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WHITE PAPER











Established in 1992

AAEON is one of the leading designers and manufacturers of advanced industrial and embedded computing platforms today.









AAEON Core Values

Reliability

Delivering dependable products in a timely manner

Integrity

Valuing business integrity and ethics

Innovation

Turning cutting-edge concepts into reality

An IPC Arm of ASUS

With a continuous pursuit of innovation and excellence, AAEON became a member of the ASUS group in 2011, further strengthening its leadership by leveraging advanced technology and resources from ASUS.

AAEON Product & Service

Committed to innovative engineering, AAEON provides integrated solutions, hardware and services for premier OEM/ODMs and system integrators worldwide. Our reliable and high quality computing platforms include industrial motherboards and systems, industrial displays, rugged tablets, PC/104, PICMG and COM modules, embedded SBCs, embedded controllers, network appliances and related accessories.

AAEON IoT Solution

AAEON offers customized end-to-end services from initial product conceptualization and product development, on through to manufacturing and after-sales service programs.

AAEON is an Associate Member of the Intel® Intelligent Systems Alliance.

NBD Department Introduction IOT

AAEON IIOT is committed to the development and application of smart city IoT, bringing customers a wirelessly seamless, connected and personal experience. We integrate versatility and flexibility in our solutions, customizing each and every one of our cases. Our systems are easy to install, and are designed to integrate seamlessly into existing infrastructure, lowering costs and enhancing efficiency. For end customers, the convenience of our designs facilitate easy operation and maintenance, eliminating bottlenecks and achieving maximum performance. As a committed service provider for smart city applications, our first priority is the development of safe, sustainable and reliable solutions. Our portfolio includes services in building management, logistics, fleet management, and agriculture, and we aim to provide for and consolidate a safer, more connected and sustainable world.

IoT Solutions



We have Worked with:















Applications which We are Capable of Developing:







Applications We are Capable of Developing:













Smart Transportation

tion Smart Agriculture



Intelligent Building Management

IBM defines intelligent buildings as real estate properties which are outfitted with IoT and smart data sensors, which integrate traditional building management systems with industrial 4.0 features to maintain and operate properties in a comfort-optimized and accessible infrastructure.

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Intelligent buildings are designed to allow building administrators to literally speak to the buildings, and provide a nuanced, real-time picture of controls and operations.

Interconnectivity 4.0

Most current electricity systems rely on manual control and data analysis, which can be a tedious and time-consuming process. In response to this, AAEON has developed a control system that integrates building management systems into a unified, single platform that can collect and analyze real-time power supply and consumption statistics, and send these numbers back to a central management system, which then delivers real-time percentages of power consumption and historical usage information to the relevant administrator for further action. This reduces the risk of human error and greatly maximizes data accuracy, as machines are far less error-prone than humans are. The network can be accessed by the main administrator via the central system itself, and can also be optimized for access on a mobile app, or routed to other offices for remote access. On top of sensing the current consumption rate of individual power grids in each separate unit, the software predicts usage patterns and future consumption rates, and provides recommendations for control changes, route alterations, optimal grid supplies, and other ways to enhance power supply and interconnectivity at a lower rate. By integrating BIM systems, users can maintain and monitor the water and electricity pipes more easily. When anomalies occur, the user can recognize and detect the malfunctions in a timely fashion and call for repair before further system degradation.

Parking Management

Car parking management is another issue that most properties have to deal with, as the current transportation infrastructure is subject to restrictions such as space limitations and, co-ordination difficulties. AAEON's detection sensor technology enables the building system to automatically identify each incoming vehicle as they enter the building, and direct them to a suitable parking space based on whether they are building occupants or visitors. The system is also available for pre-bookings, which enables visitors to log in onto the cloud and sign up for parking spots in designated time slots. Additionally, live information on the number of parking spaces available is retrieved via sensor bays, and sent back to the cloud.





Industry 4.0

Industry 4.0, also known as the smart industry, originates from a concept proposed by Germany, which advocated the application of computerized general automation on the manufacturing line. The infrastructure of smart industrial factories is built upon the evolution of the traditional B2B (business to business) model to the C2B model, or customer to business, as it is more ubiquitously known. By collecting, collating and analyzing vast swathes of data, the factories will be able to adapt to, and even predict future market trends, anticipating the needs of the customer.

