

Rhythm 1

User Manual

2025-08_v1.0



NRM
NURLMCH

Caution

1. Do not disassemble or assemble the Rhythm1 while it is powered on.
2. Make sure the gimbal port and gimbal surface are free from any liquid before installation. Make sure the gimbal is securely installed onto the aircraft, the microSD card slot cover is clean and firmly in place.
3. Do not plug or unplug the microSD card during use.
4. When not in use, store the Rhythm1 in the storage case and replace the desiccant packets as necessary to prevent fogging the lenses due to excessive ambient humidity. If the lenses focus, the water vapor will usually dissipate after turning on the device for a while. The recommended storage environment is a relative humidity less than 40% at a temperature of 20±5°C.
5. Clean the surface of the camera lenses with a soft, dry, clean cloth.

Contents

Caution	1
Product Profile	
Introduction	3
Installation	5
Remote Controller Operation	6
APP Controls	6
Camera Settings	7
Updating Firmware	9
Appendix	10
After-Sales Service Policies	11

Product Profile

Introduction

Rhythm1 is a high-precision three-axis gimbal specially designed for Sony ILX-LR1. It supports target position calculation and is equipped with an Nvidia Xavier NX AI edge computer.

The Rhythm1 system, supported by the advanced intelligent algorithms of the Nvidia Xavier NX edge computer, meets complex and diverse operational requirements.

A 35mm full-frame back-illuminated Exmor R™ CMOS image sensor with approximately 61.0 million effective pixels offers extraordinary sensitivity, resolution and dynamic range. Operating in real-time, the advanced BIONZ XR™ image processing engine delivers natural gradations and realistic colours with low noise for stills and movies. With high resolution, low noise and wide dynamic range imagery, the ILX-LR1 can reveal the finest details like small scratches and cracks during inspection, investigation, surveying and mapping. A wide ISO range of 100-32000 allows the camera to operate in most daylight conditions.



