

LINYANG's Energy Terminal Unit Leverages ADI's Fully Isolated ADC to Achieve High Accuracy in Harsh Process Control Environments



Based in the Jiangsu province of China, LINYANG Electronics Co., Ltd. was founded in 1995 as a manufacturer of electronic energy meters. The company has rapidly grown into one of the world's leading providers of smart grid solutions including energy meters, energy terminal units, LED lighting, and solar modules and systems.

LINYANG's R&D efforts are focused on developing a variety of energy efficiency platforms that combine acquisition, monitoring, and communications technologies. These platforms enable management systems for power, water, natural gas, and heating systems. They are used in businesses, universities, industrial complexes, and government buildings.

Energy Terminal Unit Design Challenges

LINYANG's new TYL2560 energy terminal unit is designed to perform power monitoring in harsh process control environments. It integrates a variety of functions including energy efficiency, power management, and voltage monitoring. The TYL2560 supports multiple acquisition channels that represent process control parameters such as pressure and temperature.

The analog input signals in a terminal unit must be isolated and decoupled from noise present within a typical harsh process control environment. Safety regulations must be followed that drive the requirements for electrical isolation. Analog input signals within 4 mA to 20 mA loop applications, which are commonly used in process control environments, can be quite small and easily distorted by background noise and interference. As a result, maintaining input signal integrity is a critical system requirement. In the past, LINYANG included isolation for each dc acquisition channel, and all of the channels shared a common power supply. This type of approach, however, can be complex, expensive, and prone to interchannel interference, which can cause measurement errors. In extreme cases, it can even lead to equipment damage.

To overcome these challenges, LINYANG designed the TYL2560 with Analog Devices' [ADE7912](#) fully isolated analog-to-digital converter. According to Wang Meng, chief engineer at LINYANG, "The ADE7912 simplified our design work because we no longer had to use external isolation components in our system, which made the hardware layout much less complex. Also, we paired each analog input signal with an ADE7912, and this configuration provided isolation in both the signal and power domains. When we began evaluating terminal performance, we were satisfied with the results because there were no measurement errors and essentially no interchannel interference. We were able to achieve a small form factor and cost effective design for the TYL2560 unit by using the ADE7912 A/D converter."

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Wang Meng, Chief Engineer, LINYANG

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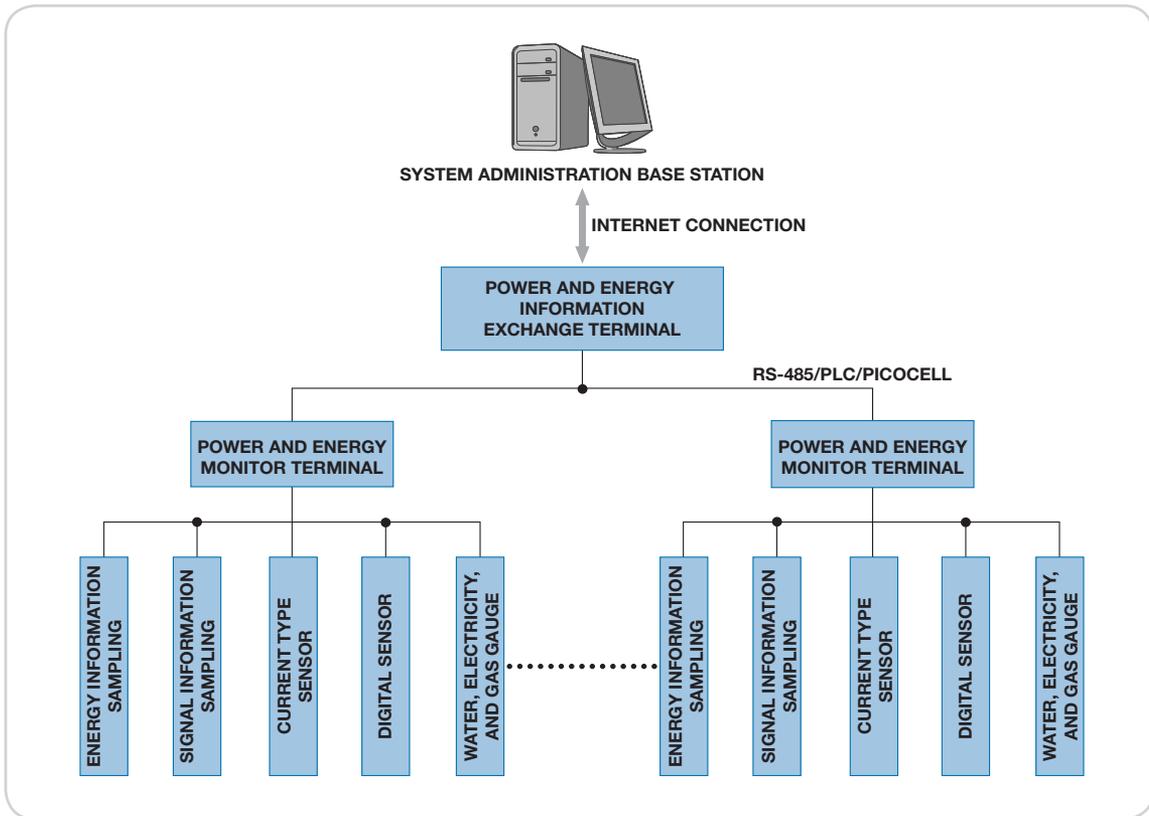


Illustration of how LINYANG's energy efficiency platform operates.

About the ADE7912 Fully Isolated Analog-to-Digital Converter

The ADE7912 2-channel, Σ - Δ analog-to-digital converter incorporates Analog Devices' patented *iCoupler*[®] and *isoPower*[®] technologies to implement isolated signal transfer and dc-to-dc power conversion across a 5 kV rated insulation barrier.

In other types of applications, such as electricity meters, this integration enables the use of shunt resistor sensing elements instead of current transformers (CTs), thereby providing immunity to magnetic field interference and tampering. The use of shunts instead of CTs also reduces system cost and size.

About LINYANG Electronics Co.

Specializing in research, production, and sales of smart electric energy meters and power management products, LINYANG is the executive director unit of the China Electricity Council (a cooperative enterprise of the China Electric Power Research Institute) and one of the top 100 electronic information enterprises in China.

