2026

PURWAY TDLAS MODEL III



Purway Innovation

Purway Model III – UAV-Mounted TDLAS Methane Leak Detection System



The Purway Model III is a UAV-mounted methane detection system designed for non-contact methane screening in industrial environments.

Based on TDLAS (Tunable Diode Laser Absorption Spectroscopy), the system measures line-of-sight methane concentration in real time during flight, enabling rapid localization of potential leak sources.

The system is integrated with DJI industrial UAV platforms and supports safe, efficient inspection of large and complex sites such as pipelines, facilities, and transmission infrastructure.

TECHNICAL SPECIFICATIONS

WEIGHT 730g	RESPONSE SPEED 5ms/10ms/100ms
CAMERA 48MP / 4K / 16x	TELEMETRY Up to 300m
ALGORITHM Ambient Value	SAMPLING 50Hz
PROTECTION IP44	GIMBAL 3-Axis DJI X-Port
RANGEFINDER 1200m	LASER SAFETY Class 3R (Green)



EVOLUTION: MODEL I VS MODEL III

FEATURE	MODEL I (Previous)	MODEL III (2026 New)
Response Speed	25ms	**5ms / 10ms /100ms (Adjustable)**
Telemetry Range	80m	**300m**
Visual Camera	External / None	**48MP Built-in (4K Video)**
Weight	660g	**730g (Includes Optical Module)**
Protection	IP43	**IP44**
Reporting	PC Required	**In-App Word Generation**

How the Laser Methane Detector Works

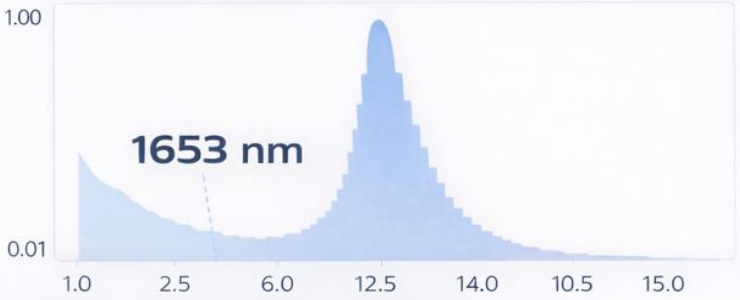
TDLAS-Based Methane Detection Principle

Non-contact methane concentration measurement using wavelength-seleci las laser absorption



Gas absorption along optical path

Methane Absorption Line

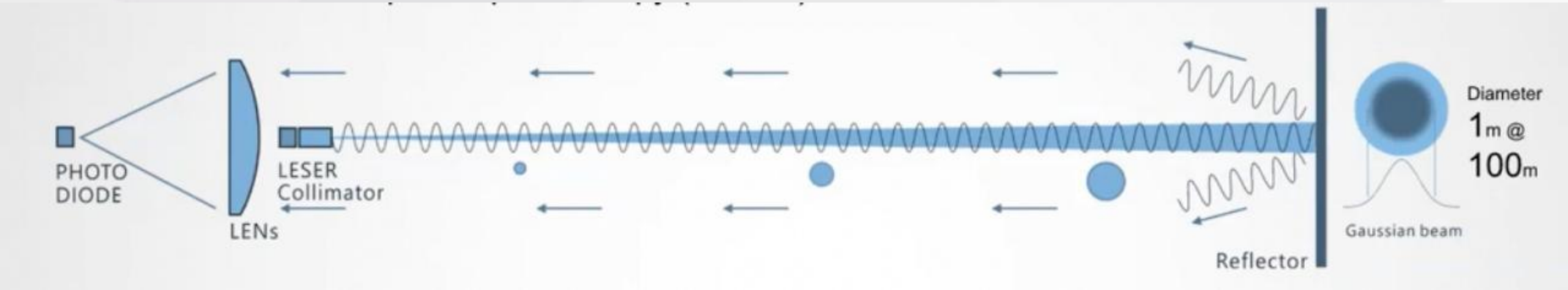


- Operating wavelength: **1653 nm**
- Gas specificity: High selectivity for CH_4
- Low cross-interference from common background gases

Measurement Principle

- **Wavelength selective**
  Only methane absorbs laser light at the selected wavelength
- **Quantitative relationship**
  Absorption ∝ gas concentration × optical path lengh
- **Remote & non-contact**
  No physical contact with the gas source required

TDLAS enables non-contact gas concentration measurement via wavelength-selective absorption



TDLAS Core Principles

•Wavelength selectivity
Each gas absorbs laser light at specific wavelengths

•Absorption ∝ concentration × path length
Higher gas concentration causes stronger signal attenuation

•Remote measurement
Gas concentration is derived by analyzing the returned laser signal

Why TDLAS?

•Selective – responds only to target gas

•Quantitative – concentration derived from physical absorption

•Non-contact – safe, remote, and fast measurement

System Overview & UAV Integration

Laser Target Indication
An integrated laser target indicator provides a visual reference of the TDLAS line-of-sight, allowing quick confirmation of measurement direction during flight.

