

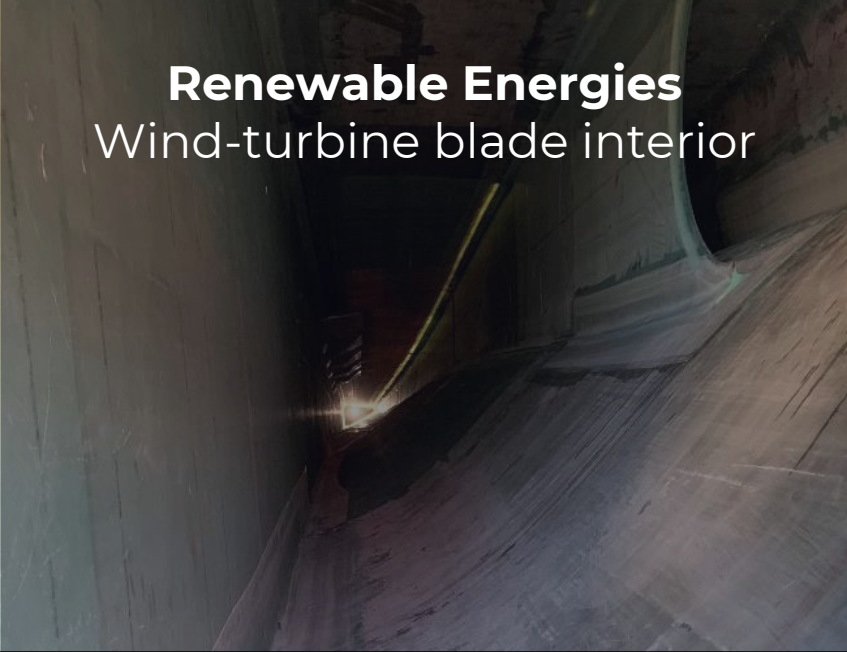


FLYBOTIX

professional inspection drones



**Ranked: #1 in
Robotics
nationwide
2024**



Renewable Energies
Wind-turbine blade interior



Chemical plants
Chemical tank




Water Infrastructure networks
Sewers

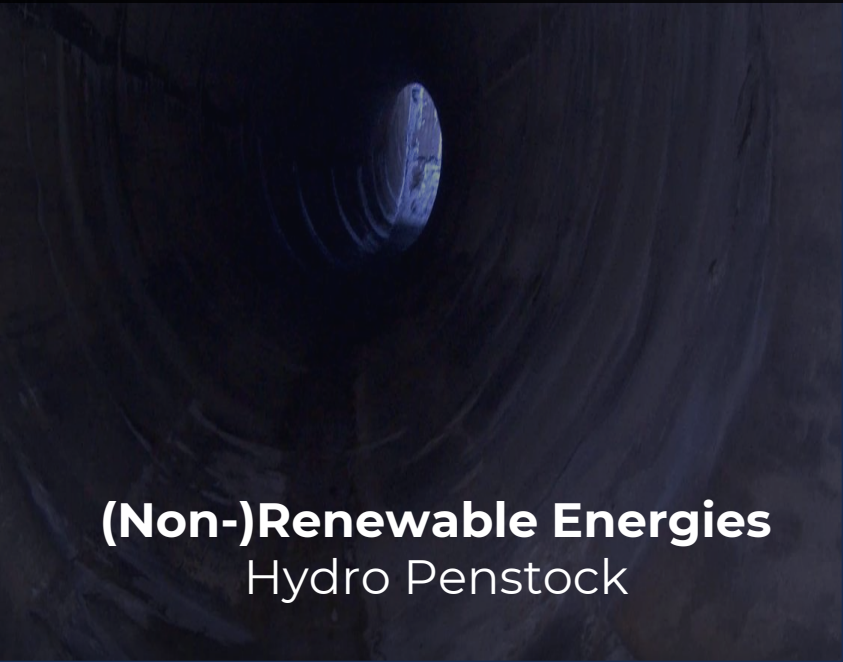
THE **ASIO DRONE** SOLUTION FOR ALL INDUSTRIES



Oil & Gas
Oil Tank – Refinery



Maritime
Ship



(Non-)Renewable Energies
Hydro Penstock



Proven Business Case

END CUSTOMERS

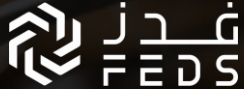


International
Paper

Chevron



TICS✓



NEXTERA
ENERGY



ACTEMIUM



G.S. Marine Services Ltd

WESTECH
INSPECTION INC.

IPARTES
INDUSTRIAL PARTS



DISTRIBUTORS

Measur
Commercial Drone Experts

iGeo®

THE
DRONE
CENTRE

PINE

RAUSCH



MAVERICK
DRONE SYSTEMS

GEOCOM
Solutions Géomatiques

DRONE VOLT®

IATEC
Plant Solutions

OPTICON
Benelux

FRONTIER PRECISION
UNMANNED

PRIZES & PARTNERS

SWISS
ECONOMIC
AWARD

FINALIST 2023
DEEPTech/
LIFE SCIENCE

TOP
100
SWISS STARTUP AWARD
2023

SR SPRINT
ROBOTICS



FIT
fondation
pour l'innovation
technologique

eesa
business
incubation
centre
Switzerland

VENTURE KICK
KICKSTART
YOUR HIGHTECH
BUSINESS

IMD
INTERNATIONAL

maxon

RIMA
ROBOTICS FOR INSPECTION
AND MAINTENANCE

CONFINED SPACE INSPECTIONS PUT **HUMAN WORKERS AT RISK** EVERY DAY

1

- **2.1million workers** enter confined space annually.
- **2 workers die every week** in accidents in confined space.

