEATEDLY press the SINGLE button) until a menu appears that says FIRMWARE UPGRADE and RESTORE DEFAULTS. If you get the progress bar, You didn't do it fast enough so switch the scope OFF and try again or watch the video on how to do it .

4. NOW.. TURN THE SCOPE ON and enter the PRE BOOT menu
5. Assuming you did that successfully, Select RESTORE DEFAULTS (this is just for good measure)
6. Now do that again and **select FIRMWARE UPGRADE.**
(it's actually a downgrade but it will say UPGRADE)
It will say "Upgrading Please Waitting" that means it started
If it doesn't start ALL THE LIGHTS ON THE SCOPE WILL BE FLASHING
(This means check your U.S.B Stick and Check that the file is not corrupted and Check that it is UNZIPPED) it must be a valid .GEL File for the scope to read it.
If you fail at this step, do not worry, it doesn't hurt your scope

When it is finished it will say SUCCESS and I think , 100%
Wait a few seconds

7. Turn the scope OFF
8. Remove the U.S.B Stick
9. TURN THE SCOPE ON AGAIN and boot up
10. Then go into the menu again and check the firmware version and confirm that it's 1.3.2.2
11. Also check that you have lost all the installed Options.

IF SO, YOU HAVE SUCCESSFULLY DOWNGRADED TO VERSION 1.3.2.2

(Remember this if you ever have to return the scope to Rigol for Servicing)

You can upgrade and downgrade anytime to any version if you want and then re apply the script and fully licence your scope, HOWEVER

After this script is applied

- You will have all options installed and a licenced scope.
- But if you downgrade you WILL NOT Lose your options, Nor if you upgrade.
- So.. if you need to return the scope without software options installed, You will need to uninstall them via the script (This will be explained later)

STEP 12.

INSTALLING PYTHON CORRECTLY.

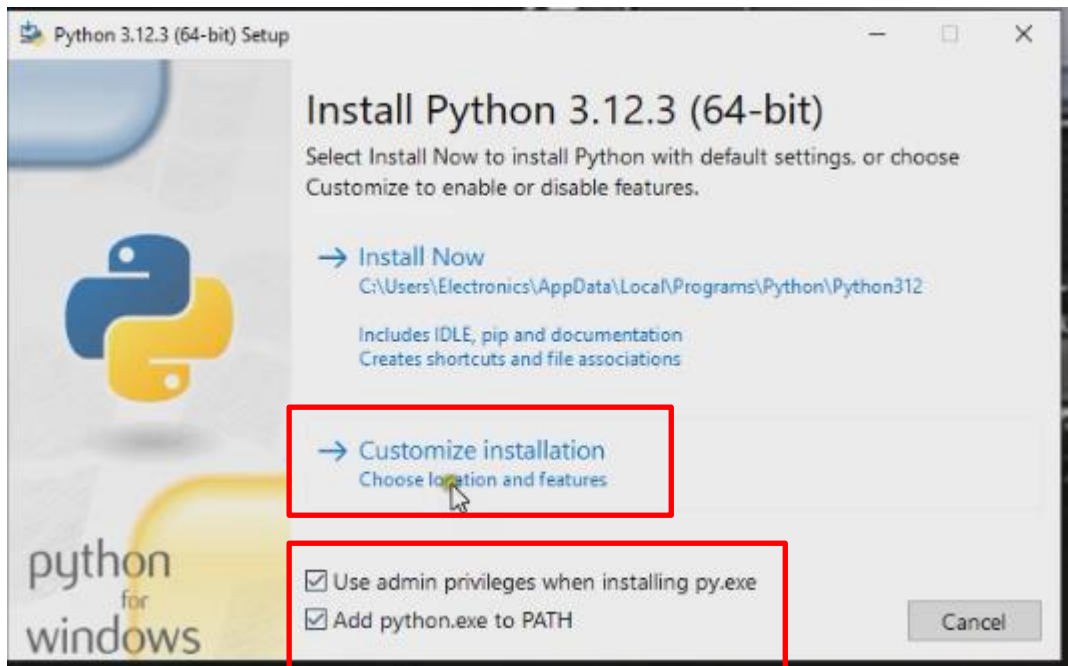
NOW IT'S TIME TO INSTALL PYTHON

- Your network is setup
- Your scope is on version 1.3.2.2 and has no software options in it
- We now need python in order to run the python script by DrMefisto

You should have already used the link to download python

THIS IS HOW YOU INSTALL IT..... **DO NOT JUMP AHEAD!!!**

- Run the installer

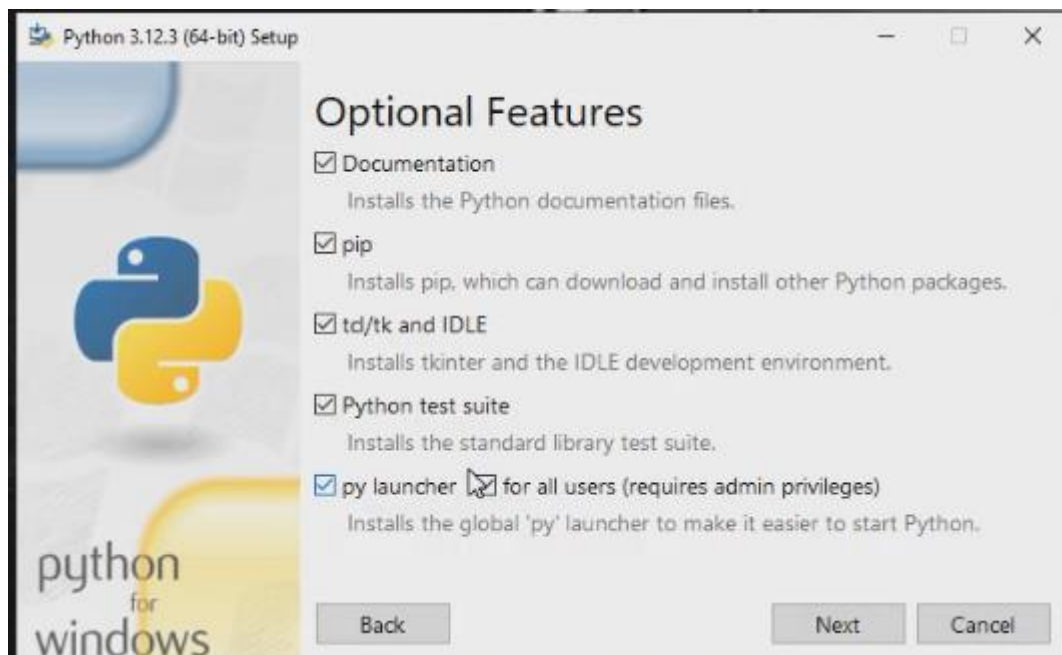


VERY IMPORTANT –

- SELECT “Use admin privileges when installing py.exe”
- SELECT “add python.exe to PATH”
- SELECT “Customize Installation”