Keeping your Finger on the Button

Globalization, and current events around the world have facilitated the smart industrial model, with factories cutting costs by hiring less employees, turning instead to machines and automation. Automation greatly expedites production efficiency, and enhances product quality as well, as machines can be configured to fine-tuned settings far beyond physical human limits. In many factories, temperature and humidity are key variables that need to be closely monitored at all times, but are often subjected to a wider margin of error when controlled manually. Automated control of these variables, however, greatly reduces the margin of error, and machines are able to record all of their processes into a data log for the administrator to view at their discretion. The administrator can then extrapolate this information to calculate yield rates, future market trends, and move up the value chain. In a broader context, smart automation will facilitate the manufacturing process in becoming more cost effective, enhancing output and product quality and quantity.



AAEON hopes to create a more efficient and eco-friendly environment by intersecting technology and the community, in order to shape a better landscape for both citizens and visitors alike. Community



IDC defines smart cities as requiring city officials to optimize quality and communication management for citizens, and to develop a sustainable, eco-friendly urban development vision that will reduce resource consumption, and maximize efficiency of urban flow control. Smart-city information and technology in this context is meant to enhance quality of living for the citizens, as well as the infrastructure and socio-economic framework of the city.

AAEON's Smart Community

AAEON's Smart City Vision is to connect and improve the quality of communities through a tech-based, sustainable network aimed at eliminating factors that cause physical harm to the human body and immune system.

Combating Air Pollution with the Latest Smart Technology

Air pollution is one of the main banes of most major cities around the world, and kills more than 600,000 children every year, according to a report conducted by UNICEF in 2016. Most current air quality surveillance systems rely on manual control and data analysis, which can be a slow and dolorous process. In response to air pollution, AAEON has developed a real-time air control system which will be able to collect and analyze aerosols and other forms of airborne particles, and send these statistics back to a central, cloud-based management system for further action. This eliminates the risk of human error and greatly increases data accuracy, as machines are far less prone to error than humans are.

Waste Control 4.0

Another aspect of AAEON's Smart City Vision is urban waste control. AAEON has devised a solution for garbage management by using sensors that detect garbage levels in city rubbish bins. When garbage reaches critical levels, notifications will be sent out to waste removal trucks in the vicinity, signaling them that it's time to collect. AAEON's data management system is ideally built for such a herculean operation; Hong Kong, for instance, features more than 42,000 rubbish bins alone, and tracking and managing all those rubbish bins is no small feat, and requires a data hub capable of harnessing all of that information. AAEON's industrial computer matrix is able to provide a platform capable of consolidating, collating and processing huge amounts of data and sending it to other sub-units, enabling connectivity and efficiency at all levels.

Efficient and Energy-Saving Street Lighting

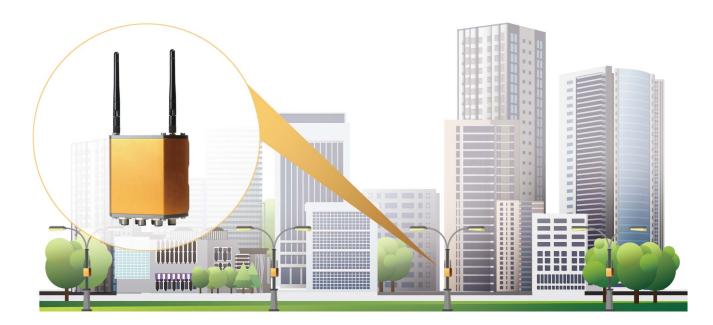
Energy efficient lighting is another industry AAEON has branched out into. We are currently working with the government to provide intelligent street lighting, which relies on a centrally controlled system that monitors every street light in the city via network-enabled sensors. These sensors detect environmental changes such as light levels and the presence and movement of humans, and adjust light settings accordingly. The government can access the central control system to obtain sensor-gathered data, monitor and adjust levels of brightness, and receive alerts when the street lights malfunction or cease to operate.



AAEON Air Box

In response to air pollution, AAEON has developed a real-time air control system which will be able to collect and analyze aerosols and other forms of airborne particles, and send these statistics back to a central management system for further action. This eliminates the risk of human error and greatly increases data accuracy, as machines are far less prone to error than humans are. The local government can then utilize this information by issuing air pollution alerts whenever air quality dips to below average, and citizens can take preemptive measures to protect themselves by wearing surgical masks, or rescheduling outdoor-based activities.

- Features Low energy consumption and long-distance transmission of LoRa.
- Detects PM2.5, temperature and humidity, and uploads collected data onto a centralized IoT cloud platform.
- Open-Data platform can be accessed by research organizations and industry developers to analyse pollution sources, and add value to applications.
- · Hundreds of AirBoxes have already been provided to the Taiwanese governments for deployment.



