## FEATURES

- 24 optically isolated, non-polarized digital inputs
- Software configurable filters on inputs for electrically noisy environments
- Can detect input state change and assert interrupt
- 24 optically isolated high-side FET switches
- Four optically isolated output groups and two optically isolated input groups
- Opto-couplers rated for 2.5kV isolation
- 8 non-isolated TTL/CMOS I/O lines
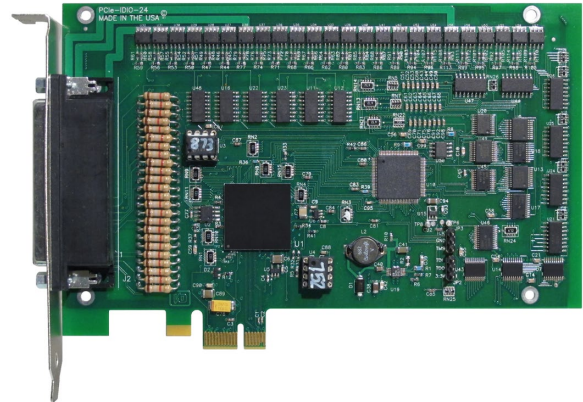
FACTORY OPTIONS

- Extended temperature (-40°C to +85°C)
- RoHS compliant version
- Available in 12-chl versions (with 4 TTL I/O)
- Input-only and output-only versions for both 24- and 12-channel models

FUNCTIONAL DESCRIPTION

This product is a x1 lane PCIe isolated digital input and FET output board with Change of State (COS) detection capabilities. In addition to the isolated signals, 8 (or 4) TTL/CMOS input/output pins are available, for your application's convenience.

The isolated inputs can be driven by either AC or DC and are not polarity sensitive. Input signals are rectified by a diode bridge and applied to the inputs of opto-isolators. A 1.8k ohm resistor in series provides current limiting. Standard 12/24 AC control transmitter outputs can be accepted as well as DC voltages. The input voltage range is 3V to 31VDC (or 40-10kHz RMS). To extend the input voltage range, you may connect external resistors in series. Inputs can be configured to generate an IRQ when the input changes from active-to-inactive, inactive-to-active, or both in groups of eight bits.

The PCIe-IDIO-24 features fully protected and isolated high side power MOSFET switch outputs which are de-energized at power-up to prevent an unintended control output signal. They are capable of switching customer supplied voltages of 5 to 34VDC, at up to 0.5A.

The card is 6.6 inches in length and 4.2 inches seated height. I/O wiring connections for this board are via a 78-pin D-sub connector. A molded round-wire "Y" cable is typically used to connect this card to termination panels with two 37-pin D-sub connectors.

OPTIONAL ACCESSORIES

STB-37	DIN-SNAP-6	CAB78-37/2	STB-37/2 Kit
Screw terminal board, mounts on DIN-SNAP or standoffs	SNAP-TRACK for DIN-rail mounting one STB-37	CAB78-37/2 Cable is a 6' round-wire "Y" cable	Screw Terminal and Cabling solution includes two STB-37's mounted to a SNAP-TRACK and the CAB78-37/2 "Y" cable

