



A429-R4T2/RS232-RS422-R1T1/USB

USB/RS422 to ARINC 429/575 Converter

The A429-R4T2/USB-RS422-R1T1 converter employs a **two ARINC 429 transmitters and four receivers with an USB/RS422** serial interface. This converter will find applications where an airborne system is required to interface through a simple serial interface to multiple ARINC 429 data buses.

The converter is housed in one of our standard ruggedised CNC machined blue anodised enclosures enabling it to comply with the most common requirements of the airborne standard of RTCA DO-160 for aircraft environments.



The transmitter can be configured for 12.5/50/100k/bps data bit rates. The receiver automatically adapts to the received bit rate. The ARINC 429 channels are configured through the serial interface by sending simple 5-byte commands from the airborne host processor. The converter is controlled by means of simple 5-byte command sequences sent and received on the serial port.

ARINC 429 Transmitters

Serial commands are used to configure the transmitter tables for one-shot or periodic frames transmission. Once the transmitters are configured it will continue to transmit the list of ARINC 429 labels contained in the table. The values for each label can be updated in real time by sending new commands to the converter. Transmission frame rates of 10,20,40,80,160,320,640 and 1280 milliseconds.

ARINC 429 Receivers

For the ARINC 429 receivers, commands are used to configure a receiver tables so that only the required labels are received and transmitted to the host processor on the serial link. In addition, a value can be assigned to each label such that it must be received 'n-times' before it is passed to the host processor. This reduces the amount of data that the host processor needs to process. Labels that are being received can also be disabled or enabled individually in real time depending upon real time changing requirements.

ARINC 429 USB & RS422

RS422 can operate at 115.2k, 921.6k and 1.84M baud.
The USB will default to 1.84M baud.

ARINC 429 Interface	
✈	2 x ARINC 429/575 Tx channel.
✈	4 x ARINC 429/575 Rx channel.
✈	12.5 / 50 / 100k/bps bit rates.
✈	256 Tx & Rx Labels per channel.
✈	Parity: ODD/EVEN/NONE.
✈	Rx Time Stamp of 100uS / 24-bit
✈	Autonomous periodic transmit scheduling or one-shot.
✈	Automatic bit rate reception.
✈	Opto isolator inputs.
✈	Dynamic update of Tx data.
✈	USB & RS422 serial interface.
✈	115200, 921600, 1,843,200 baud
✈	25-way D-sub connector.
Resources	
✈	Compatible with Y-SIM 429
✈	API 'C' source code available
✈	FLASH upgradable firmware.
✈	72MHz 16-bit Cortex M3 processor.
Physical	
✈	Operating Temp -20°C to + 70°C.
✈	Size: 31 x 90 x 166 mm CNC aluminium enclosure.
✈	Weight: 400g.
Power Supply	
✈	+28V DC @ 35mA (12-72V)

Converter operation

All of the processing of the serial message protocol, scheduling of transmitted ARINC 429 data, error checking, buffering of received data and time stamping is taken care of by the hardware, which comprises of our time proven proprietary FPGA.

This converter can operate in one of two modes of operation, "Direct" or "Table" mode. These modes can be set independently of each channel.

Direct Mode – ARINC 429 Transmission and Reception

In Direct Send Mode, ARINC 429 data will be transmitted onto the ARINC 429 bus immediately after it has been received from the host via the serial port.

In Direct Receive Mode, all valid received Labels from the ARINC 429 receiver channel will be written to the serial port.

Table Mode - ARINC 429 Transmission

In Table Send Mode, ARINC 429 words are transmitted on to the bus periodically in frames of data independent of the host. ARINC 429 Data values are updated by sending a command followed by four serial bytes containing the new 32 bits of ARINC 429 data. The same value will continue to be transmitted periodically until it is updated.

Table Mode - ARINC 429 Reception

This mode permits the filtering of specified received ARINC 429 labels. In addition to filtering labels, a "count value" can be assigned to each label such that a multiple reception of labels must occur before it will be transmitted to the host via the serial port. This effectively reduces the amount of traffic on the serial port.

ARINC 429 automatic bit rate recognition

The receiver channel will automatically adapt to the incoming ARINC 429-bit rate. The received bit rate can be interrogated by the host.

Parity

The Parity can be set independently for each transmit or receive channel. Parity checking on receive can be set to ODD, EVEN or NONE. Parity generation is automatic and can be set for ODD, EVEN or NONE. Selecting NONE allows control of Bit-32 by the host for transmitted words.

Time Stamp of Received ARINC 429

A 24-bit, 100uS, time stamp mode can be enabled, which will be appended to the 32-bits of ARINC 429 data received by the host over the serial bus. This changes the standard 5-byte sequence to an 8-byte sequence.

Interrogation of installed firmware revision and updating

The host can interrogate the currently installed version of firmware. The firmware is also updatable via the serial port when required.

Unique serial number

Each converter contains a unique serial number that can be interrogated by the host in order to identify multiple converters installed within an installation.

This converter offers extremely comprehensive features and the firmware has been proven in the field for over eight years without a single reported issue.

More information can be found in the user manual on our website.