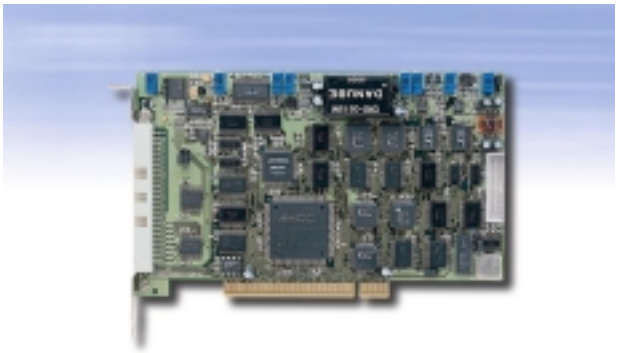
AX5095P

High Speed Data Acquisition Board



Features

- 32-bit PCI bus compatible multifunction board.
- Plug and Play
- PCI bus-master DMA data transfer
- Compact size board.
- 333 KHz 12-bit A/D converter
- Includes onboard sample-and-hold circuit
- Jumper selectable 16 single-ended or 8 differential analog inputs
- Unipolar/bipolar analog input with programmable gain
- Auto-channel/gain scanning allows different gain for each channel
- Built-in 1 K word FIFO for collecting analog input bus-master transfer data
- 12-bit high-resolution onboard standalone intelligent alarm-trigger circuit.
- 2 channels of 12-bit analog output
- 8 digital inputs and 8 digital outputs
- One 16-bit counter channel.
- Windows 95/98/NT and Red Hat Linux kernel version 2.2.X device driver supported

General Description

The AX5095P is a very-high-speed, high-performance multifunction PCI Bus plug-in DAC card for the IBM PC/AT and compatible computers. It features a 333 KHz 12-bit analog-to-digital converter, on board 1K word FIFO buffer, two 12-bit D/A output channels, 8 digital input channels, 8 digital output channels and one 16-bit counter channel.

The AX5095P applies a 12-bit high-speed A/D converter with 2.7μs conversion time. It also includes an onboard sample-and-hold circuit with software programmable input range. You can trigger the A/D converter from your program, the onboard programmable pacer timer or an external trigger.

The AX5095P also includes a 12-bit high-resolution analog alarm-trigger circuit that you can use as an analog watchdog to monitor the card's analog input signals. If the analog signal goes above or below the alarm value or the slope of analog signal exceeds the setting value; the AX5095P can generate an indication signal and start to transfer data.

The alarm-trigger function is implemented by hardware circuit. So it does not take any CPU time to deal with analog signal monitoring. Even when the PC halt, this function is still working.

AX5095P can select either eight differential or 16 single ended analog inputs by jumper. It also offers auto-channel/gain scanning. This feature allows different gain for each channel even when high-speed multi-channel sampling with Bus-Master DMA (333KHz).

The AX5095P supports PCI Bus-Master DMA data transfer. It does not take any CPU time to transfer analog input data even when the sampling rate reaches to 333KHz.

All intelligent functions described above make the AX5095P an ideal data acquisition system for your laboratory applications that require very high speed and powerful triggering capabilities and waste no CPU time.

The AX5095P can support PCI bus-master DMA data transfer capability. This capability let the onboard FIFO became PCI data transfer initiator and master. When there is any analog input data matchs alarm-trigger condition and is collected in the onboard FIFO, the FIFO initiates DMA and becomes bus-master to transfer data directly from onboard FIFO to system memory. This action needs no CPU instruction or CPU time.

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Besides, onboard standalone intelligent circuit can auto-detect the high-low alarm value or signal slope trigger value without wasting CPU time. It means the CPU can have more time to service program process especially in multitask operation system and the alarm-trigger function will be still working even when CPU halt.

Specification

A/D

- Channels: 16 single ended or 8 differential (jumper selectable)
- Resolution: 12 bit
- Conversion Time: 2.7μsec
- Input Gain: 0.5, 1, 2, 4, 8
- Input Ranges:
  - Bipolar: ±10 V, ±5 V, ±2.5 V, ±1.25 V and ± 0.625 V
  - Unipolar: 0~10 V, 0~5 V, 0~2.5 V and 0~1.25 V
- Automatic channel/gain Scan Trigger modes: Software, pacer or external trigger.
- Data transfer: Software controlled or PCI bus-master DMA data transfer (programmable)
- FIFO size: 1K word (2K or 4K word option)
- Data transfer rate: 333KHz with PCI bus-master DMA mode
- Accuracy: ±0.03% FSR
- Input Impedance:
  - Off Channel : 100 MΩ, 20pF
  - On Channel : 100 MΩ, 20pF
- Max. Input Voltage without Damage:
  - Power On : ±35V
  - Power Off : ±20V
- Bias Current: 20nA
- Output Coding: Binary Offset Binary
- Common-Mode Rejection Rate:
  Gain = 1 90dB

D/A

- DA channel: Two independent channels
- Output range: 0 to 5 V or 0 to 10 V with internal reference
- Input Data Coding: Straight binary
- Output Current: ±5 mA max.
- Source Impedance: 0.02Ω
- Resolution: 12bits
- Non-linearity: ±2LSB
- Gain Error: Adjustable to zero
- Zero Error: Adjustable to zero
- System Accuracy: ±0.025%FSR (voltage out)

