CUSTOMER SUPPORT NOTE

Using Python with LUSAS Modeller (LUSAS Version 22 and earlier)

Note Number:	**CSN/LUSAS/1037**

For LUSAS Version 23

A Python script with $Engine=LPython specified in the first line can be run from Modeller's run script dialog. This will use the embedded version of Python preconfigured to work with Modeller.

Likewise, Python can be selected from the configuration utility and the embedded version of Python will be be used to run session files.

It is however recommended that Python is installed and runs scripts "externally". This allows installation of your own python packages. Most of the GitHub examples LUSAS provides work this way and instructions can be found on GitHub for this. There is no special configuration required for this, just a standard Python install.

This support note is issued as a guideline only.

LUSAS

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1. Introduction

This document explains how to install Python and test that it works with LUSAS Modeller. It also briefly summarizes some Component Object Model (COM) aspects.

It covers instructions to install:

- 64-bit Python for use with 64-bit Modeller.
- 32-bit Python for use with 32-bit Modeller.

This document has been written for Python 3.13.2 and LUSAS v21.1-2c1. These are the latest versions of Python and LUSAS available at the time this document was written (13th Feb 2025).

The Python connection with Modeller relies on a 3rd party package called pywin32. Pywin32 version 308 (released October 12th 2024) must be used with versions of Python later than 3.11.9. It is recommended that any existing installations of pywin32 should therefore be upgraded to the latest version with **`pip install –upgrade pywin32.`**

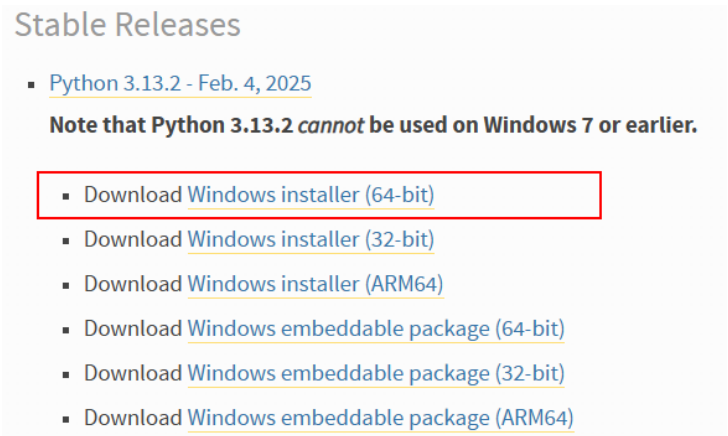
Once the Python interpreter is installed, the pywin32 module must be installed and configured. The commands noted in the instructions below are provided as a batch file (**`setup_python.bat`**) that can be run with admin privileges to avoid typing in the commands.

```
set version=3.13
py -V:%version% -m pip install pywin32
py -V:%version% C:\Users\%username%\AppData\Local\Programs\Python\Python313\Lib\site-packages\win32comext\axscript\client\pyscript.py
py -V:%version%-32 -m pip install pywin32
py -V:%version%-32 C:\Users\%username%\AppData\Local\Programs\Python\Python313\Lib\site-packages\win32comext\axscript\client\pyscript.py
```

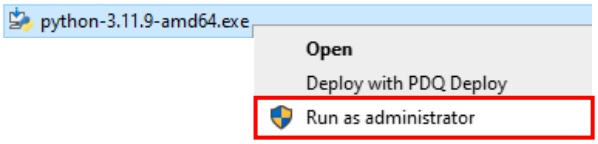
2. Python Installation (64-bit)

To install Python (64-bit), it is necessary to:

