



F-SIM-A429

ARINC 429 Simulator & Bus Analyzer Software Application

Overview

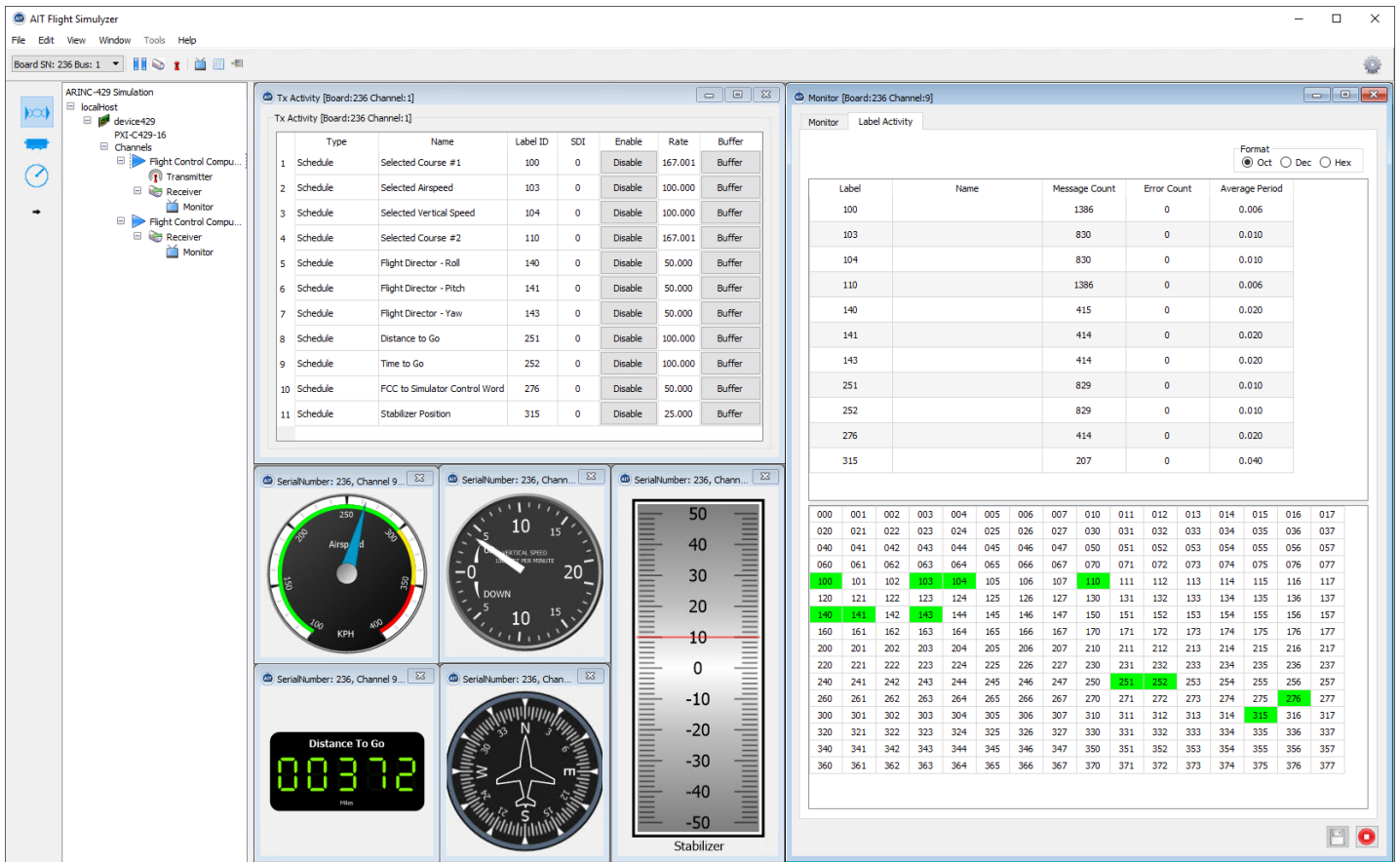
AIT's Flight Simulyzer™ application provides users with an intuitive and easy-to-use ARINC 429 simulation and data analysis application. Flight Simulyzer™ allows the user to configure, control, and view ARINC 429 bus data via a rich set of Chronological Monitor, Current Value Label Monitor, and ARINC 429 Label Simulation controls and displays. Flight Simulyzer™ is available for MS Windows.

Flight Simulyzer is compatible with AIT's entire family of ARINC 429 instruments and also provides seamless operations together with AIT's ARINC 429 Software Development Kits (SDK) supporting user applications development in C, C++, C#, and LabVIEW (VIs). All of the Flight Simulyzer input (Rx) and Output (Tx) configuration data (stored in XML format), can also be imported and used through the SDK software APIs

Key Features

- Software GUI Application for Operating AIT ARINC 429 Interfaces
- Capture & Analyze Data from Multiple ARINC 429 Input Channels
- Define & Execute Complex Simulations of Multiple Rate-Oriented Labels
- Simulate Output Data on Multiple Channels Simultaneously
- Replay Previously Captured Bus Data
- Full Error Injection & Detection
- Update, Modify, & View ARINC 429 Data on-the-fly
- Engineering Unit Displays & Software Widgets
- Receive Data to Label/SDI Specific Buffers
- Also Supports MIL-STD-1553, ARINC 664, Ethernet, & Data Load operations

Flight Simulyzer Main ARINC 429 Window



Simulate, Monitor, & Analyze ARINC 429 Bus Data

ARINC 429 Monitor Operations

AIT's Flight Simulyzer™ application provides a simple and intuitive ARINC 42 monitor that allows the users to start capturing and analyzing ARINC 429 bus words right out of the box with just a few clicks.