1. Micro SD Card Slot (store photos)

2. NX computer usb slot

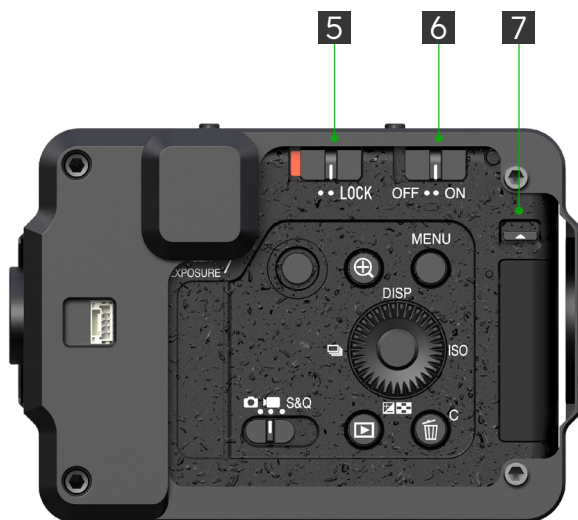
3. LED Indicator

Green - Identified photo SD card

White - Unidentified photo SD card

4. Lens (Default recommendation)

Support 24/40/50mm lenses with E-mount

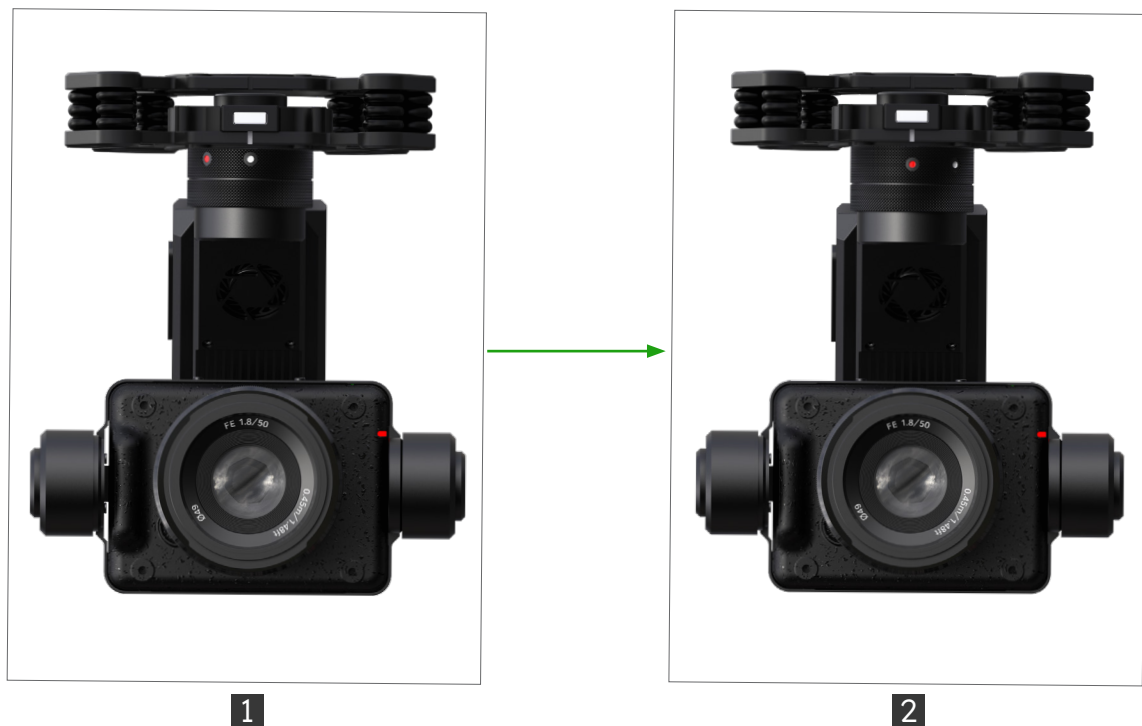


5. Locking switch

6. Power switch

7. Micro SD Card Slot (store videos)

Installation



1. Align the white and red dots and insert the gimbal.
2. Rotate the gimbal connector counter clockwise to the locked position.

After installation, make sure that the gimbal lock is locked in place.

Make sure to press down the Gimbal detachment button when rotating the gimbal lock to remove the gimbal and camera. The gimbal lock should be fully rotated when removing the gimbal for next installation.

Ensure the microSD card slot cover is firmly in place to prevent dust or moisture entering during usage or storage.

Remote Controller Operation



1. Left Dial

Turn to adjust the gimbal's tilt.

2. Right Dial

Turn to adjust the gimbal's pan.

3. Record Button

Press to start/stop recording video.

4. Shutter Button

Press to take a photo, Taking single photo is supported during video recording.

5. Zoom C2 button

Zoom in (LR1 is unavailable).

6. Zoom C1 button

Zoom out (LR1 is unavailable).

7. Function Button Fn1

Default for the Gimbal's pitch angle one click back.

8. Function Button Fn2

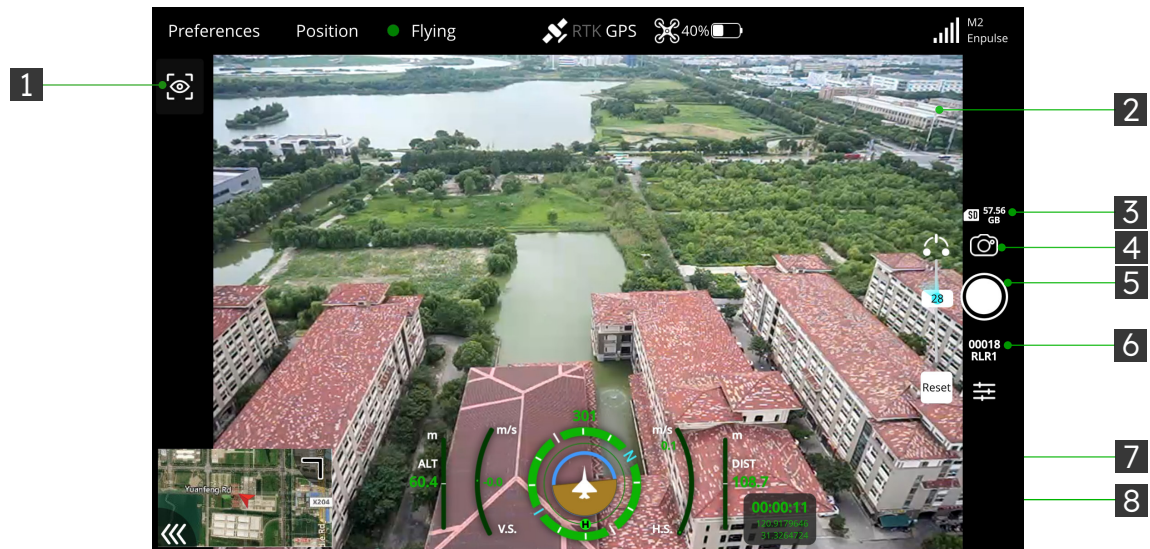
LR1 is unavailable.

9. Function Button Fn3

LR1 is unavailable.

App Controls

Besides capturing photos and recording videos, the touch interface provides more intuitive and convenient control options. The following image is for reference only. The actual interface varies according to the app version.



1. Smart track

Tap to enable the smart track function.

2. Sony Camera

Display the Sony Camera view.