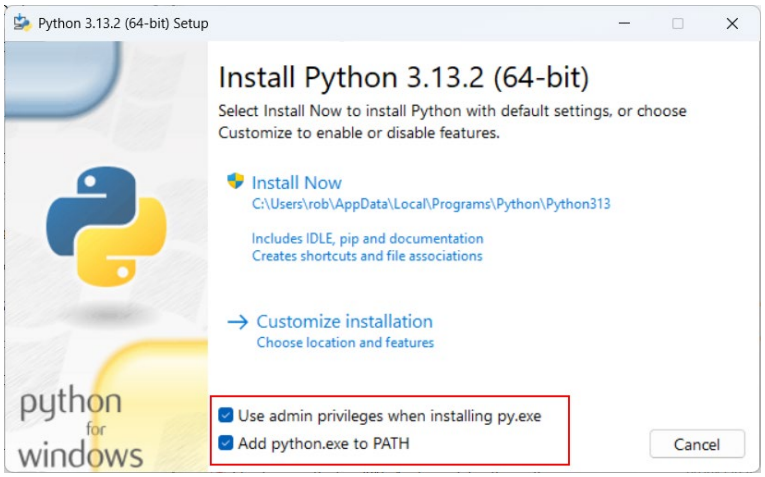
1. Go to www.python.org/downloads/windows.
2. Scroll down to find the section for your chosen version (3.13.2 is recommended and shown in the image below). Within that section, click on '**Download Windows Installer (64-bit)**'.



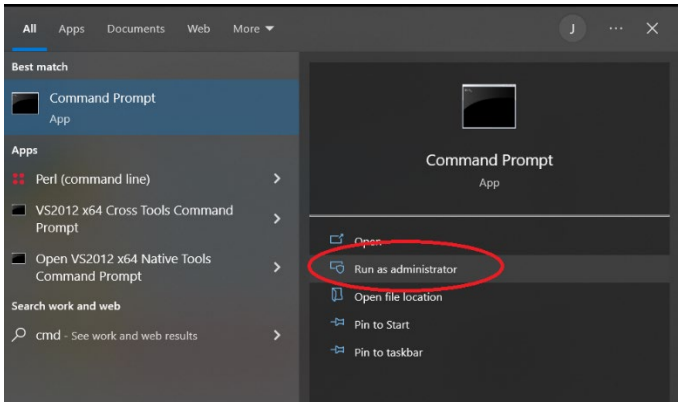
3. Find the file you downloaded in your downloads folder. Right click on it and select "**Run as administrator**"



4. Ensure both checkboxes are switched 'On' as shown below.

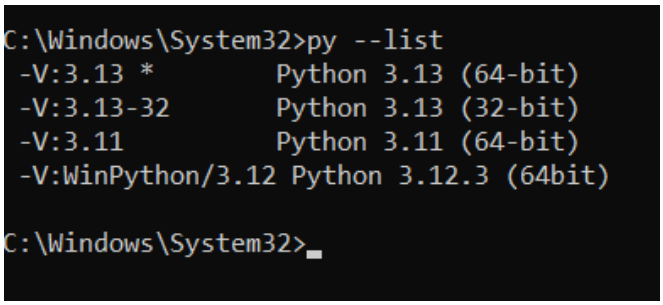


5. Press "**Install Now**"
6. Press the **Windows logo** key to open the Start menu, type **CMD**, and then click "**Run as administrator**"



7. Within the Windows Command Prompt, type `py --list`. This will list all versions of Python installed on your computer. `-V:` will be used to specify the version of Python you would like to run a command with.

   e.g. To run a command for version 3.13.2 (64-bit) you would use `py -V:3.13` before your command.



8. Type **`py -V:3.13 -m pip install pywin32`**. You may see a message telling you that a more recent version is available, this is not important.

