Contents

RflySim Platform Installation Tutorial

1.1. Check the computer configuration

1.1.1. General configuration

To be able to run the RflySim Toolchain, the following computer configurations are recommended:

- System: Windows 10/ Windows 11 x64 system (version ≥ 1809)
- CPU: Intel I5 10th generation processor and above, or AMD processor with equivalent performance
- Graphics: Intel integrated graphics UHD 620 and above, or equivalent AMD graphics
- Memory: Capacity 16G and above, frequency DDR3 1600MHz and above
- Hard disk: remaining capacity 40 G and above (solid state disk is recommended)
- Display: resolution 1080P (1920 * 1080) and above (dual-screen recommended)
- Interface: at least one USB Type A interface (expansion cable available)
- MATLAB: 2017b or above (2017b is recommended, Simulink and other toolboxes must be installed)

Note: The higher the computer configuration, the better. Low-profile computers can also run the Demo of this Toolchain, but there may be problems such as unstable control and poor experimental results. Please install MATLAB in advance.

Note: This Toolchain is more suitable for game books or game consoles. Professional servers and graphics workstations may suffer from jitter and stuttering.

Note: For users who only focus on Python for the development of upper control algorithms such as visual cluster, they can also directly use the exe one-click program below to install without installing MATLAB. This mode will not be able to use the underlying flight control development and cluster control functions related to MATLAB.

1.1.2. The underlying development configuration

The following configurations are recommended for low-level flight control development instead of visual algorithm development

- CPU: Intel I5 10th generation processor and above, or AMD processor with equivalent performance
- Graphics: Intel integrated graphics UHD 620 and above, or equivalent AMD graphics
- Memory: 8G and above

Reference configuration: None. Currently, the mainstream medium and high-end notebooks and desktops can run.

1.1.3. Optimal configuration

In order to smoothly run all routines of the Toolchain, smoothly run UE4/RflySim3D and UE5/RflySimUE5, support as many visual windows as possible for a single aircraft, and run as many cluster aircraft as possible, it is recommended to use the following configuration:

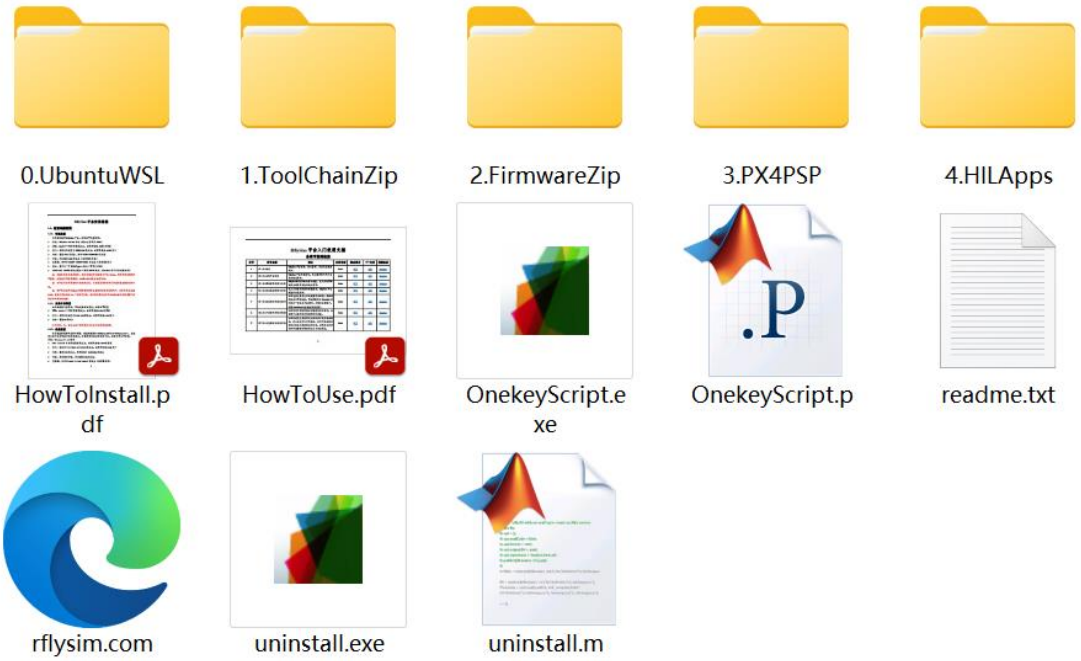
System: Windows 10/ Windows 11 x64 system (version ≥ 1809)

- CPU: Intel i9 12th generation processor and above, or AMD processor with equivalent performance
- Graphics: discrete NVIDIA GTX3080 and above, or equivalent AMD
- Memory: Capacity 32G and above, frequency DDR5 1600MHz and above
- Hard disk: High-speed solid state disk with remaining capacity of 80G and above
- Display: resolution 1080P (1920 * 1080) and above (dual-screen recommended)

Desktop reference configuration: Lenovo Saver Blade 9000K (i9-14900KF RTX4080 16g graphics card 32g DDR5 1TB SSD), https://item.jd.com/100070918986.html.

1.2. Install the package Get and Load

Obtain the installation package: Obtain the latest.iso image from the official channel (for example, the free version is RflySimAdvFree- * * *.iso, and the following * * * represents the version number). You can load the image with the right mouse button-Open Mode-Windows Explorer (or decompress it with decompression software, or load it with a virtual CD-ROM). O as to obtain the “installation package folder” shown in the right figure.



The key documents are as follows:

- HowTo Install. PDF: Installation method folder containing detailed installation methods.
- HowToUse. PDF: folder of operation manual, including detailed operation method and function index.
- Onekey Script. P: One-click installation script, with MATLAB installation mode, see Section below1.5for details.
- Onekey Script. Exe: One-click installation script, no MATLAB installation mode, see Section below1.11.1for details
- Uninstal l. M/uninstall. Exe: One-click uninstall script, with/without MATLAB installation mode.
- Readme. Txt: contains some considerations, and

Note: The free version and the full version of the image can be downloaded from the cloud disk in the https://rflysim.com/download by filling in the mailbox. Please consult the service@rflysim.com for the full download link and registration code. The link and password of the cloud disk we shared will not change, but the installation package inside will be updated frequently, so the update time of the installation package in the cloud disk is the version benchmark.

Scan the code to view the RflySim Toolchain video installation tutorial

1.3. Enable WSL Subsystem functions

1. For Win10 and Win 11 systems: It is recommended to use the WinWSL compiler. You need to perform the following operations first: Enable the WSL subsystem function: Double-click “0. Ubuntu WSL \ EnableWSL. Bat” script (first turn off the antivirus software to avoid interception), and click “Yes” in the “User Account Control” window. The WSL subsystem is automaticall y turned on.

Note: The first time the computer executes this command, you need to enter “Y” in the pop -up window and press Enter to confirm the installation and restart the computer. If this command i s not executed for the first time, the window will close automatically without restarting the comput er.

Note: If problems such as flashback occur, enter the wslconfig command in the CMD window to verify that the installation was successful. If the prompt command does not exist, it means that t he installation fails. Please try to close the antivirus software, and then try to open it manually acco rding to the process of “0. Ubuntu WSL \ readme. PDF” ”.

2. For Win7 systems (or if the WinWSL compiler installation fails, the full version is limited): only the Cygwin compiler can be used. Here you can skip the above steps and directly install the s cript page with one click later, and select "3" when entering "PX4 firmware compiler": Cygwin co mpiler, but software such as RflySimUE5 cannot be used on Win7 systems.

1.4. For the time being Turn off antivirus software (prevent blockin g)

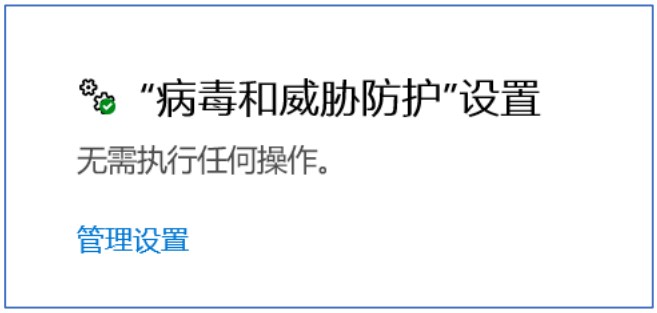
The RflySim Toolchain is green (runs only in folders and does not modify other files), offline (does not need to transfer files over the Internet), non-toxic and does not transfer any information from the user. However, the Toolchain involves a large amount of software and files, which may b e intercepted by anti-virus software, resulting in functional failure. Therefore, it is recommended t o temporarily turn off the antivirus software when installing the Toolchain to improve the installati on speed and avoid unpredictable errors caused by file interception.

