

Measured Data

CO₂ - CH₂O - PM_{2.5} - TVOC - PM₁₀

Temperature - Pressure - Noise - Seismic



AirTrack

Air Quality Boxer

- CO₂ Sensor
- CH₂O Sensor
- TVOC Sensor
- PM_{2.5} Sensor
- PM₁₀ Sensor
- Pressure Sensor
- Humidity Sensor
- Temperature Sensor

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AirTrack

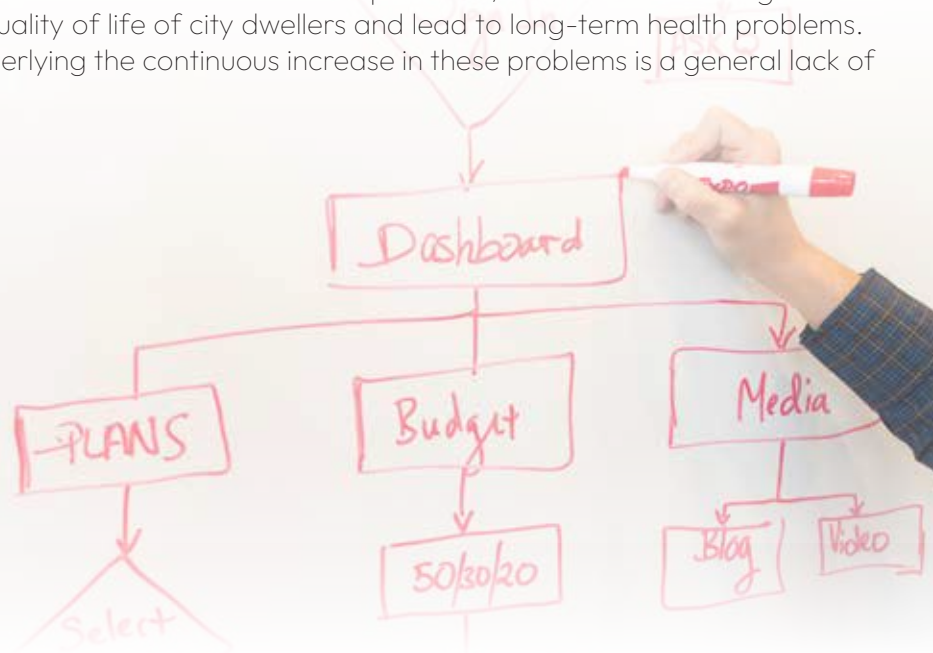
GGTEK

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What is the problem?

As modern cities grow in line with sustainable development goals, they are also faced with livability and environmental health challenges.

Air pollution and noise pollution are at the forefront of these problems, both of which are significant threats that directly affect the quality of life of city dwellers and lead to long-term health problems. However, one of the factors underlying the continuous increase in these problems is a general lack of awareness and interest.



Air Pollution

Rapidly increasing industrialization, urbanization and motor vehicle use have caused air pollution to become a serious global problem. According to the World Health Organization (WHO), 91% of the world's population is exposed to pollution above the WHO air quality guidelines. Air pollution causes serious health problems such as respiratory diseases, cardiovascular problems and lung cancer, causing millions of deaths every year. Particulate matter, especially PM2.5 and PM10, can cause irreversible damage to human health. Cities need to look for new and more sustainable solutions to tackle these sources of pollution.

Noise Pollution

With urbanization, heavy traffic and industrialization, noise pollution has become a serious threat to quality of life. According to the WHO, one in five EU citizens is exposed to noise at levels harmful to health. In the long term, noise can lead to health problems such as stress, sleep disorders and cardiovascular diseases. Noise pollution reduces quality of life, especially in sensitive areas such as schools, hospitals and residential areas. Regular monitoring of noise levels and taking strategic measures based on this data can help minimize noise-related health problems.