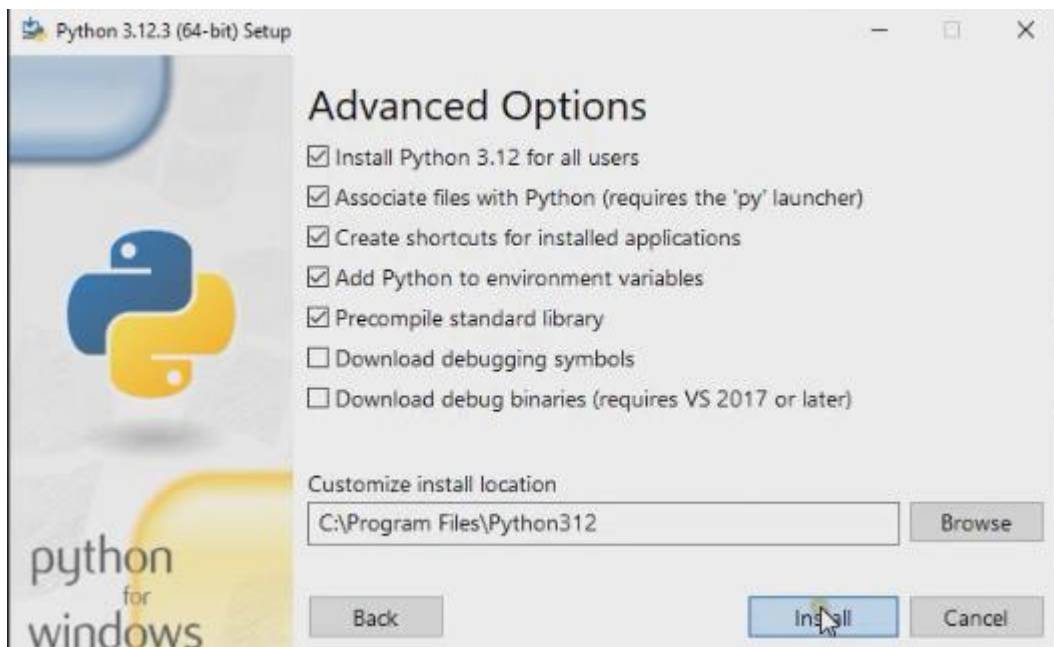
THIS STEP IS VERY IMPORTANT SO THAT YOU AVOID PROBLEMS LATER ON.

The next screen should look like this

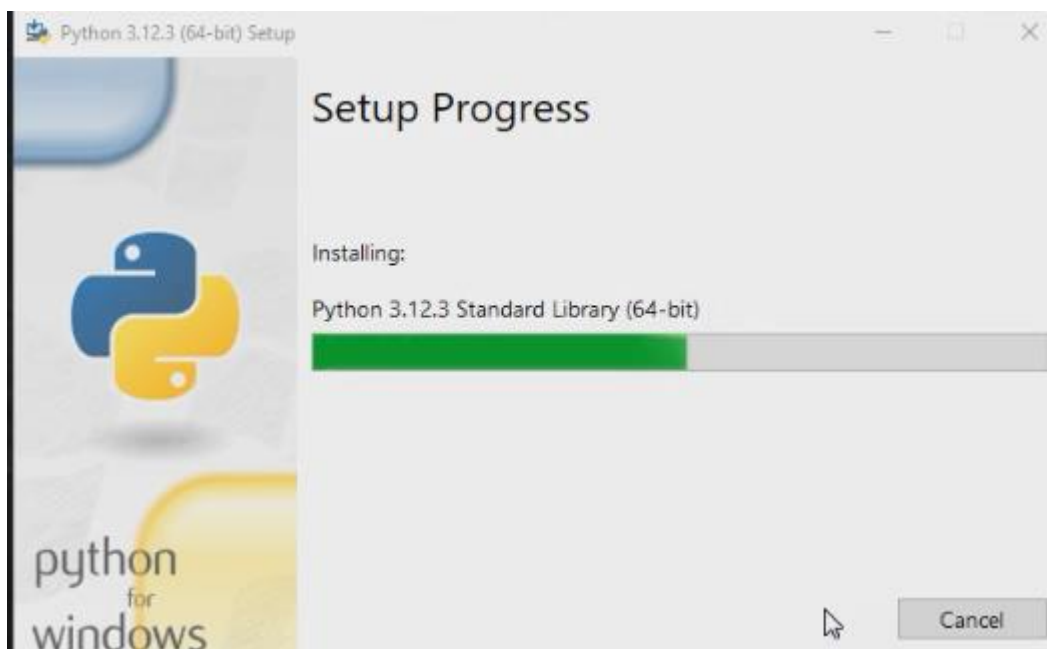


Then click NEXT

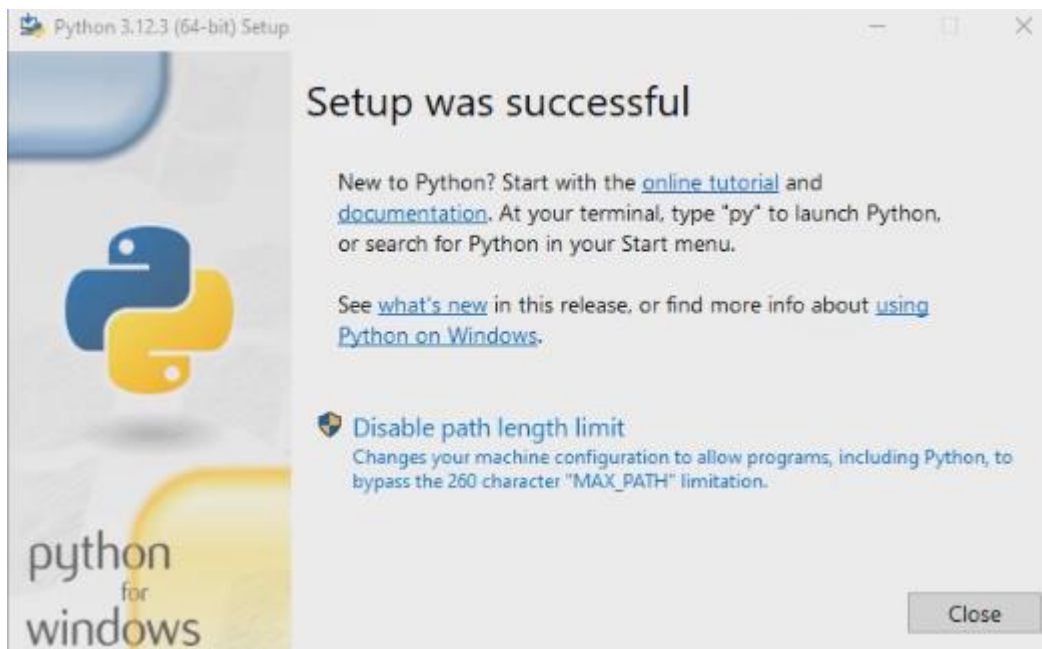
Then the ADVANCED OPTIONS should look like this