There are two main aspects of work:

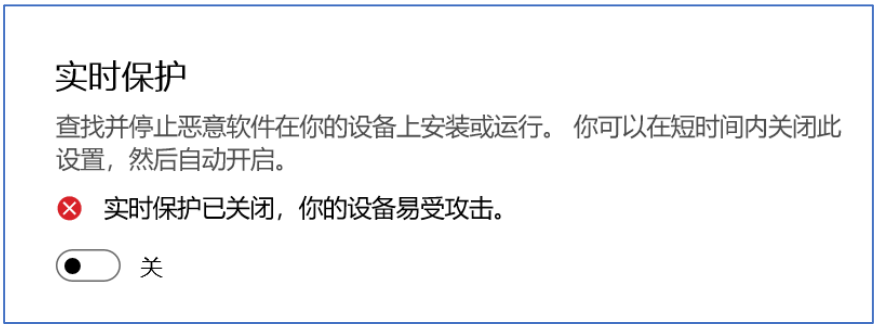
- Turn off real-time protection that comes with Windows.

Open Settings-Privacy and Security-Windows Security Center-Virus and Threat Protecti on

At this time, if third-party antivirus software is not installed, you can click “Management Se ttings”- “Real-time Protection”.



Set the switch to off



Note: If other anti-virus software is installed, the “Real-time Protection” closing box will not pop up. Press the following text to close the anti-virus software.

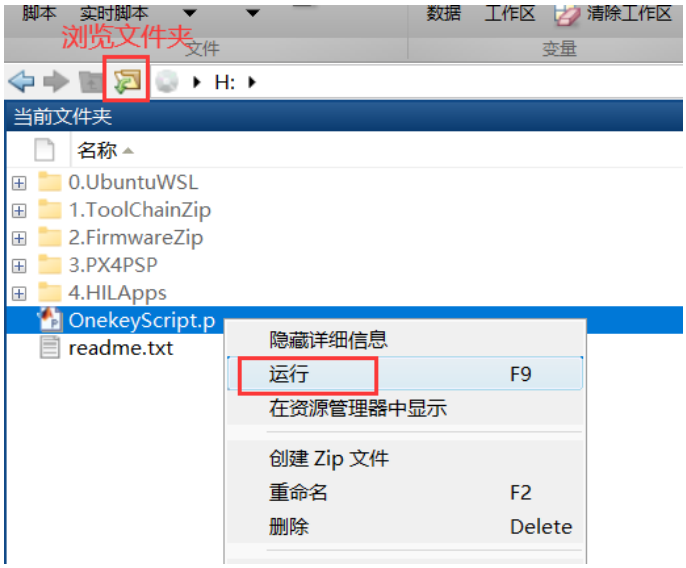
- Turn off other antivirus software (if installed). For example: Lenovo Computer Manager, Tinder, 360 Antivirus Guard/Computer Manager, Norton, etc. Turn off or uninstall the antivirus software yourself and make sure it is not running in the background.

1.5. One key Fully automatic installation

The Toolchain supports two installation methods:

- There is no MATLAB installation method, and the specific installation method is shown in Section below1.11.1. Suitable for users of Python-based visual or cluster algorithm development, unable to use the underlying flight control automatic code generation function.
- With MATLAB installation, you can enjoy all the functions of the platform.

This section focuses on the installation with MATLAB. Open any MATLAB version (greater than or equal to 2017 B), click the “Browse Folder” button on the main interface, locate the folder obtained by loading the ISO image, right-click to Onekey Script. P, and click the “Run” button (or enter the Onekey Script command in the window). If your related development work does not involve MATLAB software for the time being, you can also choose exe One-click installation of the installer .



Wait for the program to run. After the following interface pops up, you can confirm the specific installation settings. When installing for the first time, deploy the Toolchain to the system with one click (use the default configuration, select “Yes” for all), and then click “Confirm” to install the Toolchain with one click and complete all environment configurations.

Note: If it is a full paid version of the software, after running the one-click installation script, the serial number activation page will pop up. Please enter and verify the serial number as described in the following1.11.2section.

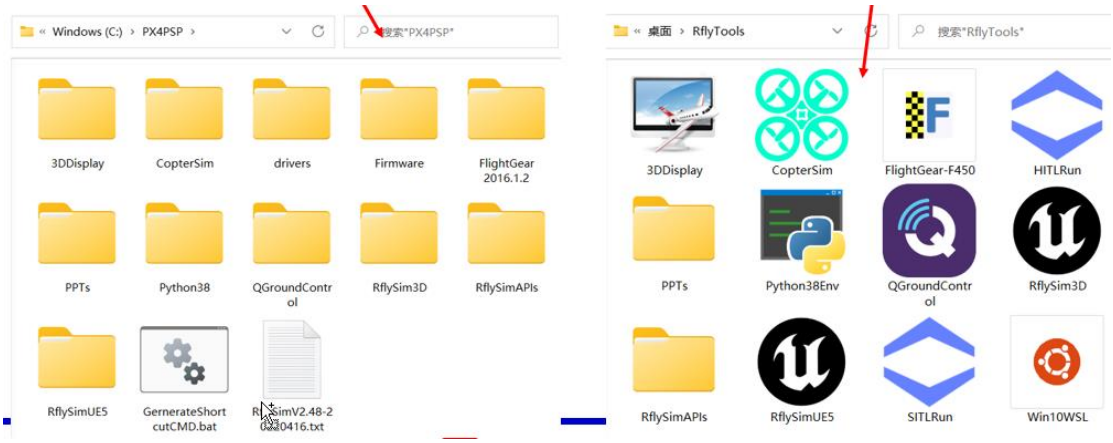
Click the picture to see the options of this interface. A detailed description

In subsequent use, run the installation script again to modify the compilation command, compiler, firmware version, restore software, etc. (Select “No” for items that do not need to be restored, and the configuration will be updated according to the situation to save time.) After downloading the new installation package, run the installation script directly (select “Automatic” to update the contents), and then click OK to start upgrading.

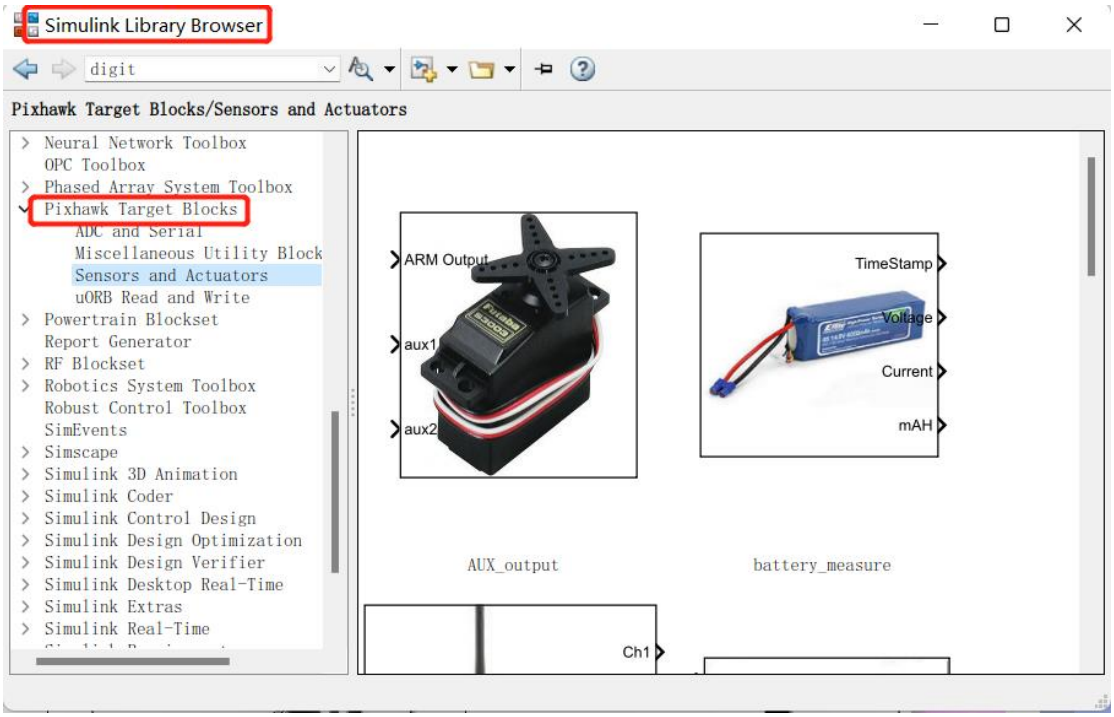
Note: For the meaning of each option and the detailed configuration method, please refer to Section below1.11.3.

1.6. Installation successful verification

1. As shown in the figure below, a series of folders can be obtained under the installation directory (C: \ PX4PSP by default), among which the “RflySimAPIs” folder is the most important interface tutorial folder for advanced functions. As shown in the figure below, a series of shortcuts can be found in the RflyTools folder on the desktop.

