DJI R SDK Demo

Software Instructions for Use

V1.0   2020.12

Edited by_____

Approved by_____

Edited on_____

Document No._____

SZ DJI TECHNOLOGY CO., LTD.

Release Notes

Version	Date	Section	Reason for Change	Description of Change
1.0.0.0	November 13, 2020			Draft document

Contents

1. Introduction

The Demo Software is developed based on DJI RS 2 v01.02.00.10 and DJI R SDK protocol v2.2.

Using the DJI R SDK protocol, DJI RS 2 can control the gimbal attitude and the mounted camera via the Ronin Series Accessories (RSA)/NATO ports.

2. About Demo Software

The Demo Software can read gimbal attitude and joint angle, control gimbal speed and position, control the tilt axis and pan axis via the joystick, and control the camera to shutter, record, and focus. Visit the DJI R product page on the DJI official website and refer to the camera compatibility for more information on supported camera models.

The Demo Software is written in Python. The UI is developed using PyQt5 and Qt Designer, and the exe file is packaged and generated by PyInstaller.
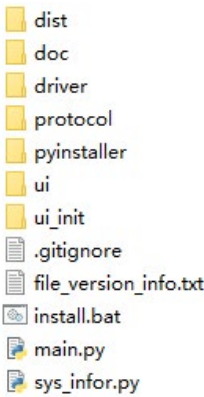
Below shows the structure of the directory:

Figure 1 Demo Software Directory Structure

Table 1 Demo Software Directory Description

Folder/File	Descriptions
dist	This folder contains the dynamic-link library and Ronin_controller.exe generated by install.bat.
doc	This folder contains the Demo Software Instructions for Use and DJI R SDK development protocol.
driver	This folder contains the driver program of the USB CAN-II C device of the Shenyang Guangcheng Technology Co., Ltd.

protocol	This folder contains the link process as well as the packaging and unpackaging files of DJI R SDK protocol, and the dynamic-link library used by the CAN converter.
pyinstaller	This folder contains the packaging tool of python to generate Ronin_controller.exe.
ui	This file contains the UI file developed by Qt Designer.
ui_init	This folder contains the implementation of controls.
install.bat	This script is mainly used for generating Ronin_controller.exe. To regenerate Ronin_controller.exe, users must install requisite dependencies, delete dist directory, and then double-click to run the script. Refer to the Installing the Packaging Tool section for details.
main.py	This python file is the function entry point of the Demo Software.
sys_infor.py	This python file is for defining the foreground and background used.

3. Using the Demo Software

1.Open the Ronin_controller.exe in the dist folder. The interface is shown below:

Figure 2 Demo Software Interface (Unconnected)

2. Users can connect devices according to the steps shown below:

    a. Mount the Ronin Focus Wheel onto the Ronin Series Accessories/NATO port of DJI RS 2.

    b. Connect the CANH and CANL pins of the focus wheel and USB CAN-II C device.

    c. Refer to the Connecting Devices section to connect the USB CAN-II C device to your computer and then install device driver software. Otherwise, the Demo Software cannot recognize the CAN device.

  If the connection is successful, the interface of the Demo Software will display "Device Connected" and the information of devices currently connected will be displayed in the bottom right corner:
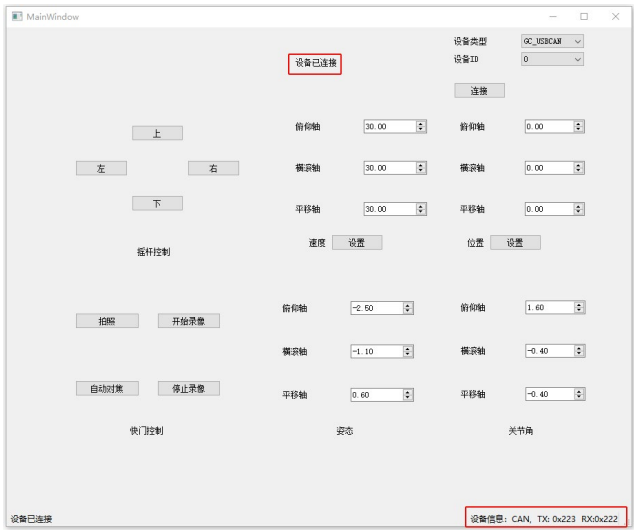

Figure 3 Demo Software Interface (Devices Connected)

3. The Demo Software has four function areas: Joystick control, gimbal speed and position, camera control, and data display.
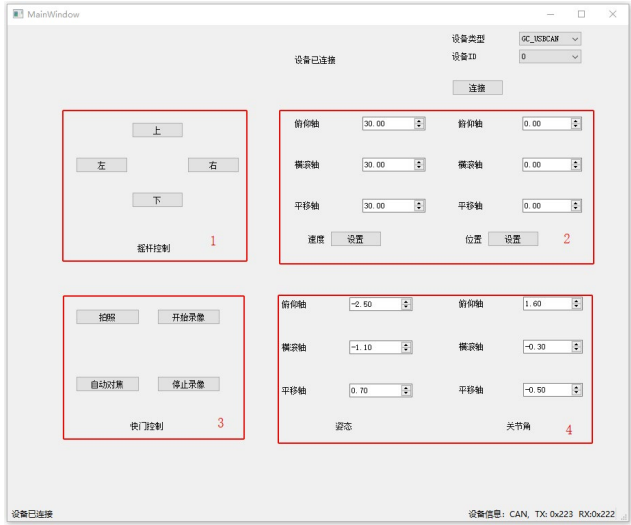
Figure 4 Demo Software Function Areas

