

GROUNDUP.AI

COGNITIVE MAINTENANCE SOLUTION



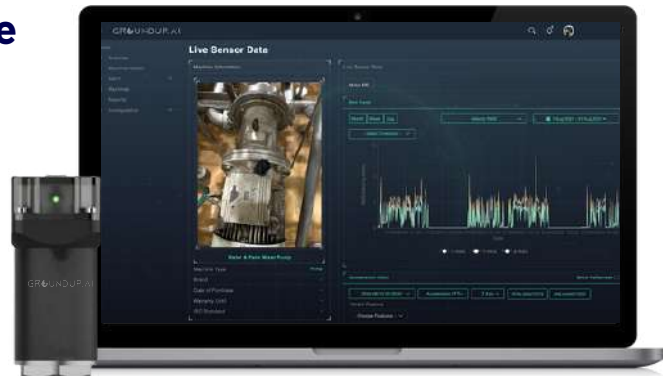
DECEMBER 2024
VERSION 2.1

ABOUT GROUNDUP.AI'S COGNITIVE MAINTENANCE SOLUTION

Unlock the future of Cognitive Maintenance

Groundup.ai's Cognitive Maintenance Solution leverages the power of data analytics, and Artificial Intelligence (AI) to predict equipment failures before they occur.

By continuously monitoring and analyzing real-time and historical data from machines, systems, and facilities, organizations can anticipate issues, schedule maintenance at the right time, and prevent costly unplanned downtime, all while optimizing resource allocation and extending the lifespan of their assets.



Benefits of utilizing Cognitive Maintenance



Reduce unplanned downtime



Attain long-term cost savings



Improve mean time between failures (MTBF)



Improve overall productivity

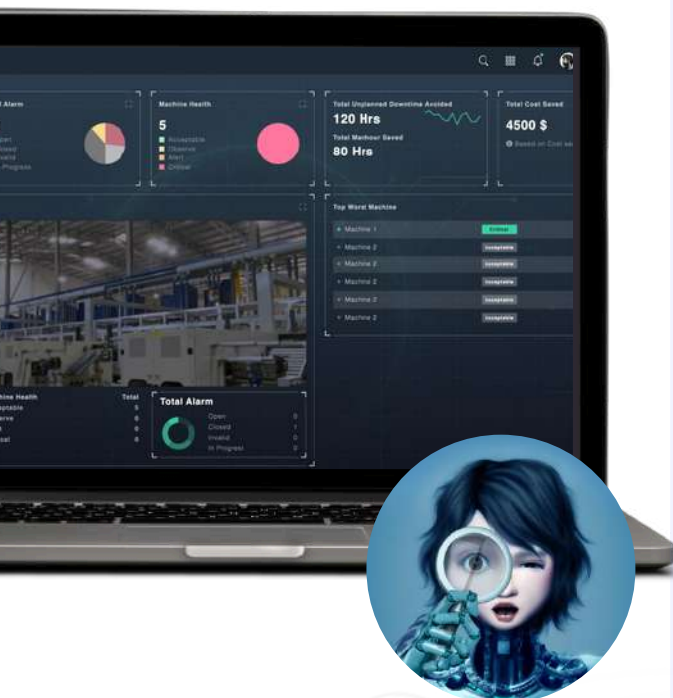


Avoid operational stress from sudden breakdowns



Create a safer working environment

Gain unparalleled insights into your machine's well-being



Machine Health Classification

We meticulously categorize your machine's health into four distinct classifications: Acceptable, Observe, Alert, and Critical. This clarity empowers you to swiftly identify the machines in dire need of your attention, enabling you to prioritize effectively and prevent costly downtimes.

Anomaly Detection & Prompt Notifications

Our advanced algorithms pinpoint machine anomalies before they escalate into costly disruptions. Be instantly notified of potential issues, empowering you to take proactive measures and safeguard your operations.