3. Display the current remaining capacity of the memory card.

4. Photo video Toggle

Tap to switch between photo and video modes.

5. Shutter/Record Button

Tap to shoot photos or start/stop recording.

6. Camera model

Display the current the number of photos/recording time.

7. Parameter Settings

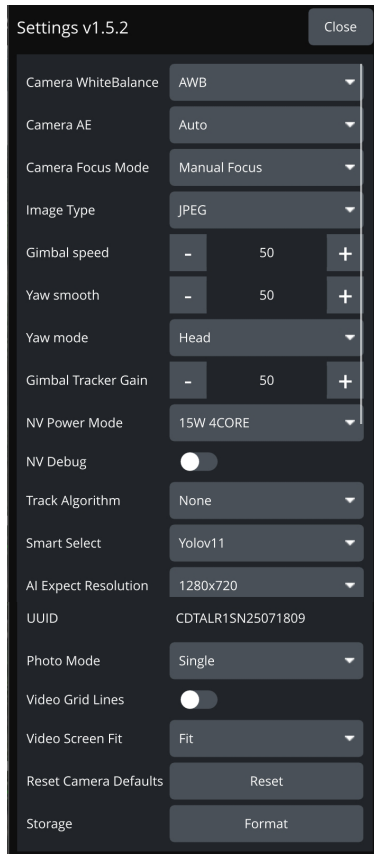
Tap to enter the photo and video settings.

8. Grid/Reset

Display the tilt axis angle of the gimbal. Click to restore the Gimbal to default status.

Camera Settings

This chapter describes the detailed operation of the Rhythm1 gimbal with Sony ILX-LR1 camera's settings menu and the AI tracking function.



Camera WhiteBalance: Regulate WhiteBalance.

Camera AE: Full Auto/Manual/Shutter Priority /ISO Priority.

Camera Focus Mode: Auto/Manual.

Image Type: JPEG/RAW/RAW+JPEG

Gimbal speed: Regulate the gimbal speed.

Yaw smooth: When Yaw mode is head, adjust the speed at which gimbal follows the head.

Yaw mode: Head/Global.

Gimbal Tracker Gain: Regulate the gimbal tracher gain.

NV Power Mode: Select the power management mode of NX.

NV Debug: Display the temperature、 CPU and Memory usage of the NX.

Track Algorithm: Select track algorithms, including Nano and SiamRPN.

Smart Select: Select smart track function.

AI Expect Resolution: Adjust the resolution of AI expect.

UUID: Universally Unique Identifier.

Photo Mode: Select photo model (Single/Time Lase).

Video Grid Lines: Tap to open the video grid lines.

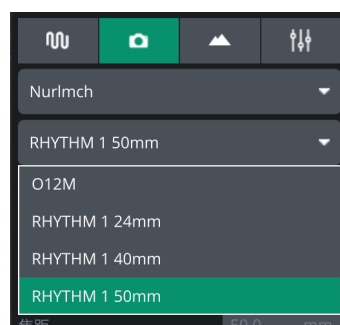
Video Screen Fit: Select video screen fit (Width/Height/Stretch).

Reset Camera Defaults: Reset the camera to the default settings.

Storage: Tap to format and remove all content from the microSD card. Opera with caution.

Survey

This chapter describes the specific operations of the LR1 camera in mapping and scanning. Using the latest version of NurlmchPilot, select the preset parameters for the corresponding lens and carry out the high-precision mapping task.



Note:

To ensure the quality of the photos, in the mapping mode, please prioritize the use of manual focusing.

Updating Firmware

Do not power off the aircraft or detach the Rhythm1 while updating the firmware. Restart them once firmware update is complete.

Please prepare the official firmware and the commissioning cable (RJ45 to 5-pin GH network cable) in advance. Here are the specific steps:

1. Make sure that the Rhythm1 is securely mounted onto the aircraft, and that aldevices are powered on.
2. Set the PC IP address to 192.168.2.5 (network segment 2).
3. Connect the PC network port to the aircraft's E1 or E2 port using the debugging cable.
4. Open the computer's default browser and access: <http://192.168.2.119:8080>
5. On the upgrade interface, select the upgrade file and click "Upload file" to upload the firmware, begin the automatic upgrade. During the upgrade process, the Rhythm1 will restart automatically.