Sustainability, smart analytics and industrial design

The AirBoxes form an embedded air-sensory network that collect and relay real-time environmental data to city agencies and the public. In the short term, the AirBox will enable long distance data transmission and low-energy consumption by optimizing and enhancing the transition from episodic to continual data collection and assimilation, whilst in the long term it will facilitate the development of a globally connected and sustainable network.

The second generation of Airboxes is designed to be customizable and easily integrated with existing frameworks and architecture, with minimum configuration and/or maintenance required.



Smart City Street Lighting

AAEON Smart Street Lighting

This technology is based on Sub-GHz wireless communication transmissions. AAEON's lighting control system is capable of scheduling lighting plans, altering light levels, maximizing energy conservation and collecting past power consumption data, which can then be converted into statistics that will aid in future power supply and cost management.

Through the use and consolidation of IoT-based technology, we will intersect predicative analytics, innovative environmental management and civic engagement, facilitating smart city urban planning and green infrastructure.

Intersecting IoT, remote management, and a data-smart sensory network

AAEON's smart street lighting is another aspect of IoT-based urban infrastructure, which utilizes smart technology to conserve and optimize energy efficiency and lower emissions. Each street light draws its energy source from a solar panel embedded at the top of the lamppost. The lampposts have been integrated with the city's public WiFi network, and are equipped with sensors that detect and collect detailed informatics on aerosols, and send these statistics back to a centralized cloud. All historical data is open source, and can be accessed and downloaded by anyone with an Internet connection.



Integrating sensory networks and facilitating low energy consumption

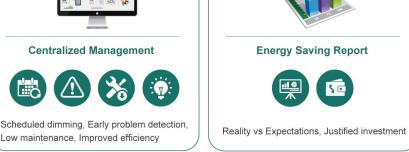


Network of Connected Street Lights that Facilitate Management of Assets and Data





Low maintenance, Improved efficiency





Intersecting Fleet Logistics and Data Management

The role of logistics has fundamentally transformed the economic landscape, and is no longer solely reliant upon the deployment of human-based resources. The consolidation of technology and industrial automation, as well as big data assimilation and smart solutions, is fast becoming key to smart fleet management and optimization. Business owners must transport goods from one point to another within a stipulated time frame, without the goods being spoiled or affected in any way, and this can only be achieved by having a failsafe deployment plan and logistics map, an ample framework and corresponding infrastructure, and professionally trained human resources to carry out their assigned tasks.

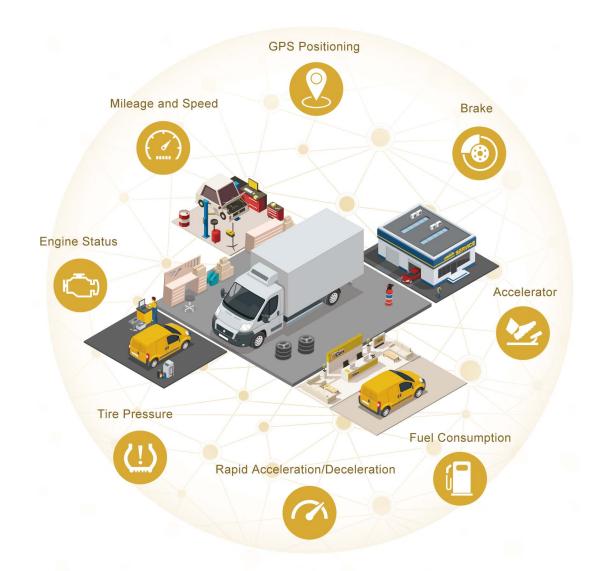
Deploying Fleet 4.0

Fleet management includes the coordination, facilitation and deployment of all transportation logistics and transport related activities, and comprises an integral part of life for everyone at all levels, from government policies at the highest level to everyday life. The act of moving products and / or goods from one location to another is a herculean operation, which starts from the planning of city transportation lines to budget planning, implementation, vehicle design and procurement, to the acquisition and deployment of the vehicles themselves.

Real-Time Tracking and Maintenance

How do we ensure cost-effective, time-sensitive and efficient facilitation of fleet management? AAEON has developed an asset tracking and maintenance system to rise to the challenges posed by the ever-changing landscape of the logistics industry by developing the CANBUS, a sensor which monitors tire wear and pressure, braking systems and engine output, and provides a real-time GPS tracking system which will be able to pinpoint the exact location of the car at any given time or location. The CANBUS is designed for absolute user integration, extending mileage and longevity, and is linked to a cloud-based matrix backend system which analyzes and consolidates the information sent from the CANBUS.

