CASE STUDY

Capitalizing on Internet of Things with a Starter Kit Based on Intel® IoT Gateways

Intel® IoT Gateways

Industrial and Energy Solution



ADLINK TECHNOLOGY INC.

FUSHENG

Introduction

Market leaders stay ahead of their competition by embracing technologies that advance their existing and future systems. Driving the adoption of the Internet of Things (IoT) concept is the potential for businesses to unlock information that is present in their existing data. Businesses that connect localized systems to the cloud—thereby creating an end-to-end approach to IoT—can transform data into valuable intelligence, enabling them to monitor and respond quickly.

Challenges

- **Implementing new technology distracts from business goals.** Although the advantages of enabling an IoT strategy are promising, the task of implementing the infrastructure may be a distraction to businesses. Instead of putting in resources to implement IoT, businesses prefer an IoT solution that is pre-verified to connect to industry-standard sensors and is ready to put into operation quickly.
- **Lacking hardware and software cohesion in IoT solution.** Picking and matching disparate components and software applications to create an IoT solution may result in compatibility and reliability issues. A complete and cohesive solution is required because businesses cannot risk their daily operations from being affected by data connectivity issues or sensor communication faults.
- **Facing cyber threats against connected systems.** With systems connected to the cloud, businesses face a rising concern about the security of sensitive information. Cyber threats have increased over the last several years, and the potential consequences of an attack on connected systems may include data extortion, loss in productivity, and harm to corporate reputation.

Solution

The ADLINK Intelligent IoT Gateway Starter Kit enables businesses to set up an end-to-end IoT network that seamlessly connects their legacy and new systems to the cloud. The pairing of the MXE-202i gateway (an Intel® Atom™ processor-based computing platform) and the ADLINK EdgePro (an IoT device and sensor management application) delivers a complete, pre-validated hardware and software building block with enterprise-grade security. The starter kit includes accessories and sensors to get the IoT infrastructure up and running quickly.

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Transforming Businesses with IoT by Revealing Insights from Data

"Having an IoT solution that connects our equipment to the cloud via wired networks and wireless networks, such as Wi-Fi and 3G, enables us to be notified automatically of any potential issues. With the ability to store up to five years of operating data, we are able to find ways to optimize our production and energy consumption."

– Kim Chen, Global Chief Information Officer, Fusheng

Making Small Changes That Give the Biggest Impact

There are bewildering possibilities when setting up an IoT strategy that businesses simply feel overwhelmed and find it easier (or more comfortable) to continue to work the same way. However, the technology behind IoT doesn't have to be intimidating. With the ADLINK Intelligent IoT Gateway Starter Kit, businesses start their IoT strategy gradually by focusing on the area in their business where IoT can bring the most benefits in the shortest amount of time.

For example, Fusheng delivers their GoService IoT Smart Service Platform that connects sensors to air compressors and then networks them to the cloud. These sensors collect operation data from the compressor and reprocessing equipment, which include data on the power consumption, discharged pressure, operating temperature, the periods for unloading or loading the equipment, and the amount of time for maintenance. By collecting and analyzing data from the equipment, businesses can build historical data that help them predict behaviors or trends. This ability to forecast events gives businesses the insight to react quickly to changes in production, customer demands, or market conditions.

With the ADLINK Intelligent IoT Gateway Starter Kit, companies like Fusheng can confidently begin their first steps into the IoT strategy, worrying less about setting up the infrastructure and instead spending more time on innovating and making the right business decisions.

Delivering a Solution That Is Greater Than the Sum of Its Parts

In the ADLINK Intelligent IoT Gateway Starter Kit, the task of managing the sensors and consolidating all the data streams from these sensors to the cloud is handled by the ADLINK EdgePro application, which comes preinstalled in the MXE-202i gateway.