Then click INSTALL



Then this will happen



PYTHON IS NOW INSTALLED

It is also a good idea to DISABLE PATH LENGTH LIMIT , but usually not required.

STEP 13.

INSTALLING THE PYTHON MODULES

this is a very easy , yet very important step.

What are Modules ? : Modules in python are like subprograms that add to the functionality of python, in order for the script to work we need to install them.

You can do this in 1 of 2 ways.

METHOD 1 : Type :

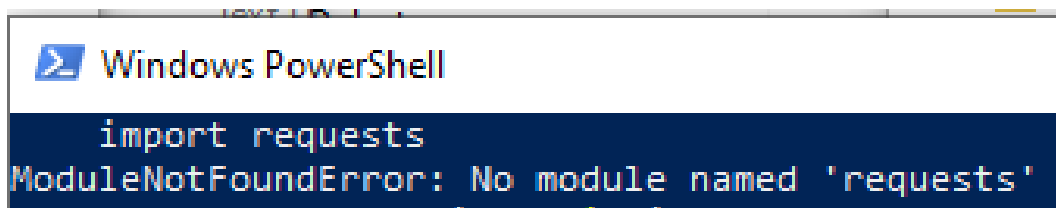
Python rigol_kg2.py -i 10.1.1.140

```
Command Prompt
Microsoft Windows [Version 10.0.19045.4355]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Electronics>python rigol_kg2.py -i 10.1.1.140
```

We are attempting to bring up the INFORMATION menu in the scope. If we don't have the correct Modules installed it will give us an error called

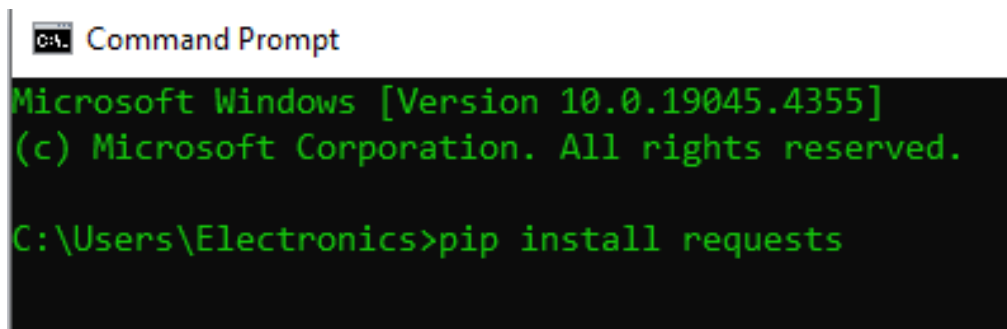
ModuleNotFoundError

When this happens there will be a module name at the end in parenthesis Example



```
> import requests
ModuleNotFoundError: No module named 'requests'
```

You now want to install the module “requests” that produced the error by typing this in...



```
C:\Users\Electronics>pip install requests
```

That’s it !! and now for every error that you get you just substitute the name of the module in brackets for the one that needs to be installed.

FYI : PIP = Preferred Installation Package (it’s the module installer for python)

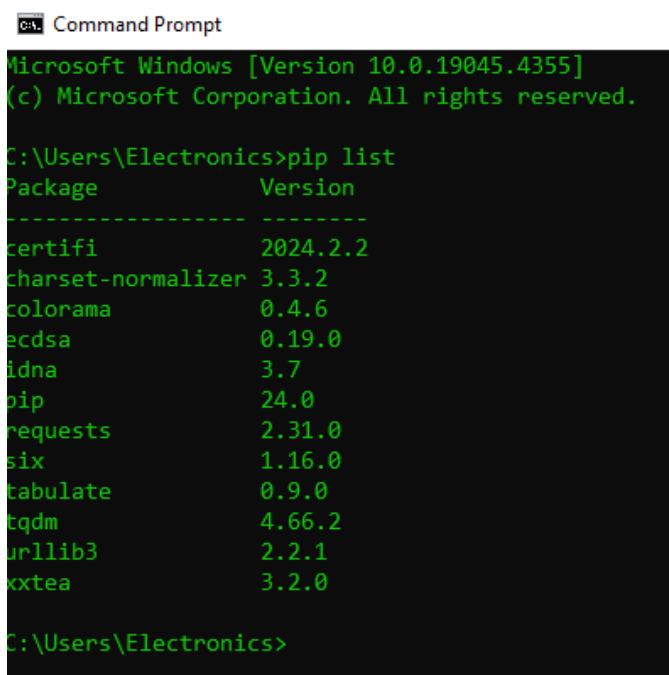
METHOD 2 – Just install them all , Here is the complete list of all modules...

But before that, You can LOOKUP what modules are installed by typing

Pip list

And something similar to this will appear.

This is the list of all modules that will make the script work



```
C:\Users\Electronics>pip list
Package            Version
-----
certifi             2024.2.2
charset-normalizer  3.3.2
colorama            0.4.6
ecdsa               0.19.0
idna                3.7
pip                 24.0
requests            2.31.0
six                 1.16.0
tabulate            0.9.0
tqdm                4.66.2
urllib3             2.2.1
xtea                3.2.0

C:\Users\Electronics>
```

STEP 14.

COPY THE PYTHON SCRIPT TO THE CORRECT LOCATION.

REMEMBER TO COPY THE CORRECT ONE FOR YOUR MODEL.

If you don't do this correctly, nothing will work as python will not find the script to execute.