[Source:](#) Occupational Safety and Health Administration

EXISTING SOLUTIONS CAUSE **EXPENSIVE SHUTDOWNS OF ASSETS** w/ CONFINED SPACE

2

- Scaffold entirely inside oil tanks costs days of shutdown and **hundreds of 1000x USD**.
- **1 day** of shutdown in a refinery costs **\$ 4 m loss**.

[Source:](#) Av. annual refining margin \$8 per barrel
x 500'000 BPSD

LACK OF CONFINED SPACE INSPECTIONS **DAMAGES THE PLANET**

3

- With classical methods, confined space inspections are **difficult and costly**. E.g., a ship owner would have to dock the ship for days to put scaffolding, so inspection is sometimes avoided. The damage on the planet is **devastating**.

[Source](#)

1



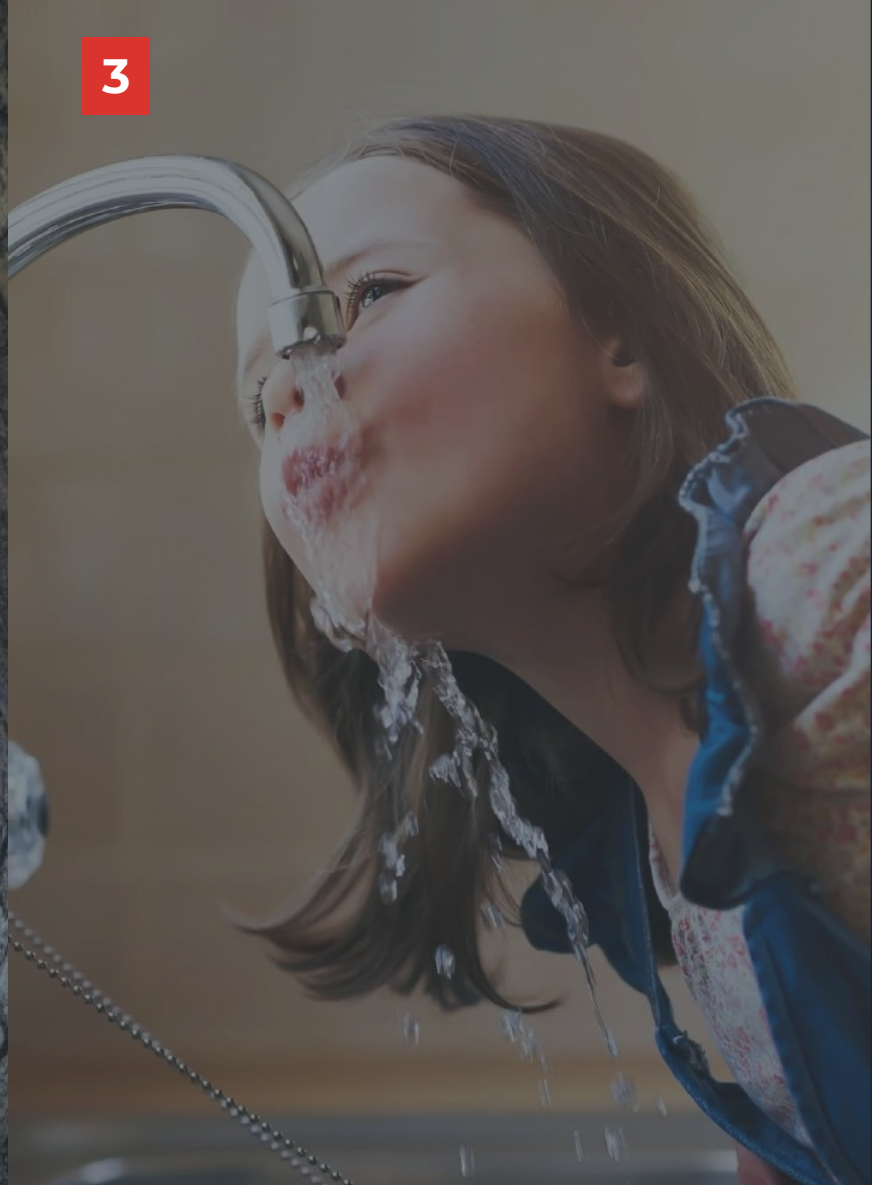
