

Advancing Campus Environmental Monitoring and Research through Polludrone's Multi-Parameter Insights: UMT Campus, Malaysia



INTRODUCTION

Universiti Malaysia Terengganu (UMT) deployed a Custom-Configured Oizom Polludrone Air Quality Monitoring Station on its campus to provide continuous, real-time visibility into air quality and environmental conditions. A university campus is a dynamic environment where academic activity, infrastructure, traffic, and surrounding ecosystems interact continuously, and understanding these interactions requires accurate, locally measured data. The station measures a wide range of air pollutants and meteorological parameters, streaming data in real time to the Envizom platform.

This deployment provides UMT with a modern, evidence-based foundation for campus environmental management and research-driven initiatives, directly linking monitoring data to academic study and long-term analysis.



01 Polludrone Stations
Deployed

12+ Parameters
Per Station

24/7 Real-time Data
To Envizom

THE CHALLENGE

A university campus is shaped by a mix of academic activity, infrastructure, road traffic, and surrounding ecosystems; each influences ambient air quality in ways that are difficult to disentangle without continuous local measurement.

Before this deployment, UMT relied on fragmented and limited monitoring approaches, making it hard to generate the accurate, consistent data that student projects, faculty research, and environmental studies require.

To address this gap, UMT established a monitoring solution to enable:

- Simultaneous measurement of multiple gases, particulate matter, and meteorological parameters for comprehensive research use, rather than relying on multiple separate devices.
- Flexible, customizable monitoring capable of adapting to evolving research requirements.
- Easy sensor replacement to minimize downtime and support long-term experiments.
- Accurate, consistent, and continuous data suitable for academic and scientific analysis.
- Intuitive access to real-time and historical data for researchers and students, without complex system management.

WHY OIZOM POLLUDRONE

A research-grade campus monitoring solution must measure multiple pollutants and meteorological variables simultaneously, remain flexible enough to evolve with academic needs, and deliver data to a single trusted platform. Oizom's Polludrone was selected to meet exactly these requirements.

Oizom's Polludrone addresses these needs in a single modular outdoor unit:

- **Comprehensive multi-parameter sensing in one station**, measuring particulates, regulated gases, and meteorological data, reducing the cost and complexity of separate instruments.
- **Research-focused flexibility**, with a modular sensor architecture enabling easy sensor replacement and future upgrades to support evolving research needs.
- **Field-grade reliability**, with continuous data collection supporting both operational monitoring and long-term academic research.
- **Native integration with Envizom**, enabling real-time dashboards, historical trend analysis, and data export for research use.
- **A scalable foundation**, providing a basis for expanding environmental monitoring across additional campus locations if required.

THE DEPLOYMENT

A single Custom-Configured Polludrone station was installed at the UMT campus, designed specifically to meet the university's extensive monitoring and research requirements. The station continuously samples its environment and automatically transmits data to Oizom's AI-powered platform, Envizom, for real-time aggregation, visualization, and analysis.

This marked a shift from fragmented, limited monitoring approaches to a unified, data-driven

environmental monitoring framework at UMT.

The station monitors a wide range of pollutants and meteorological parameters:

CATEGORY	PARAMETERS MEASURED
Particulate matter	PM ₁ , PM _{2.5} , PM ₁₀
Gases	SO ₂ (sulfur dioxide), NO ₂ (nitrogen dioxide), H ₂ S (hydrogen sulfide), CO (carbon monoxide), NO (nitric oxide), TVOC (total volatile organic compounds), CH ₄ (methane), CO ₂ (carbon dioxide), O ₃ (ozone)
Meteorology	Wind speed, wind direction, and rain

By measuring meteorological parameters alongside pollutants, the station can correlate pollutant concentrations with local weather conditions; essential for research, trend analysis, and tracing likely pollution sources on and around campus.

RESULTS

The monitoring deployment has transformed how UMT understands, manages, and studies air quality across its campus. By delivering continuous, highly accurate data, it enables stronger research, deeper insights, and more informed environmental management.

KEY OUTCOMES

Enhanced Research Support

- Continuous, high-accuracy data enabling student projects, faculty research, and environmental studies.
- Reliable real-world environmental data for learning, experimentation, and policy-aligned studies.

Deeper Environmental Insights

- Transformation of complex datasets into clear visualizations through Envizom for easier interpretation and analysis.
- Improved understanding of campus air quality patterns to support informed environmental management.

Operational Efficiency

- Easy sensor replacement reducing downtime and improving system sustainability.
- A single-platform approach for air quality and weather monitoring, reducing system complexity.



Data-Backed Decision-Making

- A shift from assumptions to measurable environmental intelligence for campus planning and research.
- Reliable historical records and trend data to support comparative studies and future sustainability initiatives.

IMPACT

By implementing this monitoring solution, UMT has advanced toward a modern, data-driven environmental monitoring system. The deployment strengthens the university's capacity to monitor air quality, supports research and informed campus management, and reinforces UMT's role as a research-driven institution committed to environmental awareness and sustainable operations.

Oizom specializes in real-time environmental monitoring solutions designed to help organizations measure, manage, and improve environmental performance. Our comprehensive portfolio includes air quality, weather, noise, and emission monitoring systems, powered by advanced sensor technology and cloud-based analytics. Trusted across industries, governments, and smart city initiatives, Oizom's solutions enable continuous monitoring, regulatory compliance, and actionable environmental intelligence.