

 interactive aerial
A **nexis** Company



ZENITH

ROBOTICS FOR INTERNAL INSPECTIONS

CONQUER VERTICAL INSPECTIONS WITH EASE

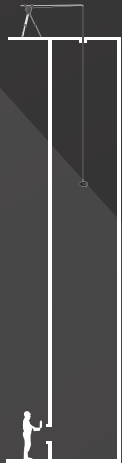
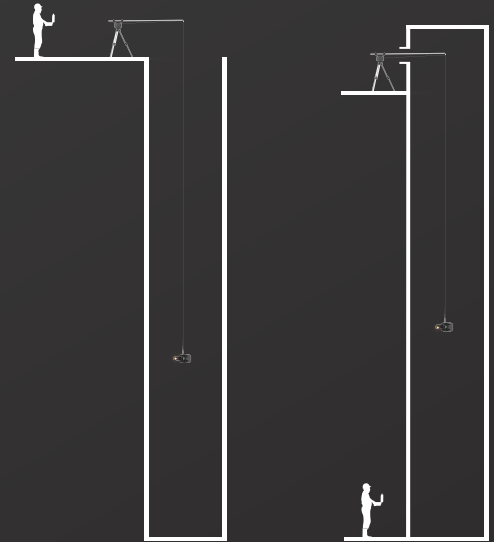
Zenith thrives in those hard to reach, vertical confined spaces.

What could traditionally cost hundreds of thousands to inspect, can be covered in a fraction of the time while also saving lives and money with the Zenith. Never break the plane for confined-space entry during your inspections again.

MULTIPLE CONFIGURATIONS

STANDARD - TOP DOWN

The Zenith tripod system is placed at the top of an asset; whether that be on the roof, or at a man-way located on the upper side. Thanks to the Extension Arm, the unit enters the environment without inspectors breaking the plane for confined space entry. The operator can control Zenith from multiple locations, whether they are right beside the tripod, or at a distance farther away; typically safe on the ground with other engineers or site management personnel. In fact, Zenith's Smart Winch acts as a repeater between the Controller and payload, enabling wireless HD video and payload control from over a half mile away. As with any Zenith configuration, other inspectors or engineers may watch the inspection live by viewing a wireless second screen.

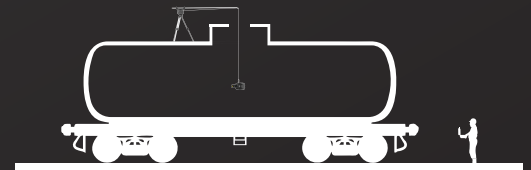


LIMITED TOP ACCESS

In some scenarios, there is no man-way or entry door for top access to lower the Zenith through. In a real-world scenario with Interactive Aerial's Inspection Service team, a tower at a pulp & paper mill did not have top access. Mill engineers pointed out a two-inch-wide vent hole on the roof near the center of the tower. This enabled our staff to feed only the Zenith's cable through the small vent opening, without the Zenith Unit attached, then lower the cable 160ft to the bottom of the asset. Once there, IA's staff stood outside the asset's lowest man-way and retrieved the cable with a "shepherds hook" on the end of a pole. They attached the Zenith box, then placed it back inside without ever breaking the plane of confined space. The Zenith successfully inspected the tower with 100% asset coverage, then was safely removed the same way it was put in.

HORIZONTAL "RAILCAR" ACCESS

With Zenith's 30x zoom camera, users can zoom in live during an inspection to see a crack as small as 1/32" from 30 ft away! For example, take the internal inspection of a railcar where the access door is located in the center, but an inspector would need to see 15 feet across the container to survey the far side. Or maybe an API inspector needs to see the opposite side of a storage tank when the access door is only on one edge of the vessel. The advanced payload on the Zenith enables an operator to complete these types of inspections with ease!



MOUNT TO EXISTING INFRASTRUCTURE

Some assets with top entry have beams built over them to effectively lower equipment inside for outage maintenance and repair. In this instance, Zenith is successfully deployed inside an environment without using the tripod, gantry, or extension arms. The operator would simply detach Zenith's winch system and mount it to existing infrastructure by using hardware specific to this application.

ZENITH FEATURES

SAFETY COMES FIRST

The operator and Zenith will always remain safe thanks to the many built in safety features throughout the system.

2+ HOURS OF BATTERY RUN TIME

The weight of Zenith is fully supported by the cable coming off the Tripod, allowing for much longer battery run time than a drone.