UAV Integration
The CH_4 laser methane detector is compatible with DJI industrial UAVs and selected third-party platforms, enabling rapid, non-contact methane screening over large and complex sites.

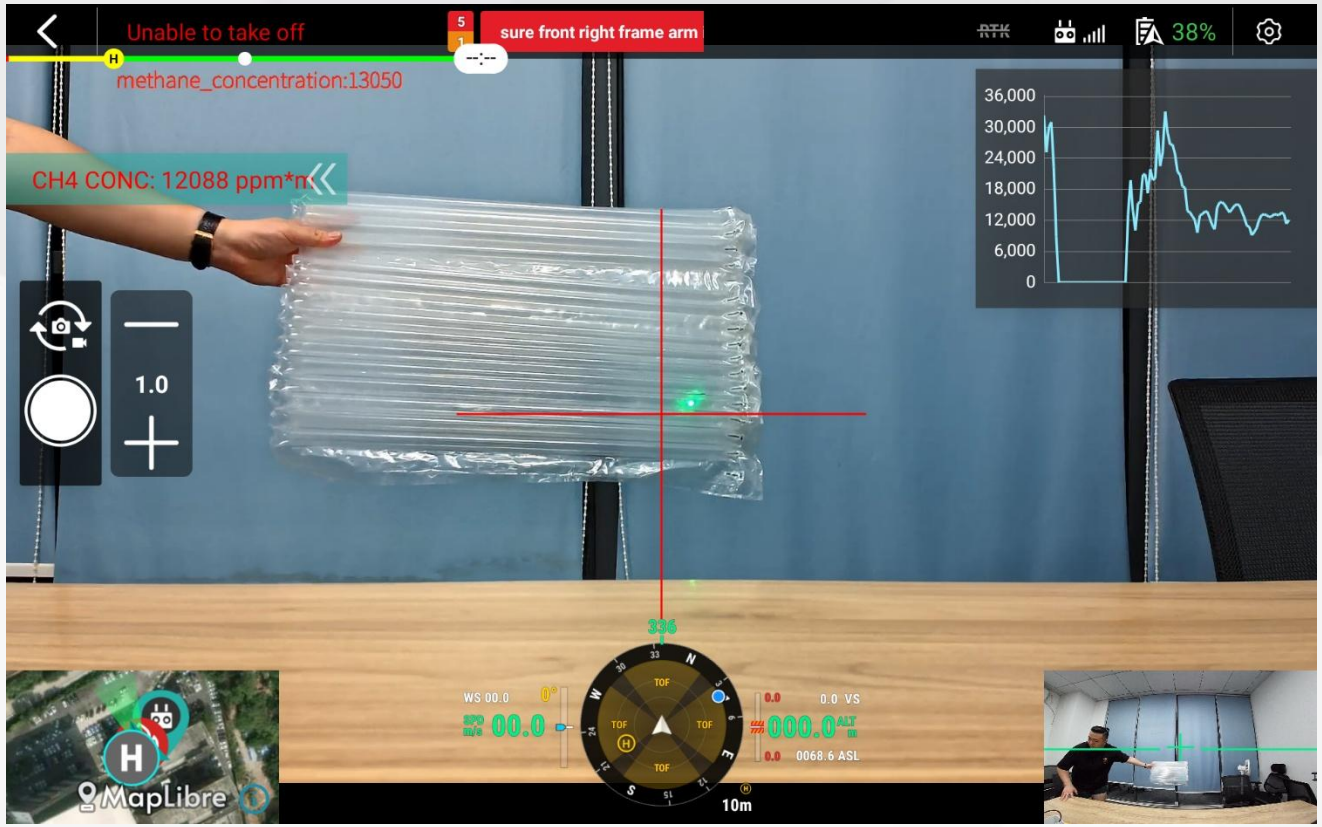


Multi-Sensor Deployment Concept



- The Purway Laser Methane Leak Detector is designed to operate as an independent sensing payload and can be deployed alongside optical or thermal gimbal cameras on DJI enterprise UAV platforms.
- During a single flight mission, the methane detector provides non-contact CH_4 screening, while the gimbal camera (e.g. visual or thermal) supplies contextual imagery of the inspection area. This parallel deployment allows methane indications to be spatially correlated with visual or thermal references without system-level coupling.
- The modular configuration enables flexible mission planning and supports comprehensive inspection workflows where gas detection and visual assessment are performed simultaneously.

