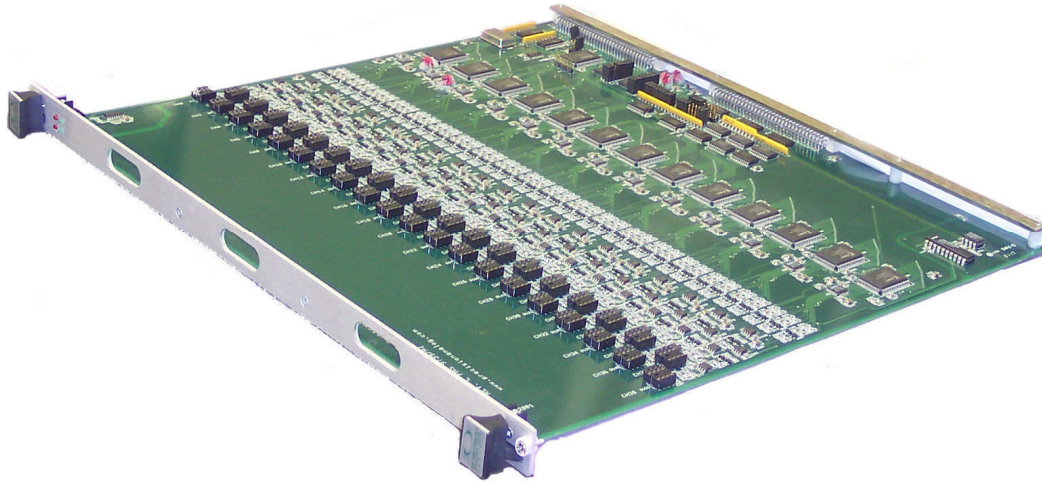


# PAS 9739/AI

## 39 Channel VME Photo-Detector Card



### GENERAL DESCRIPTION

The **PAS 9739/AI** is a VME based, thirty-nine channel, photodetector and dual ADC, Analog Input Card. Each channel consists of a photodiode driving the inputs of a pair of current to voltage conversion amplifiers. The amplifiers have different gains and provide high and low sensitivity outputs. Amplified outputs are digitized by a pair of twelve bit, 500 KHz, Analog to Digital Converters (ADCs) and stored in a memory array that is accessible by the VME bus.

Each ADC chip consists of two, 500KHz, twelve bit ADCs with a three channel multiplexer connected to the input of each ADC. In normal operation, the card simultaneously samples and converts the high and low sensitivity signals associated with a given photodetector, and stores the digitized data in the memory array. After completion of the conversion, the card increments to the next channel and performs a pair of conversions. This repeats continuously for the three channels connected to each ADC.

Thirteen ADC chips are provided on this card, and they synchronously scan their three input channels. The converted data is stored in an array that is accessible by the VME bus while the card is scanning. Data from the high and low sensitivity channels can be read with a single 32 bit VME transfer. This approach provides data for all channels with a maximum latency of six microseconds plus the VME bus access time.

Calibration circuitry is provided that will inject known currents into the front-end amplifiers, when enabled with a control instruction. The calibration feature is useful for verifying the functionality of the input amplifiers and A to D converters.

The card format is 9U by 340mm and it is configured to work in a special chassis that hardwires address bits eight through fifteen in the backplane. VME systems with A16, A24, and A32 addressing are also supported, and jumper plugs are provided to set the card's address, and width of the address bus. Data bus widths of 16 and 32 bits are supported, and the instruction selects the transfer type. A board identifier PROM, serial number register, test registers, and a control and status register are also provided.



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## Electrical Specifications

<b>Number of Channels</b>	39
<b>Resolution</b>	12 bits
<b>Input Voltage Range of ADC</b>	0 to 5 Volts
<b>LSB bit weight</b>	1.22 mVolt
<b>Conversion Time</b>	1.75 uSec (typ.)
<b>Acquisition Time</b>	0.25 uSec (typ.)
<b>Throughput Rate</b>	500 KHz (min.)
<b>Integral Linearity</b>	+/- 0.5 LSB (typ), +/- 1 LSB (max.)
<b>Differential Linearity</b>	+/- 0.4 LSB (typ)
<b>High Sensitivity Gain</b>	10 V/uA
<b>Low Sensitivity Gain</b>	100 mV/uA
<b>High Sensitivity Calibration Current</b>	0.2 uA
<b>Low Sensitivity Calibration Current</b>	5.0 uA
<b>Photo detector Dark Current</b>	1 nA (typ.), 5 nA (max.)
<b>Photo detector Responsivity</b>	
<b>Type 1</b>	0.75 A/W (min.), 0.85 A/W (typ.)
<b>Type 2</b>	0.85 A/W (min.), 0.92 A/W (typ.)
<b>Type 3</b>	0.90 A/W (min.), 0.95 A/W (typ.)
<b>Card Power Requirements</b>	5 Volts, and +/- 12 Volts

## Features

Thirty-nine channel, photo detector and dual gain analog input card

Dual gain amplifiers provide high and low sensitivity outputs for each photodiode

Thirteen synchronously scanning dual 500 KHZ ADC chips with 3:1 multiplexers

High and low sensitivity channels converted simultaneously and available in 32 bit read

Calibration signals are provided on every channel

VME Interface: D32, D16; A32, A24, A16, no interrupts

Four front panel LEDs indicate; Pass, Fail, Calibration, and Board Access

Board identifier PROM: ID code is VMEIDPAS9739AIAO

## Environmental Specifications

<b>Operating Temperature Range</b>	0 to 55 degrees C with forced air cooling.
<b>Storage Temperature Range</b>	-20 to 85 degrees C.
<b>Relative Humidity Range</b>	20% to 80%, non-condensing

## Physical Specifications

<b>Dimensions</b>	Form factor: 9U x 340 mm
<b>Weight</b>	32 oz. (typ)
<b>Connectors</b>	2 ea. 96 pos. DIN (VME bus)