SIMPLE SINGLE PERSON OPERATION

No in-person training or certifications required to start inspecting with Zenith

NEVER BREAK THE PLANE FOR CONFINED SPACE ENTRY

Thanks to Zenith's Extension Arm and Smart Winch System, the operator should never have to break the plane for confined space entry

FULLY AUTOMATED ZENITH INSPECTIONS

Place Zenith inside the asset, press go, and minutes later receive 100% asset coverage with no human interaction

LIVE HD VIEWING UP TO 3000' AWAY

30X Optical Zoom | 4K Recording
18MP Still Photos | Live Location Data
Wireless Transmission to Operator's Controller

360° VIEWING

Easily view the entire asset by rotating the CoaxDrive System and tilting the gimbal 180° up & down

ATTACHMENT CAPABILITIES

Users can mount a wide array of additional payloads to the bottom of Zenith such as survey grade LIDAR, Thermal, Gas Detection, Radiation sensors, etc. Unlike a drone, Zenith can carry additional weight and without affecting system performance, making Zenith unlike any other inspection tool.

THE CONTROLLER

The Zenith's Controller has been created with the inspector in mind. With low-profile buttons, rockers and switches, the controller is meant to be used with gloves in any tough environment. Built into a rugged Pelican Case, this controller is designed to last and bring you the results you need. Light up your asset at the press of a button and capture your inspection with ease.

SPECS

DIMENSIONS L: 10" W: 11" H: 5"

WEIGHT 7lbs

VIEWING SCREEN 10" Screen in lid - 1080p

LCD SCREEN Live Depth Readout, Heading, Battery Remaining, LIDAR distance
Automate Depth/Rotation/Heading
Change settings on Winch or Zenith

CONTROLS Electronic up & down - buttons
Yellow rings activate when in motion
Red dots indicate top & bottom limits

Winch speed adjustable by a variable knob:
- Fastest speed: 100ft/min
- Slowest speed: 1ft/min

Camera Controls:
- Red Button - press once for Photo (18.2MP), hold to start Video (4K)
- White Button - LED control - On & Off

BATTERY Built in Battery with easy charge connector



THE GIMBAL

Smaller drones require “cell phone” sized cameras to save weight. With far less weight restrictions for Zenith, it has the ability to carry a wide variety of payloads, starting with the advanced camera inside the gimbal’s protective housing. Sporting a 30x Optical Zoom Camera that can capture 18MP still photos and 4K video recording all while self-stabilizing, this is the camera for the job. Light up the darkest spaces with a 10,000 Lumen LED light that is brighter than car headlights so you can see even the smallest of defects. After the inspection, run your photos through our Photo Measurement Software that is included with Zenith to get precise defect dimensions.

SPECS

CAMERA	30X Optical Zoom 18MP Still Photos 4K Video Recording
CAMERA RESOLUTION	1/32" detection at 30ft 1/16" detection at 90ft
RANGE OF MOTION	180° Floor to Ceiling view
LIDAR	Object detection up to 100ft
LED LIGHT	100w 10,000 lumen
IMAGE STABILITY	High precision brushless stabilization
HOUSING MATERIAL	High Strength Glass infused nylon material



THE COAXDRIVE SYSTEM

Our Patent Pending CoaxDrive System is at the heart of Zenith's strengths. What makes this more than a box with a beautiful gimbal? The CoaxDrive System gives Zenith precise heading control left and right. By counter-rotating our custom paddles inside the center of Zenith, it enables the Unit to hold its heading regardless of air flow or cable unwind. Using the paddles to create torque along with a robust inertial measurement unit (IMU), provides the Unit with precise heading control. Due to Zenith being attached to a free spinning bearing, the inspector is able to rotate the Unit unlimited left or right to complete a thorough inspection.



PATENT-PENDING
COAXDRIVE SYSTEM



PRECISE HEADING CONTROL

Always know your orientation and prevent unwanted rotation to ensure the clearest of image quality

TWO COUNTER ROTATING PADDLES

Yaw 360° for full coverage while using minimal battery power

THE TRIPOD

At the base of the Zenith is a custom designed Tripod built to meet the needs of any type of inspection. Each leg can be set at independent degrees and at different heights, using angled brackets with 6 holes at roughly 15° increments. The Tripod locks at 0° for easy transport inside its case. Safety begins with the Tripod, engineered with 4 safety attachment points to anchor/secure Tripod during the operation and pin tethers to prevent a fall from a height.

SPECS

- DIMENSIONS** Collapsed Height: 30"
Fully Extended Height: 49"
Extended with Winch: 62.5"
Collapsed Tripod diameter: 7"
- WEIGHT** 19lbs
- COMPOSITION** Aircraft grade aluminum
Stainless-steel hardware
- FEATURES** Tripod head swivels 360°
Tripod head swivel lock
Extend legs to lay down 90° flat
Span legs over 7' diameter hole
4 Safety Attachment Points
Feet are swappable for magnets, rubber, etc.