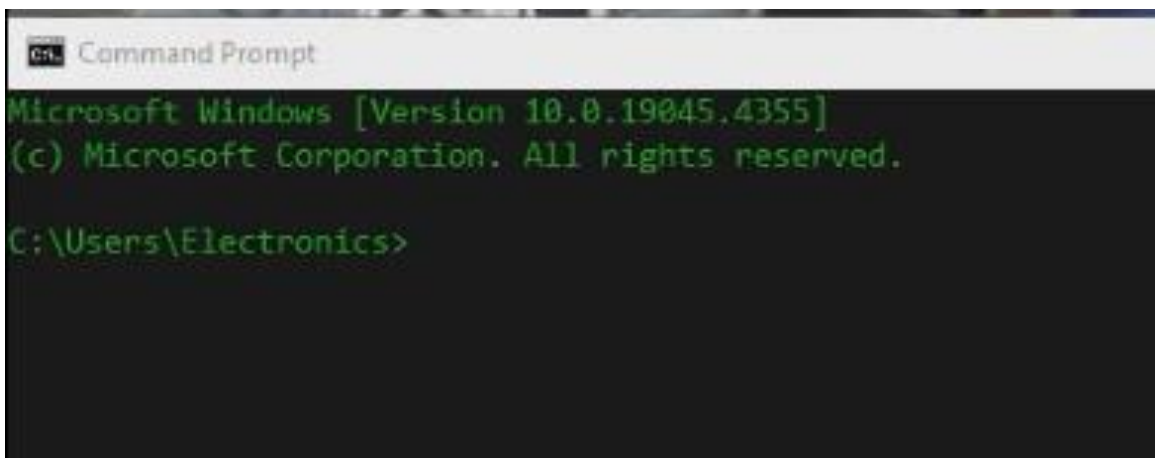
In this step, Python uses the script that DrMefisto provided and it uses the I.P. Address of the scope to communicate with the scope and apply the changes from the script to the FRAM.

If it doesn't work, YOU HAVE NOT DAMAGED OR BRICKED YOUR SCOPE – Don't worry.

You just need to troubleshoot either the python installation or your computer or where you put the script.

Let's now put the script in the correct directory.

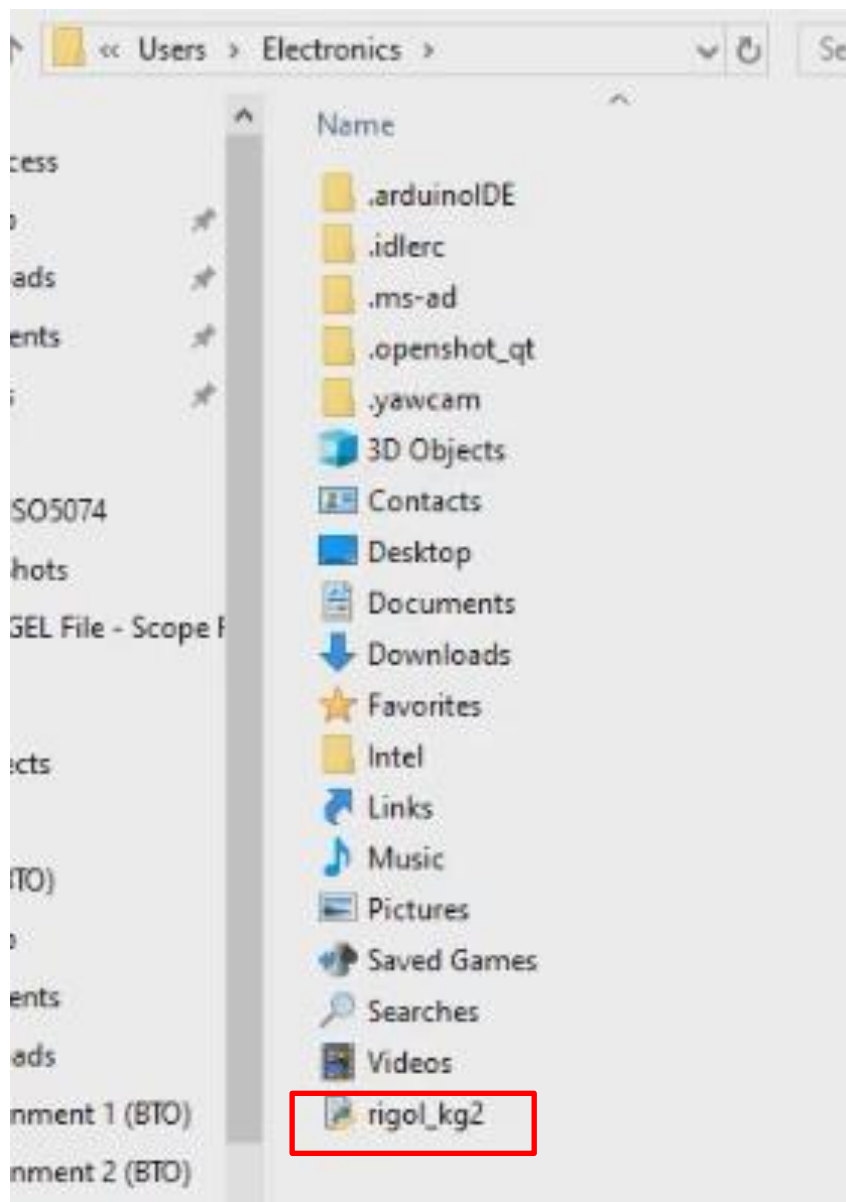
1. Open Command Prompt or Powershell (Whichever you prefer), Powershell has been known for having more success. Whichever you start with, Keep using that one.
2. When open Command prompt I get this..



```
Microsoft Windows [Version 10.0.19045.4355]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Electronics>
```

3. This means that the default file location for command prompt is C:\Users\Electronics
 - You want to go and open this file location
 - Now go and get the python script that you downloaded earlier called **rigol_kg2.py** OR **rigol_kg2_3_00.py** OR If you previously got "ASSERTION ERROR" Use **rigol_kg2_KEY2** This time.
 - Now go and paste this python script into that directory location, like this..