DIO

- Digital Input Lines: 8
- Digital Output Lines: 8
- Logic Family: LSTTL
- Input/Output Level: TTL/DTL Compatible
- Electrical Characteristics
  - Logic High Input Voltage (VIH): 2V (min.)
  - Logic Low Input Voltage (VIL): 0.8V (max.)
  - Logic High Input Current (IIH): 20mA (max.) at VI=2.7V
  - Logic Low Input Current (IIL): -0.2mA (max.) at VIL=0.4V
  - Logic High Output Voltage (VOH): 2.7V (min.) at IOH=-0.4mA
  - Logic Low Output Voltage (VOL): 0.5V (max.) at IOL=8mA
  - Logic High Output Current (IOH): -0.4mA (max.)
  - Logic Low Output Current (IOL): 8mA (max.)

Special Functions

External A/D Triggers

- Number of Trigger Lines: 1
- Functions: Trigger A/D conversion with outside event
- Input Type: Edge sensitive, clock on rising edge
- Logic Family: LSTTL
- Logic Load: 1 LSTTL load
- Input Termination: 10Kohm pull up to +5V
- Minimum Pulse Width:
  - Clock high: 20ns
  - Clock low: 20ns

Interface Characteristic

- Power Requirement
  - +5 V @ 600 mA max.
  - +12 V @ 200 mA max.
  - -12 V @ 15 mA typical
- Physical/Environment
  - Dimension 4.8" x 8.6" (122 mm x 218 mm)
  - Operating Temperature: 0°C to 50°C
  - Storage Temperature: -25 to 85°C
  - Relative Humidity: 0 to 90%, non-condensing

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Ordering Information

AX5095P

16 channels data acquisition board, including user's manual, and utility CD-ROM with Basic, C and Pascal drivers for DOS, Windows 95/95/NT drivers, and Linux driver.

Terminal Boards

- AX750
  Low cost screw terminal panel accommodates all analog input connections.
- AX752
  Table top screw terminal panel designed for thermocouple and low level inputs.
- AX951A
  Universal screw terminal panel conceived for 50 pin connector wiring conveniently.

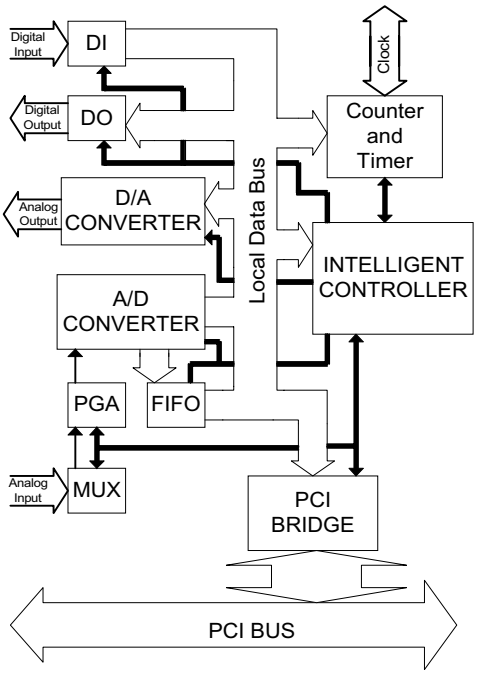
Drivers for 3rd party s/w packages

- AS59061 Labtech Control and Notebook driver
- AS59011 Labview driver
- AS59130 Dasylab driver

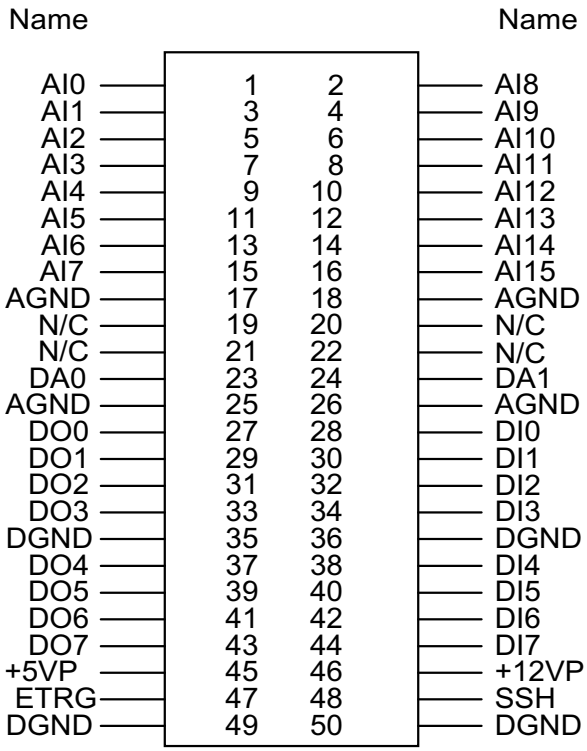
Timer/Counter

- Device: 8254 programmable interval timer counter. Three 16 bits down counters.
  2 permanently connected to 8MHz clock as programmable timer. 1 counter free and connected with 80KHz clock or external clock (jumper selectable)
- Clock Input Range: D.C. to 10MHz
- Input Level: TTL, DTL, CMOS compatible
- Built-in Frequency Source:
  - For A/D Pacer : 8MHz
  - For free counter channel : 80KHz

Block Diagram



Pin Assignment



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