Earthquake Risk

Earthquakes have become a fact of life, especially in fault-prone regions such as Turkey. Earthquakes not only cause the destruction of physical structures, but can also greatly affect the infrastructure, water and energy resources of cities. The preparedness of cities against earthquake risk is critical for the effectiveness of disaster management strategies. Earthquake risk makes it imperative for local governments to review early warning systems and city infrastructure to build resilience against such disasters. Advanced monitoring technologies and environmental sensors can help accelerate pre- and post-earthquake measures.

3 Problems One Solution

Versatile Solution

The innovative air quality, noise and earthquake sensor developed by GGTEK is an indispensable part of smart urbanization projects that will contribute to making cities more livable, healthy and sustainable.

Accurate measurement and instant monitoring of environmental and seismic risks is the cornerstone of an effective solution. Our device offers an innovation that instantly measures air pollution, noise levels and earthquake risk and presents this data in a user-friendly way. Developed in accordance with WHO air quality guidelines, European Union environmental regulations and earthquake safety standards, it enables individuals and communities to understand and take proactive measures against environmental and seismic risks. This device presents a great opportunity not only for individuals, but also for municipalities, government agencies and the private sector. The data provided by the device can guide these organizations in developing and implementing environmental and earthquake-related policies.



In line with the importance attached by Erzurum Municipality to climate and carbon crisis studies, the project was realized in cooperation with the municipality and made available to the public. Similarly, installations for monitoring environmental data will be initiated in Ankara.

Air Quality

Air pollution is one of the biggest environmental problems of modern cities. The air quality sensor developed by GGTEK provides instant data by precisely measuring PM2.5, PM10, CO2 and other harmful particles and gases. Working in accordance with WHO's air quality guidelines, our device continuously monitors the quality of the air breathed by city dwellers and sends instant warnings when dangerous levels are reached. This solution enables proactive measures against air pollution, especially for municipalities and public institutions, thus protecting public health and improving quality of life.

Noise Pollution

Noise pollution is a factor that seriously affects health and quality of life, especially in urban areas. GGTEK's noise sensors instantly monitor ambient sound levels and provide warnings against high noise levels, especially in sensitive areas such as schools, hospitals and residential areas. Developed in accordance with the European Union's Environmental Noise Directive, these sensors are designed to minimize noise-related health problems and support noise control policies. With this data, city governments can develop strategic solutions to create quieter and more livable cities.

Seismic Sensor

Earthquake risk poses a serious threat, especially for regions located in earthquake zones. GGTEK's seismic sensors provide pre- and post-earthquake data by monitoring ground movements instantaneously. These sensors help detect tremors early, allowing disaster management and emergency response teams to take faster action. Earthquake data can be used to make cities safer and increase the earthquake resilience of infrastructure. This solution provides a critical early warning system for local governments and public institutions.

Technology and Innovation

The Air Quality Eco System measures air quality parameters precisely and reliably using modern sensors equipped with Hezitech technology. With this module, critical indicators such as PM10, CH2O, TVOC, carbon dioxide, noise, temperature and pressure are continuously monitored and analyzed. The integrated WiFi, Bluetooth and LTE features of Hezitech technology enable instantaneous transfer of data from sensors to cloud systems. Devices equipped with highly accurate temperature sensors work together with Hezitech's powerful processing capabilities to maximize the reliability and accuracy of data.



● TVOC 0ug-2000ug/m ³	● CH ₂ O 0ug-2000ug/m ³	● Sıcaklık -40C°-100C°
● Basınç 300-1100hPa	● PM10 0ug/m ³ -1000ug/m ³	● PM2.5 0ug/m ³ -1000ug/m ³
● CO ² 400ppm-5000ppm	● Noise 30dB-130dB	● Omron D7S Sismik SI 0-200 cm/s
<p>● Air Quality Sensor ● Noise Sensor ● Seismic Sensor</p>		

Data Communication Infrastructure

The Air Quality Eco System enables measurement devices placed at different points in the city to send data continuously and securely via Wi-Fi, radio frequency and LTE technologies. Data security is ensured at a high level by protecting the data with encryption protocols. The “honeycomb” communication model adopted in the system enables each meter to form a coordinated and connected network like a beehive. It guarantees uninterrupted data transmission even if there are disconnections.