Now if you type in **dir** into the command shell you will see this and the script

```
Command Prompt
Microsoft Windows [Version 10.0.19045.4355]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Electronics>dir
Volume in drive C has no label.
Volume Serial Number is 60BA-4674

Directory of C:\Users\Electronics

27/04/2024  04:44 AM    <DIR>          .
27/04/2024  04:44 AM    <DIR>          ..
10/07/2023  12:28 AM    <DIR>          .arduinoIDE
24/04/2024  01:42 AM    <DIR>          .idlerc
07/07/2023  07:12 PM    <DIR>          .ms-ad
27/04/2024  04:15 AM    <DIR>          .openshot_qt
27/04/2024  04:52 AM    <DIR>          .yawcam
04/07/2023  07:56 PM    <DIR>          3D Objects
04/07/2023  07:56 PM    <DIR>          Contacts
27/04/2024  04:29 AM    <DIR>          Desktop
27/04/2024  04:25 AM    <DIR>          Documents
25/04/2024  02:38 AM    <DIR>          Downloads
17/02/2024  04:21 AM    <DIR>          Favorites
04/07/2023  06:59 PM    <DIR>          Intel
04/07/2023  07:56 PM    <DIR>          Links
04/07/2023  07:56 PM    <DIR>          Music
28/12/2023  09:58 PM    <DIR>          Pictures
24/04/2024  01:01 AM    <DIR>          12,299 rigol_kg2.py
04/07/2023  07:56 PM    <DIR>          Saved Games
04/07/2023  07:56 PM    <DIR>          Searches
27/04/2024  04:15 AM    <DIR>          Videos
               1 File(s)          12,299 bytes
               20 Dir(s) 193,435,152,384 bytes free

C:\Users\Electronics>
```

STEP 15.

GET MSO5000 SCOPE INFORMATION.

We are now going to use the python script to interrogate the scope and get information out of it.

THE AVAILABLE PYTHON OPTIONS IN THIS SCRIPT ARE

```
options:
-h, --help          show this help message and exit
-i, --info          Print options status, model and serial then exit
-r, --regen         Regenerate private key
-u, --uninstall     Uninstall all options
-s, --ssh           Activate SSH
```

FIRST LET'S DISCUSS HELP (-h) and INFORMATION (-i)

1. None of these options can harm your scope in any way. Even if you lose power or network.
2. THE FORMAT GOES AS FOLLOWS
 - First you type

python

If you are using Linux, you need to type

\$ python

(This has the effect of telling the command shell to call the python program.)

Do that now, And Press ENTER (This cannot hurt your scope in any way)

All we are doing at this stage is making sure command shell and python are talking to each other and that we can get basic scope information.

If you get this

```
'python' is not recognized as an internal or external command,  
operable program or batch file.
```

It means the python installation process did not go correctly and the PATH has not been justified correctly. I would suggest uninstall python and reinstall it , instead of trying to troubleshoot.

If you used Powershell it looks like this

```
python : The term 'python' is not recognized as the name of a cmdlet, function, script file, or operable program.  
Check the spelling of the name, or if a path was included, verify that the path is correct and try again.  
At line:1 char:1  
+ python  
+ ~~~~~  
+ CategoryInfo          : ObjectNotFound: (python:String) [], CommandNotFoundException  
+ FullyQualifiedErrorId : CommandNotFoundException
```

If you get this... YOU DID IT CORRECTLY. (This is the Python interpreter output)

```
Python 3.12.3 (tags/v3.12.3:f6650f9, Apr 9 2024, 14:05:25) [MSC v.1938 64 bit (AMD64)] on win32  
Type "help", "copyright", "credits" or "license" for more information.  
>>> _
```

Or in powershell

```
PS C:\Users\[redacted]> python  
Python 3.12.3 (tags/v3.12.3:f6650f9, Apr 9 2024, 14:05:25) [MSC v.1938 64 bit (AMD64)] on win32  
Type "help", "copyright", "credits" or "license" for more information.  
>>>
```

YOUR SHELL HAS NOW CONNECTED TO THE PYTHON INTERPRETER.....THAT'S GOOD.

NOW GET OUT OF THAT BY TYPING.. **Exit()**

and press ENTER

You don't want to be in the interpreter, YOU WANT TO BE IN THE SHELL.

Now we know that

python

Means, Get the shell to CALL the python program into use, Let's add the script name, which will

Tell the shell to call the python interpreter into use and use that script and read it and execute it.

We do this by typing (DON'T TYPE THIS IN YET, JUST READ IT FOR NOW) the one that applies to your Model.

python rigol_kg2.py

python rigol_kg2_3_00.py

python rigol_kg2_KEY2.py (Only if you had the Assertion Error)

NOW WE ADD THE SWITCH THAT WE WANT TO USE (A Switch is a way of telling a program what subroutines to perform) in our case we want INFORMATION so that's -i

python rigol_kg2.py -i Remember: python[SPACE]script[SPACE]switch[SPACE]I.P. Address

This tells python program to use that script file to obtain INFORMATION, But.. Information from where ?

Answer : From your scopes I.P. Address, in my case it's 10.1.1.140 so the full command is

python rigol_kg2.py -i 10.1.1.140

or

python rigol_kg2_3_00.py -i 10.1.1.140

or

python rigol_kg2_KEY2.py -i 10.1.1.140 (Only if you had the Assertion Error)

NOW PRESS ENTER (You can't hurt your scope in any way doing this)

From here on I will display the commands as **rigol_kg2.py** If you have a 100MHz , 200MHz Model or an ASSERTION ERROR... Make the appropriate adjustment to your command to suit your script name.

After you do the above you'll see this,

THIS MEANS YOUR SCOPE SUCCESSFULLY COMMUNICATED WITH THE SCRIPT AND PYTHON.

```
cs Command Prompt

Code      Status      Description
2RL       ----       200Mpts Deep Memory Option
COMP      ----       Computer Serial Triggering and Analysis(RS232/UART)
EMBD      ----       Embedded Serial Triggering and Analysis(IIC, SPI)
AUTO      ----       Automotive Serial Triggering and Analysis(CAN/LIN)
FLEX      ----       FlexRay Serial Triggering and Analysis
AUDIO     ----       Audio Serial Triggering and Analysis(I2S)
AERO      ----       MIL-STD 1553 Serial Triggering and Analysis
DG        ----       Dual Channel WaveGen 25 MHz AWG
PWR       ----       Integrated Power Analysis
BW07T1    ----       70MHz to 100MHz Bandwidth Upgrade Option
BW07T2    ----       70MHz to 200MHz Bandwidth Upgrade Option
BW07T3    ----       70MHz to 350MHz Bandwidth Upgrade Option

Model: MS05074
Serial: 
Version: 00.01.03.02.02
MAC: 
```

STEP 16.

UNINSTALLING SOFTWARE OPTIONS :

To Uninstall any unwanted software options or bundles simply type in the following command.

Use the (-u) switch.

If on 70MHz Models

```
python rigol_kg2.py -u 10.1.1.140
```

If on 100MHz Models

```
python rigol_kg2_3_00.py -u 10.1.1.140
```

If you receive the ASSERTION ERROR