APP-Based Real-Time Methane Measurement & Analysis

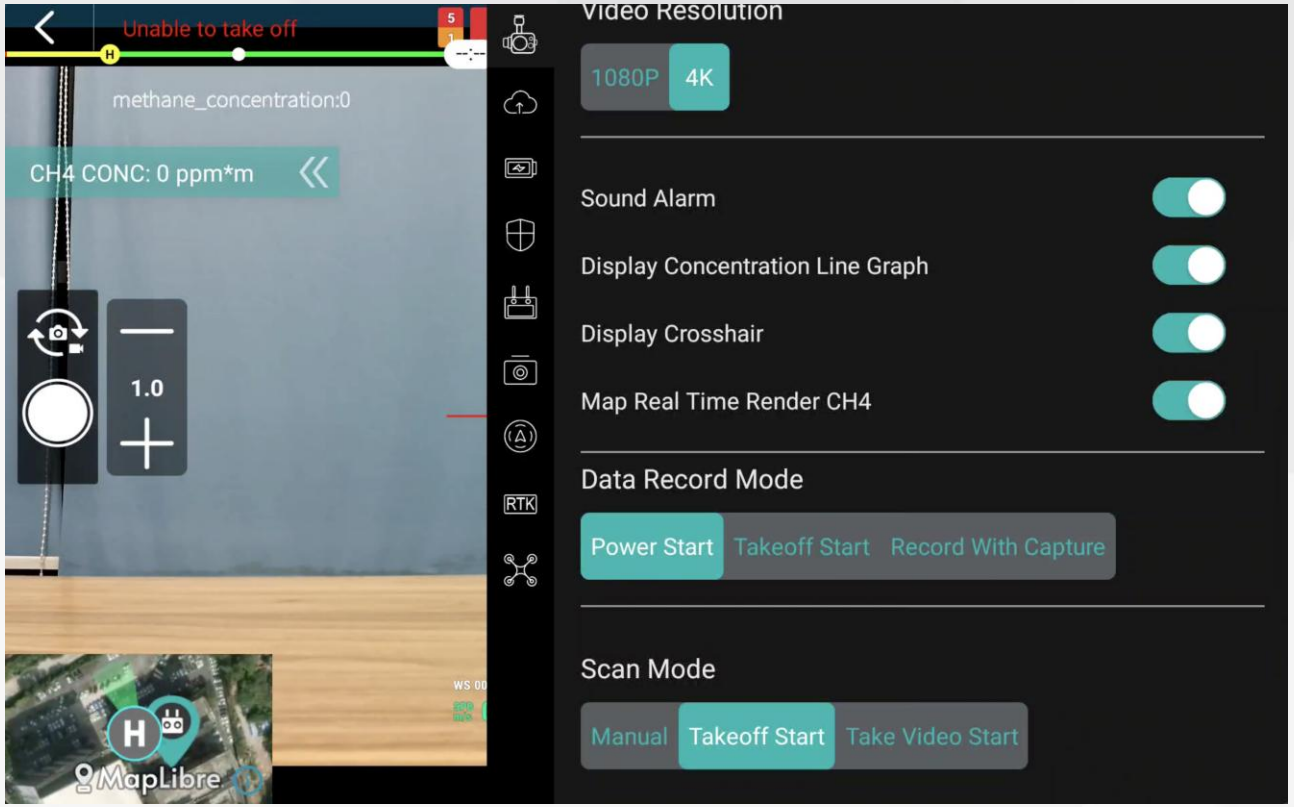


The Purway Laser Methane Leak Detector Model II APP provides real-time visualization of methane concentration in parts per million (ppm).

The APP displays live concentration values, trend curves, and GPS location simultaneously, enabling users to quickly identify, assess, and document methane leaks.

All measurement data, including time, date, and location, are automatically recorded for further analysis, reporting, and regulatory compliance.