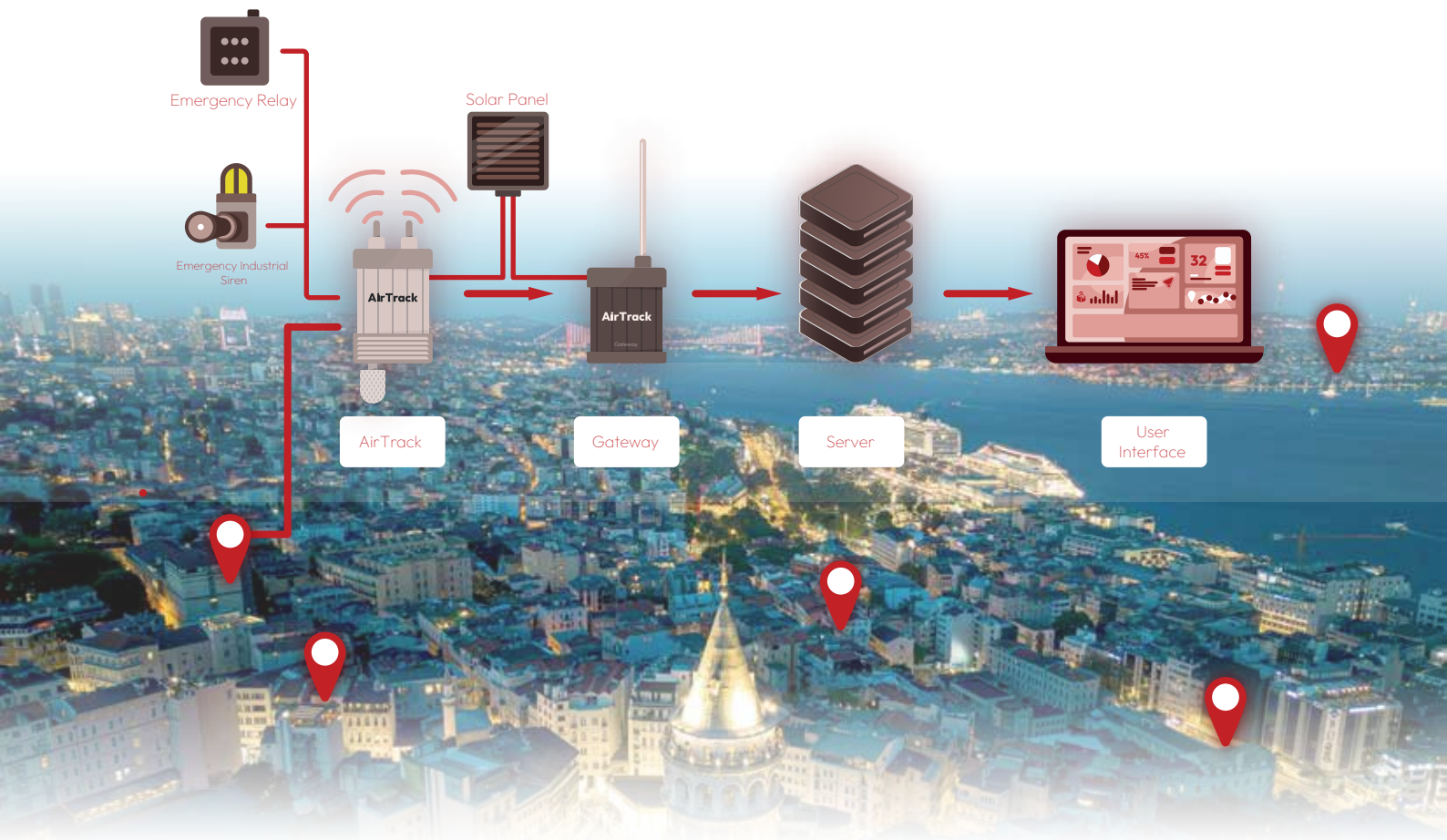


● Sensor: 4km ~ *8km ● Gateway: 19km ~ *25km

*Under favorable terrain and weather conditions

Main Features of the Device

Our air quality, noise and earthquake sensor device developed within the scope of our project is equipped with Hezitech technology that allows remote settings updating. With default settings, our devices broadcast sensor information every minute over radio frequencies and transmit this information through the gateway, which has a single LTE line, keeping costs low. By integrating multiple sensors, Hezitech technology collects and analyzes air quality, noise and earthquake data instantaneously. This increases the reliability of the data while minimizing operational costs.



