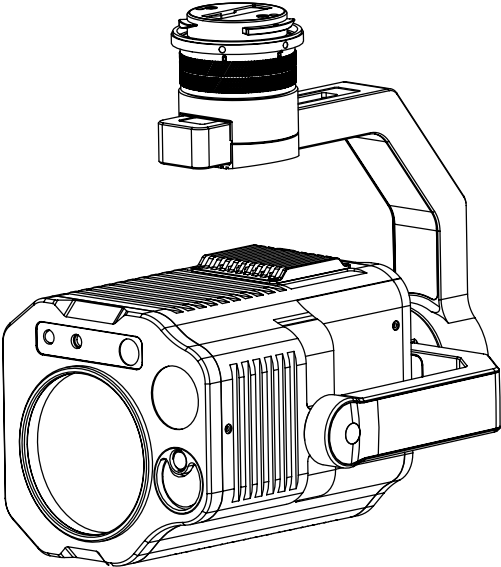


CH-4 UAV Laser Methane Leak Detector

Quick Start Guide and Disclaimer

V1.0 2023.08



Disclaimer and Warning

Thank you for purchasing Purway Innovation products. The content mentioned in this document relates to your safety, legal rights, and responsibilities. Before using this product, please carefully read this document to ensure that the product is set up correctly. Failure to follow the instructions and warnings in this document may result in harm to you and those around you, damage to the product, or other surrounding items. This document and all related documents are ultimately owned by Shenzhen Purway Innovation Technology Co., Ltd. ("Purway" or "Purway Innovation"). If updates are made, no further notice will be provided.

Purway Innovation is a subsidiary brand of Shenzhen HEQ Intelligent Technology Co., Ltd.

Please Do Not Adjust the Gimbal Structure Yourself

The HEQ PURWAY-CH-4 dronelaser methane detector has been calibrated according to the camera and lens it is equipped with before leaving the factory. Please refrain from adjusting the gimbal yourself or altering its mechanical structure. Additionally, do not attach any external accessories to the camera, such as filters or lens hoods.

The gimbal structure is precision-engineered, and any disassembly or modification of the HEQ PURWAY-CH-4 dronelaser methane detector by yourself may result in abnormal operation of the gimbal equipment.

Ensure the installation of the CH-4 drone laser methane detector on the designated aircraft

HEQ PURWAY-CH-4 drone laser methane detector is currently compatible with Matrice 300/Matrice 350 aircraft, and additional supported types will be updated in the future. Please use the HEQ PURWAY-CH-4 Captain APP for inspection purposes, utilizing the corresponding features accordingly.

Safety in Use

Please ensure the correct and safe use of your drone. Carefully read the user manual and watch instructional videos available on the Purway Innovation official website to properly install the gimbal on the drone. Follow the safety guidelines provided by the Aero Modeling Hobbyist Association for drone usage. By using this product, you acknowledge that you have read and understood the disclaimer and warnings, and you accept all the terms and conditions therein. You commit to taking full responsibility for the use of this product and any potential consequences. You agree to use this product only for lawful purposes and abide by these terms as well as any related regulations, policies, and guidelines set forth by Purway Innovation.

Purway Innovation is not liable for any direct or indirect damages, injuries, or legal liabilities resulting from the use of this product. Users should adhere to all safety guidelines mentioned in this document, among others.