**AGING SEWER SYSTEMS
AND WATER TUNNELS POSE
GRAVE RISKS GLOBALLY**

2



**CONVENTIONAL INSPECTION
METHODS PUT
HUMAN WORKERS AT RISK**

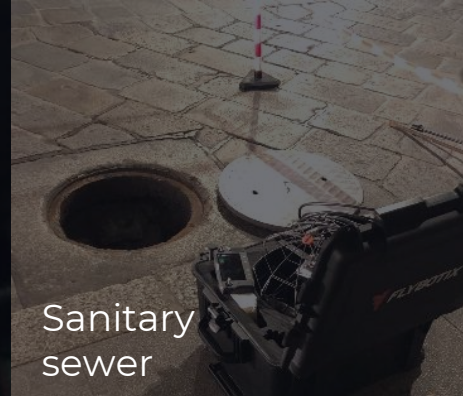
3



**INCOMPLETE OR UNFREQUENT
INSPECTIONS THREATEN SAFE
DRINKING WATER**



Culvert



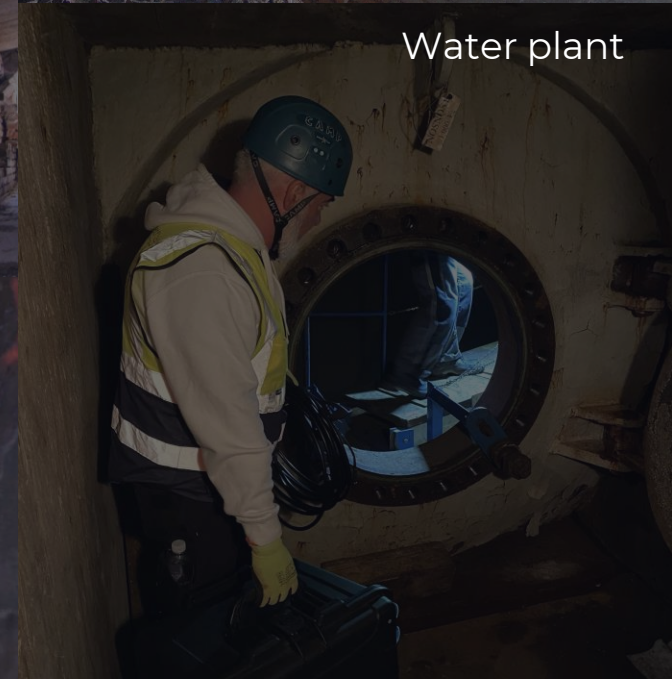
Sanitary
sewer



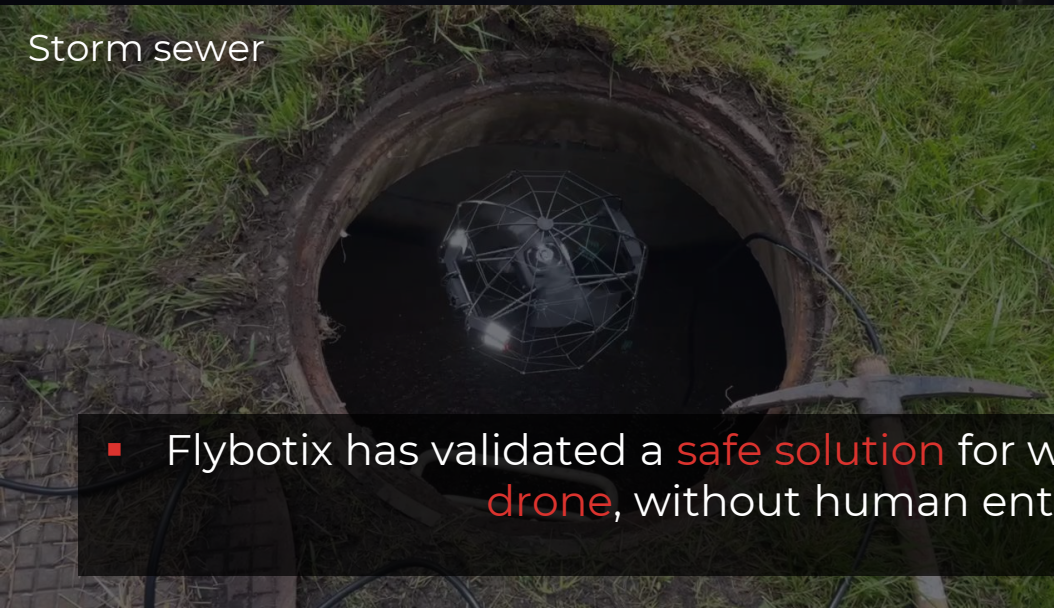
Culvert



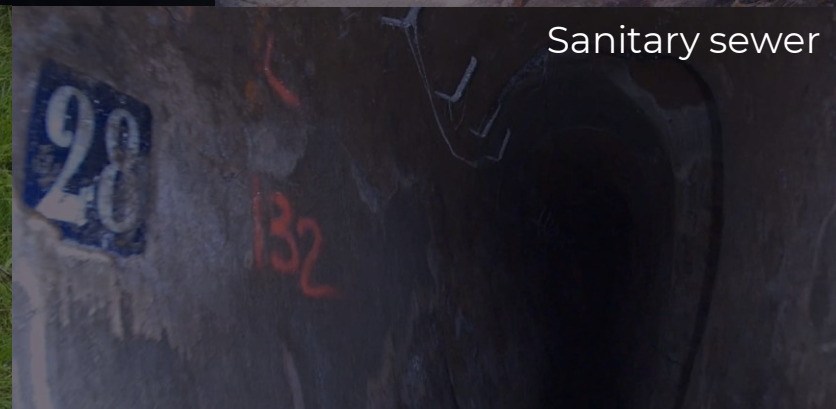
Culvert



Water plant



Storm sewer



Sanitary sewer

- Flybotix has validated a **safe solution** for wastewater network inspection & digitalization using Flybotix **ASIO drone**, without human entry. There are still 2 limitations: **radio-link range** and **easiness of use** <https://flybotix.com/>

