

Interfaces

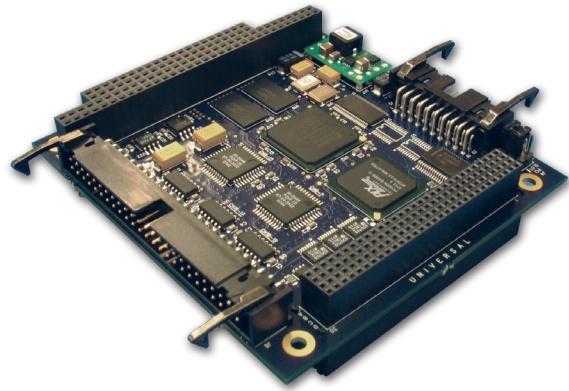
ARINC 429
ARINC 717
Discrete I/O
IRIG A/B

Features

- PC/104-Plus compliant
- Up to 16 ARINC 429 channels
- Up to 4 ARINC 717 channels
- Large 32MB memory for Tx/Rx/Mon buffering
- 16 Avionics discrete I/O signals
- 48 bit, 1 usec hardware time-tagging
- IRIG A/B PWM and AM synchronization
- Rugged extended temperature design
- Easy to use software interface

Benefits

- Large channel count and multiple protocols in a single interface
- Larger number of discretes for additional flexibility in a single board
- Unified *BTIDriver*[™] API compatible with many other Ballard products
- Offers a wide variety of configurations



Description

Ballard's PM429-2 product is a PC/104-Plus compliant interface card for communicating over ARINC 429 and ARINC 717 avionics databuses for both simulation and embedded applications. This feature rich interface provides current value registers and 32MB of SDRAM for list and monitor buffering. PM429-2 models offer up to 16 ARINC 429 channels, 4 ARINC 717 channels, IRIG time synchronization and 16 input/output avionics discretes. Both bipolar and biphas ARINC 717 signaling is provided to the user through software selection. The discrete I/O can be used as general purpose I/O or for trigger or sync activities in coordination with protocol functions. Several error detection and injection features along with label/SDI filtering enable this interface to support numerous application requirements.

The PM429-2 product line supports maximum data throughput and simultaneous operations of all ARINC 429 and ARINC 717 channels. Each ARINC 429 channel independently supports ARINC 429 rates of 12.5 KHz and 100 KHz. Each ARINC 429 receive channel may be configured to automatically detect the bus speed, or set to a fixed speed setting. All channels can be monitored independently or by using a channel/label filter. Messages can be captured by a sequential monitor buffer for the entire interface. Transmitters are capable of driving a full 20 standard ARINC 429 receiver loads. Notification of databus activity is handled through the on-board Event Log, which can be processed by polling or via a PCI interrupt. To dramatically reduce the host CPU processing, the sequential monitor has a DMA mode that automatically moves records to host memory through PCI bus mastering.

Software

Users can develop their applications using the included *BTIDriver*[™] API. With only a few function calls, a program can operate the PM429-2 and process messages to and from the avionics databuses. Functions include routines for transmitting, receiving, scheduling, recording, data manipulation, and time-tagging bus messages. Although most tasks require only a few API calls, the comprehensive API library includes a broad range of functions for specialized needs. *BTIDriver*[™] API software drivers are included for Windows[®] and Linux[®]. Other drivers are optional.

Interfaces

ARINC 429 Receive Channels

0-16 receive channels
Automatic bit rate detection
Current value and list buffers
Receive message filtering (Label/SDI)
Large buffer area

ARINC 429 Transmit Channels

0-8 transmit channels
Periodic and asynchronous messages
Hardware controlled transmit schedule
Injection of gap or parity errors
Large buffer area

ARINC 717

Software selectable biphas/bipolar
2 receive channels
2 transmit channels
Sub-frame and super-frame support
64, 128, 256, 512, 1024, 2048, 4096, 8192 wps
Large buffer area

Sequential Monitor

Monitor all or selected card activity
1 usec label time stamp
Filter activity by channels or selected messages
Large buffer area

Discrete I/O

16 programmable Input/Output signals
Open/GND configuration
Max pin voltage of 35VDC
Line pulled-up (9K with diode to 5DVC)
Outputs can sink 200mA each

Time-Tag Synchronization

48 bit, 1 usec hardware timer
IRIG A & B formats PWM TTL signal
Receiver/Generator
IRIG A & B formats AM signal Receiver
PPS TTL signal Receiver/Generator

ARINC 429

ARINC 429 receive channels feature automatic speed detection and independent label and SDI filtering. Each transmit channel automatically maintains accurate label repetition rates. To support data transfer protocols, aperiodic words may be transmitted without altering the timing of periodic words. Transmit channels may be independently set for standard low or high speed bit rate (12.5 or 100 Kbps). The *BITDriver*TM API provides for automatic scheduling of labels based on transmission rates, making it straightforward to implement transmission schedules from an ICD or migrate from third party products.

ARINC 717

The PM429-2 offers two transmit and two receive ARINC 717 channels. Each ARINC 717 channel is independently configurable for Harvard biphas or bipolar return-to-zero operation. Sub-frame data structures are used to transmit and receive from the ARINC 717 databus. In addition, super-frames can be enabled with configurable counter location and number of frames per super-frame.

General

32 MB SDRAM
4 MB Flash
Universal PCI Signaling
32b/33MHz PCI Bus
PCI bus mastering

Power

+5V Rail Current Draw
Typical: 300 mA
Maximum: 500 mA
±12V Rail Current Draw
Typical: 1 mA + (10 mA * N)
Maximum: 2 mA + (40 mA * N)
Where: N is the number of ARINC 429/
bipolar ARINC 717 transmitter channels

Environmental

Industrial temp: -40° to +70° C
Storage temperature: -40°C to +125°C
Size: 3.55 x 3.75 in. (90.2 x 95.9 mm)
Weight: 3.4 ounces (96.4 grams)
Transient voltage protected

Connectors

ARINC 429, 717 & IRIG connector

AMP 50 pin latching header
IDC Socket: 2-1658526-4 Mate
Wire Socket: 1-102387-0 Mate
Wire Contacts: 87667-5

Discrete I/O connector

20 pin AMP latching header
IDC Socket: 1-1658526-3 Mate
Wire Socket: 102387-4
Wire Contacts: 87667-5

Software

*BTIDriver*TM API software drivers are included for Windows and Linux.

Ordering Information

The PM429-2 is available in various configurations.

Part No.	Description
PM429-2/201	ARINC 429: 0R/0T ARINC 717: 2R/2T
PM429-2/210	ARINC 429: 16R
PM429-2/211	ARINC 429: 16R ARINC 717: 2R/2T
PM429-2/220	ARINC 429: 12R/4T
PM429-2/221	ARINC 429: 12R/4T ARINC 717: 2R/2T
PM429-2/230	ARINC 429: 8R/8T
PM429-2/231	ARINC 429: 8R/8T ARINC 717: 2R/2T
PM429-2/240	ARINC 429: 8R
PM429-2/241	ARINC 429: 8R ARINC 717: 2R/2T
PM429-2/250	ARINC 429: 4R/4T
PM429-2/251	ARINC 429: 4R/4T ARINC 717: 2R/2T
PM429-2/260	ARINC 429: 2R/2T
PM429-2/261	ARINC 429: 2R/ 2T ARINC 717: 2R/2T

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