Firmware upgrade

Upload Firmware

选择文件 R2L_v0.9.9.codev Upload file

```
apply default param yaml: /root/mavlink_camera/R2L.yaml
create bash shell: /root/mavlink_camera/mavlink_camera.sh
mavlink_camera not exists.
create config: /etc/supervisor/conf.d/tracker.conf
apply default param yaml: /root/tracker/R2L.yaml
create bash shell: /root/tracker/tracker.sh
tracker: started
mav_gb: started
mavlink_camera: started
Version: v0.9.9
OTA END
```

Network

IP/Netmask:

192	168	2	119	24
-----	-----	---	-----	----

Gateway:

192	168	2	1	
-----	-----	---	---	--

Mavlink UDP Target:

192	168	2	117	14550
-----	-----	---	-----	-------

Apply

Caution:

If the upgrade fails, restart and try to upgrade it again. Any other questions please contact the official after-sales service.

Appendix

Specifications

Product Name	Rhythm1
Weight Approx. (without lens)	710g
Dimensions	156*120*169mm
IP rating	IP44
Power input	24V, 10W to 24W
Operating Temperature	-10°C to 50°C
Gimbal control range	Pitch: -90° to +20° Pan: 360° limitless
Min control accuracy	1°
Angel control accuracy	±0.01°
Geo-tag	Support
Protocol	MAVLINK 2.0

Edge Computer

SOM	Nvidia Jetson Xavier NX
AI performance	21 TOPS (INT8)
GPU	384-core NVIDIA Volta™ GPU with 48 Tensor Cores
GPU Max Freq	1100 MHz
CPU	6-core NVIDIA Carmel ARM®v8.2 64-bit 6MB L2 + 4MB L3
CPU Max Freq	2-core @ 1900MHz; 4/6-core @ 1400Mhz
Memory	8GB 128-bit LPDDR4x @1600MHz 51.2GB/s
Storage	16 GB eMMC 5.1

Camera

Sensor	35mm FF(35.7x23.8mm) Exmor R CMOS
Number of pixels (effective)	Still images: Approx. 61.0 megapixels max Movies: Approx. 50.8 megapixels max
Camera type	Interchangeable lens digital camera
Lens Mount	E-mount
Supported Lenses	24mm, 40mm, 50mm
Operating Temperature	0°C to 40°C/32-104°F

After-Sales Service Policies

Limited Warranty

Under this Limited Warranty, Nurlmch Inc warrants that each Nurlmch Inc product that you purchase will be free from material and workmanship defects under normal use in accordance with Nurlmch Inc's published product materials during the warranty period. Nurlmch Inc's published product materials include, but not limited to, user manuals, safety guidelines, specifications, in-app notifications, and service communications.

The warranty period for a product starts on the day such product is delivered, If you cannot provide invoice or other valid proof of purchase, then the warranty period will start from 60 days after the shipping date that shows on the product, unless otherwise agreed upon between you and Nurlmch Inc.

What This After-Sales Policy Does NOT Cover

1. Crashes or fire damage caused by non-manufacturing factors, including but not limited to, pilot errors.
2. Damage caused by unauthorized modification, disassembly, or shell opening not in accordance with official instructions or manuals.
3. Water damage or other damages caused by improper installation, incorrect use, or operation not in accordance with official instructions or manuals.
4. Damage caused by a non-authorized service provider.
5. Damage caused by unauthorized modification of circuits and mismatch or misuse of the battery and charger.
6. Damage caused by flights which did not follow instruction manual recommendations.
7. Damage caused by operation in bad weather (i.e. strong winds, rain, sand/dust storms, etc.)
8. Damage caused by operating the product in an environment with electromagnetic interference (i.e. in mining areas or close to radio transmission towers, high-voltage wires, substations, etc.).
9. Damage caused by operating the product in an environment suffering from interference from other wireless devices (i.e. transmitter, video-downlink, Wi-Fi signals, etc.).
10. Damage caused by operating the product at a weight greater than the safe takeoff weight, as specified by instruction manuals.

11. Damage caused by a forced flight when components have aged or been damaged.
12. Damage caused by reliability or compatibility issues when using unauthorized third-party parts.
13. Damage caused by operating the unit with a low-charged or defective battery.
14. Uninterrupted or error-free operation of a product.
15. Loss of, or damage to, your data by a product.
16. Any software programs, whether provided with the product or installed subsequently.
17. Failure of, or damage caused by, any third party products, including those that Nurlmch Inc may provide or integrate into the Nurlmch Inc product at your request.
18. Damage resulting from any non-Nurlmch Inc. technical or other support, such as assistance with “how-to” questions or inaccurate product set-up and installation.
19. Products or parts with an altered identification label or from which the identification label has been removed.

Your Other Rights

This Limited Warranty provides you with extra and specific legal rights. You may have other rights according to the applicable laws of your state or jurisdiction. You may also have other rights under a written agreement with Nurlmch Inc. Nothing in this Limited Warranty affects your statutory rights, including rights of consumers under laws or regulations governing the sale of consumer products that cannot be waived or limited by agreement.