Root Cause Analysis & Prescriptions

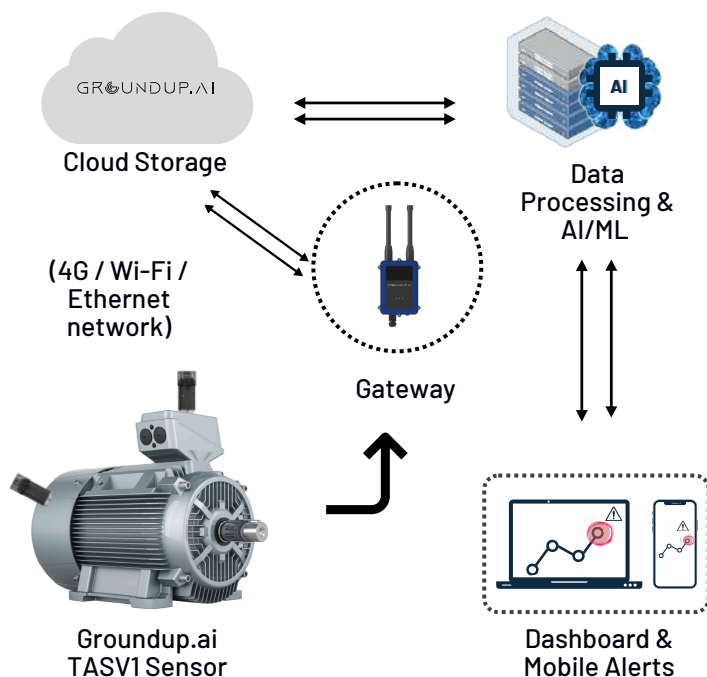
Say goodbye to countless hours spent on diagnosing issues – our advanced algorithms point you straight in the right direction. Not only do we identify the root cause of machine issues with precision, we also provide actionable insights, guiding you towards immediate resolution.

START YOUR COGNITIVE MAINTENANCE JOURNEY WITH HIGH-QUALITY DATA

Wireless Triaxial Acoustic Sensor (TASV1)

Wireless Triaxial Acoustic Sensor (TASV1) combines vibration, temperature, and sound data collection to enable intelligent diagnostic algorithms.

How it works



Why our sensor?

Non-intrusive Approach

Our sensor features a magnetic base for easy and flexible installation, without compromising the structural integrity of any machinery.

Easy to Install

Our sensor only needs less than 10 minutes to retrofit.

Comprehensive Data Acquisition

Our sensor enables the detection of early-stage machine faults, offering comprehensive data for smart maintenance decisions.

Reliable Wireless Communication

Strong wireless system keeps your data secure, even in challenging environments, ensuring equipment connectivity.

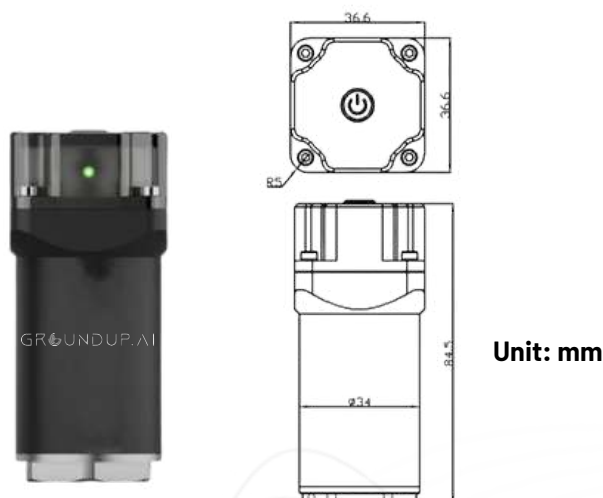
Long-lasting Power

Enjoy uninterrupted equipment monitoring with the extended battery life that lasts up to 3 years.

Built to Last

Equipped with an IP68 rating, our sensor is able to withstand outdoor and harsh deployment environments while delivering top-notch performance.