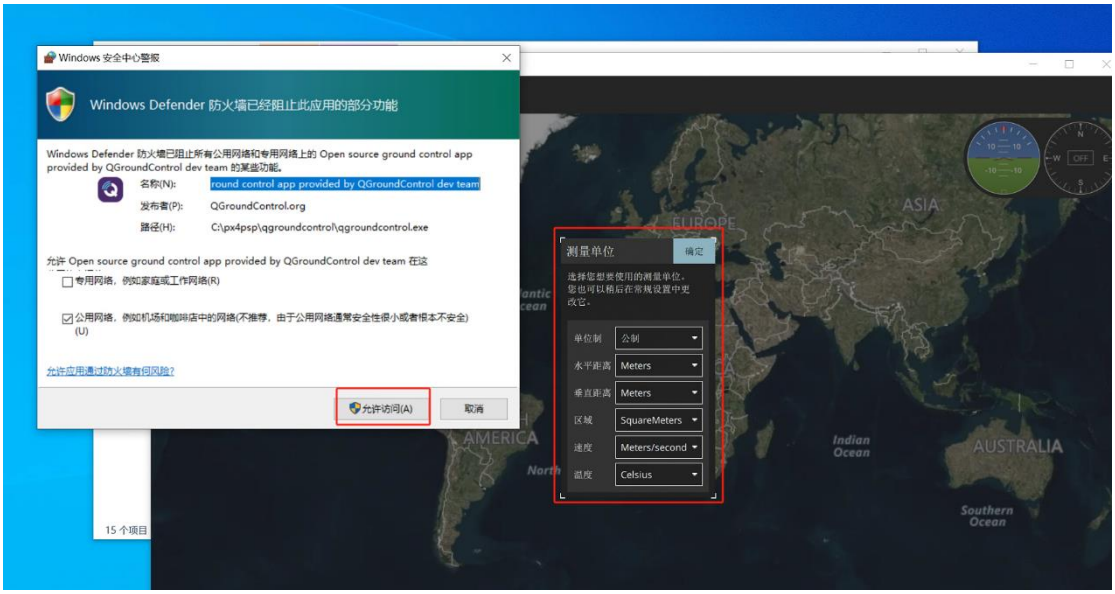


2. (This step can be omitted if the method is adopted exe One-click installation of the installer) Open MATLAB, create a new Simulink program arbitrarily, and enter the Library browser page. As shown in the figure below, you can see the toolbox of the Pixhawk Target Blocks, indicating that the installation is successful. This function is developed for the underlying flight control algorithm, supports Simulink to design the flight control algorithm, and generates the code to be uploaded to Pixhawk for hardware-in-the-loop simulation and real machine experiment.

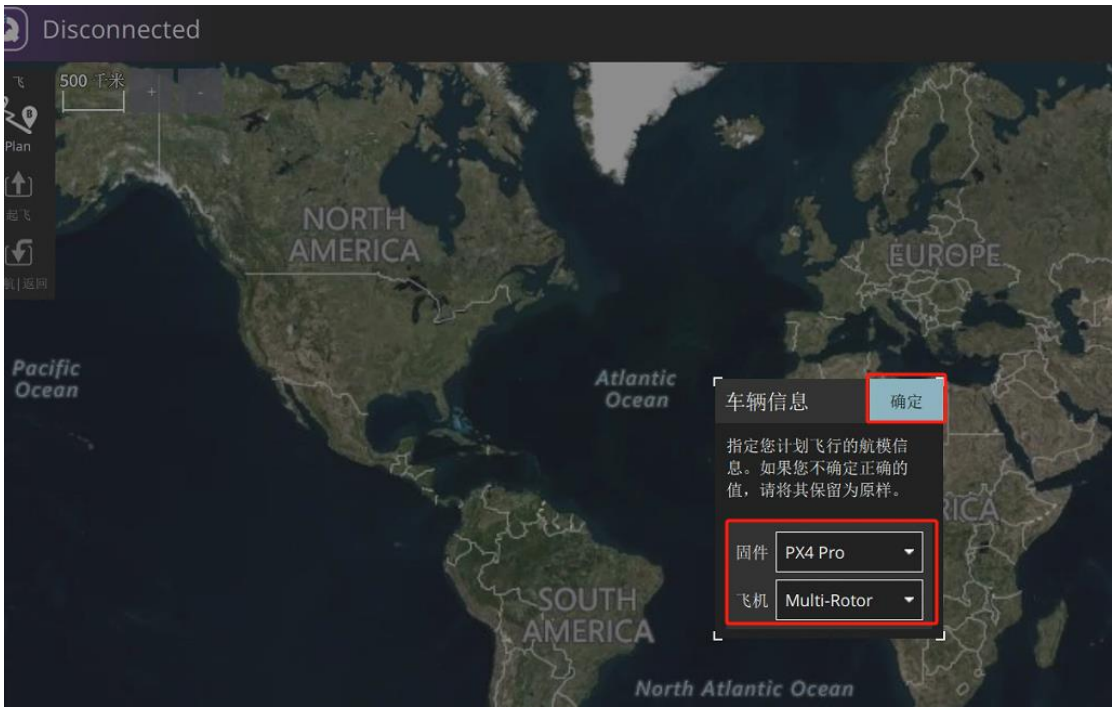


3. Enter the "RflyTools" folder on the desktop and double-click the shortcut of "QGroundControl". When the software is opened for the first time, the configuration selection window as shown in the following picture willpop up.

➢ If the firewall alarm is prompted,click Allow access, and the measurement unitis configr ed as shown in the following figure：

