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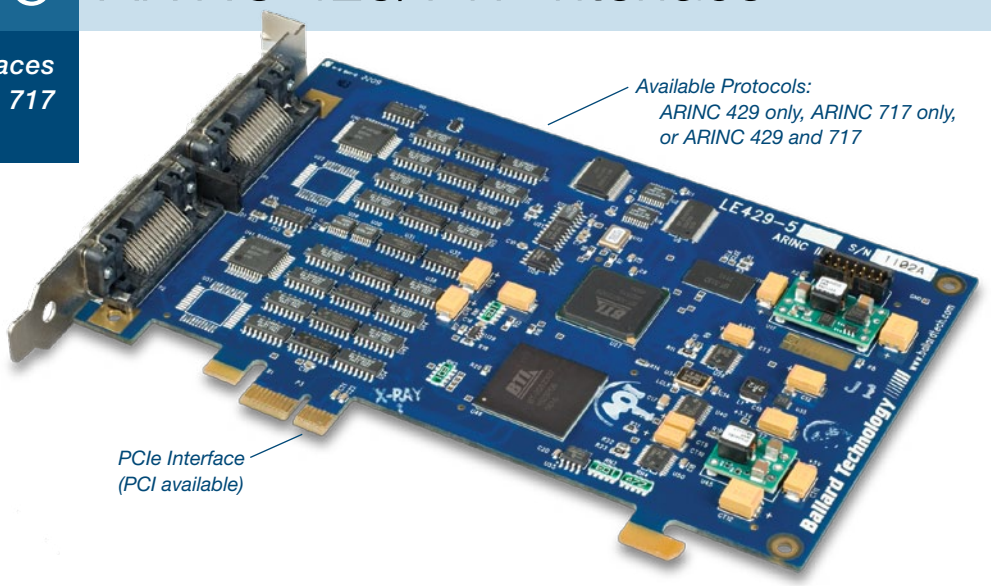
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Find the *Astronics / Ballard Technology LP429-5/8R8T* at our website: *Click HERE*

Technical Data Sheet

Lx429-5 ARINC 429/717 Interface

PCI and PCIe Interfaces to ARINC 429 and 717



Features

Up to 32 ARINC 429 Channels
Up to 4 ARINC 717 Channels
16 Avionics Discrete I/O
IRIG A/B PWM and AM
32 MB Data Memory
Universal PCI and PCIe Interfaces

Description

The Lx429-5 family of PCI and PCI Express (PCIe) cards enable computers to interface with ARINC 429 and ARINC 717 avionics databuses. They provide extensive functionality and are used to communicate with, simulate, test, and monitor ARINC 429/717 equipment and systems. The family includes a selection of models with different channel counts and capabilities.

These interface cards are easy to install and operate. Both PCI and PCIe versions are available, so the Lx429-5 family is compatible with most modern desktop computers. Each card supports maximum data throughput on all channels and has a large 32 MB built-in memory. With all its capability and versatility, the Lx429-5 is suitable for a wide range of applications.

Hardware

Lx429-5 interfaces have the latest 5th generation protocol engine and use bus mastering to yield high performance. Power is obtained from the backplane bus—no supplemental power is needed. All cards are standard half size and include sixteen avionics level input/output discretes and IRIG time synchronization/generation. User software can indicate status by controlling the two LEDs. In addition, the Lx429-5 provides useful non-standard functionality, such as the ability to set alternative data rates, to use parity bits for data, and to inject errors.

Once configured, the Lx429-5 hardware performs all protocol processing. It manages the reception, transmission, error checking, time-tagging and buffering of messages. This frees the software to focus on high-level user-specific processing.

Software

Users can develop their own software applications with the included BTIDriver API. With only a few function calls a program can operate the Lx429-5 and process messages to and from the avionics databuses. Functions include routines for transmitting, receiving, scheduling, recording, time-tagging, and manipulating data. The Lx429-5 can use applications developed for other Ballard devices. Code migrates seamlessly from BTIDriver compatible devices or through a translation driver from older Ballard devices.

Alternatively, Ballard's optional CoPilot software provides easy-to-use, interactive tools for databus test, analysis, and simulation. CoPilot simplifies project development and provides added productivity through virtual instrument displays, flexible monitoring and analysis tools, and a powerful scripting engine.