GGTEK engineers have proven the high accuracy of our sensors by calibrating and validating the instrument. These tests verify that our sensors comply with industry standards and provide reliable data. In addition, with the earthquake sensor feature, the device takes automatic action through emergency relays that shut down hazardous lines such as electricity, water and natural gas in the event of an earthquake.

Thus, secondary hazards during earthquakes are prevented and safety is maximized. The collected air quality, noise and earthquake data is continuously transmitted by our devices to the gateway via radio frequency. The data is collected and analyzed on a central server. This system ensures comprehensive data storage and management and guarantees that the data is quickly accessible when needed. In addition, in the event of an earthquake, a siren connected to the device warns the public and provides advance warning of the danger with its siren sounding feature.

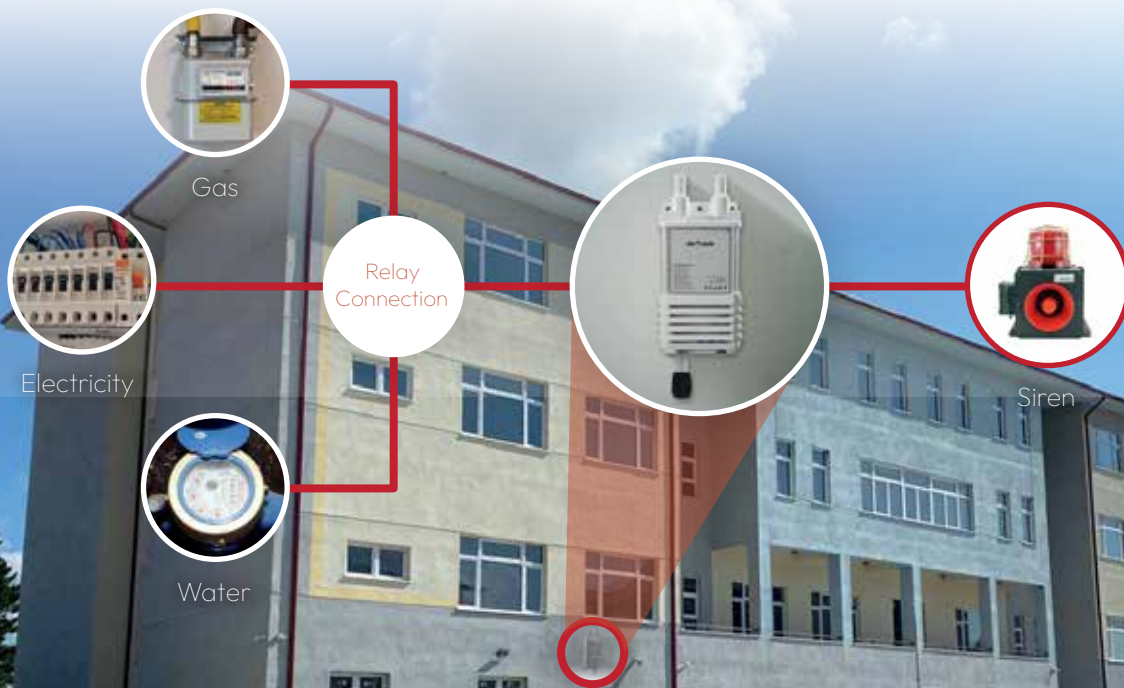
This data is made accessible in real time on the web by city managers and the public, providing city managers with a powerful tool for environmental regulation and earthquake response. In particular, situations in areas with high air quality, noise and earthquake risks can be monitored and managed based on this data. This paves the way for actively improving the quality of life in the city and effectively controlling environmental factors and seismic hazards.