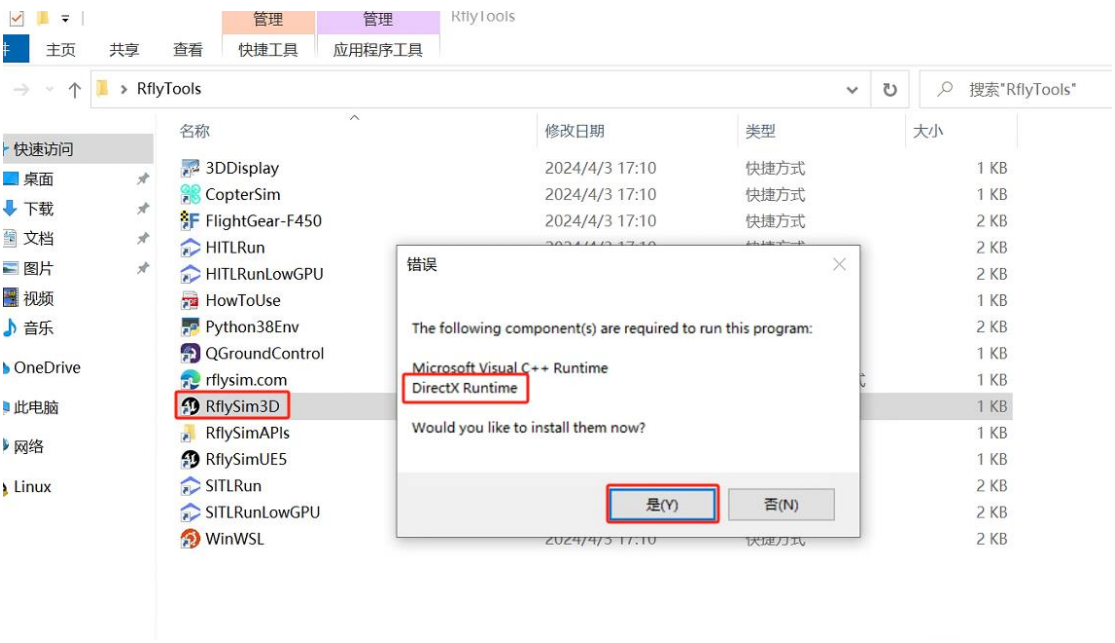


➢ The vehicle infommation is configured as shown in the following figure：

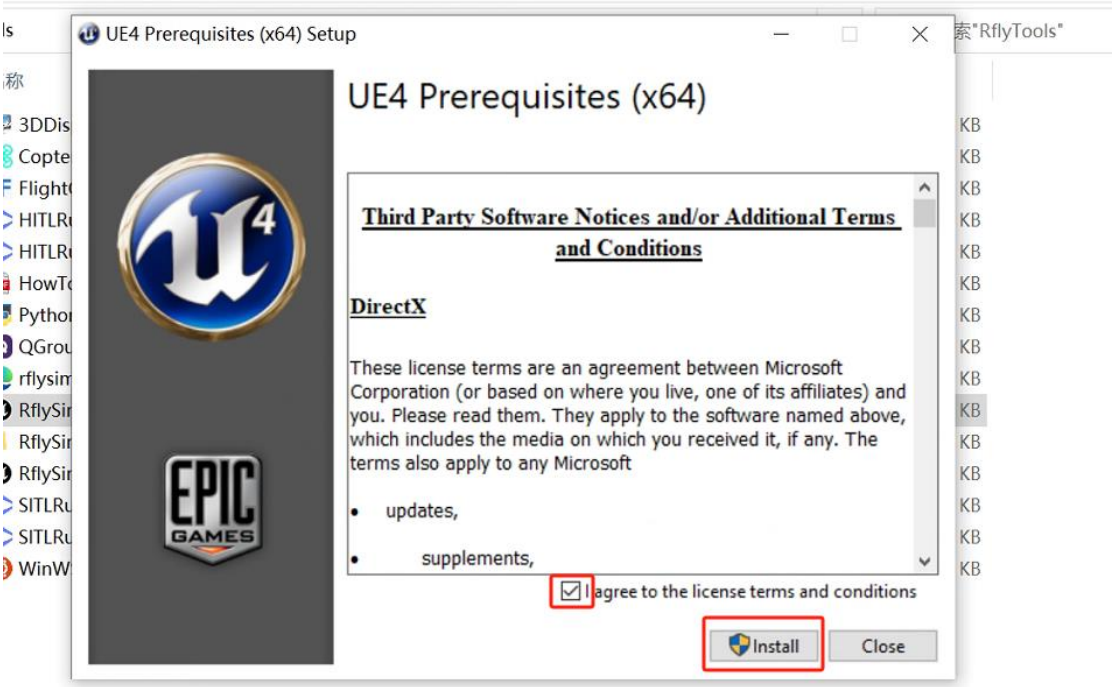


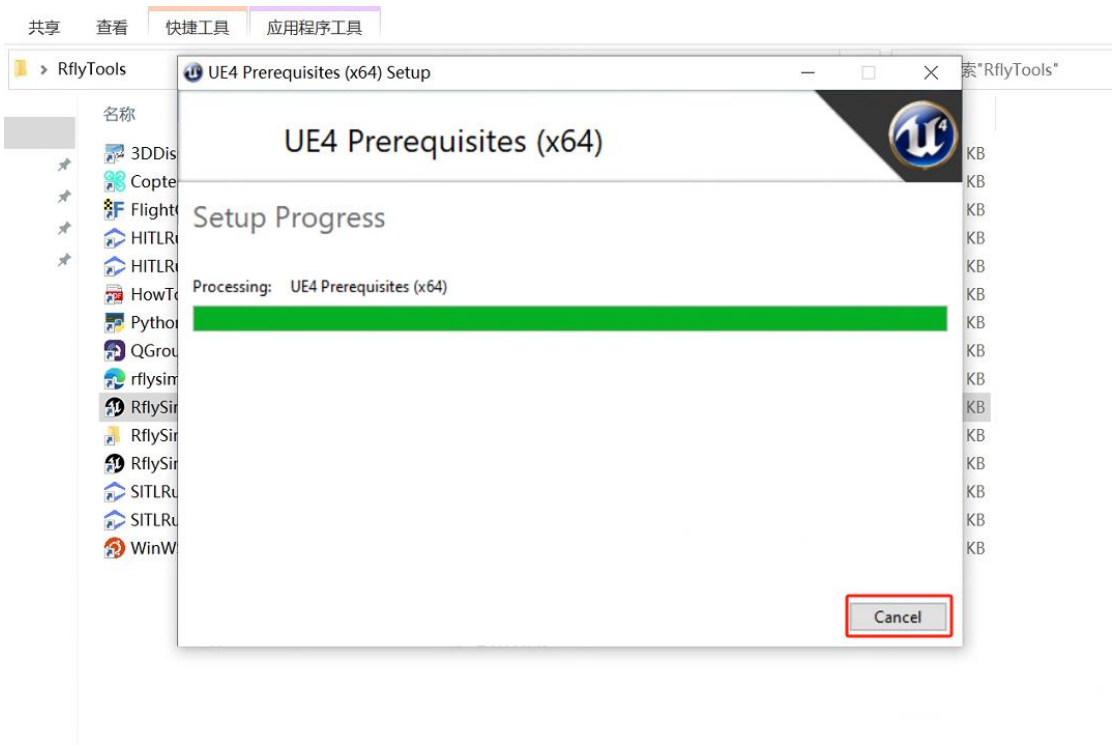
4. Go to the "RflyTools "folder on the desktop, double-click the "Rflysim3D" shortcut, and th en the option to install Directx will pop up, click OK, and run the installation accordingto the steps shown below.

➢ After running Rflysim3D software, the error window as shown in the following picture will b e displayed. click "Yes".



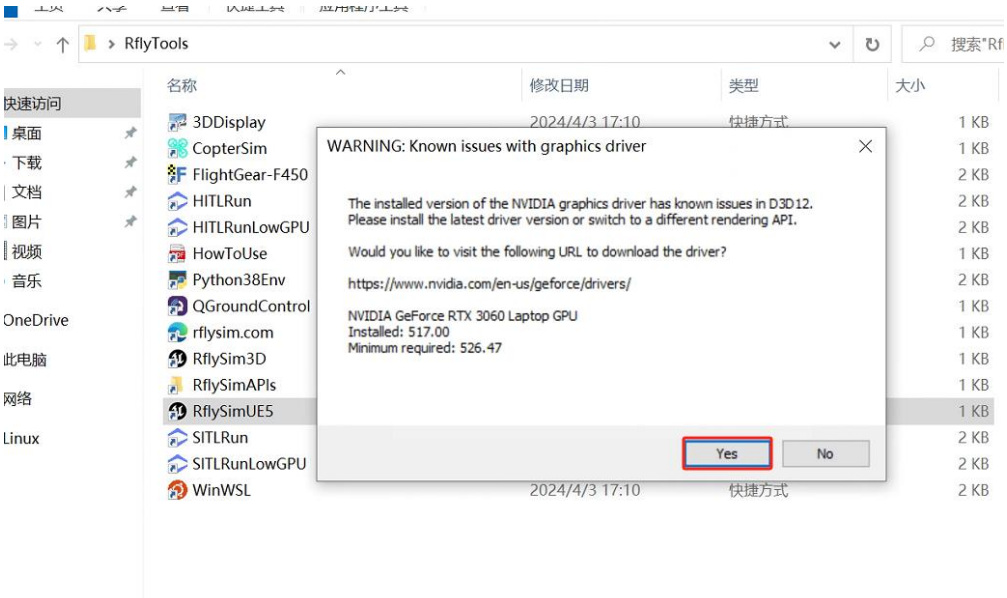
➢ Then click "Agree" in the pop-up installation window, then click "install" to wait for the com pletion of DirectX installation, and finally click "Finish"



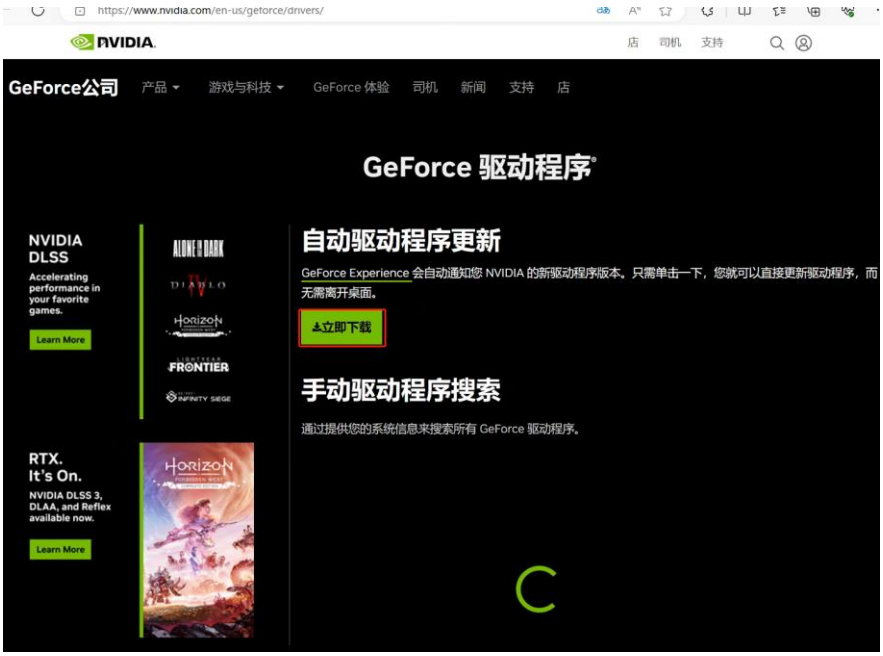


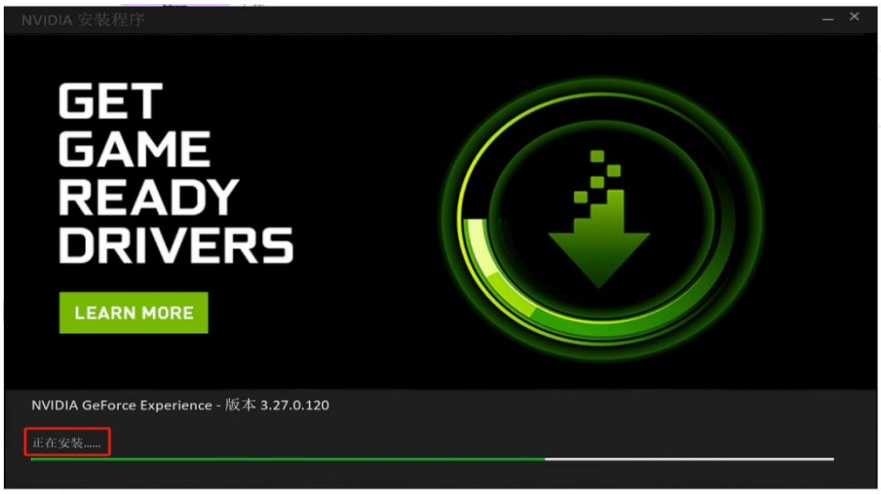
5. Go to the RflyTools folder on the desktop, double-click the RflySimUES shortcut, and a message is displayed indicating that you can update the graphics card driver in the following way: (Take the RTX3060 graphics card as an example)

