

GSEE-TECH

Designing Small, Low-Power Analog Input Modules with MAX11270 ADC



GSEE-TECH's 4-/8-channel analog input block, designed for use with Maxim's MAX11270, is very small and low power, has self-configurable current and voltage signals, and features 16-bit high precision, wide operation temperature, and low temperature drift.

Geneuo (or GSEE-TECH), founded in 2010 and located in Tianjin, China, specializes in the development, production, and sales of industrial automation products, along with system integration and engineering services. The company not only has the perfect sales network in the domestic market, but at the international level, it also owns a strong segment on the development side of the industrial automation market.

Challenge

- Solutions must meet a variety of requirements: support for multi-channels, current/voltage configurability, high precision, very small size, low power, wide temperature operation, low temperature drift, and low cost

Solution

- **MAX11270**

Benefits

- Saved 6 months of development time
- 23.4% growth for customer's order
- Helped customer reduce cost of control system by about 16%
- Stable quality and performance

GSEE-TECH offers an extensive portfolio of industrial Ethernet communication products, including switches, gateway modules, I/O modules, industrial wireless blocks, and more. The company has developed PROFINET, EtherNet/IP, EtherCAT, and Modbus TCP protocol fieldbus products, with signals including digital input, digital output, analog input, and analog output. Its products serve the metallurgy, automotive, logistics, and manufacturing industries. As Industry 4.0 and industrial Ethernet protocols continue to become more pervasive, relevant products such as analog input modules are expected to provide compact size, low cost, multiplexed signal processing, and a high level of protection.

Challenges

In the metallurgy industry, a lot of analog signals are collected and processed by the field equipment layer. Customers want to use an analog input module that supports multi-channels and can process both current (0/4-20mA) and voltage (-10/0V/+10V). At the same time, there are demands for smaller module sizes, as this can save a lot of space in the control cabinet.

In other industries, the new module must meet the IP67 protection standard, but this brings a heat dissipation problem, so it's important for the hardware platform to be low power and provide wide temperature operation. Temperature also influences the accuracy of the analog-to-digital converter (ADC) in the module. As such, low temperature drift is especially important.

With the industrial environment becoming more and more complicated, an excellent analog input module should be able to prevent short circuiting, overcurrent, and overvoltage and provide diagnostic functions with improved electromagnetic compatibility (EMC) capability.

CUSTOMER SUCCESS STORY: GSEE-TECH



"GSEE-TECH is excited for this opportunity to partner with Maxim, offering a perfect solution in our analog input block with a very small size and multi-signal support, enhancing the user experience and user accessibility."

- Li Yan, Fieldbus PM of Marketing, GSEE-TECH

"Using the MAX11270 solved our customer's various requirements. The new module has increased our advantage. Maxim's support team helped make our project easier, and the properties of our module carry out the ultimate goal to satisfy our customers. "

- Li Tao, R&D Manager for Industrial Communication



Solution and Benefits

To help their customers extract the maximum performance possible from GSEE-TECH fieldbus products, the company's new analog input module uses Maxim's **MAX11270**, a 24-bit delta-sigma ADC that achieves excellent 130dB signal-to-noise ratio (SNR) while dissipating an ultra-low 10mW. The ADC also integrates a PGA function to enable a simplified design. User-configurable current and voltage signal processing is available via the programmable logic controller parameters setting function. Users can shift these analog signal types based on their work site (between 0/4-20mA and -10V/0-+10V). Users can also take advantage of the analog input module's small solution size by installing multiple modules in a single control cabinet, potentially reducing the total cost of the entire controller system by about 16%. The team saved six months in the development cycle for this project.

With the MAX11270, the GSEE-TECH engineer was able to design a 4-channel AI-V/I module with a case size of only 76mm x 50mm. Inside the module are a highly integrated power circuit, an MCU, Ethernet interface chips, and the ADC. Notes the company's marketing PM, Mr. Li Yan: "GSEE-TECH is excited for this opportunity to partner with Maxim, offering a perfect solution in our analog input block with a very small size and multi-signal support, enhancing the user experience and user accessibility."

GSEE-Tech's module has been used in the metallurgy industry. For example, it was installed in a blast furnace body to collect various analog sensor signals. The application engineer involved with the project has noted that this module is stable and provides a high EMC capacity.

"Using the MAX11270 solved our customer's various requirements. The new module has increased our advantage. Maxim's support team helped make our project easier, and the properties of our module carry out the ultimate goal to satisfy our customers," said Mr. Li Tao, R&D manager for Industrial Communication at GSEE-TECH. "Maxim's China support team created a turnkey solution for our requirements in this project, providing a small, high-performance ADC with isolation of signal inputs, multi-channel analog switch, and so on."

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