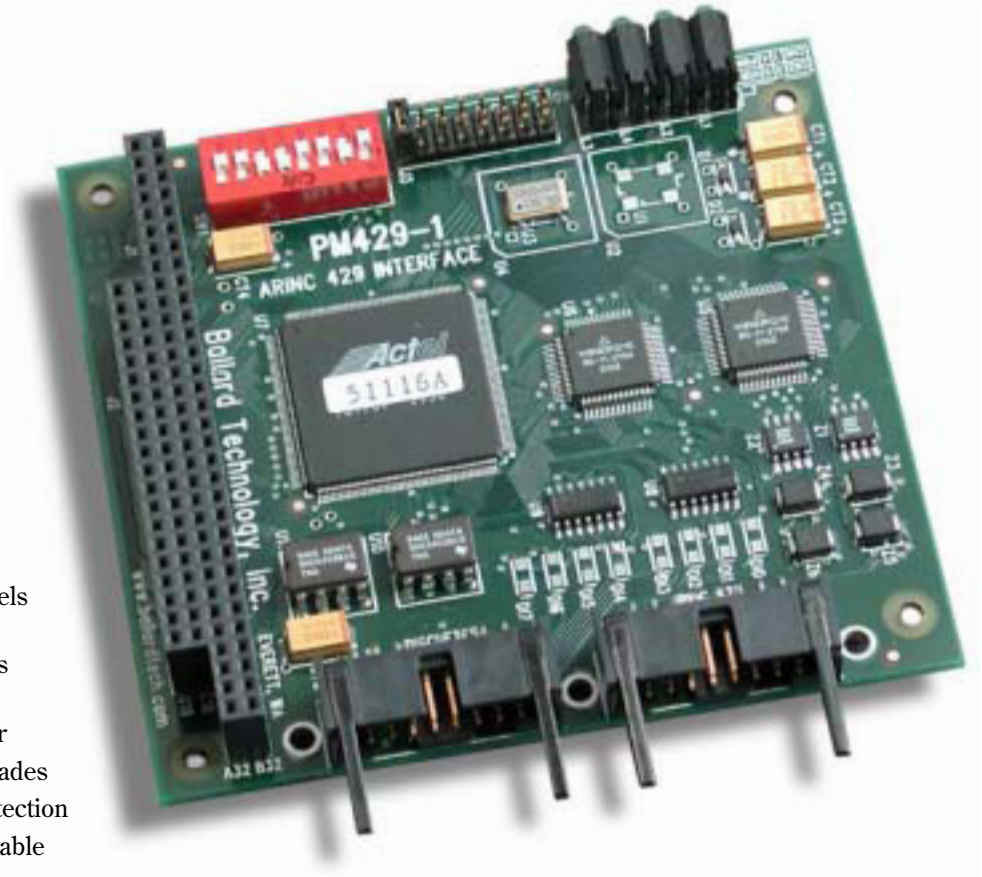
PM429-1

ARINC 429 Interface for PC/104 Computers



Features

- PC/104 compliant
- Six ARINC 429 channels (4R2T)
- Configurable discretes (8 in/4 out)
- General-purpose timer
- Three temperature grades
- Transient voltage protection
- Custom versions available

Description

The PM429-1 is a low-cost ARINC 429 interface for PC/104–embedded computers. In addition to the four receive and two transmit ARINC 429 channels, the PM429-1 has configurable input (8) and output (4) discretes and a programmable timer. The PM429-1 has many features that are not available on simpler ARINC 429 interfaces. These features minimize the load on the host processor and can even eliminate the need for additional cards. The straightforward architecture and I/O–mapped registers make integration and applications programming a simple task in any operating system.