- After running the RflySimUE5 software, a warning window as shown in the following figure will be displayed indicating that there is a problem with the installed graphics driver. click Yes as prompted to go to the official website of NVIDIA（https://www.nvidia.cn/geforce/drivers/）

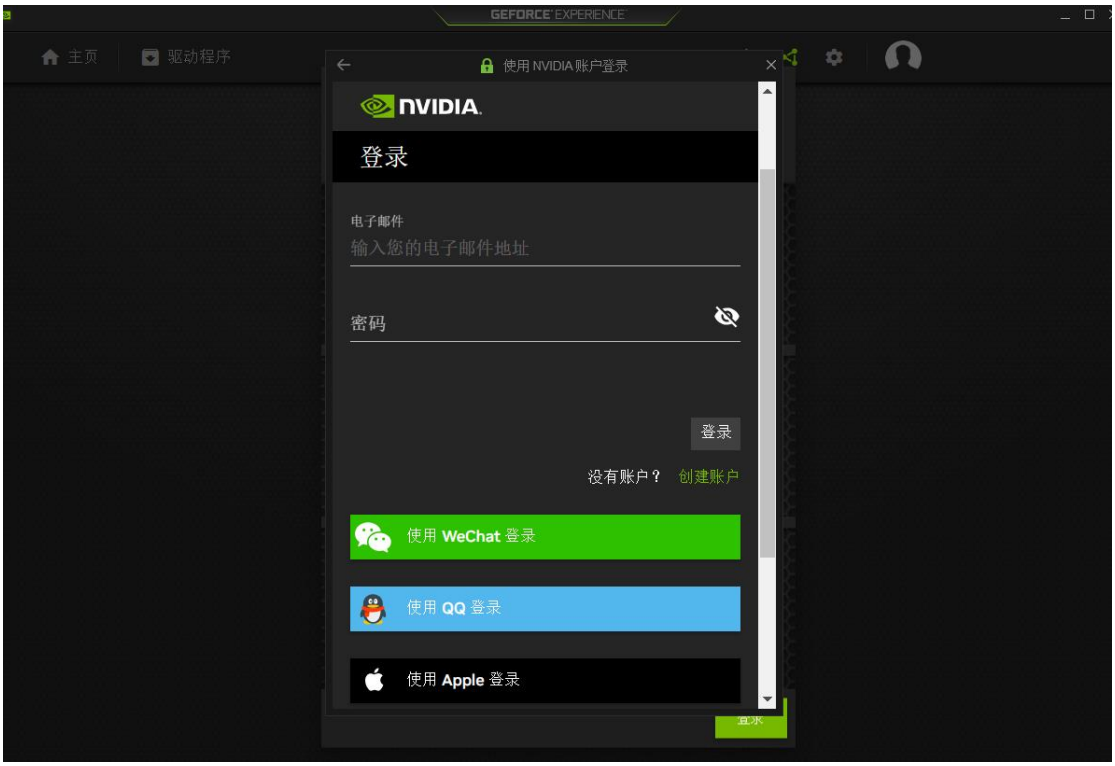


- Click Download Now, wait for the download to complete, and then complete the installation of NVDIA GeForce Experience.

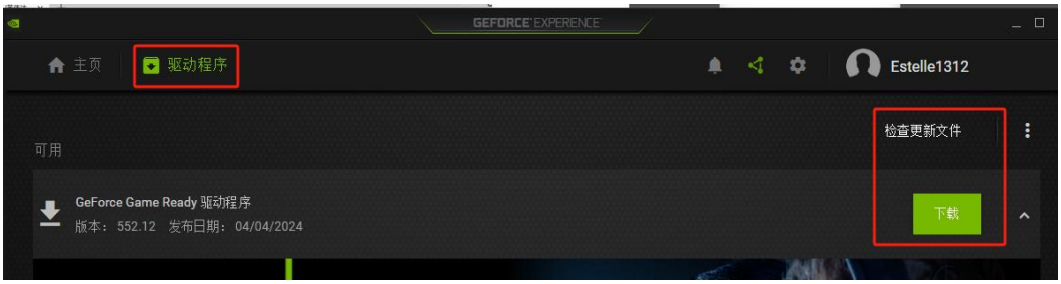


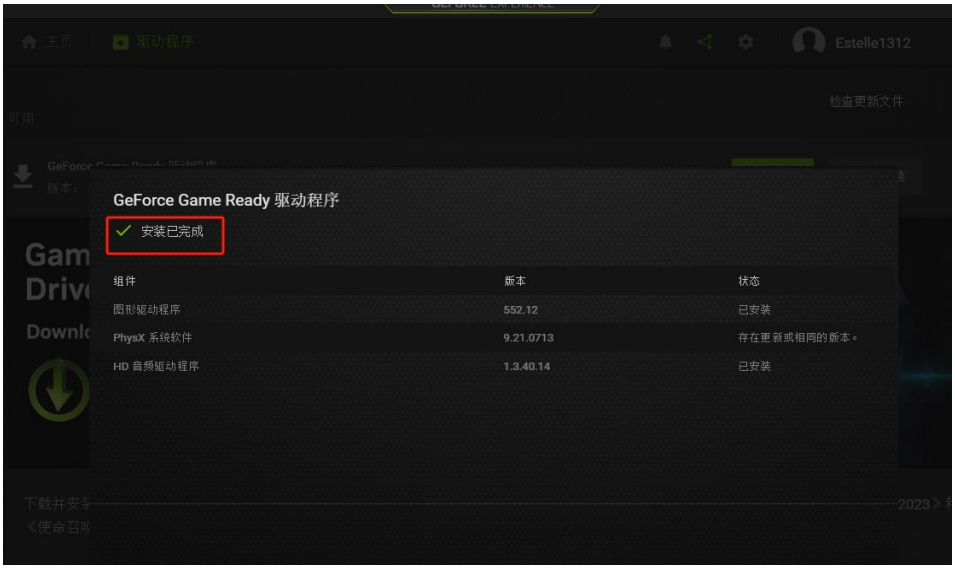


- Open the GeForce Experience app and follow the prompts to log in to your NVlDlA account (you can create an account using your own email)

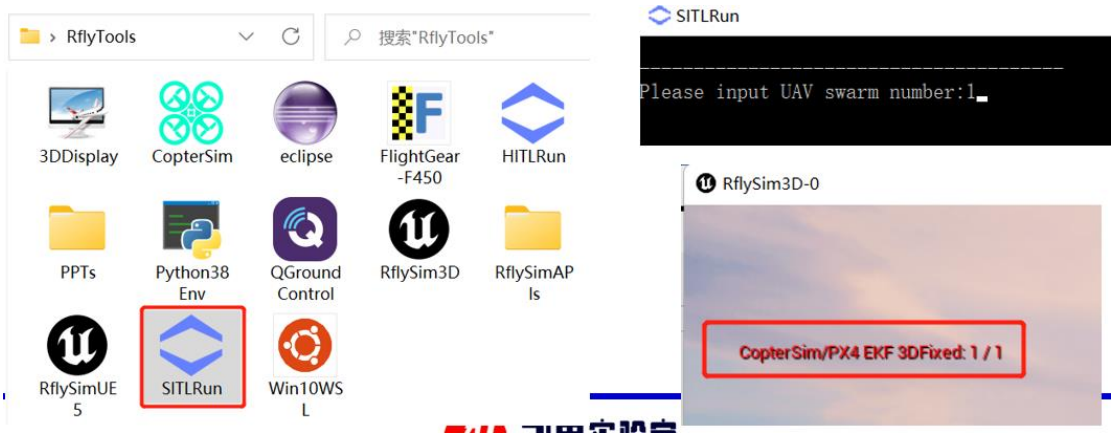


➢ Click the driver, and then click the upper right corer to check the update file, the latest driver will automatically pop up, click to download, and finally install, after the installation, restart t he computer.

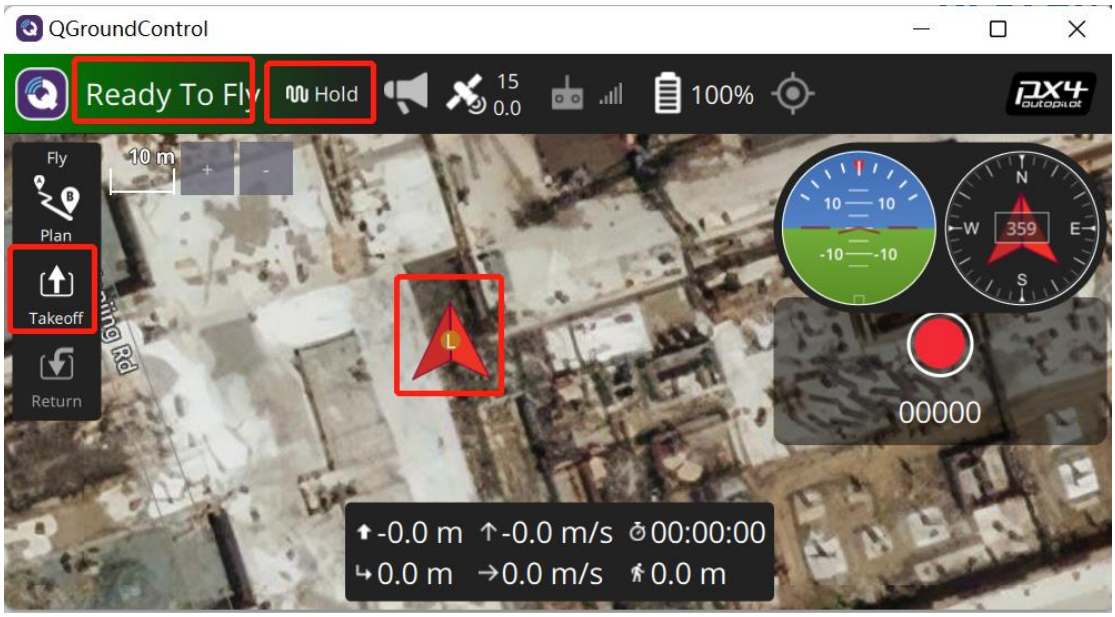




6. Go to the “RflyTools” folder on the desktop, double-click the “SITLRun” shortcut, enter 1, and press Enter. Wait until RflySim3D displays ”* * * EKF 3DFixed” (also displayed on CopterSim), indicating that the flight control has been initialized and autonomous flight can be controlled.