APP-Based Configuration & Real-Time Control

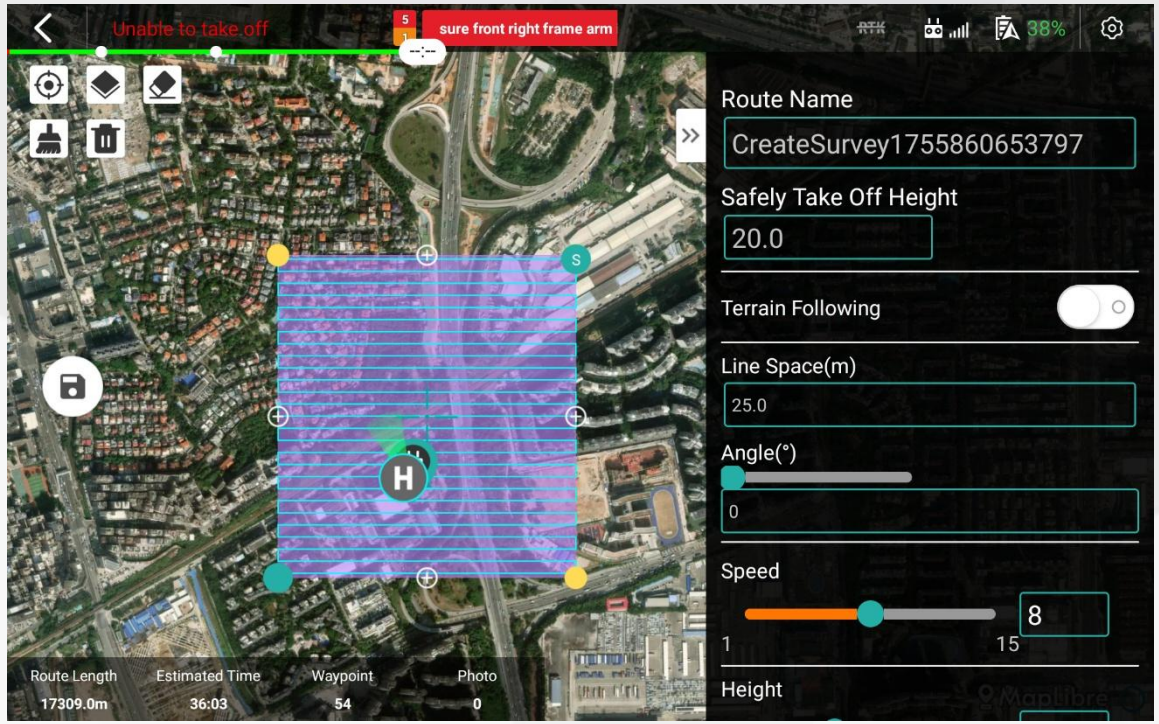


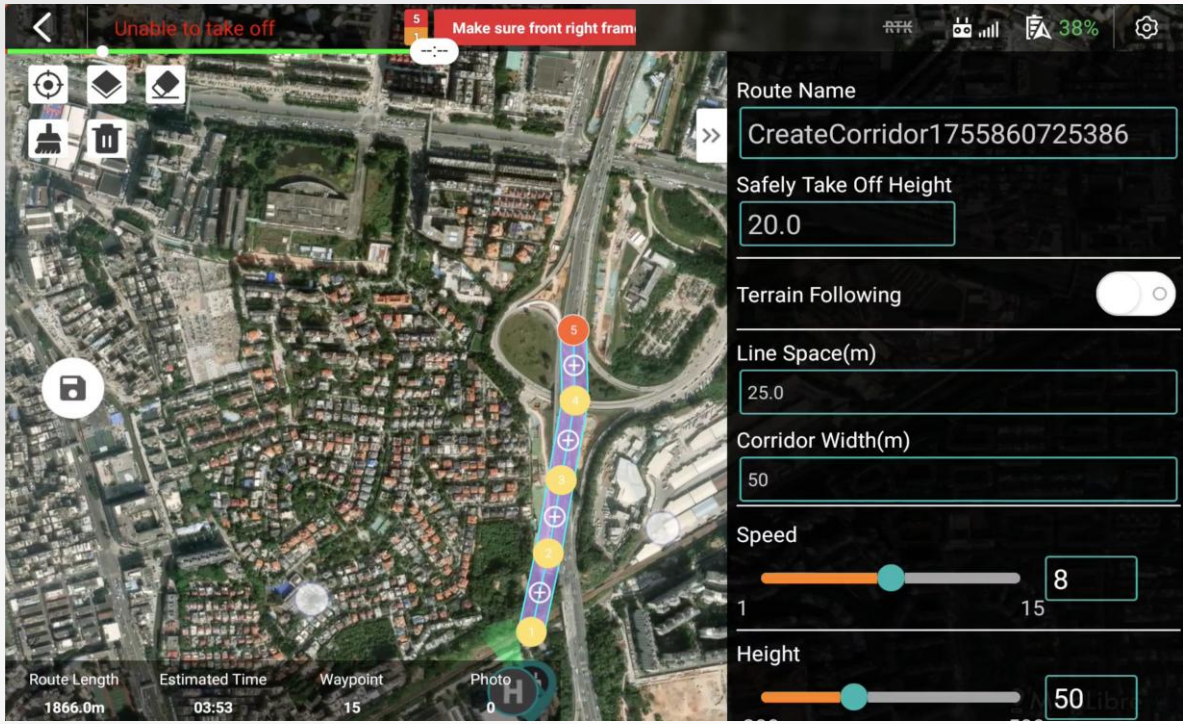
The system is supported by a dedicated APP compatible with DJI M300, M350, and M400 RTK platforms.

The APP allows operators to configure key inspection parameters on-site, including methane concentration thresholds, background air settings, and alarm options.

It also integrates real-time methane visualization, data recording, and UAV control functions, enabling efficient and flexible field inspections through a unified interface.

Efficient Methane Leak Inspection Along Gas Pipelines





1.The system supports flexible UAV flight planning for natural gas pipeline inspections, including both area-based scanning and corridor-based inspection modes.

2.Operators can define inspection routes, altitude, speed, and spacing directly within the APP, enabling efficient coverage of long-distance pipelines and complex infrastructure.

