



ARINC-429

INTEGRATION & HARDWARE/DRIVER
SUPPORT FOR AVIATION/AVIONICS —
WITH OPAL-RT'S RELIABILITY & QUALITY!

ARINC-429 is the most common avionics data bus used in commercial and cargo aircraft applications requiring point-to-point communication, interchangeability and interoperability between equipment.

OPAL-RT'S ARINC-429 SOLUTION

OPAL-RT provides a high channel density ARINC 429 solution for Hardware-In-the-Loop (HIL) and rapid control prototyping (RCP) applications, such as full authority digital engine/electronic control (FADEC) and aircraft systems components testing.

Based on the ABACO RAR-PCIE board, our solution connects OPAL-RT simulators to the ARINC 429 avionics data bus, and facilitates the configuration of up to 32 independent channels for transmission (TX) and reception (RX) at a bit rate of either 12.5 kb/s or 100 kb/s.

Transmission and reception are on separate ports, so many independent buses can be configured on the same simulator platform when multiple avionics systems and devices are interfaced.

CORE FEATURES

- Supports the latest ARINC-429-18 standard from the AEEC (2012)
- Provides a wizard to import ARINC-429 configuration files
- Provides an interface for message configuration
- Supports standard data encoding formats (BCD, BNR, Discrete)
- Label filtering: receive labels with fixed IDs, SDI or all labels (promiscuous mode)
- Supports up to 16 Rx and 16 Tx channels
- Supports one or more boards per chassis, as required
- Bus monitoring and sniffing

FEATURES

- Receives/transmits at data rate of 12.5 or 100 kbits/s
- Supports error injection on parity bit or inter-word gap
- Scheduled transmission and asynchronous/asperiodic transmission on demand
- Provides transmission and reception status
- Supports SDI (source destination identifier) bits
- Supports SSM (sign/status matrix) bits
- Multiple transmission rates for multiple labels; notification of scheduling fails
- Provides timestamps for sent/received messages
- Dynamic modification of SDI, SSM of message values
- Simulink block to access and manipulate data structure
- Activate/deactivate label reception/transmission
- Loopback mode supported
- Interactive Generator (IG) can be used to set signal values, define signal waveforms and send specific messages
- Python API provides scriptable generation of ARINC-429 configurations (create, print, save and validate)

TECHNICAL SPECIFICATIONS

SPECIFICATION	SUPPORTED
Number of Channels	Up to 16 Rx and 16 Tx channels
Data Rate	12.5 or 100 kbits/s
Power (Typical)	+ 3.3 VDC 600 mA; +12 DVC 140 mA (no loads)
Physical	PCI Express interface board standard, half length: 4.376" x 5"
Operating Temperature	-40 to +75 °C
Standard Input Levels	± 6.5 to ±13 VDC (A to B)
Standard Output Levels	± 10 VDC typical (A to B)
Parity	Odd, Even or None
Filtering Incoming Messages	Filter based on SDI and/or Label
Error Reporting	Parity
Label Gap	Stop/Restart the transmit operation for a specific label
Interword Gap	Supported at all rates between 12.5 and 100 kbp/s

SUPPORTED ABACO™ RAR-PCIE BOARDS

NAME	DESCRIPTION
ABACO RAR-PCIE-22	4-lane PCIe board, 2 RX, 2 TX channels; ROHS compliant
ABACO RAR-PCIE-44	4-lane PCIe board, 4 RX, 4 TX channels; ROHS compliant
ABACO RAR-PCIE-88	4-lane PCIe board, 8 RX, 8 TX channels; ROHS compliant
ABACO RAR-PCIE-1616	4-lane PCIe board, 16 RX, 16 TX channels; ROHS compliant

†Your OPAL-RT simulator may not have enough or suitable PCI slots available for the carrier board(s). Please contact your local OPAL-RT representative to ensure compatibility prior to ordering and/or installing.

ABOUT OPAL-RT TECHNOLOGIES

OPAL-RT is the world leader in the development of PC/FPGA Based Real-Time Digital Simulator, Hardware-In-the-Loop (HIL) testing equipment and Rapid Control Prototyping (RCP) systems to design, test and optimize the control and protection systems used in power grids, power electronics, motor drives, automotive industry, trains, aircraft and various industries, as well as R&D centers and universities.



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