Designed for flexibility, the PM429-1 can be ordered in various configurations to provide the most cost-effective solution for a given application. Industrial temperature range is standard; commercial and military temperature ranges are available. For rugged applications, the standard switches and moveable jumpers can be replaced with fixed settings, and conformal coating is available. Input discretes may be configured for different voltages in a variety of series and shunt circuits. Output discretes are open-collector with an optional internal pull-up resistor. The number of discretes and the ARINC 429 channel count can be reduced for cost savings and a second clock can be added for non-standard ARINC 429 frequencies (such as ARINC 575). For critical applications, the PM429-1 can be ordered with the transmitters permanently disabled.

ARINC 429

Each ARINC 429 channel has a large FIFO buffer (32 ARINC 429 words) that can provide a service request when the FIFO is empty, half-full, or full. The speed of each channel may be independently set for high or low. Non-standard speeds may be obtained through a

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programmable divider and/or a custom clock. Each receive channel has independent label and SDI filtering. When enabled, received words are rejected if they do not match the specified SDI and one of the 16 programmable label filters. Each transmit channel has a gap timer that simplifies the programming required to maintain label repetition rates. After all the words in the FIFO have been transmitted, the gap timer counts out the specified number of bit-times before a new group of words can be transmitted, thus maintaining an exact schedule. Each ARINC 429 channel has an LED that blinks when there is activity on that channel.

Discretes

The PM429-1 is available with up to eight input and four output discretes. The input discretes are factory-configured to the desired circuit and threshold voltage. A variety of series and shunt configurations (open/ground, voltage/ground, and voltage/open) are available. In addition to analog filtering, inputs are debounced through a programmable digital circuit. Each input discrete may be programmed to issue a service request on the positive and/or negative edge of the input signal. Output discretes are under host control and have open-collector circuits with optional pull-up resistors.

General-Purpose Timer

The 32-bit general-purpose timer can be software configured to operate with a resolution of 1 to 1000 microseconds, to count up or down, to free run or halt at zero, and to issue a service request when it reaches zero. The timer may be read or set to a desired starting value through accesses to registers.

Programming

The PM429-1 may be programmed in most languages and operating systems. All accesses to the PM429-1 are through registers in an I/O address window. Polling and/or interrupts may be used to handle the service requests generated by the various resources. Provided with the PM429-1 are files containing many software helper functions and examples that demonstrate how easy it is to program and use the PM429-1.

Software drivers are included for Windows® 95/98/NT/Me/2000/XP. Linux and VxWorks® drivers are available separately.

Ordering Information

Standard products are:

PM429-1/261: Industrial temperature, 4R2T, with 5 VDC discretes.

PM429-1/260: Industrial temperature, 4R2T, with no discretes.

PM429-1/230: Industrial temperature, 2R1T, with no discretes.

Other configurations on request. Includes board, manual, and software disk.

Technical Specifications: PM429-1

ARINC 429
- Configurations: 4R2T, 2R1T, 4R0T, or 2R0T
- Speeds
  - Low: 12.5 Kbps
  - High: 100 Kbps
  - Others: Programmable and custom
- FIFO: 32 words/channel
- Bit 32 usable as parity or data
- Receiver filters/channel: SDI and 16 labels
- Transmit gap: 0–65,535 bit-times

DISCRETES
- Inputs: Up to 8
  - 5, 12, 28 VDC or other
  - Series or shunt
- Outputs: Up to 4
  - Open-collector (optional pull-up)
  - 50 VDC at 500 mA (max)

GENERAL-PURPOSE TIMER
- 32-bit
- Resolution: 1, 10, 100, or 1000 µs
- Modes: Free run or single; up or down

OTHER
- PC/104: 8 or 16-bit
- Interrupts: 3, 4, 5, 7, 9, 10, 11, 12
- Power required
  - 5 VDC at 80 mA
  - +/–12 VDC
    - at 15 mA (transmitter idle)
    - at 50 mA (transmitting)
- Size: 3.55 x 3.75 in. (90.2 x 95.9 mm)
- Weight: 2.4 ounces (68 grams)
- Transient voltage protected
- Temperature grades
  - Industrial (std): –40° to +70° C
  - Military: –55° to +85° C
  - Commercial: 0° to +55° C

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