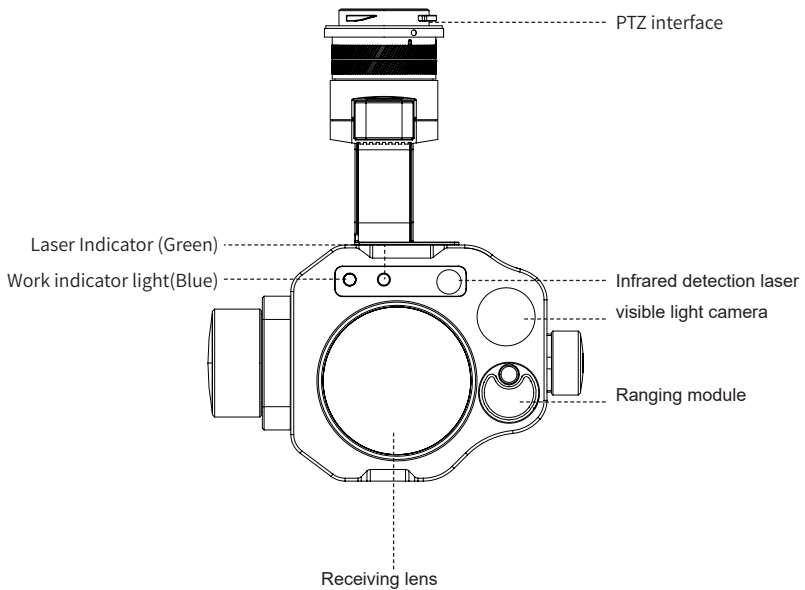
CH-4 Laser Methane Detector

CH-4 Laser Methane Detector is a compact and lightweight drone payload known for its high sensitivity, long-range remote sensing capability, and rapid response. It utilizes laser absorption spectroscopy technology to swiftly detect trace amounts of methane gas in the air, with a maximum inspection distance of up to 300 meters.

This device combines laser detection with visible light sensors, employing Tunable Diode Laser Absorption Spectroscopy (TDLAS) technology for real-time data analysis. It integrates with drone systems, keeping the detection equipment away from potential leak sources. It is a powerful tool for natural gas inspection operations, helping to improve safety, reduce environmental impact, improve operating efficiency, and achieve accurate visual inspection. Coupled with gimbal intelligent stabilization control, laser rangefinding, and other technologies, it can quickly provide users with key information on leak points, help users seize the opportunity, and improve perception capabilities and operating efficiency to a new level.

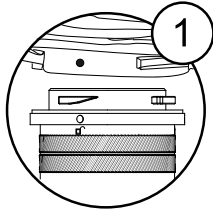
Combined with the HEQ PURWAY-CH-4 Captain ground station, users can easily plan complex route tasks with just a tap of the screen and realize fully automatic waypoint flight operations.

CH-4 Laser Methane Detector

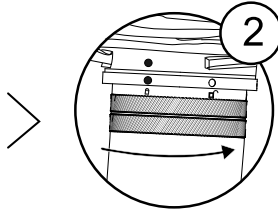


Install The CH-4 Laser Methane Detector

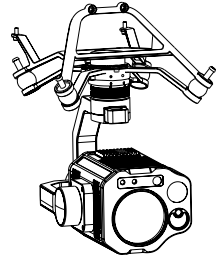
Using Matrice 300/Matrice 350 aircraft as an example for installation: Adjust the CH-4 DroneLaser Methane Detector gimbal interface to the unlocked position. Insert it into the gimbal mounting location of the Matrice 300/Matrice 350. Rotate the gimbal lock lever to the locked position to secure the gimbal in place.



Align the white dot on the telescope with the red dot on the interface and embed it into the installation location



Rotate the quick-release interface of the telescope so that the red dots are aligned with the red dots of the interface to secure the telescope.



The gimbal interface is designed with a compact structure. When installing or removing it, please firmly hold the mounting platform with one hand while applying rotational force.

Camera Controls

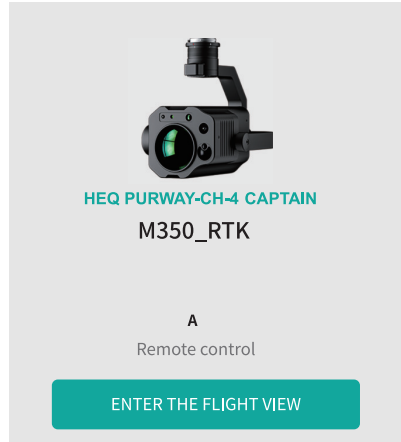
The left dial can control the gimbal's pitch angle, while the right dial can adjust the camera's pan angle. The C1 button is used for the previous selection, while the C2 button is used for the next selection.