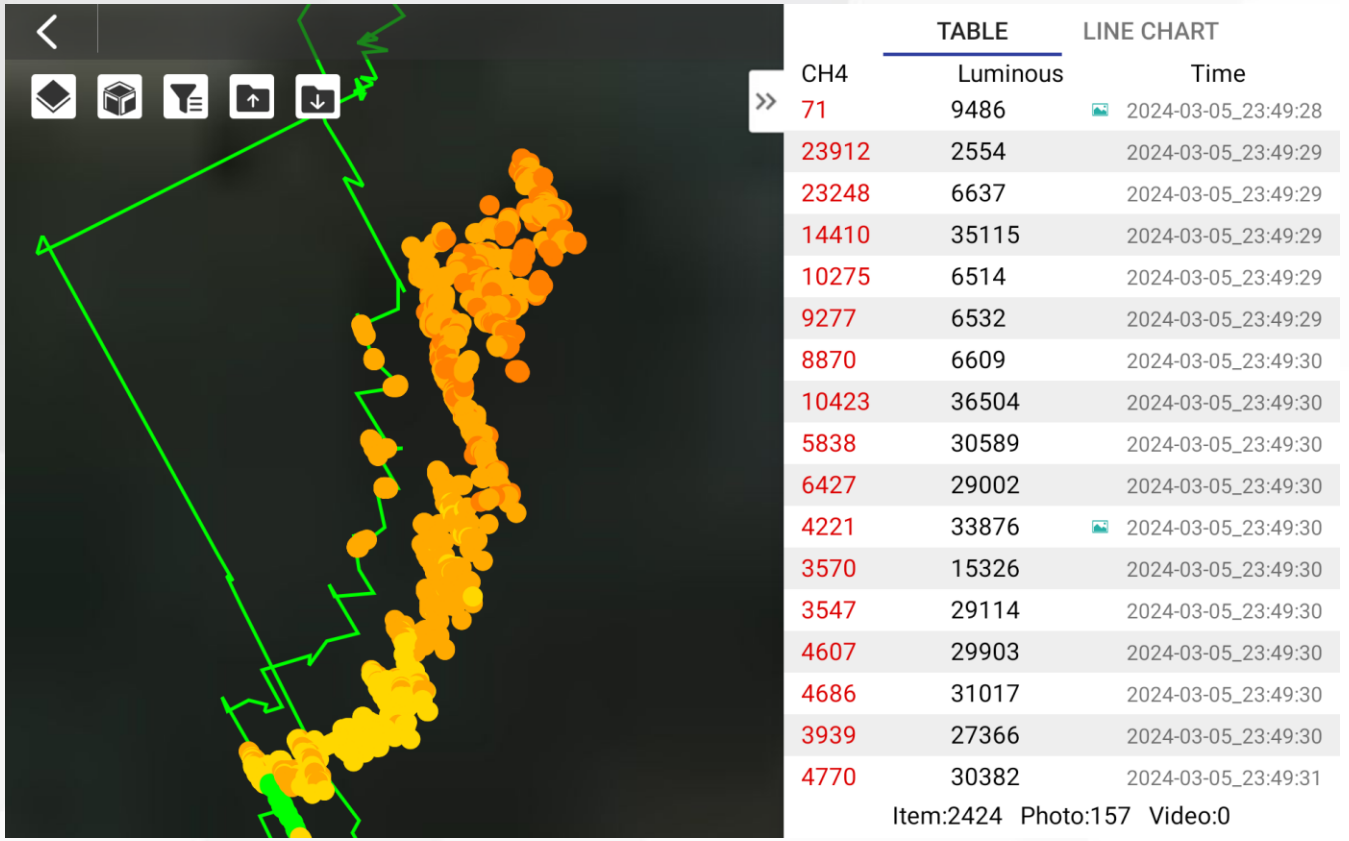
3.This approach significantly improves inspection efficiency, reduces manual workload, and enhances safety compared to traditional ground-based surveys.

Inspection Results & Data Visualization

All inspection data is **stored locally** on the detector's internal storage and organized by mission, ensuring full user control over data access and management.

With the upgraded software workflow, inspection results can be reviewed, categorized, and exported directly **without relying on cloud services** or external data platforms.

Inspection data and visual evidence can be seamlessly compiled into Word-format reports through the application, significantly improving reporting efficiency while maintaining **data privacy and security**.



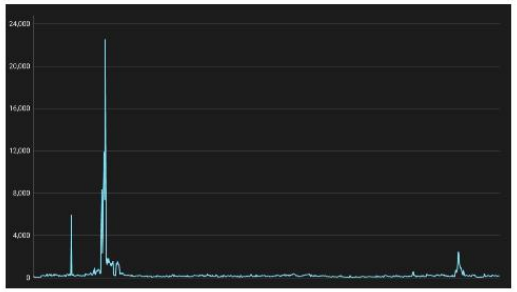
Automated Inspection Report Output

Purway TDLAS Detector Data Report

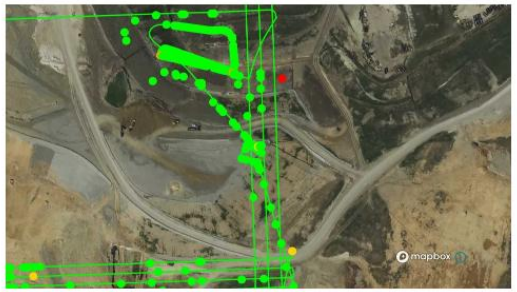
1、Inspection Overview

Address	address				
Staff	staff		Generation Time	2025/07/29 17:52	
Warning	840	Duration	00:18:26	Voyage	6372.0m