Where can solutions be applied?

The device can be used for a wide range of environmental monitoring and assessment purposes. It can be applied in various fields to both protect public health and improve quality of life. The data provided by the device plays an important role in identifying and monitoring environmental problems and developing solution strategies for these problems. In this way, effective solutions can be developed to ensure environmental sustainability and improve the quality of urban life.

1- Schools

Schools are one of the critical areas where the safety of students must be ensured at the highest level. GGTEK's devices with air quality, noise and earthquake sensors offer instant monitoring and warning systems for the health and safety of students in schools. While the device monitors air quality and noise levels in the school thanks to Hezitech technology, it is also ready for earthquake risk with its earthquake sensor.

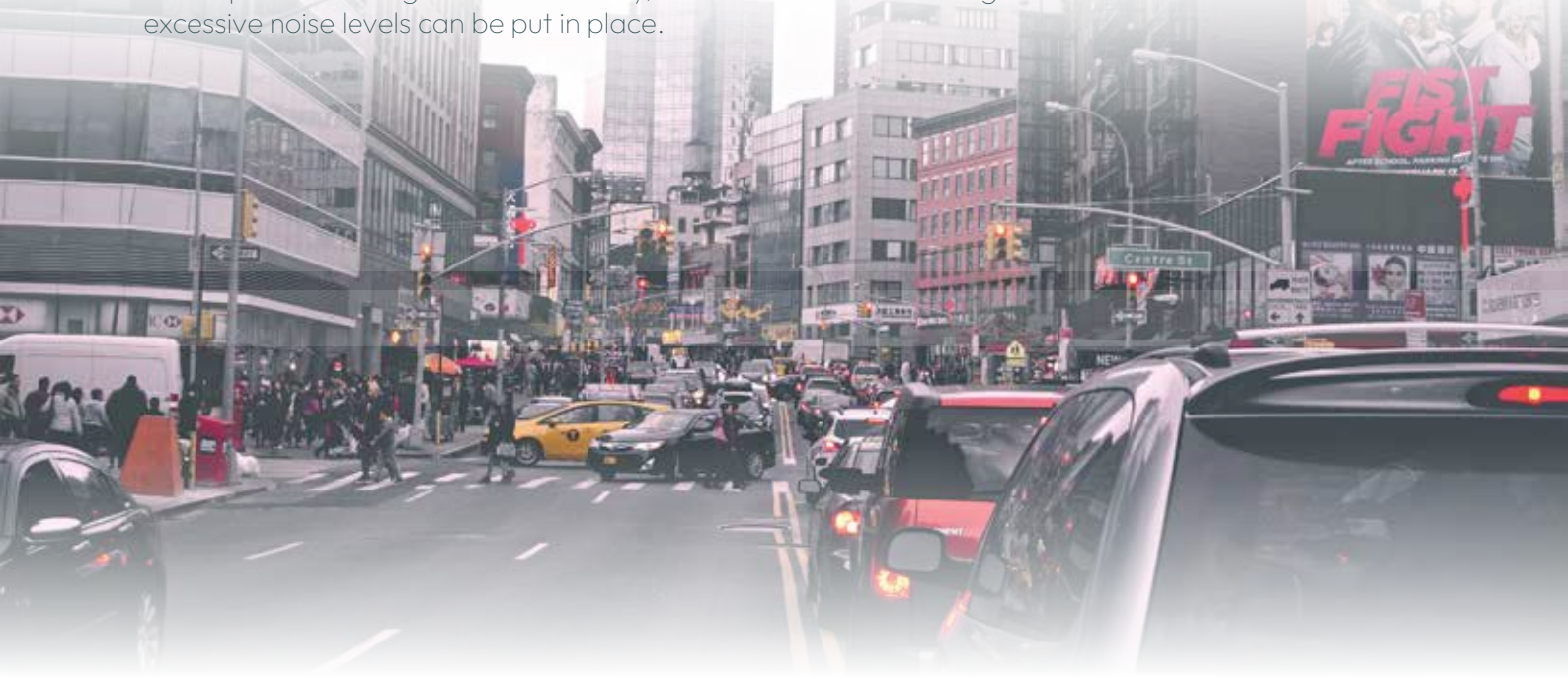


In the event of an earthquake, the device activates the siren connected to the device to quickly alert the students and staff in the school and gives a loud emergency alarm. This alarm allows everyone in the school to evacuate safely. At the same time, the device's integrated emergency relays automatically disconnect the school's electricity, water and natural gas lines, preventing secondary hazards such as fire and gas leakage that can occur during an earthquake.