		The left dial is used to control the gimbal's pitch angle. Turn the dial clockwise to tilt the gimbal upward, and counterclockwise to tilt the gimbal downward.
		The right dial is used to control the gimbal's pan angle. Turn the dial clockwise to rotate the gimbal clockwise, and counterclockwise to rotate the gimbal counterclockwise.

Enter CH-4 Captain APP

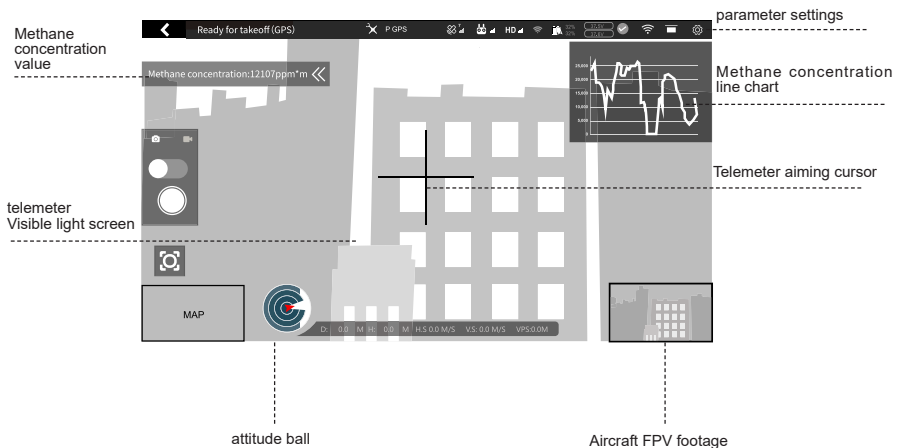
1. Install the CH-4 Captain APP on the Matrice 300/Matrice 350 remote controller.
2. Power on both the Matrice 300/Matrice 350 aircraft and the remote controller.
3. Once the communication between the Matrice 300/Matrice 350 aircraft and the remote controller is established, click on "Enter Flight Interface" to access the APP.

Log in DJI



Captain APP Interface Explanation

The parameters and information on the APP interface can be adjusted and turned off through the "Settings."



Payload Parameter Settings

The image displays two screenshots of the 'Payload' settings screen in a mobile application. The top screenshot shows the following settings:

- Methane concentration Value Threshold:** 0
- Air Background Value:** 0
- Sample Count In Line Chart:** 100
- Recording Time:** -1000 -100 +100 +1000

The bottom screenshot shows the following settings:

- Recording mode:** Manual (selected), Photograph, Video
- Recording Time:** 1 minute, 3 minutes (selected), 5 minutes
- Sound Alarm:**
- Display Concentration Line Graph:**
- Display Crosshair:**
- CONFIGURATION** button

Note: To record detection data, you need to choose the automatic photo/video option. When methane is detected, it will automatically take photos or record videos. In manual mode, it will only take photos or record videos.

Configuration Mode: Modify device false alarm level, device response speed, etc.

Service Options: Data and Video Streaming

Serve

Data push address Not connected

RTK

IP: 0.0.0.0

Port: 1883 **CONNECT** Log in anonymously

Video push address Connected

IP: RTMP://

SD HD FHD

DISCONNECT

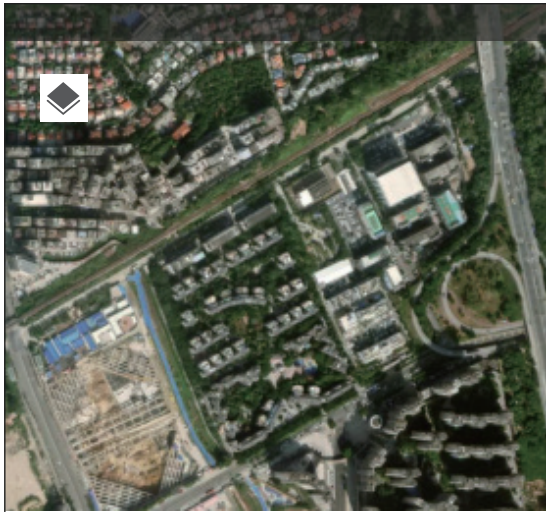
MQTT Upload Frequency (HZ)