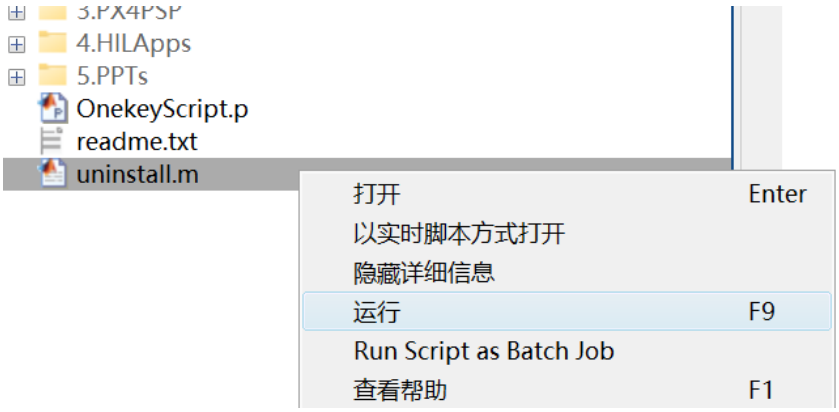


7. Enter the QGroundControl software, see that the aircraft enters the “Hold” mode, and click the “Takeoff” button. The confirmation slider will pop up, drag it to the far right and start the automatic takeoff. If the aircraft can take off from the ground, the Toolchain configuration is correct.



1.7. Toolchain software unloading method

- **Automatic uninstall: Use MATLAB to open the installation package directory and run the "uninstall. M" "script (for installation without MATLAB, please double-click to run the uninstall. Exe) to complete all the uninstall work.**
- Manual uninstallation: including the following process (check the notes in the uninstall. M)
  1. Delete the shortcut shown in RflyTools on the desktop;
  2. Delete the [Documentation] \ MATLAB \ Add-Ons \ Toolboxes \ PX4PSP folder.
  3. Edit the MATLAB "pathdef. M" to find and delete the remaining PX4PSP path entries;
  4. Uninstall the Ubuntu 18.04 LTS program on a Windows system.
  5. Delete temporary directories such as QGroundControl and FlightGear under the [Document] directory
  6. Delete the local temporary Cesium map directory for RflyMaps
  7. Note: The file sn6.txt such as the serial number is stored in the [Document] \ Ogre directory, and the full version will be retained.
  8. Delete all files and subfolders within the installation directory (default "C: \ PX4PSP") folder

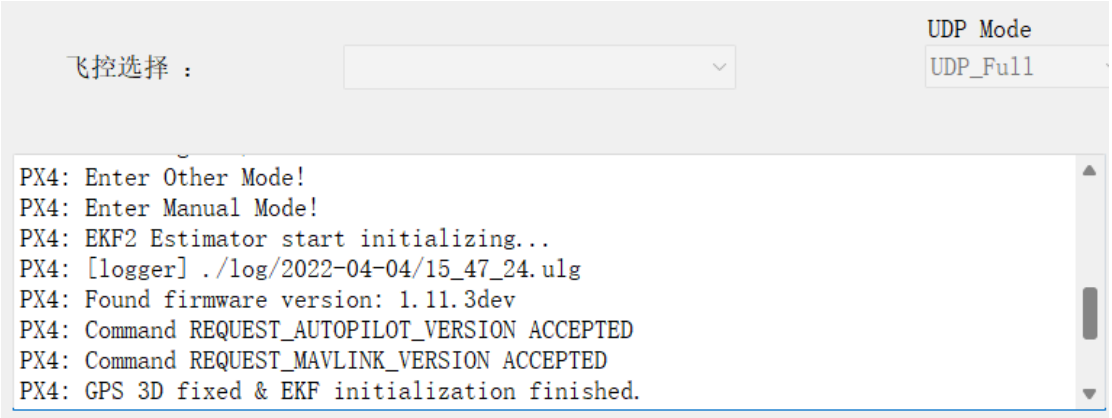


1.8. Troubleshooting Toolchain Installation

If the screen is blue, the simulation is not possible, or the takeoff is not possible, confirm the following points:

- If there are problems such as slow compilation, blue screen during compilation, unable to connect to QGC during SITL, unable to control the aircraft by Offboard, and unable to connect to the LAN computer, please confirm that the computer antivirus software (such as Lenovo Computer Manager, Tinder, 360 Antivirus/Security Guard, Tencent Computer Manager, etc.) Is completely closed or uninstalled. And turn off Windows 10's real-time protection!

- In the SITLRun command line window, check whether the command reports an error and confirm that the px4 _ sitl software controller runs successfully.
- On the CopterSim page, the message box displays the words “3D Fixed” to ensure that the aircraft model is properly initialized and connected to the flight control.
- Re-run the one-click installation script and enter the configuration page to confirm that the firmware version is ≥ PX4 1.10 and the compiler is WinWSL.
- If you still cannot take off, please post a picture and a description of the problem on the https://github.com/RflySim/RflyExpCode/issues.
- If there is a file occupation error in MATLAB during installation, first try to restart and reopen MATLAB to install. If it cannot be solved, please uninstall and reinstall.



For users with low computer configuration and flight simulation jitter, you can first try to right-click to run bat script in administrator mode. Second, you can try running the PX4PSP \ RflySim APIs \ SITLRunLowGPU. Bat to enable the first performance 3D cause mode. If it can run smoothly in LowGPU mode, for some subsequent experimental bat scripts, you can compile and find the UE4 _ MAP variable, set it as LowGPU map, and enable the simple 3D engine to observe the effect.

1.9. Start using Toolchain

Read the [Installation Directory] \ RflySimAPIs \ HowToUse.pdf file or visit thehttps://rflysim.com/website to learn how to use the Toolchain.

RflySim Toolchain involves three-dimensional scene construction of unmanned system development, dynamic model establishment of unmanned system, bottom control, intelligent perception, health assessment, network simulation, cluster control and so on. As shown in the following table, it is a detailed description of each subfolder in the ” [Installation Directory] \ PX4PSP \ RflySim APIs” folder.

Table 1 Retrieval of each lecture under the RflySimAPIs directory

Serial number	Chapter name	Introduction	Folder
1	Lecture 1 Introduction	This lecture focuses on the introduction, version differences, installation and features of the RflySim Toolchain.	1.RflySimIntro
2	Lecture 2 Experimental platform configuration	This lecture mainly describes the configuration process of RflySim Toolchain, the use of core components and the experimental process.	2.RflySimUsage
3	Lecture 3 3D scene modeling and simulation	This lecture mainly describes the architecture and functions of RflySim3D software, the use of 3D modeling and scene development software, and the interface of RflySim Toolchain.	3.RflySim3DUE
4	Lecture 4 Modeling and Simulation of Vehicle Motion	This lecture mainly describes the building of the unmanned vehicle control model, the RflySim Toolchain model import interface and steps to help readers understand the basic theory of unmanned system modeling.	4.RflySimModel
5	Lecture 5 Pose control and filtering estimation	This lecture contains a large number of low-level development routines for unmanned systems, provides code generation and download functions, and can generate PX4 firmware from the designed Simulink control algorithm with one key and burn it into the autopilot. Realize the basic experimental process of Sim2Real.	5.RflySimFlyCtrl
6	Lecture 6 External Control and Trajectory Planning	This lecture focuses on the external control interface developed by the unmanned system to send commands to the agent to achieve the upper control functions such as trajectory planning.	6.RflySimExtCtrl
7	Lecture 7 Safety Testing and Health Assessment	This lecture mainly focuses on the process from software unit and integration verification, embedded software and hardware verification, software and hardware integration verification to overall integration and test verification in the development of unmanned system. Implement fault injection and safety testing for all the above development phases.	7.RflySimPHM
8	Lecture 8 Visual Perception and Obstacle Avoidance Decision	This lecture focuses on the vision sensor and related theories, such as the carrier and the coordinate system of each sensor, common sensors for vision control, etc., and introduces	8.RflySimVision

		the environment configuration of Linux, ROS, MAVROS and other related vision development and the vision interface of RflySim Toolchain.	
9	Lecture 9 Communication Protocol and Cluster Networking	This lecture mainly describes the mode and current situation of unmanned system networking, the system architecture of trunking communication in RflySim Toolchain, and the simulation routine of unmanned system networking.	9.RflySimComm
10	Lecture 10 Cluster Control and Game Confrontation	This lecture mainly focuses on the development of multi-agent unmanned system cluster control, introduces cluster formation, mission planning, game and other technologies, and focuses on the distributed control framework of UAV cluster system based on RflySim Toolchain and the cluster control interface based on MATLAB/Python. It provides multi-UAV mission planning based on ant algorithm, multi-UAV formation, curve pipeline control, large-scale UAV cluster control and other cases to help readers understand the principle and implementation of cluster control.	10.RflySimSwarm

At the same time, the internal structure of the routine folder of each lecture is shown in the following table. There are different difficulty experiments in different folders to help users learn the relevant content of this lecture step by step.