2、Concentration Curve



3、Track Map



4、Concentration Table

Num	Time	Longitude	Latitude	CH4	Luminous	Photo
1	2024-10-21_18:47:34	-96.9506059	33.0303613	242	7279	
2	2024-10-21_18:47:35	-96.9506169	33.0303651	72	23060	
3	2024-10-21_18:47:35	-96.9506206	33.0303665	90	25037	
4	2024-10-21_18:47:35	-96.9506221	33.0303668	51	27323	
5	2024-10-21_18:47:35	-96.9506266	33.0303685	95	26970	
6	2024-10-21_18:47:35	-96.9506282	33.0303689	57	24924	
7	2024-10-21_18:47:35	-96.9506299	33.0303696	81	22447	
8	2024-10-21_18:47:36	-96.9506315	33.03037	45	21159	
9	2024-10-21_18:47:36	-96.9506343	33.0303711	65	20529	
10	2024-10-21_18:47:36	-96.9506357	33.0303713	57	17639	
11	2024-10-21_18:47:36	-96.9506373	33.0303718	62	13594	
12	2024-10-21_18:47:36	-96.9506388	33.0303723	90	13067	
13	2024-10-21_18:47:36	-96.9506406	33.0303726	76	13451	
14	2024-10-21_18:47:36	-96.9506452	33.0303742	54	10552	
15	2024-10-21_18:47:39	-96.9506112	33.0303596	194	3548	
16	2024-10-21_18:47:39	-96.9506117	33.0303597	251	3086	
17	2024-10-21_18:47:39	-96.9506108	33.0303594	225	3090	
18	2024-10-21_18:47:39	-96.9506115	33.0303591	195	2933	
19	2024-10-21_18:47:51	-96.9506519	33.0303218	248	3782	
20	2024-10-21_18:47:51	-96.9506577	33.030317	201	4256	
21	2024-10-21_18:47:54	-96.9507112	33.0302021	204	4167	
22	2024-10-21_18:47:55	-96.9506509	33.0301882	157	3866	
23	2024-10-21_18:47:55	-96.9506331	33.030185	220	3802	
24	2024-10-21_18:47:56	-96.9505423	33.030163	255	3941	
25	2024-10-21_18:47:56	-96.9505338	33.030161	393	3740	
26	2024-10-21_18:48:00	-96.9504734	33.0301558	169	3558	
27	2024-10-21_18:48:01	-96.9504743	33.0301565	186	3230	
28	2024-10-21_18:48:02	-96.950475	33.0301562	232	3257	
29	2024-10-21_18:48:03	-96.9504751	33.0301554	345	3360	
30	2024-10-21_18:48:05	-96.9504746	33.0301549	350	3322	
31	2024-10-21_18:48:05	-96.9504742	33.0301549	205	3441	
32	2024-10-21_18:48:06	-96.9504744	33.0301545	367	3584	
33	2024-10-21_18:48:09	-96.9504806	33.0301611	181	3794	
34	2024-10-21_18:48:10	-96.9504674	33.0301225	182	3640	
35	2024-10-21_18:48:10	-96.9504638	33.0301124	269	2951	
36	2024-10-21_18:48:11	-96.9504574	33.0300941	197	3465	
37	2024-10-21_18:48:11	-96.9504473	33.0300657	285	3698	
38	2024-10-21_18:48:11	-96.9504452	33.0300581	355	3804	
39	2024-10-21_18:48:14	-96.9503814	33.0298811	186	2826	
40	2024-10-21_18:48:17	-96.9502781	33.029592	365	2136	
41	2024-10-21_18:48:18	-96.9502067	33.0293805	250	1715	
42	2024-10-21_18:48:21	-96.9501244	33.0291432	326	1958	
43	2024-10-21_18:48:32	-96.949941	33.0286082	269	2897	
44	2024-10-21_18:49:00	-96.9518868	33.0285504	245	2636	
45	2024-10-21_18:49:11	-96.9532727	33.0285076	289	4303	
46	2024-10-21_18:49:12	-96.9533325	33.0285063	145	3885	
47	2024-10-21_18:49:13	-96.9535385	33.0284999	153	3782	
48	2024-10-21_18:49:14	-96.9536161	33.0284977	278	2901	
49	2024-10-21_18:49:16	-96.953833	33.0284911	200	3318	

