

### FEATURES

- 48 Digital Input channels each with:
  - Optically isolated differential inputs accept voltage differential up to 30 volts
  - 1500 Vrms input to output isolation
  - Debounced inputs
- Generates an interrupt on signal change-of-state
  - Supports 48 event sense lines
  - Software selectable edge polarity for each line
  - Software enabled interrupt for each line
  - Change-of-state latched for each line
- Dual 50-pin header connectors
- STD Bus and CMOS STD Bus interface
- +5 volt only operation
- Extended operational temperature range: -40° to +85°C for the LPM-OPTO48

The LPM/MCM-OPTO48 is a highly versatile 48 channel, optically isolated and debounced STD Bus digital input card for industrial applications. Each input line is isolated from the others and from the bus interface circuits to provide a barrier between the control system and harsh industrial environments.

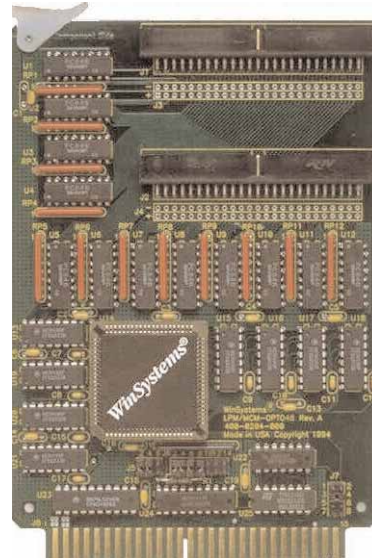
One important feature of this card is its ability to debounce then monitor both rising and falling edge transitions of a signal, latch it and then interrupt the processor to signal that a change of status has occurred on any input line.

### FUNCTIONAL CAPABILITY

**Bus Interface** - The MCM-OPTO48 is the STD Bus and the LPM-OPTO48 is the CMOS STD Bus version of the board. Programming, cable pin-outs, bus pin assignments, and jumper configurations are identical for both cards. The LPM/MCM prefix indicates the card has the same features and functionality but a different bus interface logic, power requirements and operational temperature range.

**Addressing** - The LPM/MCM-OPTO48 card is I/O mapped for either 8-bit or 10-bit addressing on any even 16-port boundary. IOEXP is jumper selectable as active high, active low, or don't care.

**Digital Input Circuit** - Each digital input line on the LPM/MCM-OPTO48 is wired in series to a photocoupler, a contact bounce eliminator and then to WinSystems' WS16C149 OPTO I/O controller ASIC.



**Opto Isolation** - Each input line is optically isolated from others and from the bus interface circuits. The isolation voltage rating between the input and output of the photocoupler device exceeds 1500V.

The voltage differential required to guarantee an ON state is between 10 to 30 volts. Contact WinSystems if your input requirements differ. The standard input configuration is differential; however, an option is supported to provide a common anode or common cathode configuration with all the photocouplers.

**Contact Bounce Elimination** - After the opto-isolation circuit, each of the 48 input lines inputs a MC14490 contact bounce eliminator. Its purpose is the elimination of extraneous level changes that result when interfacing with mechanical contacts from devices such as switches or relays. This circuit will remove bounce on both the "make" and "break" of a contact closure before it inputs the WS16C149.

There is a small amount of time delay in this circuit which is a function of the edges of the input signal and the clock frequency of the MC14490 device. The typical debounce time is 20 milliseconds. Contact us if you need a different time period.

**Event Sense Operation** - WinSystems' WS16C149 ASIC supports all 48 lines and can generate an interrupt

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when an event occurs either on a positive or negative transition of the input. Transition polarity is programmable and enabled on a bit-by-bit basis. Each lines' transition is latched by the event so that even short duration pulses will be recognized. An interrupt ID register is maintained for each line for writing more efficient Interrupt Service Routines. The board can generate system interrupts which are routed through a jumper block to any of the four STD Bus interrupt signals on the backplane.

**I/O Connectors** - The digital inputs lines are differential with each pair wired to one of the two 50-pin connectors. Channels 0 to 23 are on J1 and Channels 24 - 47 are on J2.

## **SPECIFICATIONS**

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### **Electrical**

STD Bus: MCM-OPTO48  
CMOS STD Bus: LPM-OPTO48  
Input isolation voltage = 1500 volts  
Vcc = +5V @ 120mA typical (MCM-OPTO48)  
+5V @ 12mA typical (LPM-OPTO48)

### **Mechanical**

Dimensions: 4.5" x 6.5"

### **Connectors**

Digital Input: Two, 50-pin dual 0.100" headers  
STD Bus: 56-pin dual 0.125 inch centers  
Jumpers: 0.025" square posts

### **Environmental**

Operating Temperature:  
LPM-OPTO48: -40° to +85° Celsius  
MCM-OPTO48: 0 to +65° Celsius  
Non-condensing relative humidity: 5% to 95%

## **ORDERING INFORMATION**

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LPM-OPTO48 CMOS STD Bus 48-line opto-isolated input card with interrupts  
MCM-OPTO48 STD Bus 48-line opto-isolated input card with interrupt support