Serial number	**Name**	**Folders/Files**
1	Base Interface Routine Folder	0.ApiExps
2	Base Instance Folder	1.BasicExps
3	Advanced routines folder	2.AdvExps
4	Custom Routine Folder (Full Version Only)	3.CustExps
5	This lecture introduces the document.	Intro.pdf
6	Interface description document of this lecture	API.pdf
7	Courseware files for this lecture	PPT.pdf
8	All routines in this lesson retrieve files.	Index.pdf

Note: Please refer to the introduction in Lesson 1 “1. RflySimIntro” for the recommendation and configuration of teaching AIDS.

1.10. Toolchain version differences

The RflySim Toolchain is currently available in three versions: free, full, and enterprise (consu lt service@rflysim.com).

- Free version: support up to 8 aircrafts (hardware and software in-loop simulation of 8 airc rafts); support visual board in-loop simulation of 1 aircraft. Note: When the CopterID of C opterSim is 1, the LAN communication mode can be enabled to support the virtual machi ne or NX board to realize visual in-the-loop simulation; with DLL dynamic models such a s helicopter, vertical aircraft and underwater vehicle, the software and hardware in-the-loo p simulation at the task level can be carried out, but the model source code is not provided. The Go Online button is not supported. Messages cannot be sent to the LAN. It can only be simulated by a single computer, and does not support distributed multi-computer netwo rking to form large-scale cluster simulation. Advanced simulation modes such as HITL _ NET are not supported, and it is impossible to connect Pixhawk (for example, 6x) with a n etwork port in the LAN or a third-party flight control for hardware-in-the-loop simulation.
- Full version: Retain all functions of RflySim. RflySim3D supports receiving LAN data (o ff by default, on selectively) and generating infrared images. CopterSim supports online m ode (UDP mode, small-scale distributed simulation) and does not support Redis communi cation protocol. No support for RflySimCloud large-scale cluster framework (for large-sca le distributed cluster simulation) No support for LOGO replacement or masking (for enter prise customization) with UDP-based distributed visual cluster simulation routines, digital twin routines, etc.
- Enterprise customized version: CopterSim and RflySim3D support hidden or customized LOGO; support multi-computer distributed networking architecture large-scale cluster sim ulation; support Redis communication protocol (for large-scale distributed cluster simulati on). Customized large-scale advanced routines (helicopter, tilt-rotor, multi-aircraft cluster experiments, etc.); support Windows high-performance computers or Linux servers for de ployment (RflySimCloud cloud platform); FPGA-based ultra-high real-time hardware-in-t he-loop simulation Toolchain (support flight control such as Ardupilot).

More differences between versions can be found in: https://rflysim.com/doc/zh/RflySimAPIs/1.RflySimIntro/RflysimVersions.pdf

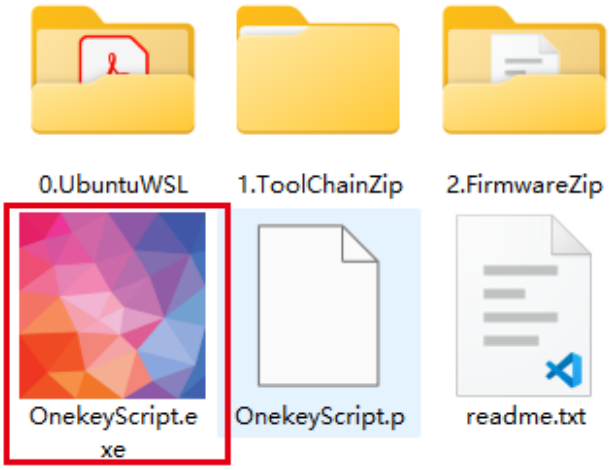
1.11. Other settings

1.11.1. One-click installation script (without MATLAB installation)

Because MATLAB needs to take up a lot of space, users who mainly use Python to develop u pper algorithms such as stand-alone, vision, cluster and communication can also use exe installatio

n program to install without installing MATLAB. The steps are as follows:

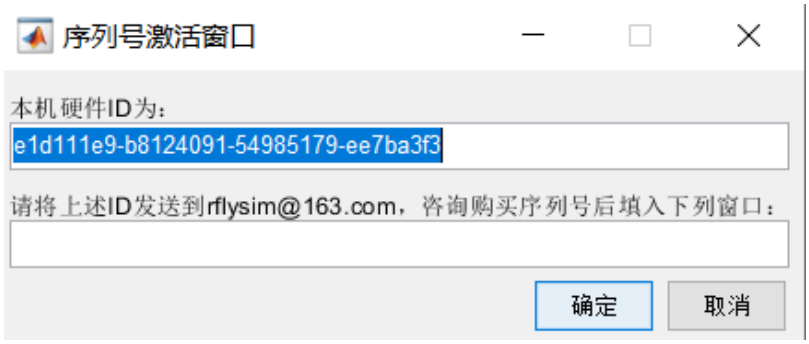
First download and install the MATLAB runtime file MCR _ R2017b _ win64:https://pan.baidu.com/s/1vVNJLtFIQg7fDrV4p0OeUg?pwd=yzdw. Double-click the Onekey Script. Exe “file in the installation package to pop up the installation interface



Note: This method cannot install MATLAB-related functions such as the automatic code generation toolbox, so it does not support the development of underlying control algorithms, DLL model generation, Simulink cluster control, etc.

1.11.2. Full Version Installation Serial Number Entry

The full version will pop up the activation page, get the serial number and enter it. The experience version will not pop up the activation window without entering the serial number!



Then the installation page as shown in the right figure will pop up (please close the antivirus software according to the readme. Txt in the installation package before installation).

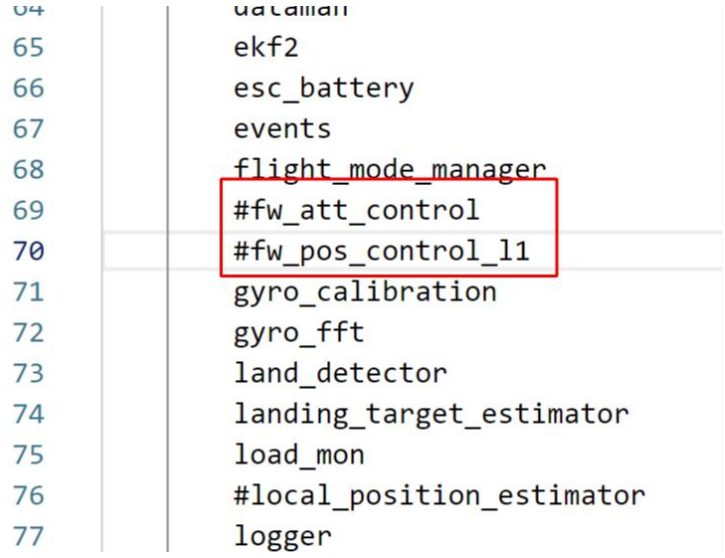
1.11.3. Detailed description of one-click installation script

1. Toolkit installation path. All the dependent files of this Toolchain will be installed in this path, which requires about 20 gigabytes of space. The default installation path is “C:\PX4PSP”.

If there is not enough space on the C drive, you can choose a path under another drive letter. Note: The path name must be correct, and only the pure English path can be used, otherwise the compilation will fail.

2. PX4 Firmware Compile Command. It mainly corresponds to the development requirements of the underlying controller and uses the code generation function. It is necessary to select the compilation command according to the flight control hardware (Note: the user does not need to configure the top-level vision and cluster algorithm development, and it is enough to keep the default). The default is "droneyee _ zyfc-H7 _ default" corresponds to Zhuoyi H7 autopilot". In addition, the Toolchain will support the following three flight controllers for a long time: Pixhawk V6X compilation command: px4_fmu-v6x_default ; Pixhawk V6C compilation command: px4 _ fmu-v6c _ default; The Pixhawk 1 compilation command is: px4 _ fmu -v3 _ default. For more flight control compilation instructions, please see:https://doc.rflysim.com/hardware.html. Note: After the first installation is completed, in addition to re-running this installation script, there is another way to change different compilation commands (for example, px4 _ fmu-v3 _ default) for different Pixhawk hardware boards. Just enter the command in MATLAB: PX4CMD ('px4 _ fmu-v3 _ default') or use the command: PX4CMD px4 _ fmu-v3 _ default.