SMART WINCH SYSTEM



SPECS

- DIMENSIONS** Full System Height: 13.5"
SWS without Gantry Height: 10"
L: 10.5" W: 10"
- CABLE DEPTH** 500ft - stock cable
- CABLE** 20-gauge .84mm cable
- MOTOR SPEED** Up to 100ft/min
- FEATURES** Hall-Effect encoder for precise height readout.
Manual override - Built in hand crank for equipment retrieval if necessary.
Swap a battery mid-inspection with no risk
11 holes to pin lock holes for precise angle control: -45° to +45°

The Smart Winch System (SWS) includes: Winch Motor & Reel, Electronic Control Box, and Gantry. Angle your Zenith 11 different ways thanks to the pivoting Gantry that holds the Extension Arm. View live Zenith readouts on the LCD screen to see height, heading, LIDAR distance, and more. Use the switches to control the Zenith height in addition to the controller. The SWS can also be removed and attached to existing infrastructure such as a beam above the manhole.



ZENITH BATTERIES

The batteries used for both the Zenith Unit and the Smart Winch System's electronic control box are interchangeable. The standard purchase includes 2 swappable batteries and 2 battery chargers. The batteries are splash resistant and rugged; built with impact resistance thanks to a thermal plastic polyurethane housing. The built in battery management system ensures easy charging and safe operation. They socket directly into the Zenith housing for simple and quick installation.

SPECS

AVG RUN TIME 2+ Hours (Winch & Zenith)
DIMENSIONS L: 3.5" W: 2.75" H: 3.75"
BATTERY 7000mAh
155.4Wh
22.2V

CHARGE TIME High Capacity - 3.5hrs on Standard Charger
MATERIAL Thermal plastic polyurethane housing
SPLASH RESISTANT Sealed housing & connector



TRANSPORTATION

The entire Zenith System breaks down neatly into two rugged hardshell cases with rollers and handles. Never lose a component to your Zenith thanks to our custom cut cases that provide protection for each part of the system. Divided up to meet airline luggage requirements, the Zenith is designed for travel. Along with weight compliance, the Zenith batteries are also manufactured for aircraft travel, making Zenith one of the easiest transportable inspection tools.

SPECS

MAIN CASE Exterior Length: 31.75"
Exterior Width: 20.75"
Exterior Depth: 12.5"

PACKED WEIGHT 65lbs

TRIPOD CASE Exterior Length: 40.25"
Exterior Width: 12.5"
Exterior Depth: 11"

PACKED WEIGHT 50lbs



ADDITIONAL COMPONENTS

There are a number of additional components available for purchase to fit the many needs an inspector may have. The standard Zenith System comes with a Zenith Unit, Tripod, Controller, the Smart Winch System, Extension Arm (8ft of tubes), 2 High Capacity Batteries, 2 Standard Battery Chargers, 2 cases for travel, and the Photo Measurement Inspection Software. Below are the add-ons available to make Zenith a form fitting inspection tool, always ready for the job.

LOWER CAPACITY BATTERY

For Air Travel - FAA regulations allow a passenger to carry on an unlimited amount of batteries if they are below 100 watt hours*

*NOTE: Per the most recent FAA guidelines March 2020

4200mAh,
93.24Wh
22.2V

FAST BATTERY CHARGER

Charge Time - High Capacity Battery: 1hr 45min
Low Capacity Battery: 1hr 15min

EXTENSION ARM KIT

Includes Tube and Tube Coupler

Max 2 additional for 12ft of total extension

VIDEO RECEIVER

For Second Viewing Screen

Modified for different second screen options
Live feed from Zenith's camera

ATTACHMENT PLATE

For Additional Primary Payload

Customized - Zenith can carry a variety of Primary Payloads due to the powerful SWS and high strength cable
Thermal, 360° LIDAR, Gas Detection, Radiation Detection

INSPECTIONS MADE EASY

INTERACTIVE AERIAL

Interactive Aerial is a Michigan based, manufacturing and service company that is committed to creating robotic solutions that will revolutionize the way traditional internal inspections are carried out.

Through timely customer service in the United States, Interactive Aerial is establishing quality relationships on a global basis. Streamlining the way manual inspections are presently accomplished within the PowerGen, Pulp & Paper, Maritime, Petrochem and Municipal industries. By doing so, we are reducing the risk to inspectors, all the while, saving exponential amounts of time and money compared to traditional internal inspection methods. We will continue these initiatives with high-quality products, market leading innovation, and our passionate employees.



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