This solution enables both the monitoring of environmental data to protect the health of students and fast and effective response during natural disasters such as earthquakes. By monitoring all this data in real time, the school management can take the necessary measures as soon as possible.

2- Main Traffic Roads

Main traffic roads are critical areas in terms of both air pollution and noise pollution due to high vehicle traffic. The device we developed detects traffic-related pollution by continuously monitoring harmful substances such as PM10, CO2, TVOC in these areas. In addition, our device also monitors traffic density and sound levels caused by vehicles with noise sensors. Equipped with Hezitech technology, the device transmits the data obtained to municipalities in real time, both guiding traffic regulations and helping to take measures against noise pollution. In this way, alternative routes can be developed according to traffic density, vehicle traffic can be regulated and measures to control excessive noise levels can be put in place.



3- Parks and Green Spaces

While parks and green spaces provide recreation and socialization areas for city dwellers, it is important that the environmental conditions are healthy and safe. Our device continuously monitors the air quality and noise levels in these areas, ensuring that visitors are in a healthy environment. Hezitech technology transfers temperature, humidity and air quality data instantaneously to central systems, allowing these data to be integrated into automatic irrigation systems. Thanks to this integration, the amount of water required by plants can be adjusted accurately, contributing to the protection of the environmental balance.



4- Industrial Zones

Industrial zones carry a high risk in terms of both air pollution and noise pollution as they are areas where production activities are intense. Our device monitors harmful particles and noise levels emitted from industrial facilities and continuously monitors environmental impacts in these areas. In addition, the device's integrated earthquake sensor prevents secondary hazards by automatically cutting off electricity, water and natural gas lines in industrial facilities in the event of an earthquake. This system allows environmental risks to be minimized while increasing occupational safety.