Automated Inspection Report Output

Index: 1

393 ppm*m

Latitude:
33.0303613

Longitude:
-96.9506059

Time:
2024/10/21 18:47:34



Index: 2

365 ppm*m

Latitude:
33.029592

Longitude:
-96.9502781

Time:
2024/10/21 18:48:17



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	time	methane_c	light_intens	absorption_	relativity	pcb_temper	laser_tempe	tec_current	laser_housing_te	SNR	status	ver	err_code	longitude	latitude	altitude	relative_alt	speed	reliability	distance	dest_longit	dest_latitu
2	2024-10-21_	242	7279	172	999	44	30	-16	37	2	0	17	0	-96.950606	33.0303613	155.58	3.18	0	0	0	-96.950606	33.0303613
3	2024-10-21_	72	23060	172	999	44	30	-158	36	2	0	17	0	-96.950606	33.0303618	159.097	5.887	0	1	3.9	-96.950617	33.0303651
4	2024-10-21_	90	25037	172	999	44	30	-39	37	5	0	17	0	-96.950606	33.0303624	159.097	6.59	0	1	5.1	-96.950621	33.0303665
5	2024-10-21_	51	27323	172	999	44	30	-41	37	2	0	17	0	-96.950606	33.0303625	159.097	7.031	0	1	5.6	-96.950622	33.0303668
6	2024-10-21_	95	26970	172	999	44	30	-11	37	4	0	17	0	-96.950606	33.0303627	159.097	8.192	0	1	7.2	-96.950627	33.0303685
7	2024-10-21_	57	24924	172	999	44	30	-210	37	2	0	17	0	-96.950607	33.0303627	159.097	8.456	0	1	7.7	-96.950628	33.0303689
8	2024-10-21_	81	22447	172	999	44	30	-36	37	3	0	17	0	-96.950607	33.0303628	159.097	9.143	0	1	8.3	-96.95063	33.0303696
9	2024-10-21_	45	21159	172	999	44	30	-36	37	2	0	17	0	-96.950607	33.0303628	164.199	9.474	0	1	8.8	-96.950632	33.03037
10	2024-10-21_	65	20529	172	999	44	30	-39	37	2	0	17	0	-96.950607	33.0303629	164.199	10.32	0	1	9.8	-96.950634	33.0303711
11	2024-10-21_	57	17639	172	999	44	30	-147	37	2	0	17	0	-96.950607	33.030363	164.199	11.075	0	1	10.2	-96.950636	33.0303713
12	2024-10-21_	62	13594	172	999	44	30	-165	37	2	0	17	0	-96.950607	33.030363	164.199	11.488	0	1	10.8	-96.950637	33.0303718
13	2024-10-21_	90	13067	172	999	44	30	-72	37	2	0	17	0	-96.950607	33.0303631	164.199	12.188	0	1	11.3	-96.950639	33.0303723
14	2024-10-21_	76	13451	172	999	44	30	-38	37	3	0	17	0	-96.950607	33.0303631	164.199	12.154	0	1	11.8	-96.950641	33.0303726
15	2024-10-21_	54	10552	172	999	44	30	-41	37	2	0	17	0	-96.950607	33.0303632	164.199	13.664	0	1	13.5	-96.950645	33.0303742
16	2024-10-21_	194	3548	172	999	44	30	-20	37	2	0	17	0	-96.950607	33.0303629	179.233	24.689	0	1	25.5	-96.950611	33.0303596
17	2024-10-21_	251	3086	172	999	44	30	-165	37	2	0	17	0	-96.950607	33.0303629	179.233	24.96	0	1	26.2	-96.950612	33.0303597
18	2024-10-21_	225	3090	172	999	44	30	-14	37	2	0	17	0	-96.950607	33.030363	179.233	25.205	0	1	26.5	-96.950611	33.0303594
19	2024-10-21_	195	2933	172	999	44	30	-144	37	2	0	17	0	-96.950607	33.030363	179.233	25.758	0	1	27	-96.950612	33.0303591
20	2024-10-21_	248	3782	172	999	44	30	-186	36	2	0	17	0	-96.95065	33.0303159	183.014	24.419	0.5	1	26.8	-96.950652	33.0303218
21	2024-10-21_	201	4256	172	999	44	30	-180	36	2	0	17	0	-96.950657	33.0303125	183.014	24.528	0.5	1	26.3	-96.950658	33.030317
22	2024-10-21_	204	4167	172	999	44	30	-158	36	2	0	17	0	-96.950707	33.0302093	183.425	26.852	0.4	1	25.3	-96.950711	33.0302021
23	2024-10-21_	157	3866	172	999	45	30	-170	36	2	0	17	0	-96.950647	33.0301911	183.36	25.653	0.6	1	25.8	-96.950651	33.0301882
24	2024-10-21_	220	3802	172	999	44	30	-146	36	2	0	17	0	-96.95063	33.0301869	183.36	25.652	0.7	1	26.9	-96.950633	33.030185
25	2024-10-21_	255	3941	172	999	45	30	-150	36	2	0	17	0	-96.950538	33.0301657	183.328	26.203	0.7	1	27.3	-96.950542	33.030163
26	2024-10-21_	393	3740	172	999	45	30	-153	36	2	0	17	0	-96.95053	33.0301639	183.328	26.353	0.6	1	27.5	-96.950534	33.030161
27	2024-10-21_	169	3558	172	999	45	30	-26	36	2	0	17	0	-96.950469	33.0301602	183.451	27.914	0	1	28.4	-96.950473	33.0301558