9. We now need to register the Python interpreter as script engine. Within the cmd prompt window, change directory to this stated folder using the command **`cd C:\Users\%username%\AppData\Local\Programs\Python\Python313\Lib\site-packages\win32comext\axscript\client`**[1]

10. Run the command **`py -V:3.13 pyscript.py`**. You should see the message "Registered: Python".

11. Locate the following two Python scripts (that can be downloaded from the LUSAS website at https://www.lusas.com/user_area/documentation/technical_notes.html)

    a. **`Test_Modeller_from_Python.lpy`**

    b. **`Test_Python_from_Modeller.lpy`**

12. Make or locate a temporary folder, for example: **C:\temp**.

13. Copy the two scripts to that folder.

14. Change the working folder of the Windows Command Prompt window to that folder, e.g. type **`cd C:\temp`**.

15. Identify any correctly installed version of LUSAS. You should use the most recent you have.

    For example, if you have V22.0 installed, type this command:

    `py -V:3.13 .\Test_Modeller_from_Python.lpy "22.0"`

    Or use a similar command if you have some other version installed (you only need to do this once, even if you have many versions of LUSAS installed).

16. The script takes around 30 seconds to run. If it ran successfully, it will have created the file Python_test.mdl in your temporary folder and it should show a message similar to the one shown in the image below.

[1] If you cannot find this folder, follow these instructions to locate it:

1. Within the Windows Command Prompt window (ran as administrator), type **`python`** to start the Python interpreter.

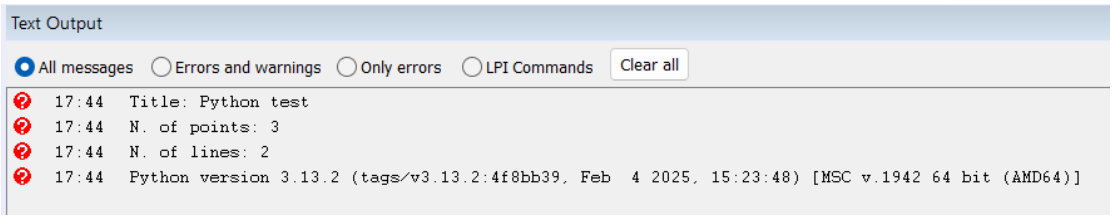
2. To find the Python installation folder, type the following command which prints the absolute path of the executable binary for the Python interpreter (this file is located in the installation folder).

   `import sys; print(sys.executable)`

5. Append **`Lib\site-packages\win32comext\axscript\client`** to the folder reported

```
C:\temp>py -V:3.13 Test_Modeller_from_Python.lpy "22.0"
Title: Python test
N. of points: 3
N. of lines: 2
Python version 3.13.2 (tags/v3.13.2:4f8bb39, Feb  4 2025, 15:23:48) [MSC v.1942 64 bit (AMD64)]
```

17. Start an instance of your chosen version of LUSAS Modeller normally.
18. In Modeller, open the file **Python_test.mdl** from your temporary folder.
19. In Modeller, run the script **Test_Python_from_Modeller.lpy**[1]. If the script ran successfully, the text output should look like that shown in the image below.

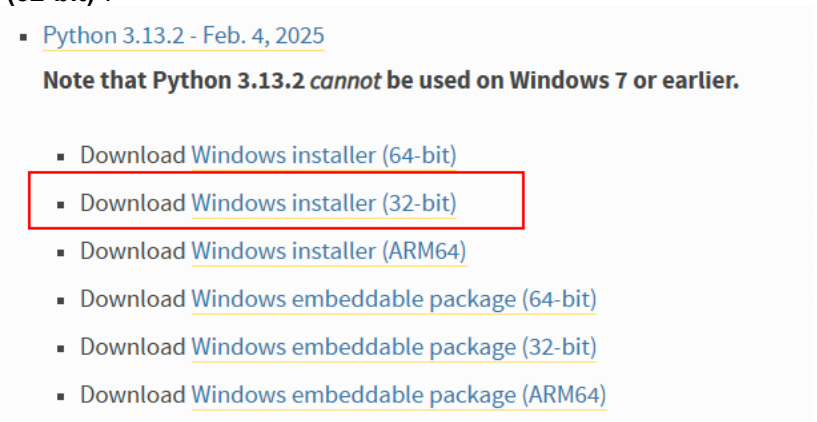


If you see these results, installation has been successful, and you are finished.