Software: Powered by Intel® IoT Gateway Technology

The ADLINK EdgePro is a device and sensor management application powered by Intel® IoT Gateway, which integrates the Wind River Intelligent Device Platform® (IDP) XT* and McAfee® Embedded Control*. The ADLINK EdgePro delivers a pre-validated middleware that enables a broad range of connectivity options for end-to-end IoT communication. Using plug-ins, the ADLINK EdgePro supports popular communication protocols such as ZigBee*, Modbus*, LAN, and WAN network access.

The starter kit can be effectively applied in an industrial situation. For Fusheng and their customers, the data collected from the equipment enable facility engineers to give informed instructions to the employees in the production line in order for them to react quickly and efficiently. Furthermore, the service team from Fusheng monitors the data for any potential faults, allowing the team to communicate with their customers and plan the best time to perform routine maintenance or repair tasks without affecting their customers' schedule. As a result, customers reduce their operating costs, gain greater production efficiency, and contribute to a sustainable environment by reducing energy wastage.

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Hardware: Powered by Intel® Architecture

The computing platform in the ADLINK Intelligent IoT Gateway Starter Kit is the MXE-202i gateway, powered by the Intel® Atom™ processor E3826. The two processing cores in this System on Chip (SoC) deliver the computing performance to handle the flow of data from sensors, yet power efficient enough to perform reliably in a fanless enclosure. Encased in a fanless and compact enclosure, the MXE-202i gateway can be placed in small spaces, where airflow may be restricted, without taking up valuable space in the factory. Furthermore, the MXE-202i gateway performs reliably under extended operating temperatures (from –20 °C to 70 °C when fitted with industrial SD card).

To connect to the sensors and to the cloud, the MXE-202i gateway provides a broad selection of I/O ports: two Gigabit Ethernet LAN ports, two COM ports, one USB 3.0 and two USB 2.0 ports, four optional isolated digital-in (DI) and isolated digital-out (DO) ports, two mini PCIe slots, one mSATA slot, and two USIM socket for Wi-Fi, Bluetooth*, and 3G connectivity.

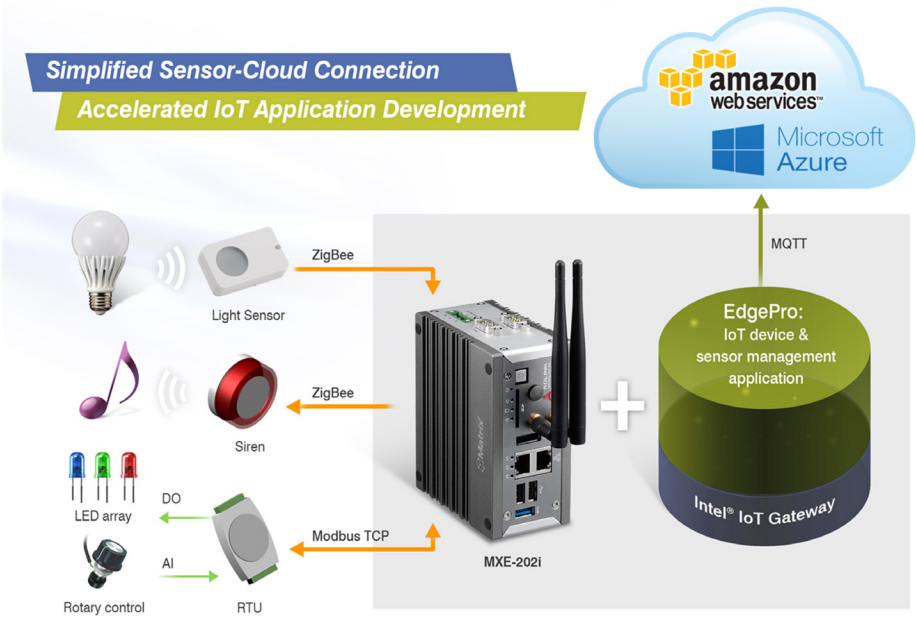
Finding a Balance of Security and Usability

As more areas of the business are connected to the cloud as part of the IoT strategy, concerns about the security of the sensitive information transmitted continue to rise. Businesses are concerned about security breaches and are reluctant to put too much data into the cloud. However, for an IoT deployment to be effective—to extract valuable information from data—businesses need to put even more data in the cloud. Therefore, security cannot be considered an afterthought. Instead, security should be baked into the IoT solution, like the ADLINK Intelligent IoT Gateway Starter Kit.