1

MAP

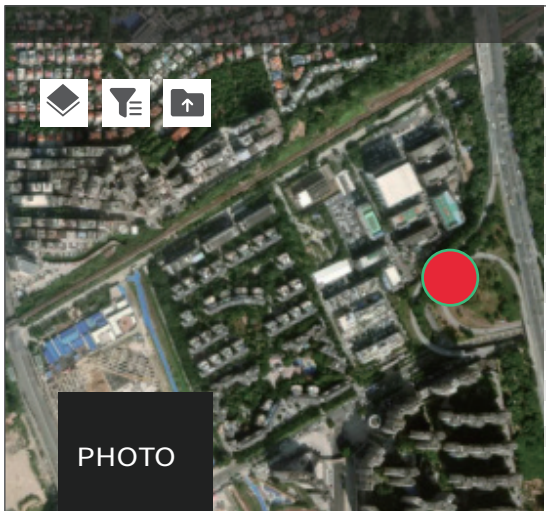
CH-4 Captain Data Analysis

Inspection data is stored on the device's camera SD card. To access it, remove the silicone cover at the rear of the device and take out the SD card. You can use a card reader to directly insert the SD card into the remote controller or move the recording files from the SD card to the local storage of the remote controller. Then, open the CH-4Innovation Captain APP's homepage and go to 'Export Reports'.



Import .CSV file to start analysis

IMPORT



PHOTO

	<u>TABLE</u>	<u>LINE CHART</u>
Concentrati	Luminous	Time
51	4240	2023-08-30_20:51:00
3688	2156	2023-08-30_20:51:00
99999	2156	2023-08-30_20:51:00
99999	7049	2023-08-30_20:51:00
74704	7049	2023-08-30_20:51:00
99999	2156	2023-08-30_20:51:00
99999	7049	2023-08-30_20:51:00
74704	7049	2023-08-30_20:51:00
99999	2156	2023-08-30_20:51:00
99999	7049	2023-08-30_20:51:00
74704	7049	2023-08-30_20:51:00
99999	2156	2023-08-30_20:51:00
99999	7049	2023-08-30_20:51:00
74704	7049	2023-08-30_20:51:00
99999	2156	2023-08-30_20:51:00
99999	7049	2023-08-30_20:51:00

Item:71 Photo:25 Video:0

The screenshot displays a software interface with an aerial view on the left and a data table on the right. An 'Export Report' dialog box is overlaid in the center. The dialog box contains two input fields labeled 'Staff' and 'Address', and two buttons labeled 'Cancel' and 'Confirm'. The table on the right has columns for 'Concentrati', 'Luminous', and 'Time'. The data in the table is as follows:

Concentrati	Luminous	Time
51	4240	2023-08-30_20:51:00
3688	2156	2023-08-30_20:51:00
99999	2156	2023-08-30_20:51:00
99999	7049	2023-08-30_20:51:00
74704	7049	2023-08-30_20:51:00
	6	2023-08-30_20:51:00
	9	2023-08-30_20:51:00
	9	2023-08-30_20:51:00
	6	2023-08-30_20:51:00
	9	2023-08-30_20:51:00
	9	2023-08-30_20:51:00
	6	2023-08-30_20:51:00
	9	2023-08-30_20:51:00
74704	7049	2023-08-30_20:51:00
74704	7049	2023-08-30_20:51:00
99999	2156	2023-08-30_20:51:00
99999	7049	2023-08-30_20:51:00

At the bottom right of the table, it says 'Item:71 Photo:25 Video:0'.