SOFTWARE

The card is supported for use in most operating systems and includes Linux and Windows compatible software packages. This package contains sample programs and source code in Delphi and Visual C++ for Windows. Linux support includes installation files and basic samples for programming from user level via an open source kernel driver. Third party support includes a Windows standard DLL interface usable from the most popular application programs. Embedded OS support includes Windows XPe.
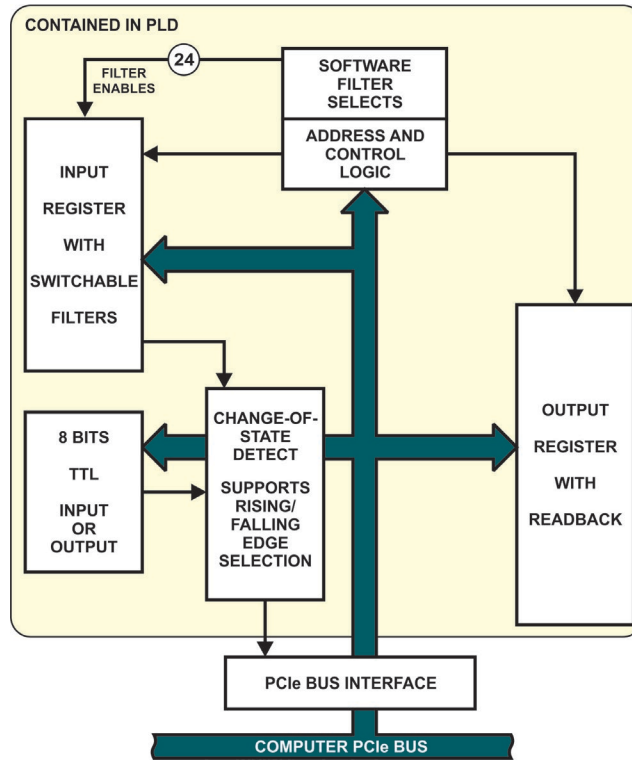
BLOCK DIAGRAM

SPECIFICATIONS

Isolated Digital Inputs

Number of inputs: 24

Type: Non-polarized, optically isolated sharing a common return per 12 channel group (not TTL/CMOS compatible)

Voltage Range: 3 to 31VDC or VACrms (40-10kHz)[1]

Isolation: Opto-couplers rated at 2.5kV (see manual)

Input Resistance: 1.8k ohms in series with two diodes and a photo-coupler LED

Response Time:
with filter: 4.7 mSec
without filter: rise time = 10 uSec
fall time = 30 uSec

Note 1: The design specs a minimum voltage of 3V for the isolated input to comply with the optocoupler's test conditions, ensuring operation within the specified input current range. This approach enables accurate measurement of the Current Transfer Ratio (CTR), minimizes input power consumption, and ensures safe operation during use. While a voltage of around 2V may also generate a high signal, the exact threshold can vary between boards due to component tolerances. The maximum input voltage is 31VDC / VACrms due to the 1/2 watt current-limiting resistor. The design specs the maximum voltage that will be detected as "low" as 1.2VDC. Values between 1.2 and 3VDC are in the hysteresis range.

Non-Isolated Digital Input/Outputs

Number of lines: 8, programmable as all ins or all outs

Type: TTL/CMOS compatible, pulled up to 5V via 10k ohms

Interrupts Change of State Detection available on all 32 input bits; software enabled in 8 bit groups; byte-wide pattern recognition

Solid State FET Outputs

Number of outputs: 24, Isolated in four, 6-channel groups

Output Type: Smart High Side Power MOSFET Fully Protected (short circuit, over-temp., ESD, inductive flyback)

Voltage Range: 5-34VDC recommended (40VDC absolute maximum)

FET Ratings: On-state resistance = 60mΩ
0.5A continuous per FET, with a 2.5A cumulative total per group of 6 FETs

Environmental

Operating: 0° to 70°C, optional -40° to +85°C

Storage: -40 to +85°C

Humidity: 5 to 90 percent (non-condensing)

Mechanical

Size: Standard height 4.2" (106.65 mm), half-length 6.6" (167.6 mm) long

Connector: DB78 Female

Mating Connector: AMPLIMITE 1658674-1 or equivalent

ORDERING GUIDE

PCIe-IDIO-24	24 isolated inputs, 24 high-side FET outputs, 8 TTL/CMOS digital I/O
PCIe-IDI-24	Inputs only (24 isolated, 8 TTL/CMOS)
PCIe-IDO-24	24 isolated FET outputs
PCIe-IDIO-12	12-isolated inputs, 4 TTL I/O's, 12-isolated outputs

Model Options

-T	Extended temperature (-40° to +85°C)
-RoHS	RoHS compliant version

Optional Accessories

STB-37	Screw terminal board
CAB78-37/2	6' shielded molded "Y" cable assembly
STB-37/2 Kit	Complete screw termination solution including 6' "Y" cable assembly
STB-37/2 Kit-CL	Includes four clips for mounting the STB-37/2 Kit to a standard DIN-Rail