Major savings thanks to drone-based inspections

100%

Personnel
safety

5x

Faster
inspections

5x

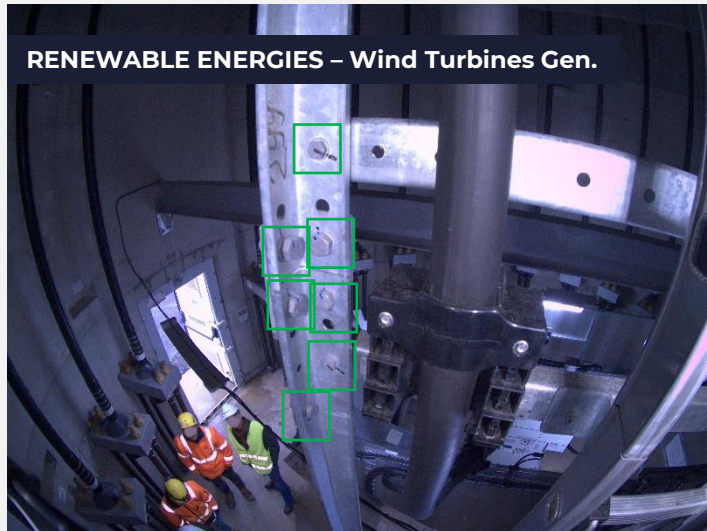
Monitoring
frequency

2x

More
insights

100%

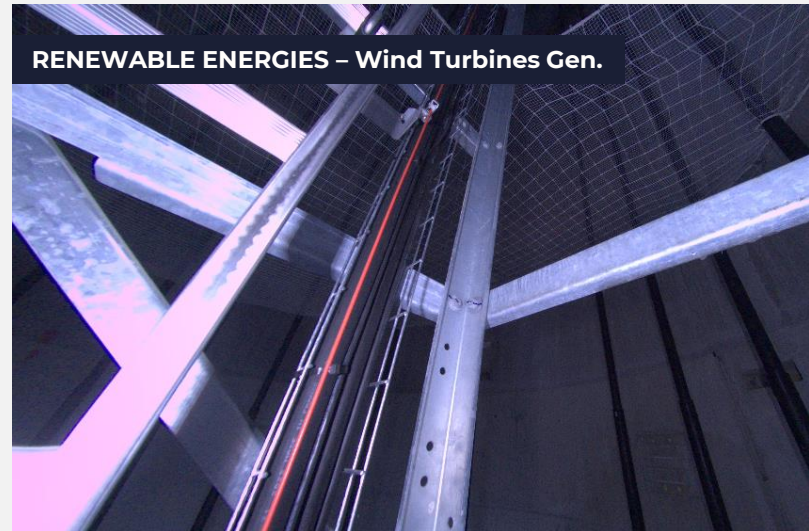
Accuracy &
consistency



Wind turbine inspection – **Mast** internal

**AI based Bolt (tightness)
automatic detection**

Fast bolt (& bolt tightness) detection,
safer as humans do not have to go up the
ladder. More WTG productivity



Wind turbine inspection – **Mast** internal

**Structural visual inspection
Spatial 3D mapping**

Super fast inspection, safer as humans do
not have to go up the ladder. More WTG
productivity



Wind turbine inspection – **Blade** intern.

**Structural visual inspection
Spatial 3D mapping**

Up to 50% faster internal inspection of
blades maximizes WTG uptime, while
being safer & simpler

Major savings thanks to drone-based inspection

100%

Personnel
safety

5x

Faster
inspections

5x

Monitoring
frequency

2x

More
insights

100%

Accuracy &
consistency

GAS INSULATED TRANSMISSION LINE – GIL



Image: Hitachi Energy

Underground **transmission lines**

**Structural visual & thermal
inspection**

Fast inspection, while being safer as humans do not have to go inside the GIL tunnels

HIGH VOLTAGE STATION – POWER PLANTS



Image: BBC Cellpack power

Underground **transmission lines**

**Structural visual & thermal
inspection**

Easy inspection of the connection and cable condition on top of transformer, while being safer as humans do not have to go inside the station

HIGH VOLTAGE TRANSFORMER STATIONS



Image: MBT

Underground **transmission lines**

**Structural visual & thermal
inspection**

Easy inspection of the connection and cable condition on top of transformer, while being safer as humans do not have to go inside the station

Major savings thanks to drone-based inspection

100%

Personnel
safety

5x

Faster
inspections

5x

Monitoring
frequency

2x

More
insights

100%

Accuracy &
consistency

RAIL INDUSTRY

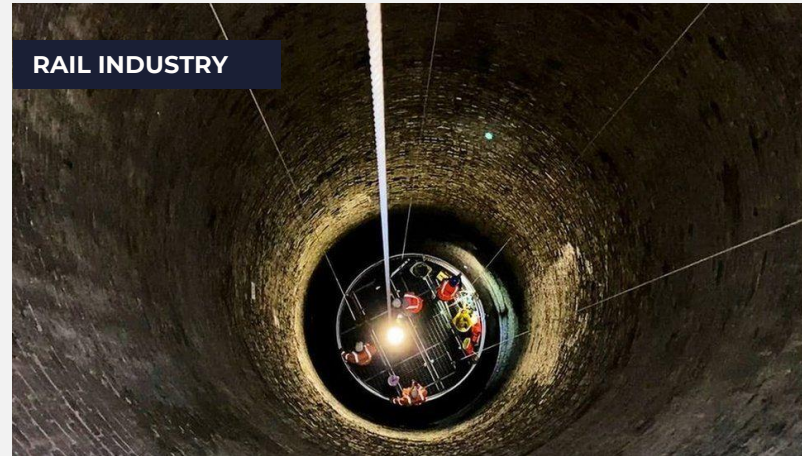


Underground rail **tunnels**

Structural visual inspection
Automatic defect detection

Fast & simple inspection, safer for human
inspectors

RAIL INDUSTRY



Underground **ventilation** shafts

Structural visual inspection
Spatial 3D mapping

Fast & easy inspection, while being safer
as humans do not have to go inside the
shafts

RAIL INDUSTRY



Rail tunnel **boring** works

Structural visual inspection
Spatial 3D mapping

Fast & accurate inspection, while being
safer as humans do not have to go inside



Meet *ASIO X*



PROBLEM – TIME

Today, existing solutions offer only 8 minutes of flight-time, causing:

50%

Battery-life lost in travelling in and out of confined space to change the battery

These Back & forth flights make **inspections slow**, and the plant shutdowns longer for these **terribly expensive plants**.



LONGEST FLIGHT TIME



20 MIN



ULTRA BRIGHT LIGHTING



40k lumens

**2,5x brighter than
competitive inspection
UAVs**





World ▾Business ▾Markets ▾Sustainability ▾Legal ▾Breakingviews ▾Technology ▾Investigations

Europe

Five workers killed in sewage plant accident in Sicily

By Reuters

May 6, 2024 6:49 PM GMT+2 · Updated 2 months ago



ROME, May 6 (Reuters) - Five workers were killed on Monday in an accident at a sewage treatment plant near Palermo, on the island of Sicily, while another was found unconscious and taken to hospital, firefighters said.

According to Italian broadcaster RAI, the workers suffered from toxic gas poisoning, with one team member managing to get away and raise the alarm. There was no comment from AMAP, the regional group which is responsible for waste water treatment.



