

Silicon Labs Launches Industry's First High-Speed Multi-Channel PLC Input Isolators

New Si838x Digital Isolators Outperform and Outlive Outmoded Optocouplers in Programmable Logic Controllers for Factory Automation

“ Silicon Labs’ Si838x family addresses the unique challenges of PLC design by offering a compact, multi-channel, high-speed digital isolation solution ”

AUSTIN, Texas--([BUSINESS WIRE](#))--[Silicon Labs](#) (NASDAQ: SLAB) has introduced the industry's first high-speed, multi-channel digital isolators designed to meet the demands of programmable logic controller (PLC) applications. The new Si838x PLC field input isolator family offers an unmatched combination of high-speed channels (up to 2 Mbps), exceptional channel integration (up to eight channels per device), bipolar input flexibility, high noise immunity and 2.5k VRMS safety isolation. The Si838x family provides a purpose-built solution for PLC applications including industrial I/O modules, computer numerical control (CNC) machines and servo motor control. The Si838x isolators are also ideal for process automation controllers (PACs) used in distributed process control systems.

Get all the details about Silicon Labs’ Si838x PLC field input isolators including product pricing and availability, development tools and data sheets at www.silabs.com/isolation.

Widely deployed in harsh factory floor environments, PLCs must be robust and compact. Many PLC designs scale up to 128 channels and have multiple high-speed inputs. While optocouplers have provided the default isolation solution for decades, they present major challenges to PLC designers. Lacking high-speed capabilities, optos are not fast enough for high-performance PLC applications such as servo motor control. Optos also lack high noise immunity, and their performance degrades over time and temperature, posing reliability risks in high-temperature industrial applications. The Si838x family addresses these challenges for the first time by providing a flexible, high-speed, multi-channel bipolar isolation solution in a compact QSOP package with much longer service life and higher reliability than opto-based solutions.

Silicon Labs’ Si838x isolators are highly integrated single-chip devices providing eight channels of 24 V digital field interface. This high level of integration enables significant bill of materials (BOM) and board space savings in PLC designs. By “daisy chaining” 16 Si838x isolators in a system design, developers can create PLCs with up to 128 channels supported by a single serial peripheral interface (SPI) port on the system's embedded processor.

The controller interface can be eight parallel channels or a four-port SPI. Developers can configure the SPI for on-the-fly programming for custom de-bounce of noisy signals and for daisy chaining to support high-channel-density PLC designs. An optional de-bounce filter is either pre-programmed in a parallel configuration or programmable in a serial-out configuration.

Leveraging Silicon Labs’ groundbreaking CMOS-based LED emulator technology, the Si838x isolators feature a flexible bipolar input capability that gives developers a choice of sinking or sourcing inputs. The LED emulator input circuit supports up to eight sinking or sourcing inputs in a single isolator device with no power supply required on the field side. The output interface to the controller supports low-power operation with 2.25 V operation capability.

The Si838x isolators provide a high-speed capability of 1 MHz (2 Mbps), which is essential for servo motor control applications. The isolators also offer best-in-class noise immunity on high-speed channels (50 kV/μs CMTI typical) to enhance system reliability.

“Silicon Labs’ Si838x family addresses the unique challenges of PLC design by offering a compact, multi-channel, high-speed digital isolation solution,” said Ross Sabolcik, vice president of power products at Silicon Labs. “PLC developers can now easily migrate their optocoupler-based designs to state-of-the-art digital isolation technology providing the benefits of higher performance, greater design flexibility, higher channel density and long-term reliability.”

Si838x PLC Field Input Isolator Family Highlights

- Bipolar input capability offers flexible design options for sinking or sourcing PLC inputs
- Up to 8 channels in one package reduces board space for compact PLC designs
- High-speed 2 Mbps channels enable reliable servo motor control
- High noise immunity (50 kV/μs CMTI on high-speed channels) ensures reliable operation
- Parallel or SPI interface provides flexible design options
- Single SPI port supports 128 channels with 16 Si838x devices, saving control I/O pins
- User-programmable de-bounce capability using SPI
- 2.25-5.5 V VDD capability reduces power consumption for low-power controller interface
- Integrated 2.5k VRMS safety rated isolation

Pricing and Availability

Samples and production quantities of the Si838x PLC field input isolators are available now in a compact 20-QSOP package. Si838x family pricing in 10,000-unit quantities begins at \$1.91 (USD.) To simplify PLC application development, Silicon Labs offers the Si838xISO-KIT evaluation kit priced at \$29.00 (USD MSRP). To purchase product samples and development tools, visit www.silabs.com/isolation.

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