ARINC 429

- Full ARINC 429 functionality
- Mix of receive and transmit channels
- Handles periodic and transfer protocols
- Message filters and schedules
- Standard and non-standard bit rates
- Amplitude and frequency control
- Error detection and selective injection
- Variety of syncs and triggers
- Several message buffering schemes
- ARINC 575 support

Software

- Universal BTIDriver™ API compatible
- Efficient DMA monitoring
- Compatible with other Ballard hardware
- Translator for older Ballard devices
- CoPilot® software (optional)

Benefits

- Universal PCI and PCIe interfaces
- Powerful protocol engine
- Easy installation
- Free customer support for product life
- 3-year limited warranty standard
- RoHS compliant

Applications

- Product development and validation
- Production testing
- LRU and system simulation
- System analysis and integration testing
- Performance monitoring and analysis
- OEM test equipment

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Lx429-5 ARINC 429/717 Interface

ARINC 429 Features

General

Numeric and file transfer protocols
Standard and custom bit rates
  12.5 and 100 kb/s standard
  Configurable per channel
  Wide range of custom bit rates
Set parity per channel (odd/even/data)
Sync output on all or selected messages
Internal self-test bus

Message Data

Buffering schemes facilitate data handling:
  Guaranteed data integrity
  Current value buffers (default)
  Circular lists transmit a repeated pattern
  FIFO list buffers for sequential data
  Asynchronous list buffers
Message record contains the ARINC word, time-tag, channel, speed, error data, min/max elapsed time, hit counter, and/or gap time

Receivers

Automatic bit rate detection
Receive message filtering (Label/SDI)
Current value and list buffers
Error detection: gap, timing, length, parity
Log and/or interrupt on errors

Transmitters

Single, scheduled, and asynchronous messages
Tag messages for error injection, sync out, and logging/interrupts
Error injection: parity, inter-message gap
Externally trigger all or selected messages
Parametric amplitude and frequency control

Transmit Schedules

Schedules: automatic or explicit
Automatic based on repetition rates
Contain messages (labels), gaps, and controls for pausing, halting, pulsing discrete outputs, and event logging
Modes: Continuous or single step for debugging

Other Features

Base Configuration

- Model dependent 429/717 capability
- 16 Avionics Discrete I/O
- IRIG A/B input and output
- 2 user controlled LED indicators
- 32 MB on-board memory

Sequential Monitor

A time-tagged record of selected activity on ARINC 429, 717, and discrete I/O
Filter 429 data by channel/label/SDI
Includes ARINC data, channel, speed, errors, and time-tag
Efficient DMA monitor to host

ARINC 717

Software selectable biphase/bipolar
Sub-frame and super-frame support
Data rates: 64, 128, 256, 512, 1024, 2048, 4096, 8192 words per second
ARINC 717 Monitor Utility software

Avionics Discrete I/O

16 programmable inputs/outputs
Output: Open/Gnd, 35 VDC, 200 mA (max), self monitoring, inductive load protected
Log transitions to sequential record

Time-tag/IRIG

48-bit hardware time-tag (1µs resolution)
IRIG A or B, AM, PWM, and PPS modes
  Generate or synchronize (AM is input only)
  Synchronize hardware time-tags

Specifications

Component temperature: -40 to +85 deg C
Storage temperature: -55 to +100 deg C
I/O connectors: LFH60
Dim: 4.2 x 6.9 inch (75 x 107 mm)

LP429-5 (PCI)

PCI bus: 32-bit, 33/66 MHz, universal signaling, bus mastering
Power: +5 and +/-12 VDC
MTBF: 1,200,000+ hours

LE429-5 (PCIe)

PCIe bus: x1 lane, bus mastering
Power: +3.3 and +12 VDC
MTBF: 1,200,000+ hours

Software

Universal BTIDriver API for C/C++, C#, VB, VB.Net, and LabVIEW™
MS Windows® and Linux® OS drivers
Translation DLLs for older Ballard devices
Williamsburg protocol library
CoPilot analysis and test software (optional)
Call for latest language and OS support.

Interrupts/Logging

Poll or use interrupts
Configurable event log
Programmable event logging/interrupts from messages, tx schedules, and buffers

Ordering Information

Hardware

Includes manuals and software CD.
Part No. Example: L**E**429-5/**14**R**14**T**/717**

Form Factor
  P = PCI, **E** = PCI Express
429 Channel Counts
  R = receive, T = transmit
  429-only models, choose one:
  R|T = **2**|**2**, **8**|**0**, **4**|**4**, **0**|**8**, **16**|**0**, **12**|**4**, **8**|**8**, **4**|**12**, **0**|**16**, **32**|**0**, **24**|**8**, **16**|**16**
  429/717 models, choose one:
  0|**0**, **6**|**6**, **14**|**14** (+ add suffix below)
ARINC 717 Suffix
  Blank = None, **/717** = 717 (2R2T)

CoPilot Systems

To include CoPilot, place "CP-" before the above Part Number.
Example: CP-LE429-5/16R16T

Cables and Accessories

Order separately. Visit www.ballardtech.com or call for more information.

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