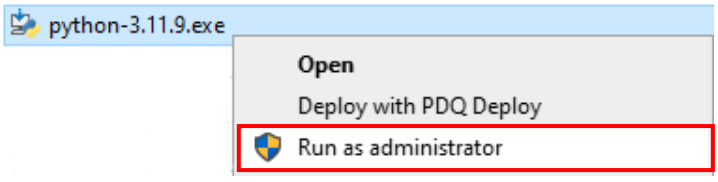
3. Python Installation (32-bit)

To install Python (32-bit), it is necessary to:

1. Go to www.python.org/downloads/windows.
2. Scroll down to find the section for your chosen version (3.13.2 is recommended and shown in the image below. Within that section, click on the link "**Download Windows Installer (32-bit)**".

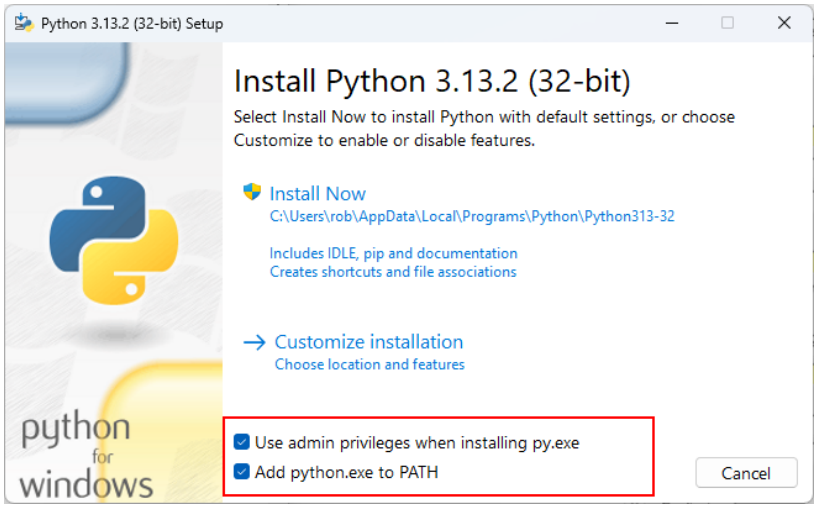


3. Find the file you downloaded in your downloads folder. Right click on it and "**Run as administrator**"

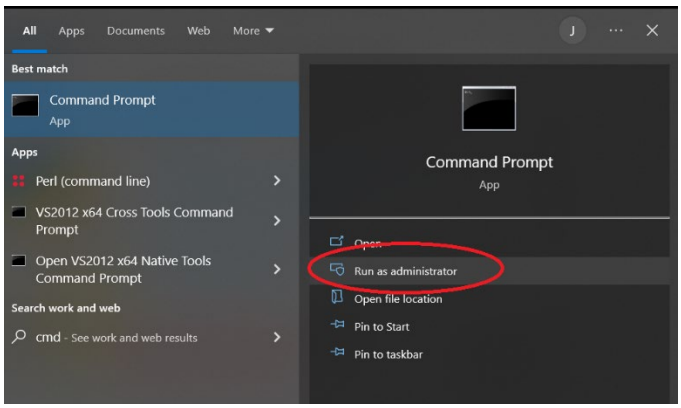


[1] V19.1 will not show lpy scripts by default in the file open dialog, but you can nonetheless type its name, and it should run successfully. V20.0 will show the file in the list.

4. Ensure both checkboxes are switched ‘On’ as shown below.

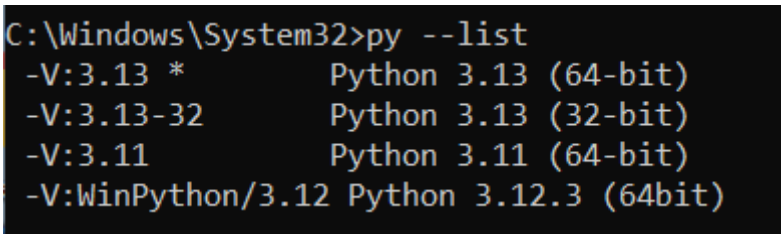


5. Press “**Install Now**”
6. Press the **Windows logo** key to open the Start menu, type **CMD**, and then click “**Run as administrator**”



7. Within the Windows Command Prompt, type `py --list`. This will list all versions of Python installed on your computer. `-V:` will be used to specify the version of Python you would like to run a command with.

   e.g. To run a command for version 3.13.2 (32-bit) you would use `py -V:3.13-32` before your command.