Technical Specifications



SECRET SAUCE TO FASTER RESULTS & ROI

Introducing Groundup.ai Asset Library™

The World's most differentiated and unique Anomaly Library

Our Anomaly Library consists of machine data collected across a wide spectrum of equipment from different OEMs, employing an unbiased strategy. This approach empowers clients with a comprehensive insight into their performance within the broader industry context, with a benchmark for comparison.



Outer Race Failure



Outer Race Looseness



Gear Failure



Coupling Failure



Slide Bearing Failure



Roller Failure



Poor Lubrication



Seal Failure



Impeller Failure



Loosening

**3X DEPLOYMENT
SPEED & HIGH
ACCURACY**

Applications in the CPG industry

Unplanned downtime and production delays can lead to insufficient stock availability in the market, resulting in lost sales revenue and jeopardizing critical shelf space. Groundup.ai acts against such disruptions and ensures seamless operations for our partners in the industry.



Pumps



Palletizers and Depalletizers



Motors



Mixing Tanks



Packaging Machines



Conveyor Belts



Air Compressors



Filling & Capping Machines



Blowers

CASE STUDY: COGNITIVE MAINTENANCE FOR GLOBAL FOOD MANUFACTURER

About the client

A global leader in eye care, dedicated to helping people see brilliantly. With over 75 years of experience, they are the largest eye care device company in the world, with complementary businesses in Surgical and Vision Care. They operate in 60 countries and serve patients in more than 140 countries.

They are committed to developing new and better products to improve the lives of people with eye conditions. Their products include contact lenses, intraocular lenses, surgical equipment, and eye drops. They also offer a variety of services, such as laser vision correction and cataract surgery.

Their need for C Maintenance

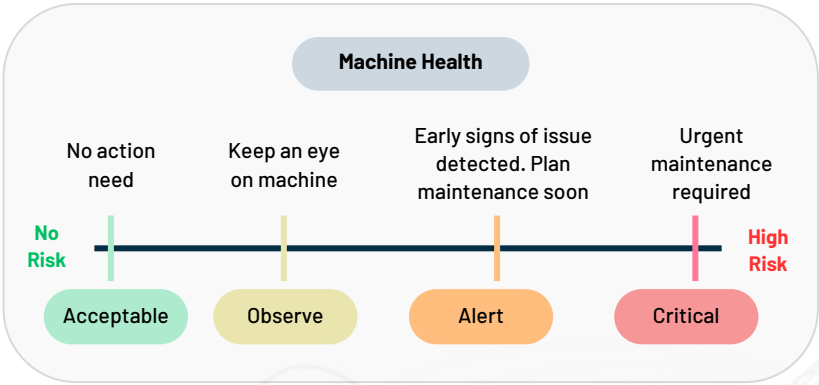
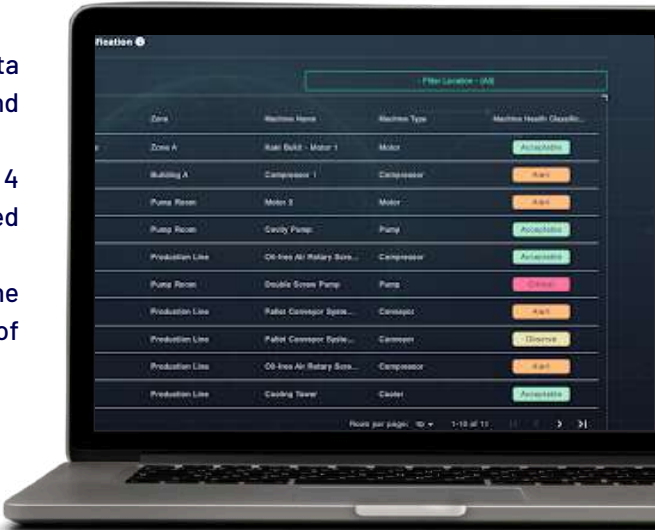
Operating around the clock to meet global demand, their production lines adhere to tight schedules. However, prior to Groundup.ai, **critical machines lacked active monitoring, operating on a reactive 'run-to-failure' basis.**