```
python rigol_kg2_KEY2.py -u 10.1.1.140
```

STEP 17.

REGENERATE THE PRIVATE KEY.

BE CAREFUL FROM HERE

- Make sure your Ethernet cable cannot fall out
- Make sure your router, PC or Scope does not lose power FOR ANY REASON!!

The next step will READ the FRAM, if you lose power or network connection

Your scope can be bricked (But It's unlikely if you are careful)

IF YOU GET AN ASSERTION ERROR YOUR SCOPE IS NOT BRICKED...DON'T WORRY

From here the command is the same EXCEPT WE JUST CHANGE THE SWITCH from -i to -r

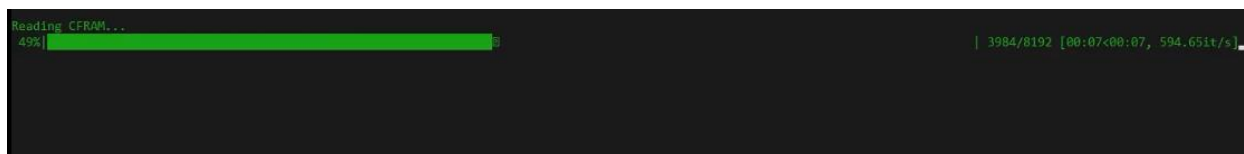
So type in

python rigol_kg2.py -r 10.1.1.140

Press ENTER

2 THINGS WILL HAPPEN

1. THIS SCREEN



2. A File called **PRIV.PEM** will be seen in the same location where your rigol-kg2.py script is.
This file is a generated key that the script uses to licence your scope, don't move it just yet.

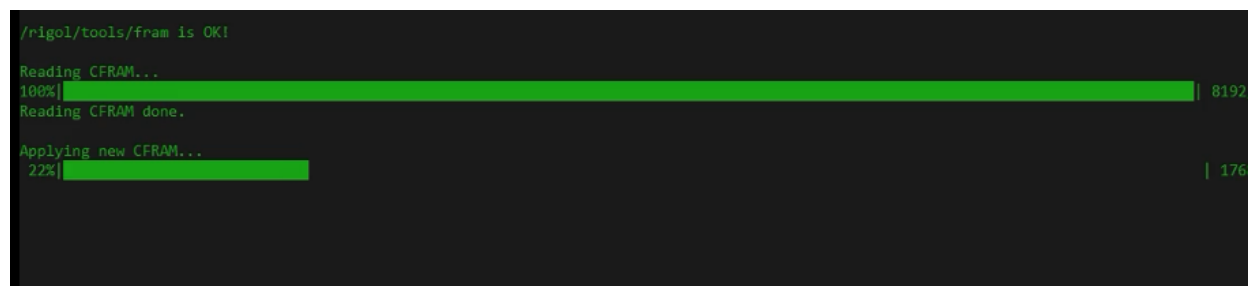
THEN. Another progress bar will appear

THIS IS THE CRITICAL WRITING STAGE (This is where your scope, IF YOU LOSE POWER OR NETWORK will be bricked) **AT THIS STAGE IT IS POSSIBLE TO GET ONLY 1 BAR AND AN ASSERTION ERROR**

If that happens, Don't worry.... Your scope is fine.

GO BACK TO STEP 14 and Redo the steps with the script rigol_kg2_KEY2.py

If the error didn't happen and the second line "Applying now CFram" Started... Keep reading on..



HOWEVER..... IF THE PROGRESS BAR PAUSES or seems to freeze **DO NOT RESTART YOUR SCOPE.**

1. Do not panic, it's just paused
2. You probably accidentally clicked the screen.....
3. **JUST RIGHT CLICK SOMEWHERE ON THE BLACK PART AND IT'LL CONTINUE**, don't worry about it.

THIS SECOND PROGRESS BAR WILL TAKE A FEW MINUTES (that's normal)

Then you'll see stuff like this

```
Reading CFram...
100% | 8192/8192 [00:14<00:00, 584.95it/s]
Reading CFram done.

Applying new CFram...
100% | 8192/8192 [02:42<00:00, 50.54it/s]
New CFram applied.

Key data backup created.
New Key data applied.
Activating: 2RL [MS05000-2RL@620F7F2C83D4D0E990285EC8BFBA12FD2548026A3688C2CD02962C6D4C2FD709995C85F085C63E1228C80805949876F1AEFFC7C0829F980A6B6654A17F90A]... unavailable.
Activating: 4CH [MS05000-4CH@1288E1D211B3F0D2EC8FE198AD85F63F7C78AC87601E51E83416C4D21211423F8392516318274878030100E0F68858A7D3C2362CEC503C5D0868E82C7C4C08]... not activated.
Activating: 5RL [MS05000-5RL@507B8760A9688F9410288348D8CFC3422E8E4E1AA1CA87C89191A6112FC1B729CC9B3CA274828A3008930C2357088A1D8E6AE347772C308C9C933652070D2]... unavailable.
Activating: AERO [MS05000-AERO@999FDFB173746108F0727868FDC2887A5EE6CC887B437C5A6A7CBA895589E275882AF8D5C521C88737C86EEF28816178A2C003D187AAEFF98135888FE087CD]... not activated.
Activating: ARINC [MS05000-ARINC@6F47E805CD685E5449C89F2AFARD3CD8385E3D38196F6469AF9C42094933085A545748F88079466F6ACAE67899078A25E1AF8392300C35E67036754B24447B48]... not activated.
Activating: AUDIO [MS05000-AUDIO@2AB19D7426DC8490F1CFCF680580F824A55828938D7FE9CA68067A871F5409C65E8AB8407734FD0DF6257890ED47D6340F52C817E42D361C76EFD178194897F]... not activated.
Activating: AUTO [MS05000-AUTO@07566AA66F010587F51A8ED3453E3858E987357890992A91304B315C3A6846F671F8582F9CA4A2D0E891EF4F984BF1288861A03447982EC2EC796AC39F8D7819]... not activated.
```

It is now attempting to License your scope

ACTUALLY, WHAT'S IT'S DOING IS THIS...

1. It's searching for INSTALLED Software Bundles
2. It's searching for AVAILABLE Software Bundles
3. It's then applying the available one's to your scope
4. It's normal for some to say NOT ACTIVATED (Because they won't relate to your scope)
5. After it's finished you'll get the information window again

It will still NOT be fully activated, don't worry, But if you survived this step, Your scope is not bricked.

STEP 18.

RUNNING THE PYTHON SCRIPT FULLY.

Now we need to run the script itself in full (WITHOUT SWITCHES)

So...

python rigol_kg2.py 10.1.1.140

python rigol_kg2_KEY2.py 10.1.1.140 if you previously had ASSERTION ERROR

If you were using Linux the command would be

\$ python rigol_kg2.py 10.1.1.140

\$ python rigol_kg2_KEY2.py 10.1.1.140 if you previously had ASSERTION ERROR

BEFORE PRESSING ENTER , Make sure you won't lose power or network,

This is a critical part of the process, Your scope CAN be bricked now if you lose power or network.

PRESS ENTER when ready

The same thing will happen as above

1. 2 PROGRESS BARS WILL APPEAR
2. THEN THE HEX CODES WILL APPEAR AND ATTEMPT TO LICENSE YOUR SCOPE
3. LASTLY THE INFORMATION TABLE WILL SHOW UP

STEP 19.

WHY ISN'T IT ACTIVATED ????.

This is the step where everyone wonders, why it's not activated and did you do something wrong

NO,... YOU DID NOTHING WRONG, it's still ok and the script does work.

It's just part of the process, ok, Just go with it.

Now Get your U.S.B STICK AND TAKE EVERYTHING OFF IT EXCEPT FOR THE RUFUS FILES

THEN.. PUT THE 1.3.2.2 GEL FILE ON IT (I know, Your scope already has 1.3.2.2)

But, You have to now do the upgrade again

SO GO BACK AND REPEAT STEP 9 and STEP 11

Basically, you're just re using the 1.3.2.2 GEL file to reload the firmware onto the same firmware version. And you do that via the PRE BOOT menu as discussed earlier.

Once you've done that, come back here.

STEP 20.

RUNNING THE PYTHON SCRIPT FULLY.....AGAIN.

Use this command after the scope has restarted to check if it still has connection with python.