U.S. BUREAU OF LABOR STATISTICS

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Injuries, Illnesses, and Fatalities

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Fact Sheet | Fatal occupational injuries involving confined spaces | July 2020

From 2011 to 2018, 1,030 workers died from occupational injuries involving a confined space. The annual figures range from a low of 88 in 2012 to a high of 166 in 2017. These data are from the Bureau of Labor Statistics, Census of Fatal Occupational Injuries (CFOI).

Table 1. Fatal occupational injuries involving confined spaces, 2011-2018

Year	2011	2012	2013	2014	2015	2016	2017	2018
Fatal work injuries	120	88	112	116	136	144	166	148



INTEGRATED GAS DETECTION

Detects, locates & quantifies **4 gases**:


- Methane (CH₄)
- Hydrogen Sulfide (H₂S)
- Oxygen (O₂)
- Carbon Monoxide (CO)



INTEGRATED ORIENTABLE LIDAR



Generates point clouds and highly accurate crack and defect measurements.



ROBUST CAGE

Protects from impacts and collisions.

Fly again after impacts and collisions.

Save on repair cost thanks to top durability & survivability.





EASY TO PILOT

Offers intuitive user interface for a super quick learning curve.

Inspect dark, dusty and narrow environments. Authorise simplified inspection and pilot assistance.

Save on expert pilots.



VERY STABLE IN HARSH ENVIRONMENTS

16 Sensors and...

- Distance and optical flow sensors
- VIO cameras
- IMU
- Barometer
- Radar to “see” in dust, smoke and fog

5 Flight Assist Modes..

- Wall lock
- Tube lock
- Height lock
- Repulsion mode
- Velocity mode

...ensuring a **stable & save flight**



World leading drone technology

ASIO X

INTEGRATED MULTI-GAS DETECTOR

Detects, locates & quantifies 4 gases: Methane, Hydrogen, Sulphide, Oxygen, Carbon Monoxide.

ULTRA BRIGHT LIGHTING

Illuminates confined spaces to provide crystal clear images with industry leading 40k lumens.

LONGEST FLIGHT TIME

20min per battery for a full inspection in a single flight.

DUAL CAMERA SYSTEM

Dual 4K and RadioMetric IR Cameras with 180° unobstructed vertical FOV.

INTEGRATED ORIENTABLE LIDAR

Generates point clouds and highly accurate crack and defect measurements

EASY TO USE

Intuitive user interface and controls to expedite the learning curve.

STABLE IN HARSH ENVIRONMENTS

Advanced Radar-based stabilization Technology increases inspection success in volatile environmental conditions.

VIO TECHNOLOGY

Utilize camera data and inertial sensors to maintain precise positioning even in GPS-denied environments.

ROBUST CAGE

Protects from impacts and collisions.



[Click here for Video](#)



ASIO SOLUTION **WORKFLOW**



ASIO X Drone
Drone unit for
effective data
collection

Data collection



ASIO FlyStation
A dual-screen solution to
enhance efficiency,
visibility, and comfort.