This led to significant disruptions, with some machines taking up to a week to repair, halting production lines for the same duration. This posed a considerable challenge for production and engineering teams, necessitating a **more effective maintenance approach.**



Our approach

- Installed IoT sensors on their critical machines and collected data continuously. Machines monitored include dosing pumps and gearboxes.
- From the data collected, we classified the Machine Health into 4 categories (Acceptable, Observe, Alert, and Critical), and established the baseline for each of the machines monitored.
- Our AI then comes into play to actively monitor the conditions of the machine and pick out any anomalies which are early indications of machine issues.



CASE STUDY: COGNITIVE MAINTENANCE FOR GLOBAL EYECARE MANUFACTURER

Our findings and how unplanned downtime was prevented

Groundup.ai does not focus on a single-point alert system but studies the overall machine behaviour and trend over time. From there, we identified that there was an issue with one of the Dosing Pumps as it was **continuously trending beyond an acceptable range**, whereas the other Dosing Pump was behaving at an acceptable condition. This is a critical piece of equipment that will affect 13 production lines downstream.

Machine: Dosing Pump (Left)



Location: Water System 1

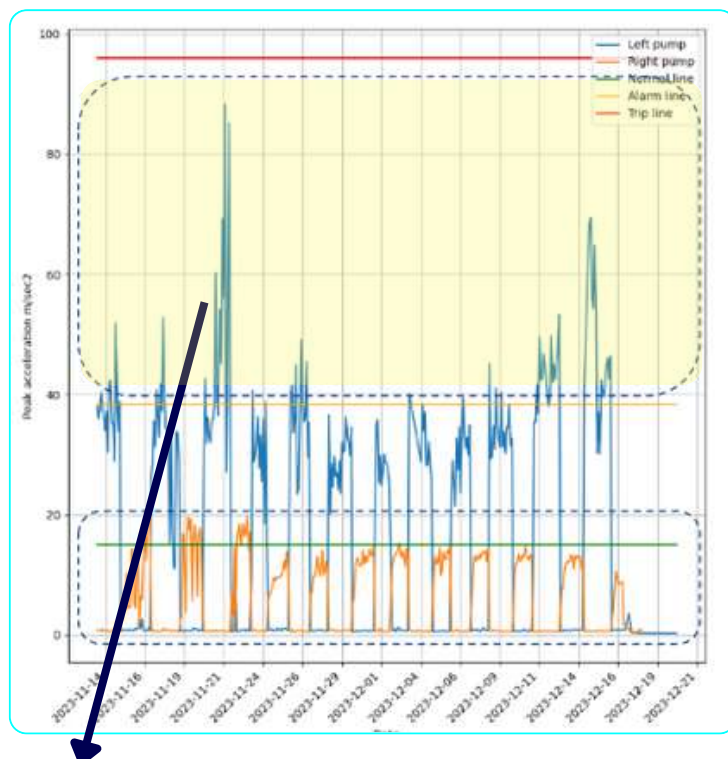
Machine Health : **Alert**

Findings:

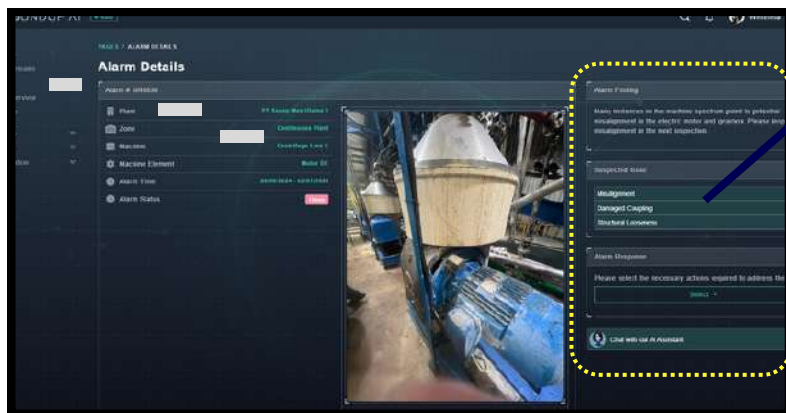
- Severe vibrations [above alert limit] have been detected in the left dosing pump at various times