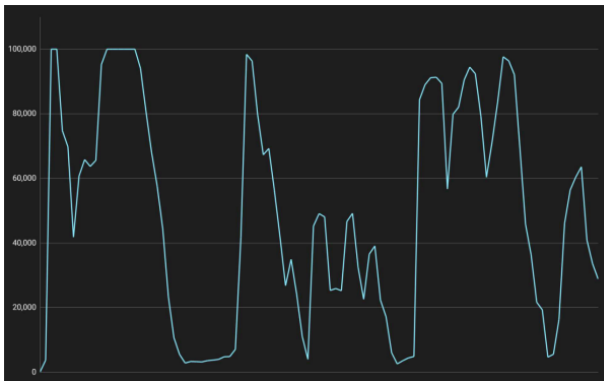
Note: The exported report files will be stored in the corresponding recording folder.

UAV Laser Methane Detector Report

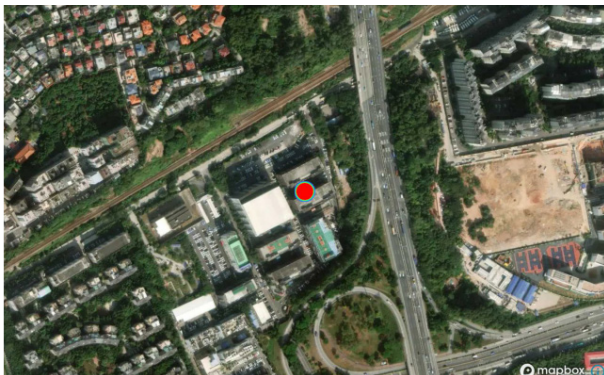
1、Inspection Overview

Location	XXXXX				
Inspector	XXXXX		Inspection Time	XXXXX	
Alarm Points	XX	Operation Duration	XXXXX	Operation Distance	XXXXX

2、Concentration Curve



3、Inspection Trajectory



4、Concentration Sheet

Name : XXX

Location: XXXXX

Time:XX:XX:XX

No	Longitude	Latitude	Concentration	Luminous	Site Photo
1	83.70xxxxxx	40.75xxxxxx	10506	555	photo
2	83.70xxxxxx	40.75xxxxxx	10006	399	photo

Report display

UAV Laser Methane Detector Report

1. Inspection Overview

Location	XXXXX				
Inspector	XXXXX				
Alarm Points	XX	Operation Duration	XXXXX	Operation Distance	XXXXX

2. Concentration Curve

3. Inspection Trajectory

4. Concentration Sheet

Name : XXX Location: XXXXX Time:XXXXXX

No	Longitude	Latitude	Concentration	Luminous	Site Photo
1	83.70xxxxxx	40.75xxxxxx	10506	555	photo
2	83.70xxxxxx	40.75xxxxxx	10006	399	photo

Detector parameters	
Detection Object	Methane and methane-containing gases
Gimbal Stabilization	YAW+PITCH+ROLL
Aim Camera	1080 P
Video Definition	FHD 1920 * 1080(30P)
Sensitivity	5ppm*m
Sensitivity	0~99999 ppm*m
Sampling Frequency	500KHz
Measurement Accuracy	±10% (100~50000 ppm*m)
Response Speed	5ms、10ms、100ms(configurable)
Telemetry Distance	300m
Laser Ranging	real-time coordinate function
Instrument Weight	770g
Protection Level	IP54
Operating Temperature	-20°C to 50°C
Rated Current	< 1A Typical value 8V power supply,current 0.3A
Rotation Range	Pitch: +30° to -90°; Pan: ±135°
Route Function	Route planning, KML import
Supported Models	Standard interface, Custom support
Infrared Detection Laser	Class 3R, avoid direct laser exposure to eyes
Wavelength	1.65 μm, <25 mW
Green Indicating Laser	class 3R, avoid direct laser exposure to eyes
Wavelength	520 nm, < 5 mW

This document will not be notified of updates separately.