Big-data assimilation and smart solution are now key to smart fleet management.



Transportation

Cold Chain Logistics

Linking the Supply Chain

Cold chain logistics is one of the most important links in the supply chain industry. A constant temperature of +2°C ~ +8° must be maintained at all times, and failure to do so could result in costly damages to goods, disrupting entire shipment lines and supply networks.

Cloud-Enabled Tracking

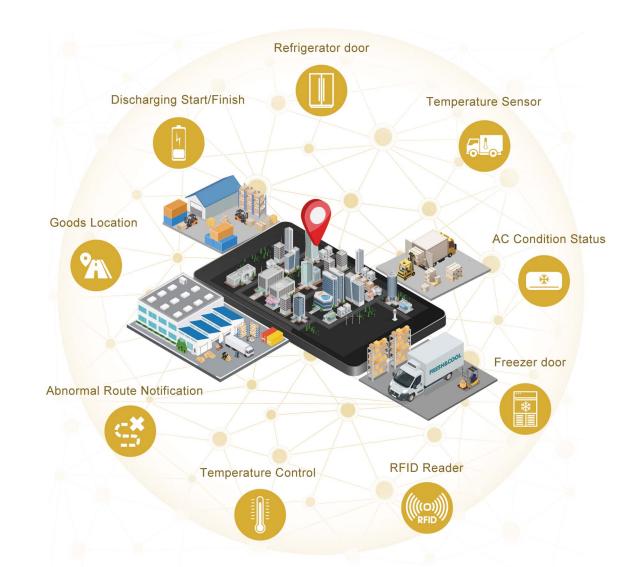
AAEON has developed a solution to the cold chain dilemma, effectively keeping all relevant personnel perpetually in the loop by providing a customized real-time cold chain management system. The client can access a cloud-based database to track their orders, and obtain an estimate on when their deliveries will arrive.

Smart Facility Smart City Smart Transportation Smart Agriculture

AAEON's sensors have been optimized to detect changes in compressor fluctuation, and to send back alerts to both the client and the business owner if excessive exposure to heat is detected. In addition, AAEON has enabled a user-friendly interface for the client by allowing the customers themselves to adjust temperatures for their products within an operable range. All changes in temperature variation are available to the driver, and are simultaneously recorded and sent back to the main database.

Customers can also control the duration of transfer time during shipments, and will receive a notification when transfer times are not consistent with the values that have been pre-configured by the customer.

will be able to read and disseminate real-time location progress and status information on tracked goods, and send that data it receives from the RFID along with the GPS tracking data it receives from the carrier, and update the system once





Current Challenges in Agriculture

Nicknamed 'Beautiful Island' by Portuguese colonists sailing past the mountainous realm in the 16th century, Taiwan is small but densely populated, with an average of 1.02 hectares of farmland allocated to each farming household. Most farmers operate on a smaller but high-yield scale, requiring a higher profit ratio in order to keep their heads above water. Taiwan is currently experiencing an aging society along with a declining birth rate, and many millennials and Gen Xers are returning to their roots and going into agriculture, automating much of the farming processes that were traditionally done by virtue of sweat and toil. Farming automation, therefore, would be able to fill the vacuum of declining manpower in agriculture. Older farmers are gifted with the ability to tell how many pests there are and the level of damage inflicted, but the younger generation are not as savvy as their forbears. Instead they rely on data and machines to call the shots for them.

Smart Farming

One needs to understand and control variables such as soil moisture, humidity, temperature and the ratio of oxygen and carbon dioxide. Once the crops are fully grown, they are sold at the right time to maximize profits. AAEON's smart farming solutions have been tailored to meet the rising challenges that come along with global warming, with customized procedures which will integrate sensor arrays, gateways and cloud interfaces.

Smart Facility Smart City Smart Transportation Smart Agriculture

Real-Time Connectivity

Apart from the integration of sensors, AAEON also provides a solution for real-time farm management and crop field monitoring, and has developed a light intensity control system which will send notifications to users and the server database whenever the monitors detect anomalies in light provision, and adjust light sources accordingly.

Remote Farming at Your Fingertips

With the entire agriculture industry leaning towards automation and robotized management, the focus has been shifted to machination and the maximization of time and profits. As this technology progresses, the presence of onsite farmers is no longer a requisite, as remote sensor controlling of crop environment has already become a feasible option. AAEON equipment requires minimum manual control and is capable of withstanding water and dust corrosion, and will ultimately be able to tailor decisions on a foot-by-foot basis, accelerating the quantity and quality of crop yield.