```
python rigol_kg2.py -i 10.1.1.140
```

```
python rigol_kg2_KEY2.py -i 10.1.1.140 (if you previously had ASSERTION ERROR)
```

Now for the final step.

- You **DO NOT** need to regenerate the private key
- You **DO NOT** need to do any backups at this stage
- Take the USB Stick out of your scope
- Your script and Priv.Pem file are ready to go

Just type this in and press enter

```
python rigol_kg2.py 10.1.1.140
```

```
python rigol_kg2_KEY2.py 10.1.1.140 (if you previously had ASSERTION ERROR)
```



```
Command Prompt
Activating: BW07T1 [MS05000-BW07T1@2E19EE7E7739F655F141A6CA219FCC8066A48FFA6C9386E508E01EA9D644CB454A4DFCF5BEC38645585EF58DFF1288593568B668E45E2862C96F2EBC696CC]... activated.
Activating: BW07T2 [MS05000-BW07T2@077794BAF2C737EE94510A78699F544A537755A2C330AF60E544596789256A6F88E8E04CB34EC3FA48608C6A46396F41E160CB8E26C67002A609E2A31C2]... unavailable.
Activating: BW07T3 [MS05000-BW07T3@2EC7643F839B1F506AC0557AA386EB21565C69832E8A3F1A94C52080811B4C6650F7C6FFF41962A2D1463AB4BE8CDEC2C7C406C9080436A10E66FAF87CCCA]... unavailable.
Activating: BW07T5 [MS05000-BW07T5@2E9CADFDDC2CAE003856C4DC691230868677C44F87B11DAA5CB6490E219771D67EB63A1CB6C4FF50AC4D81D7E5D01DA509A84F8364F9D9C0E8F800963248125CD]... unavailable.
Activating: BW1T2 [MS05000-BW1T2@71906FBCA3BF705988B6953BAAD17E309D37E8B084933DA92F4B60EA88288E650F90AA01829D155C5F0C21F4A79CC6227FC6F9388DC826C95488D568F123D]... unavailable.
Activating: BW1T3 [MS05000-BW1T3@654B4DAB190F874050191F43CF601C61CA007A58307267088469520FC226D1F7190C2283F1D92C8E0F579688DC85372578D084D1E79367F65830E08FC1A2564]... unavailable.
Activating: BW1T5 [MS05000-BW1T5@8C8A7F6978BD4C7FB209E6FFB8E374D0876AC525801D9D3D3D179840C40E5E891951EC4DC902966AE68C6E2DD0E5459A741065607650E549D1FE3A5497A75AAD]... unavailable.
Activating: BW2T3 [MS05000-BW2T3@08EE7862EE83D085F49F066810A7CGAB14AA380088E677299CFCC941DD3778712CFB247A00EEEC82AC5E8F1518FD411EE38A4089257DC9813503379CA4914214]... unavailable.
Activating: BW2T5 [MS05000-BW2T5@6584D856844BE103A2C129E17176803696716AA8E32CF56E850CA0E13D5E363003FA3EBEFD04ED2A204EF71C23E86CCE6663E50AEF454198000891B74434ED1]... unavailable.
Activating: BW3T5 [MS05000-BW3T5@9430F554F30C728069717EA24236FA93E62848230C5EB7E5ACE03810ADC60886723784C5F465786A10CF79FB48D67E3D2A132C2D055D1C1915A0654A74AA45B]... unavailable.
Activating: COMP [MS05000-COMP@3AE0485AC0F6589CF227800D808FAC8888B175E3B565FEFEECF7C4A76C69EC575D11EC7FF8A080DE874760FD27E191E9A965A00091C8CE8852E8E811E18B6E]... activated.
Activating: CTR [MS05000-CTR@549F07FDC03D0833C05E683740801F26427CC7467F08E9F9CB3E840194EDBA62C6369F7CC2A246137C6473D6B98370C15ACC9E8F2CC40F41F9003DE38D950]... activated.
Activating: DG [MS05000-DG@140EB155A05E4A27C0C9A3D28F243858BAACF950928AB849ECE791F44E6F4E198E57E98ACE0A50054330730CE0D098717011F58F4328F0AF42DEC178D2D8F53]... unavailable.
Activating: DVM [MS05000-DVM@61355223E398C144A8B2323653A1209689AAC65D00011F1FE92D2D9C05A6CCC8F094B2CF29C5924E480CAC281AAB2C908D4EDCF14D3E6D884AF8FEFF5029D6F32]... activated.
Activating: EDK [MS05000-EDK@4D93D3C90858929AAE93C463F1D70FA01EF154583A8881157AE2291049519E1E546E88AEC71D43182BE400DE0F12B206DC0818356604AFB53D0CF2713A8D52]... activated.
Activating: EMBD [MS05000-EMBD@4E4F27F9B8AA382E248AA4734154A08F21511388119F4E68835D08ADFEB981D32D03999068FC1EF844CE9C3994C8FAAEFF4697A9013F3076B01F4711FEBAA2]... activated.
Activating: FLEX [MS05000-FLEX@61F3B07F32CE7CF2B81A4608812626CFE2EA142B10755069566C868A3CE96838C11C2B57C2320302ACC318C1DE232FC6B0830E7B1489EF7A4D07A5E70820E7]... activated.
Activating: JITTER [MS05000-JITTER@99A465E4C69ABA12F845F478055F3B892692AFAEE3226B061E7C84102652028B1491FC058FCF510884622A678567DF1B2A5500960650A0F0874A5D9088D4367]... not activated.
Activating: MASK [MS05000-MASK@6A646A5D96AC6F0B968030AC9309EE5473D0681EC551145178F973DC0E00CE1D41F7CD74E4050AE800A8C12A406F81E680010EAB86967E681ED61A87E9E8418]... activated.