The ADLINK EdgePro manages all the data exchanges between the sensors to the MXE-202i gateway, and from the gateway to the cloud. Targeted cyber attacks attempt to exploit security vulnerabilities in connected systems in order to access confidential data or to manipulate processes in the system. Powered by Intel® IoT Gateway, the ADLINK EdgePro leverages the McAfee® Embedded Control technology to avoid unauthorized applications from running on the gateway. The McAfee® Embedded Control technology provides layers of security, such as *whitelisting* applications which only trusted applications are allowed to run and *memory protection* which prevents most types of buffer overflow exploitation where the attacker downloads compromised code into the system. These layers of security provide protection from cyber threats with minimal strain on the system resources of the MXE-202i gateway.

The ADLINK EdgePro communicates to the cloud using the Message Queue Telemetry Transport (MQTT) protocol. This is a popular communication protocol for IoT applications that is lightweight, efficient, and easy to use because it is based on the industry-standard TCP/IP. To secure the transfer of data to the cloud, the following are several industry-standard methods available:

- using a VPN as the foundation for communication between the gateway to the cloud, which provides security at the network level
- enabling data encryption with TSL/SSL prevents attackers from reading the data, which provides security at the transport level
- implementing user logins ensures access by authorized users and devices, which provides authentication at the application level



ADLINK Intelligent IoT Gateway Starter Kit

Delivering a complete end-to-end IoT connection solution, the ADLINK Intelligent IoT Gateway Starter Kit includes the folowing items:

- MXE-202i gateway powered by the Intel® Atom processor E3826 with 2GB RAM and 8GB SD card:
  - 1 × HDMI
  - 1 × mSATA
  - 2 × GbE LAN
  - 2 × USB 2.0 and 1 × USB 3.0
  - 4 × isolated DI and 4 × isolated DO (both optional)
  - 2 × mini PCIe slots
  - 1 × mSATA
  - 1 × USIM socket for Wi-Fi, Bluetooth, and 3G cellular
- ADLINK EdgePro preloaded to manage the IoT devices and sensors, powered by Intel® IoT Gateway, which integrates the Wind River® IDP XT 2.0 and the McAfee Embedded Control
- Wi-Fi and Bluetooth preinstalled
- ZigBee USB adapter (IEEE 802.15.4 module)
- Modbus RTU module
- ZigBee wireless light sensor
- ZigBee wireless siren
- Rotary control
- LED array
- Ethernet cable

Conclusion

Forward thinking businesses seeking to gain greater business insights and manageability want to implement the IoT strategy. However, setting up the connected infrastructure is a daunting endeavor.

With an Intel® Architecture based MXE-202i gateway and the Intel® IoT Gateway powered ADLINK EdgePro application, the ADLINK Intelligent IoT Gateway Starter Kit delivers a complete package with enterprise-level security for businesses to begin their first steps toward their IoT strategy. Quick to set up and deploy, the starter kit gives businesses the opportunity to gradually expand their IoT strategy, first by starting at an area in their business where IoT can deliver the quickest and biggest impact.

For Fusheng, leading the way with the IoT strategy enables the company to provide their customers greater clarity on the operation of their compressor and reprocessing equipment, which in turn drives more efficient management over the production and maintenance processes at the customers' facilities.

For more information on the ADLINK Intelligent IoT Gateway Starter Kit, visit **www.adlinktech.com**.

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