8. Type **`py -V:3.13-32 -m pip install pywin32`**. You may see a message telling you that a more recent version is available, this is not important.

9. Within the cmd prompt window, change directory to this stated folder using this command `cd` **`C:\Users\%username%\AppData\Local\Programs\Python\Python313-32\Lib\site-packages\win32comext\axscript\client`**[1]

10. Run the command **`py -V:3.13-32 pyscript.py`**. You should see the message "Registered: Python".

11. Locate the following two Python scripts (that can be downloaded from the LUSAS website at https://www.lusas.com/user_area/documentation/technical_notes.html)
    a. **`Test_Modeller_from_Python.lpy`**
    b. **`Test_Python_from_Modeller.lpy`**

12. Make or locate a temporary folder, for example: **C:\temp**.

13. Copy the two scripts to that folder.

14. Change the working folder of the Windows Command Prompt window to that folder, e.g. type **`cd C:\temp`**.

15. Identify any correctly installed version of LUSAS. You should use the most recent you have.

    For example, if you have V22.0 installed, type this command:
    `py -V:3.13-32 .\Test_Modeller_from_Python.lpy "22.0"`

    Or if you only have V21.1 installed, type this command:
    `py -V:3.13-32 .\Test_Modeller_from_Python.lpy "21.1"`

    Or type a similar command if you have some other version installed (you only need to do this once, even if you have many versions of LUSAS installed).

16. The script takes around 30 seconds to run. If it ran successfully, it will have created the file **Python_test.mdl** in your temporary folder and it should show a message similar to the one shown in the image below.

---

[1] If you cannot find this folder, follow these instructions to locate it:

1. Within the Windows Command Prompt window (ran as administrator), type **`python`** to start the Python interpreter.

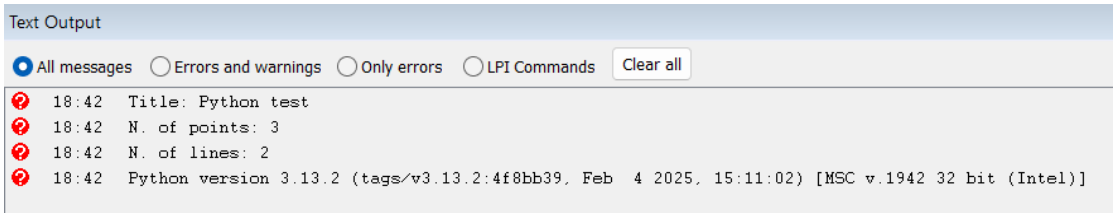
2. To find the Python installation folder, type the following command which prints the absolute path of the executable binary for the Python interpreter (this file is located in the installation folder).
   `import sys; print(sys.executable)`

5. Append **`Lib\site-packages\win32comext\axscript\client`** to the folder reported

```
C:\temp>py -V:3.11 .\Test_Modeller_from_Python.lpy "22.0"
Title: Python test
N. of points: 3
N. of lines: 2

C:\temp>
```

17. Start an instance of your chosen version of LUSAS Modeller normally.
18. In Modeller, open the file **Python_test.mdl** from your temporary folder.
19. In Modeller, run the script **Test_Python_from_Modeller.lpy**[1]. If the script ran successfully, the text output should look like that shown below.



If you see these results, installation has been successful, and you are finished.

[1] V19.1 will not show lpy scripts by default in the file open dialog, but you can nonetheless type its name, and it should run successfully. V20.0 will show the file in the list.