Data collection



ASIO Explore
Computer app for
on-site data
verification

On-site
Data verification

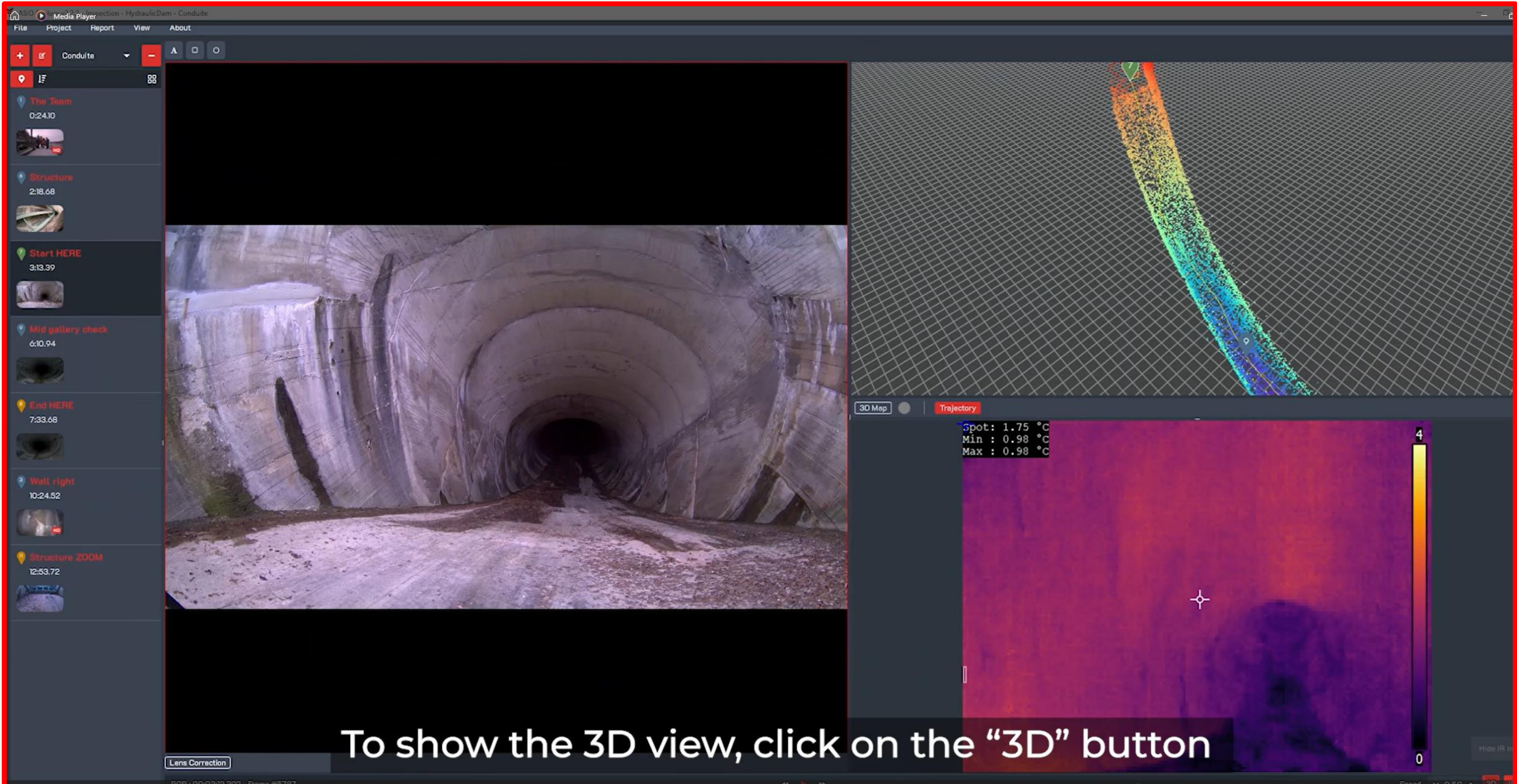


ASIO Connect
Cloud app for data-
management, AI analytics,
inspection management

Data management &
AI analytics



Data Processing in ASIO Explore



The screenshot displays the ASIO Explore software interface, which is used for data processing and visualization. The interface is divided into several sections:

- Left Panel:** A sidebar containing a list of video segments with timestamps and thumbnails. The segments are:
 - The Team (0:24.10)
 - Structure (2:18.68)
 - Start HERE (3:13.39)
 - Mid gallery check (6:10.94)
 - End HERE (7:33.68)
 - Wall right (10:24.52)
 - Structure ZOOM (12:53.72)
- Main View:** A large central area displaying a 2D video feed of a tunnel. The tunnel has a concrete lining and a dirt floor. A black bar is visible at the top of this view.
- Top Right View:** A 3D point cloud visualization of the tunnel, showing the tunnel's geometry in a wireframe mesh. A color gradient (from blue to red) is applied to the point cloud, likely representing temperature or distance data.
- Bottom Right View:** A thermal image (heatmap) of the tunnel wall. A color scale on the right indicates temperature values from 0 to 4. A white crosshair is visible in the center of the thermal image.
- Bottom Panel:** A control bar with a "Lens Correction" button and a "3D" button. The "3D" button is highlighted, indicating it is the active view.

To show the 3D view, click on the "3D" button

In-Picture Measurement with ASIO Software

ASIO Explore v2.4.2 - Inspection - 20241105_Sewer_Lausanne - 004 * (Not Responding)

FileProjectReportViewAbout

+

004

-

I

F

5:35.07

1°

125°

1°

125°

Measurement Mode

Lens Correction

Number of points: 81755

Camera Mode

Grid Spacing: 2m

3D Map

Trajectory


Snapshot

Number of points: 192,000

Help

Click here for Video

Data Management & 3D Modeling with ASIO Software



Filtermenü...