Activating: MSO [MS05000-MSO@216A86E251961758CD2113CF4EDF386012E5A3733C8203083466C3CC43A7A0F6E75D0DF4D80FF61A30230AAE18D15F280314EDF618D719560A087107D6021F0]... activated.
Activating: PWR [MS05000-PWR@651D36F555A64D7D46A9BA1CD490C10EAC7C7FFC7E46793D4C4B2288935660029298D1C52384911557587B47A6A4B2A043A8E270E21C5E7A8F171E3A8BD47B9]... activated.
Activating: SENSOR [MS05000-SENSOR@41A44E7EB351E86591D95D412D26B5622E42E92B7B4]... activated.
```

Code	Status	Description
2RL	Forever	200Mpts Deep Memory Option
COMP	Forever	Computer Serial Triggering and Analysis(RS232/UART)
EMBD	Forever	Embedded Serial Triggering and Analysis(IIC, SPI)
AUTO	Forever	Automotive Serial Triggering and Analysis(CAN/LIN)
FLEX	Forever	FlexRay Serial Triggering and Analysis
AUDIO	Forever	Audio Serial Triggering and Analysis(I2S)
AERO	Forever	MIL-STD 1553 Serial Triggering and Analysis
DG	Forever	Dual Channel WaveGen 25 MHz AWG
PWR	Forever	Integrated Power Analysis
BW07T3	Forever	70MHz to 350MHz Bandwidth Upgrade Option

C:\Users\Electronics>

And when that's done it will say FOREVER

Activating: SENSOR [MS05000-SENSOR@41A44E7EB351E86591D95D412D26B5622E42E92B7B4]

Code	Status	Description
2RL	Forever	200Mpts Deep Memory Option
COMP	Forever	Computer Serial Triggering and Analysis(RS232/UART)
EMBD	Forever	Embedded Serial Triggering and Analysis(IIC, SPI)
AUTO	Forever	Automotive Serial Triggering and Analysis(CAN/LIN)
FLEX	Forever	FlexRay Serial Triggering and Analysis
AUDIO	Forever	Audio Serial Triggering and Analysis(I2S)
AERO	Forever	MIL-STD 1553 Serial Triggering and Analysis
DG	Forever	Dual Channel WaveGen 25 MHz AWG
PWR	Forever	Integrated Power Analysis
BW07T3	Forever	70MHz to 350MHz Bandwidth Upgrade Option

YOUR SCOPE IS NOW LICENSED.

And if you had an Assertion Error, it should now have disappeared. If not...Contact me!

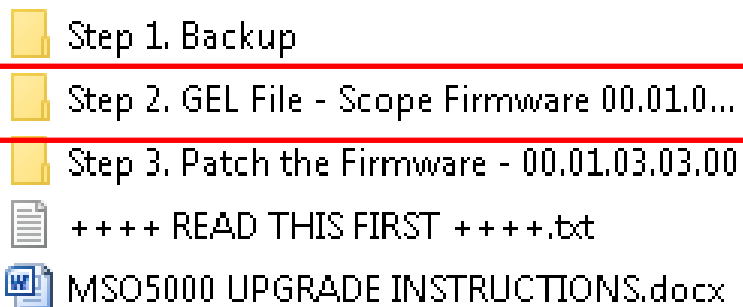
STEP 21.

UPGRADING TO FIRMWARE VERSION 1.3.3.0 (LATEST).

You now need to upgrade to the latest version (The hard part is over), CONGRATULATIONS.

Now, get your U.S.B Stick and remove the 1.3.2.2 GEL File

And go the folder with the 1.3.3.0 zip file, when you extract it, it will look like this



GO STRAIGHT TO STEP 2 GEL FILE – SCOPE FIRMWARE 1.3.3.0

No need to do a backup or Patching

Grab this file

Name	Date
++++ READ THIS FIRST ++++.txt	2/1
DS5000Update.GEL	22/
MSO5000 Upgrade Instructions.txt	15/

- Copy it to your U.S.B. Stick
- Turn your scope OFF
- Put the U.S.B Stick in the scope
- Go into the PRE BOOT Menu (or .. you can do this from the operating system with LOCAL UPGRADE)
- Select Upgrade Firmware
- When completed, RESTART THE SCOPE

STEP 22.

CONFIRM VERSION 1.3.3.0 (LATEST).

- You now go into ABOUT and check that you have the latest version
- Then go into OPTION LIST and you'll see that all your licensed options SURVIVED THE UPGRADE.
- (and if you want to downgrade again if you're curious, THEY WILL ALSO SURVIVE THE DOWNGRADE, I downgraded to Version 1.1.4.4 just to see what would happen, it's all still there.
- **From now on, if a new version comes out, Just go to the Rigol site, download it and install it, NO NEED FOR PATCHING EVER AGAIN**

STEP 23.

DO YOUR BACKUPS.

- You now Need to do steps 6 , Step 7 and Step 8 Again
- This will create a backup of your entire scope
- KEEP THESE FILES SAFE

STEP 24.

CALIBRATIONS.

- You now need to do a SELF TEST
- There are 3 tests in this sequence
- Then you need to do a SELF CALIBRATION (Self Cal)

Once this is completed, RESTART YOUR SCOPES AND YOU'RE DONE

CONGRATULATIONS YOU ARE NOW FULLY LICENCED AND ALL OPTIONS UNLOCKED.

FINAL NOTE : IF YOU GOT AN ASSERTION ERROR

- And you got this far
- And after using rigol_kg2_KEY.py you successfully activate and no longer got the error
- **YOUR SCOPE IS NOT DAMAGED IN ANY WAY**
- The Assertion Error actually protects your scope from Damage or Bricking so , don't worry.

ENJOY YOUR SCOPE YOU ARE NOW PROPERLY LICENCED.