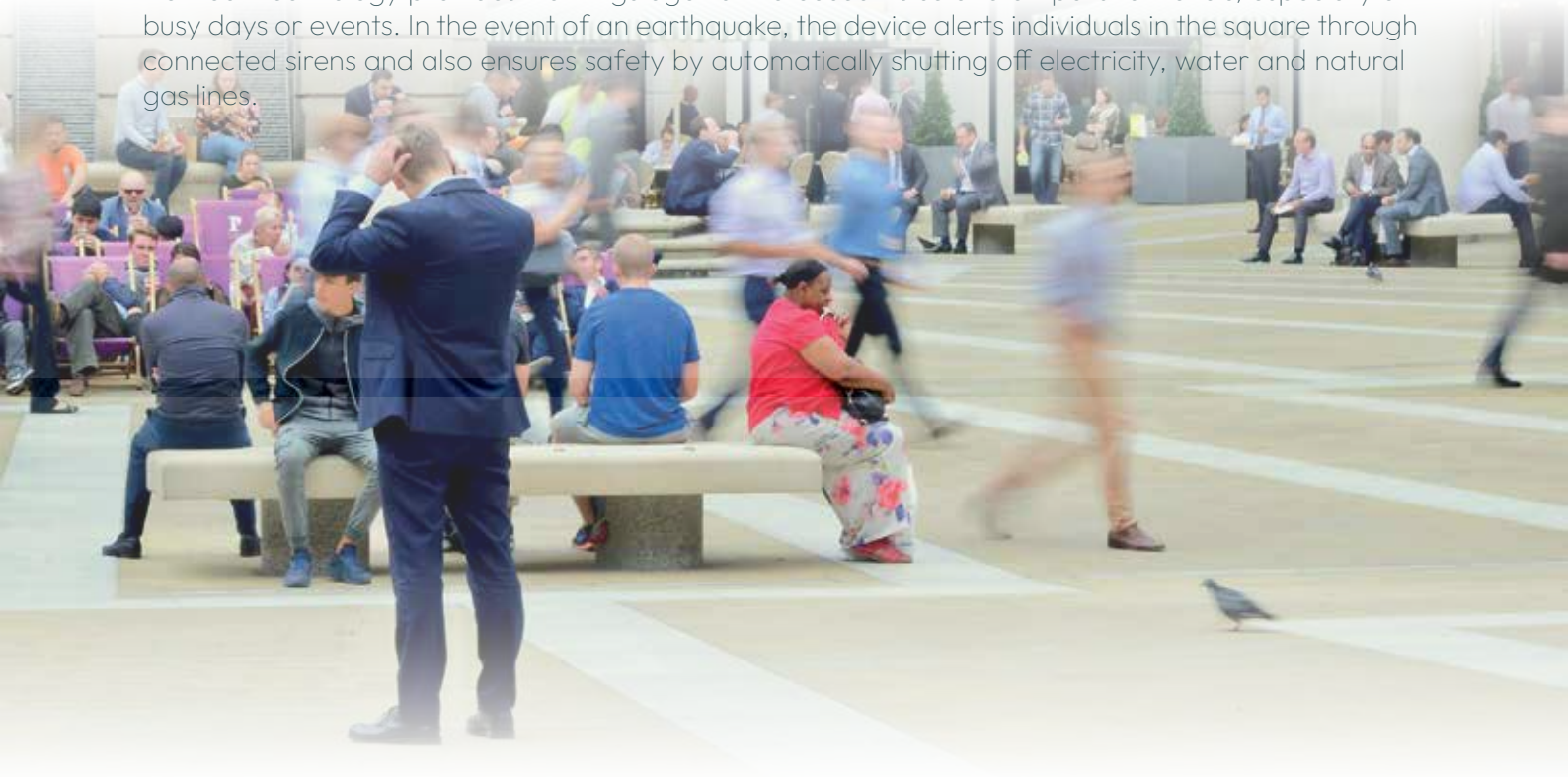
5- Greenhouses

Greenhouses are places where plants need to be constantly monitored to ensure optimum growth conditions. Our device continuously monitors air quality, temperature, humidity and carbon dioxide levels in greenhouses and transfers the data to a central system. This data is integrated into the greenhouse's automatic irrigation and ventilation systems, providing the optimal environment for plants to grow. Hezitech technology precisely adjusts carbon dioxide levels to optimize the plants' photosynthesis process.



6- Pedestrian Zones and Square

Pedestrian zones and city squares stand out as areas with high human mobility and where social activities take place. By monitoring air quality and noise levels in these areas, our device ensures that environmental conditions in the area are kept under constant control. By analyzing the data obtained, Hezitech technology provides warnings against increased noise and air pollution levels, especially on busy days or events. In the event of an earthquake, the device alerts individuals in the square through connected sirens and also ensures safety by automatically shutting off electricity, water and natural gas lines.



7- Public Transportation Stops

Public transportation stops are among the areas with high environmental pollution and are important in terms of air pollution and noise levels caused by vehicle exhausts. Our device helps to minimize environmental impacts by continuously monitoring data such as air quality, noise level and temperature in these areas. The data collected with Hezitech technology is integrated into the ventilation and energy management systems of the stops, allowing them to be optimized.



AirTrack and how it differs from others

The AirTrack device stands out by offering significant advantages over other competitors on the market. Typically, devices used for environmental monitoring offer separate air quality, noise pollution and earthquake detection functions, requiring separate costs and installation processes for each. In contrast, AirTrack combines these three key functions into a single device, offering a solution that is up to 3 times more cost-effective than other solutions on the market.

Providing all these functions with a single device not only reduces initial investment costs, but also significantly reduces operational costs. Compared to other solutions, instead of managing and maintaining each system separately, AirTrack has an integrated structure that is both user-friendly and energy efficient.