Startseite

Plan der Objekte

Objekte


Plan der Objekte

Inspektionen

Werkzeuge

Administration

Startseite

Details der Inspektion -  - Hydroelectric Power Plant - Factory - 05.05.2024

KI Analyse

Zusätzlicher Point-of-Interest


Vorheriger

All

Manuell


Sämtliche

POINT-OF-INTEREST



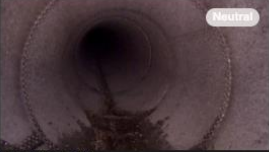
Start

0m 3s 368ms



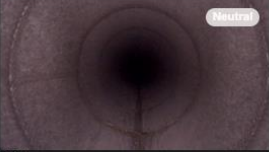
Scrap

1m 16s 148ms



Bending point


1m 20s 191ms



Mid

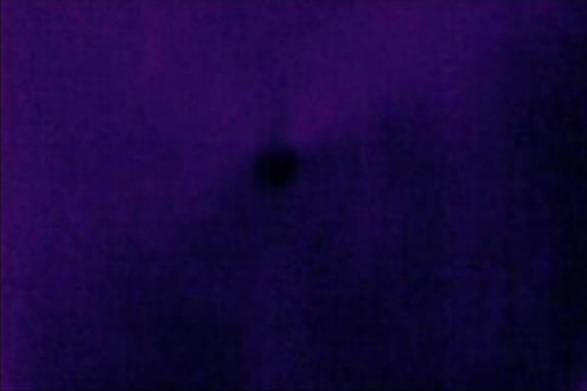
2m 42s 405ms

Farbbild




02:42 11:18

Infrarot



02:42 11:18



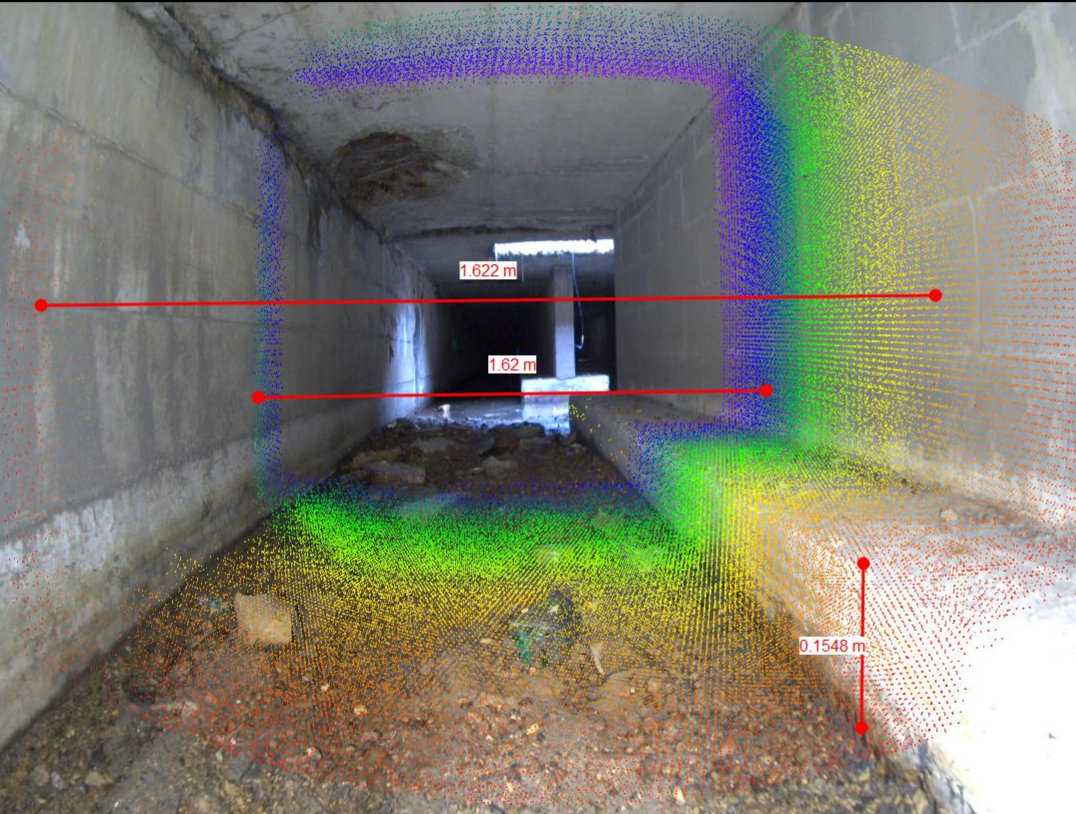
Click here for Video

v2.4.2_cluster1

3:37.37

-5°

-163°



Measurement Mode

Lens Correction Number of points: 87303

RGB : 00:03:37.373 - Frame #5782

3D Map

Session

Session 15:4

Selection

Noise reduction

Generation

Scale

Display

Point Size

Background

World Coordinate Axes

Camera Size

Cloud Opacity

Measurement Unit

Meter

Pointcloud Filtering

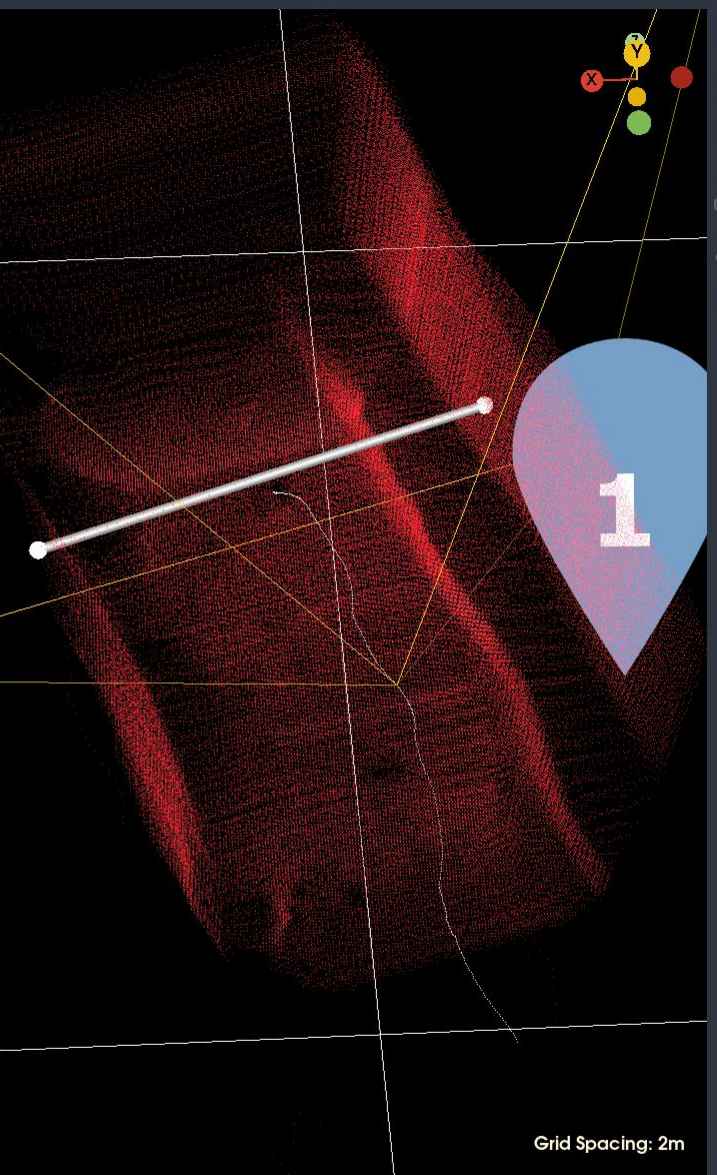
Time range

Start position

End position

Filter

3D Map Trajectory Snapshot Number of points: 287,580



Grid Spacing: 2m

2:30.00 3:00.00 3:30.00 4:00.00 4:30.00 5:00.00 5:30.00 6:00.00 6:30.00 7:00.00 7:30.00 8:00.00 8:30.00 9:00.00

Speed 1.00 3D IR RGB

Managing Inspection Data in ASIO Connect



Filter Menu

Home

Assets Management

Inspections

Assets

Assets map

Tools

Administration

Assets Management

Assets map

Assets map

Search

Advanced filters

A map of Europe showing various countries and cities. Three green location pins are visible on the map, indicating inspection data points. The pins are located in France (near Paris), Switzerland (near Zurich), and Germany (near Frankfurt). The map is titled 'Assets map' and includes a search bar and an 'Advanced filters' dropdown menu. The map is displayed on a red background.