Note: If the underlying controller designed by the user is too complex and the amount of code is too large, an error overflow (firmware size overflow) may be reported during compilation. In this case, the user needs to manually find the compiled file (for example, Firmware \ boards \ px4 \ fmu-v6x \ default. Cmake, note that version 1.14 starts with the.px4board suffix), and then manually delete or comment out the unwanted modules with # to reduce the size of the firmware. Deletion method: If you do multi-rotor development, you can delete the fixed-wing module starting with FW.



The Toolchain also provides an automatic shielding method, which only needs to add "# at t

he place where the script compilation command is input; The code of “model abbreviation” is e nough. Code abbreviations include

- MC: Multi-rotor development mode. Other irrelevant modules such as FW, votl, rover a nd uuv will be shielded to reduce the size of firmware.
- FW: Fixed wing development mode. Other irrelevant modules will be shielded to reduce the size of the firmware.
- VTOL: vertical development mode. Other irrelevant modules will be shielded to reduce the size of the firmware.
- Rover: Unmanned vehicle/ship development mode. Other irrelevant modules will be shi elded to reduce the size of the firmware.
- Uuv: Underwater vehicle development mode. Other irrelevant modules will be shielded to reduce the size of the firmware.

For example

```
Multi-rotor bottom layer development, using the following command
px4_fmu-v6x_default;mc
```

The command effect is shown in the following figure.

3. PX4 firmware version. The PX4 source code is updated every year, and the latest firmwar e version is 1.14. With the upgrade of firmware version, the functions will gradually increase and more new products will be supported, but the compatibility with some old autopilot hardware will become worse. It is recommended to use Zhuoyi H7 flight control in this experimental course, the corresponding compilation instruction is “droneyee _ zyfc-H7 _ default” ”, and the selected fir mware version is PX4-1.12.3.

4. PX4 Firmware Compiler. Because the compilation of PX4 source code depends on the Li nux compilation environment and related components, this Toolchain provides three sets of compil ation environments to simulate the Linux compilation environment under the Windows platform. T hey are: Windows Subsystem for Linux (WSL) based compilation environment WinWSL compiler, Msys2-based Msys2Toolchain compilation environment and Cygwin-based CygwinToolchain co mpiler. Note that if you need to compile firmware above PX4-1.8 version, you need to select Cygw inToolchain compiler; for firmware version ⩽ PX4-1.8, you can choose Msys2Toolchain compile r. The local compiler based on Msys2 or Cygwin is easy to deploy and supports PX4 firmware com pilation in Win7 system, but RflySimUE5 and other software can not be used in Win7 system, so t he compilation efficiency is low. For Windows10 1903 and above, it is recommended to install Wi

nWSL compiler, which can greatly speed up the compilation speed and is compatible with all versi ons of PX4 flight control firmware.

5. Do you want to install the PSP Toolbox from scratch. If this option is set to Yes, the PSP Toolbox is installed in the local MATLAB software. If the PSP Toolbox is already installed, a fres h installation of the PSP Toolbox is performed. If you select No, the script does not make any chan ges to the PSP toolkit (it does not uninstall the installed PSP toolkit or other actions).

Note: You can also select “Automatic”, which will only update the change file and improve the installation time.

6. Do a clean install of other dependent packages. If this option is set to “Yes”, software such as QGC Ground Station, CopterSim, 3DDisplay will be deployed on the set installation path, relevant drivers for Pixhawk hardware will be installed, and shortcuts for these software will be ge nerated on the desktop. If the relevant dependent software has been deployed on the installation pa th, selecting “Yes” will delete the old installation package and perform a new reinstallation. If th is option is set to No, no changes are made.

Note: You can also select “Automatic”, which will only update the change file and improve the installation time.

7. Whether the firmware compiler compilation environment is newly configured. If this o ption is set to Yes, the selected compiler (WinWSL, CygwinToolchain, or Msys2Toolchain) is depl oyed to the set installation path. If the environment already exists, the old compilation environmen t is cleaned up, restored, and deployed fresh. Conversely, if the option is set to No, no change is m ade.

Note: You can also select “Automatic”, which will only update the change file and improve the installation time.

Note: PX4 firmware compilation under Win7 system is supported, but software such as RflyS imUE5 cannot be used under Win7 system.

8. Whether to deploy the PX4 firmware code from scratch. If this option is set to Yes, the selected PX4 Firmware source code is deployed to the specified installation path. If firmware exist s, the old firmware folder is deleted and a fresh deployment is made. If this option is set to No, no changes are made.

Note: You can also select “Automatic”, which will only update the change file and improve the installation time.

9. Whether to compile a new firmware. If this option is set to Yes, the deployment firmware will be pre-compiled, which can greatly save the time of subsequent code generation and compilat

ion, and can detect whether the environment installation is normal. If this option is set to No, no changes are made.

Note: You can also select “Automatic”, which will only update the change file and improve the installation time.

10. Whether to shield the controller output of PX4 itself. If this option is set to “Yes”, the control signal of the motor in Firmware will be shielded to prevent conflict with the generated code (Note: this option will not shield the output of the PX4 _ SITL controller, so software in-the-loop simulation can be performed normally). If “No” is selected, the firmware output will not be masked and can be used to test the control algorithm included in PX4. Therefore, if you want to generate the official firmware, please select “No” for this option.

Note: You can also select “Automatic”, which will only update the change file and improve the installation time.

Note: You can also optionally enter actuator _ controls _ 0 here to mask only this uORB message. This method can replace the default PX4IO motor output replacement mode, and support the creation of control routines with a wider range of applications (support PX4FMU output, support DShot, and support various vehicles). The usage method is as follows:

See Routine for details: RflySimAPIs\5.RflySimFlyCtrl\0.ApiExps\15.Ctrls0Output\readme.pdf

Note: You can also enter an xlsx file here to replace the specified file, or to replace the string in it, to achieve a more free code masking method. Through the code masking function, we can mask the specific module of PX4, such as the output of the position controller, and then send the corresponding message to realize the replacement of PX4 function.

See Routine for details: RflySimAPIs\5.RflySimFlyCtrl\2.AdvExps\e0_AdvApiExps\1.CusMaskPX4Code\Readme.pdf

1.12. Other considerations

1. If you encounter any problems during installation, please try to close or uninstall the antivirus software of the computer (or ensure that it is completely closed in the task manager). If it is a W

in10 system, please close the real-time protection function of the system, and then run “4.HILAp ps \ MSVCP _ 2019.07.20 _ X64.exe” to repair it. After restarting the computer, Run this script a gain by running MATLAB as an administrator. If the problem persists, download the https://rflysi m.com/res/DirectXRepair-v3.7.zip and run the hotfix in it.

2. For the first installation, it is recommended to use the default configuration. Just click “O K”. The total installation time is about 30 minutes.

3. If you want to uninstall the RflySim system, you only need to run the uninstall. M or uninst all. Exe to uninstall automatically, or refer to the command in the uninstall. M to uninstall manuall y. Note: For the paid version, the serial number file Sn *.txt is stored in the [My Documents] \ Ogr e directory. It is recommended to keep it.

4. Antivirus software may prevent this script from generating desktop shortcuts. If the script p rompts that the shortcut generation fails, please close the antivirus software first (Win10 system als o needs to close the “Settings” > “Update and Security” > “Windows Security Center” > “Virus and Threat Protection” > Management Settings > “Real-time Protection” tab). Then g o to the installation directory (the default is C: \ PX4PSP) and double-click the mouse to run the G enerateShortcutCMD. Bat script.

5. If you want to change the compilation command for different Pixhawk hardware boards (fo r example, to px4 _ fmu-v3 _ default), Simply enter the command in MATLAB: PX4CMD (‘px4 _ fmu-v3 _ default’) or use the command: PX4CMD px4 _ fmu-v3 _ default

6. If you want to change the firmware compilation version or restore and repair the compilatio n environment, you can run the “Onekey Script” “command again and select the correspondin g option.

7. For Windows 10 1809 and above, it is recommended to use the advanced version and instal l the Ubuntu subsystem, then reconfigure the environment options according to the “Note 2” me thod, and select the Win10 WSL compiler, which can greatly speed up the compilation.

8. If the opening of the CopterSim. Exe fails (it prompts that “VCRUN * * * *.dll” cannot be found or there is no response), please check whether the antivirus software is blocked by mistak e, and run the file “4.HILApps \ MSVCP _ 2019.07.20 _ X64.exe” under this folder to repair it. If FlightGear never opens properly, use 3D Display instead to see the flight.

9. When users use the RflySim Toolchain software, if they need to find files, they can go to th e Resource Manager display interface for convenience. Turn on the "Show file extension" option t o avoid suffixes that fail to distinguish bat, txt, and pdf.

10. After the user installs the RflySim Toolchain for the first time, if the compiling window re ports an error or is stuck, you can go to the security protection center of the Windows system to rul e out whether the real-time protection is turned off and whether the computer as anti-virus softwar

e running.