Table 2 Demo Software Function Areas Descriptions

Number	Function Area	Description
1	Joystick control area	Click the direction button to adjust the tilt and pan axes. Click and hold the direction button to continuously rotate the gimbal in that direction.
2	Gimbal speed and position area	After adjusting the speed values, click the confirmation button on the left. After setting the position of each axis, click the confirmation on the right to move each axis to the set position.
3	Camera control area	Click the shutter button on the top left to take a photo. Click the start button on the top right to start recording and click the stop button on the bottom right to stop recording. Click and hold the autofocus button on the bottom left to focus and release to cancel focus. Note that before controlling the camera, make sure to use the correct camera control cable to connect the camera and the gimbal.

4	Data display area	When the Demo Software connects to the gimbal via the CAN device, the data display area will display the gimbal attitude and joint angle data in real time.

4. Connecting Devices

For more information on connecting devices, refer to the 3.1.1 Device Connection Diagram section in the DJI_R_SDK_Protocol_and_User_Interface_EN.

Below show the CAN device model used for development:

Table 3 USB CAN Device Used by the Demo Software

Brand	Shenyang Guangcheng Technology Co.,Ltd.
Model	USBCAN-II C
Supported Software	CAN Test, CAN Pro, ECANTools
Dimensions	95×65×26 mm
Port Type	OPEN6 terminal port
No. of CAN Channels	2
Operating Temperature Range	-40° to 80° C (-40° to 176° F)
Operating Voltage	5 V
Power Supply	USB
Isolation Voltage	DC 1500 V electromagnetic shielding
Operation System	Windows 98/2000/2003/ME/XP/7/8/10
Programming Environment	C, C++, C++Builder, VB, VC, EVC, .NET, Delphi, labWindows, labVIEW
Baud Rate	5 Kbps - 1 Mbps
Original Equipment Manufacturer (OEM)	Yes
Customization	Yes

5. Installing the Packaging Tool

If there are no development requirements, run the dist\Ronin_controller\Ronin_controller.exe program to control the gimbal.

If developers need to customize, debug software, or regenerate Ronin_controller.exe on the Demo upper computer software, they must install requisite software and dependencies. Make sure the computer is connected to the internet during the entire development process.

1. Install Python software. The Python version used in the current development environment is 3.7.4. Visit the website https://www.python.org/ to download the latest version and add to the PATH environment variable. If the setting is correct, enter the command shown below

under the CMD window to check the Python version number:

>>Python --version

Python 3.7.4

2. Double-click install.bat and the following prompts will appear:

>>>python pyinstaller\pyinstaller.py --windowed --version-file=file_version_info.txt --name=Ronin_controller main.py

PyInstaller cannot check for assembly dependencies.

Please install pywin32-ctypes.

pip install pywin32-ctypes

3. Open the CMD window and enter the command shown below to install pywin32 (Make sure the computer is connected to the internet):

>>pip install pywin32-ctypes

If the installation is successful, the following prompt will appear:

>>Requirement already satisfied: pywin32-ctypes in c:\python37\lib\site-packages (0.2.0)

4. To install the requisite dependencies of pyinstaller, enter the command shown in the CMD window:

>>pip install –r E:\gimbal_tools\pyinstaller\requirements.txt

If the installation is successful, the following prompts will appear:

>>Installing collected packages: altgraph, pyinstaller-hooks-contrib, pefile

Successfully installed altgraph-0.17 pefile-2019.4.18 pyinstaller-hooks-contrib-2020.10

5. Install the requisite tool of PyQt5.

>>pip install PyQt5 pyqt5-tools

If the installation is successful, the following prompts will appear:

Installing collected packages: PyQt5-sip, PyQt5, qt5-applications, pyqt5-plugins, python-dotenv, pyqt5-tools

Successfully installed PyQt5-5.15.1 PyQt5-sip-12.8.1 pyqt5-plugins-5.15.1.1 pyqt5-tools-5.15.1.2 python-dotenv-0.15.0 qt5-applications-5.15.1.1

6. After installing requisite dependencies, run install.bat again. If the following prompts appear, the packaging is successful and new Ronin_controller.exe has been generated under the dist folder:

892 INFO: Building EXE from EXE-00.toc completed successfully.

896 INFO: checking COLLECT

898 INFO: Building COLLECT COLLECT-00.toc

2400 INFO: Building COLLECT COLLECT-00.toc completed successfully.

6. Notice

1. Only the USB CAN device of the Shenyang Guangcheng Technology Co., Ltd. is supported. If users need to use other devices, refer to the GC_USBCAN implementation function of CanTunnel class in protocol\connection\CANconnection.py to connect new devices and receive and send data packet via the new device.

2. When using the Demo Software for the first time, the USB CAN-II driver program must be installed and can be found under the driver/ directory. If the USB CAN-II driver program is already installed on the device, it is not necessary to reinstall.

This content is subject to change.

If you have any questions about this document, please contact
DJI by sending a message to **Ronin.SDK@dji.com.**