Managing Inspection Data in ASIO Connect



FLYBOTIX
Filter Menu
Home
Assets Management
Tools
Administration

Asset Details - Tramway Roadwork - Simple

Inspection # 0
Mar 25, 2024

Inspection # 1
Apr 18, 2024

Inspection # 2
May 14, 2024

Tramway Roadwork (Simple)
Project to build a tramway Lausanne-Renens

Attachments (0)
No Data Available

Points of Interest
Neutral Low Medium High
Clear

	Junction - 20240514_DJI 0m 1s 0ms Neutral
	Top View - 20240514_DJI 4m 48s 34ms Neutral
	Parking Entrance - 20240514_DJI 7m 2s 107ms Neutral



Managing Inspection Data in ASIO Connect



Inspection Details - 📍 - Firefighter Training Center - Factory - 4/30/2024

DJI + ASIO-X / Outdoor - Indoor -

Manual - All -


POI

00:00:00 00:03:50

00:30:00 01:00:00 01:30:00 02:00:00 02:30:00 03:00:00

Point Size Three - AI Analysis - Add POI ↕ Back


Low



Stairs - Door

7m 46s 470ms

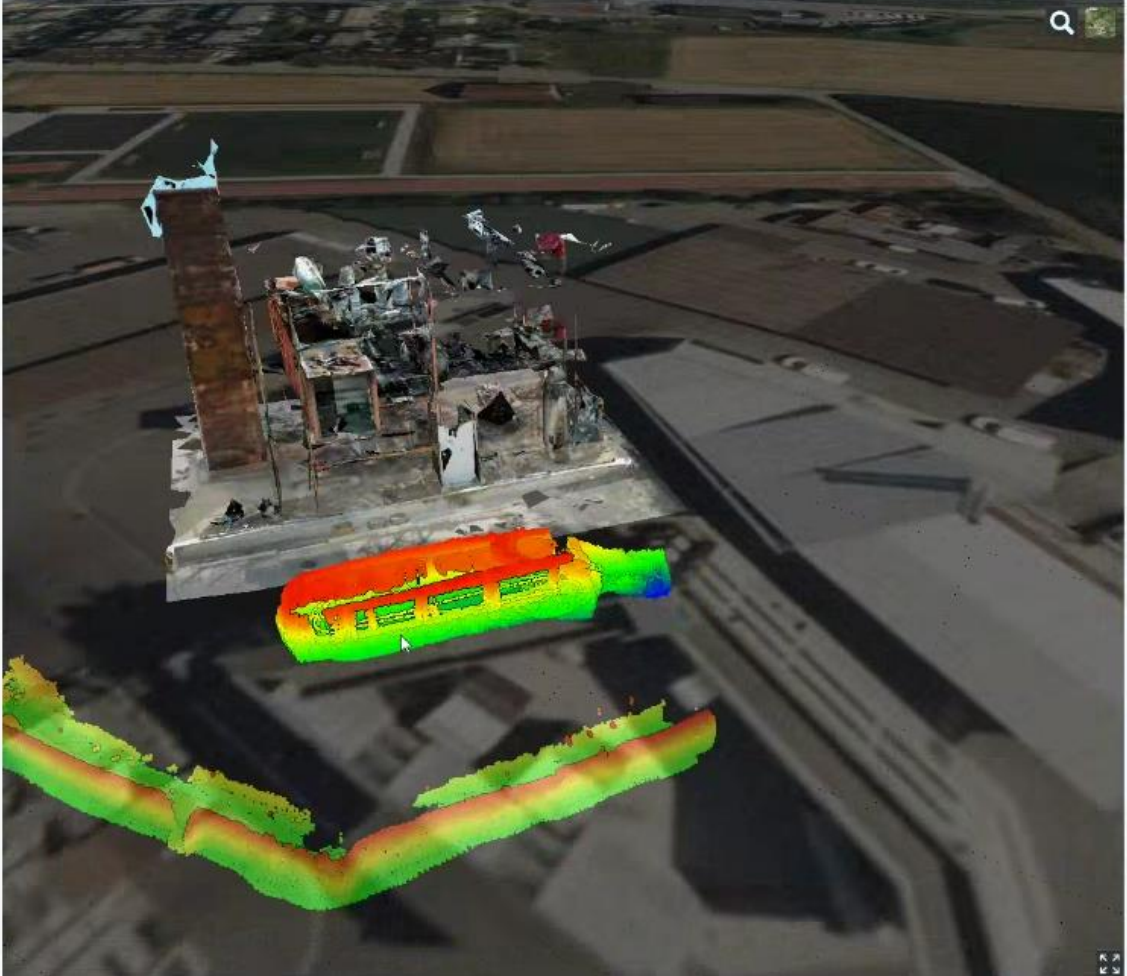
Original Rust



00:05:35 HD

No recordings have been added to this flight yet.

⏮ ⏪ ⏩ ⏭







How can we help you make your inspections more efficient?

The ASIO is an **Incredible tool** packed full with the latest hardware and software!

Alexander Harding - UAV pilot at TerraCam

ASIO has an **enormous advantage thanks to its flight time**. It is much more pleasant for me to fly the ASIO, my heartbeat is slower than when I fly competitive products!

Rosario DE SANCTIS - Head Product Officer
at DroneVolt

Top team and **Top product!**
First inspection drone to fly as long as needed in technical inspection!

David Duval - Chief Executive at Flying Report

Inspections in confined spaces with a drone have become **very easy** with the ASIO Pro from Flybotix! Flybotix is a great company that keeps its promises and delivers a great drone

Rob Dikkerboom – General Manager
at Opticon B

The ASIO Drone is a **game changer** with its **long flight time** and its **user-friendly** interface.

The Flybotix team is wonderful to work with a well-deserved **5 stars!**

Kenneth Andrews
Inside Sales Representative at Pine Environmental

In the confined space, inspection world there is not much room for error. That is why we **trust** the ASIO Pro drone from Flybotix! With the **advanced technology**, you can complete the tasks while saving money, time, and promoting worker safety!

Austin Robison – Pilot at I.I.S





www.flybotix.com

info@flybotix.com