Real-Time Monitoring: The device monitors air pollution and noise levels instantaneously, giving users and authorities instant access to up-to-date data.

Comprehensive Sensor Network: It can measure environmental factors such as PM10, PM2.5, CO2, TVOC, temperature, pressure as well as noise pollution and has earthquake sensors.

Data Analysis and Reporting: The collected data is analyzed in detail, user-friendly reports are created and shared with the relevant units.

Modular and Flexible Use: Thanks to Hezitech technology, the device can be customized according to the needs in different regions.

Remote Access and Intervention: It enables municipalities and private organizations to access device data remotely and make the necessary arrangements.

Hezitech Integration: Hezitech technology enables all these features to coexist, expanding the device's usage area and increasing its performance.

Durability: While it performs well in standard conditions, it is less durable in harsh environmental conditions.

Similar Devices

Real-Time Air Quality Monitoring: Monitors PM10 and CO2 levels, but remains limited on more specific parameters such as PM2.5 and TVOC.

Limited Modularity: Provides only basic air quality monitoring, with limited integration with other systems.

Remote Access: Data is only accessible through a limited platform, no sharing with a broader cloud system.

Moderate Energy Efficiency: High energy consumption with short lifetime.

Lack of Local Government Integration: Limited collaboration with local governments, data only used for environmental monitoring.

Sensor Support: No noise pollution measurement capability, focusing only on air pollution.

Historical Data Support: Access to historical data analysis is limited and only short-term data is kept.

AirTrack's Contribution to the Sustainable Development Goals

Designed to contribute to the United Nations' Sustainable Development Goals (SDGs), we aim to address environmental and social challenges globally. Our innovative air quality and noise monitoring devices work with solar panels to increase energy efficiency, while optimizing resource use by making external materials from recyclable or recycled materials. These approaches are directly related to the following global goals:

Article 3: Promoting Health and Wellbeing - Our devices help improve health conditions in cities by providing precise and reliable data on air quality and noise levels.

Article 7: Increasing Access to Energy and Renewable Energy - Harnessing renewable energy sources using solar panels increases energy efficiency and reduces dependence on fossil fuels.

Article 8: Good Jobs and Economic Growth - Creating green jobs and contributing to local economies by producing environmentally friendly technologies.

Article 9: Industry, Innovation and Building Infrastructure - Our high-tech sensors and smart city solutions improve the quality of infrastructure and promote sustainable industrial practices.

Article 11: Sustainable Cities and Communities - The data we collect on air quality and noise levels contributes to building more sustainable and livable cities, enabling informed decisions in urban planning and management.

Article 12: Responsible Consumption and Production - By using recyclable and recycled materials, we increase resource efficiency in our production processes and reduce our environmental footprint.

Article 13: Climate Action - Our real-time environmental data collection provides an important tool in combating the impacts of climate change and helps policy makers develop action plans.

Article 15: Life on Land - By monitoring environmental parameters, our devices contribute to the conservation of biodiversity and the sustainable management of natural habitats.



User Friendly and Powerful Web Panel

Our web dashboard presents air pollution and noise data from our instrument in a user-friendly interface, making the data easy to understand and analyze. Features such as instant data streaming, historical data review and graphical reporting allow users to effectively monitor environmental risks. The panel is designed in accordance with WHO air quality standards and European Union environmental regulations.



The powerful History Feature of the GGTEK Environmental Monitoring Panel allows users to analyze in detail the environmental changes that have occurred over a specific time period. The panel graphically presents historical data of various parameters such as temperature, humidity, pressure, air pollution levels (CO2, PM2.5, PM10). These graphs are an ideal tool for monitoring and analyzing how environmental conditions have changed at a specific sensor's location.

Graph History allows users to historically track fluctuations in air quality, temperature increases or pressure changes. This feature provides critical data, especially for environmental management and future strategic planning. For example, it enables detailed tracking of environmental issues such as increased air pollution during certain hours in industrial areas, changing temperature trends in urban centers, or decreases in humidity in agricultural areas.





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