28	2024-10-21_	186	3230	172	999	45	30	-53	36	2	0	17	0	-96.950469	33.0301603	183.505	27.755	0	1	28.3	-96.950474	33.0301565
29	2024-10-21_	232	3257	172	999	45	30	-8	36	2	0	17	0	-96.95047	33.03016	183.546	27.581	0	1	28.4	-96.950475	33.0301562
30	2024-10-21_	345	3360	172	999	45	30	-198	36	2	0	17	0	-96.95047	33.0301596	183.591	27.31	0	1	28.4	-96.950475	33.0301554
31	2024-10-21_	350	3322	172	999	45	30	-124	35	3	0	17	0	-96.95047	33.0301591	183.708	27.743	0	1	28.4	-96.950475	33.0301549
32	2024-10-21_	205	3441	172	999	45	30	-161	35	2	0	17	0	-96.95047	33.0301592	183.708	27.356	0	1	28.4	-96.950474	33.0301549
33	2024-10-21_	367	3584	172	999	45	30	-124	35	2	0	17	0	-96.95047	33.0301593	183.772	27.557	0	1	28.4	-96.950474	33.0301545
34	2024-10-21_	181	3794	172	999	44	30	-44	35	2	0	17	0	-96.950474	33.0301595	183.923	26.198	0.1	1	28.4	-96.950481	33.0301611
35	2024-10-21_	182	3640	172	999	45	30	-44	35	2	0	17	0	-96.950461	33.0301216	184.007	25.69	0.4	1	29	-96.950467	33.0301225
36	2024-10-21_	269	2951	172	999	45	30	-17	35	2	0	17	0	-96.950457	33.030111	184.007	25.43	0.5	1	29.3	-96.950464	33.0301124
37	2024-10-21_	197	3465	172	999	44	30	-144	35	2	0	17	0	-96.950451	33.0300927	184.061	25.142	0.6	1	29.7	-96.950457	33.0300941
38	2024-10-21_	285	3698	172	999	44	30	-118	35	2	0	17	0	-96.95044	33.0300643	184.061	25.139	0.7	1	30.1	-96.950447	33.0300657
39	2024-10-21_	355	3804	172	999	45	30	-18	35	3	0	17	0	-96.950438	33.0300573	184.061	25.055	0.7	1	30.3	-96.950445	33.0300581
40	2024-10-21_	186	2826	172	999	44	30	-171	35	2	0	17	0	-96.950374	33.0298795	184.158	23.753	0.1	1	34	-96.950381	33.0298811
41	2024-10-21_	365	2136	172	999	44	30	-137	35	2	0	17	0	-96.950271	33.0295905	184.255	23.61	0.12	1	39.7	-96.950278	33.029592
42	2024-10-21_	250	1715	172	999	44	30	-138	35	2	0	17	0	-96.950198	33.0293785	184.264	24.588	0.12	1	40.5	-96.950207	33.0293805
43	2024-10-21_	326	1958	172	999	44	30	10	35	2	0	17	0	-96.950116	33.029142	184.427	23.999	0.12	1	39.2	-96.950124	33.0291432
44	2024-10-21_	269	2897	172	999	44	30	-125	34	2	0	17	0	-96.949933	33.0286071	177.376	19.698	0	1	31.4	-96.949941	33.0286082
45	2024-10-21_	245	2636	172	999	44	30	-87	33	2	0	17	0	-96.95189	33.0285432	180.496	20.181	0.11	1	35.3	-96.951887	33.0285504
46	2024-10-21_	289	4303	172	999	43	30	-4	32	2	0	17	0	-96.953276	33.0285021	182.91	22.868	0.12	1	28.9	-96.953273	33.0285076
47	2024-10-21_	145	3885	172	999	43	30	-138	32	2	0	17	0	-96.953336	33.0285003	182.912	22.974	0.12	1	29.2	-96.953333	33.0285063
48	2024-10-21_	153	3782	172	999	43	30	-109	32	2	0	17	0	-96.953541	33.0284939	182.942	23.051	0.11	1	29.5	-96.953539	33.0284999
49	2024-10-21_	278	2901	172	999	43	30	-14	32	2	0	17	0	-96.953619	33.0284917	182.979	23.077	0.11	1	29.5	-96.953616	33.0284977
50	2024-10-21_	200	3318	172	999	43	30	-150	32	2	0	17	0	-96.953836	33.0284854	183.003	23.375	0.11	1	30	-96.953833	33.0284911
51	2024-10-21_	156	3441	172	999	43	30	-122	32	2	0	17	0	-96.954235	33.0285956	182.69	26.318	0.3	1	29.2	-96.954233	33.0285906
52	2024-10-21_	169	3057	172	999	43	30	-72	32	2	0	17	0	-96.954231	33.0285969	182.69	26.613	0.3	1	29.4	-96.954229	33.0285922
53	2024-10-21_	242	3112	172	999	43	30	-20	32	2	0	17	0	-96.954228	33.0285978	182.69	25.962	0.3	1	29.4	-96.954226	33.0285928
54	2024-10-21_	169	3088	172	999	43	30	-8	32	2	0	17	0	-96.95422	33.0285991	182.69	25.878	0.3	1	29.5	-96.95422	33.0285932
55	2024-10-21_	179	3405	172	999	43	30	-73	32	2	0	17	0	-96.954189	33.0285995	182.839	25.148	0.3	1	29.8	-96.954191	33.0285946
56	2024-10-21_	217	2469	172	999	43	30	-95	32	2	0	17	0	-96.9541	33.0285995	182.919	25.263	0.6	1	30.5	-96.954103	33.0285964

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