Suspected Issue:

- Power transmission problems (worm gear or electric motor)



Severe vibrations have been found continuously at several timestamps, indicating that there is an early sign of a machine issue.



We promptly triggered an Alert in the dashboard and informed the client of our findings. Along with the finding, we also **provided recommendations to fix the problem**.

Client promptly went to take the required actions, and the machine's condition has improved since. This anomaly finding, along with the accurate detection of root cause, **successfully prevented an unplanned stoppage of 13 production lines**.

TECHNICAL SPECIFICATIONS

Technical Specifications	
Number of axes	3 axes
Sensory Unit	MEMS
Amplitude Range	±50 g peak (Z-axis) and ±16 g peak (X and Y axes)
Acceleration Frequency Range	Z-axis: 0.1 Hz (±3dB) to 10 kHz (±3dB) X and Y axes: 0.5 Hz (±3dB) to 1.6 kHz (±3dB)
Acceleration Amplitude Range	± 50 g
ADC Accuracy	32-bit ADC
Sampling Rate	1KHz - 51.2 KHz
Sample Length	2K bytes - 2M bytes
Measurement Interval	5-minute indicator and 2-hour time-domain waveform
Output Method	Total value, effective value, and spectrum time-domain waveform
Measuring Temperature Range	-40°C to 120°C (equipment surface temperature)
Acoustic Sampling Rate	44 KHz
Acoustic Signal-to-Noise Ratio	69 dB
Acoustic Sensitivity	-42 dB
Radio Frequency Standard	IEEE 802.15.4
Wireless Communication Distance	350 meters visual barrier-free distance
Battery Model	Replaceable C-size 3.6V disposable lithium-ion battery
IP rating	IP68 waterproof and dustproof rating
Operating Temperature	-40°C to 70°C
Corrosion Resistance	Stainless steel body, solvent-resistant nylon material
Drop Resistance	1.5m drop to concrete
Weight	218g (including battery)
Dimensions	Height: 85 mm; Diameter: 34 mm

Technical Dimensions

The technical drawing includes three views of the device: a top view showing a square footprint with side lengths of 36.6 mm and a central circular logo; a side view showing a cylindrical body with a total height of 84.5 mm and a diameter of Ø34 mm; and a front view showing the device's profile with a green indicator light at the top. The text 'GROUNDUP.AI' is visible on the front view. A label 'R5' points to a corner radius on the top view. The unit for all dimensions is mm.

Unit: mm

A photograph of the physical device, a black cylindrical sensor with a green LED light at the top and the 'GROUNDUP.AI' logo on the front.

ABOUT GROUNDUP.AI

Driving for a real impact, from the ground up

Groundup.ai helps industrial companies prevent unplanned downtime and unnecessary wastages. Our core solutions lie in Cognitive and Prescriptive Maintenance for a wide range of industries including Manufacturing, Maritime and Heavy Machinery. We achieve this by deploying our IoT sensors and AI platform, thereby helping clients to save substantial maintenance expenses without the need for a huge learning curve or high-risk deployments on the ground.



Innovativeness

We use our cutting edge technology to solve unique industrial problems, and are quick to adapt in times of need.



Community-driven

We solve problems for the sake of the people. Head home as you wish, as your machines are in safe hands.



ROI driven

Buy results, not technology. We deliver great value without the need for breaking the bank.

Groundup.ai transforms your business and helps your organization strive towards Industry 5.0

Let's drive for a real impact together, from the ground up.

CONTACT US



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