The ARINC 429 Monitor provides a chronological display of the received bus words including the high resolution timestamps, Label ID, Parity Bit, Data, and the Label name. Simple filters can be defined to mask unnecessary bus data. All errors detected are clearly displayed in the monitor.

The ARINC 429 Monitor also includes a Label ID Activity display which provides an intuitive and easily recognizable display of the active Labels detected on the ARINC 429 channel. The data rate of each detected Label ID as well as the count and number of errors detected for the Label ID. Captured bus data can be stored to a file for offline analysis or replay using Flight Simulyzer™ output features. Captured data can be exported to common data format (e.g. .csv) for post processing.

The screenshot shows the 'Monitor [Board:236 Channel:9]' window. It has two tabs: 'Monitor' and 'Label Activity'. The 'Monitor' tab displays a table of bus words with columns: Label, Name, Message Count, Error Count, and Average Period. The 'Label Activity' tab displays a grid of Label IDs (000 to 360) with columns for each ID. The grid shows the activity of each Label ID, with some cells highlighted in green.

Label	Name	Message Count	Error Count	Average Period
100	Selected Course #1	11231	0	0.010
103	Selected Airspeed	6725	0	0.010
104	Selected Vertical Speed	6725	0	0.010
110	Selected Course #2	11231	0	0.006
140	Flight Director - Roll	3362	0	0.020
141	Flight Director - Pitch	3362	0	0.020
143	Flight Director - Yaw	3362	0	0.020
251	Distance to Go	6725	0	0.010
252	Time to Go	6725	0	0.010
276	FCC to Simulator Control Word - Simulator Use Only	3362	0	0.020
315	Stabilizer Position	1681	0	0.040

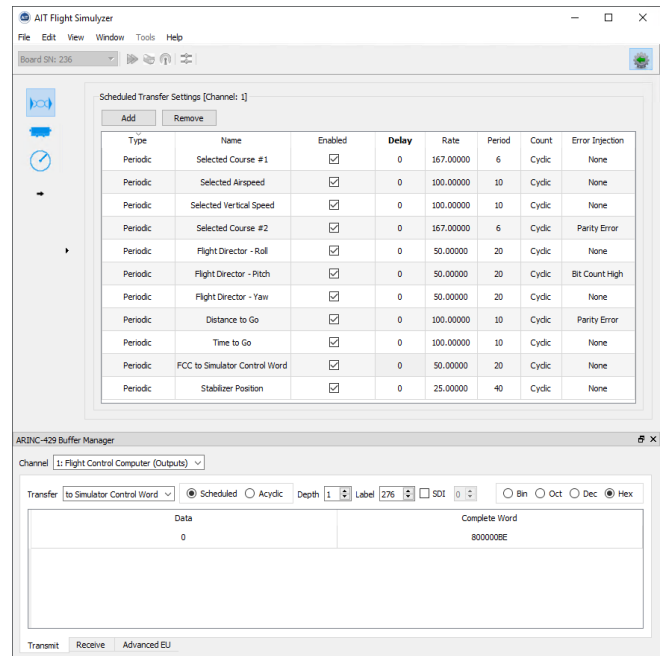
ARINC Data Transmission

Flight Simulyzer™ provides easy-to-use controls for configuring and simulating ARINC 429 data outputs. Data Label transmissions can be easily configured for periodic output by setting either the period or rate independently for each Label ID. Additionally, acyclic (one-time, on demand), and block transmissions can also be simulated.

Error injection is supported with the following error types:

- Bit Count High/Low Errors
- Parity Errors Data
- Inter-word Gap Errors

For each ARINC 429 channel interface, the user can also independently select the data rate. High Speed, Low Speed, and Custom Speeds (including 50kbps) are supported.



Transmit Data Setup

The screenshot shows the 'Monitor [Board:236 Channel:9]' window. It has two tabs: 'Monitor' and 'Label Activity'. The 'Monitor' tab displays a detailed table of bus words with columns: Timestamp, Channel, Channel Type, Label Description, Parity, Data, Label ID, Bus Word, and Error. The 'Label Activity' tab displays a grid of Label IDs (000 to 360) with columns for each ID. The grid shows the activity of each Label ID, with some cells highlighted in green.

Timestamp	Channel	Channel Type	Label Description	Parity	Data	Label ID	Bus Word	Error
14235	2676 14h 55m 10s 190205us	9	Rx	Selected Course #1	0	00000000	100	00000000100
14236	2676 14h 55m 10s 190206us	9	Rx	Selected Course #2	0	00000000	110	00000000110
14237	2676 14h 55m 10s 196185us	9	Rx	Selected Course #1	0	00000000	100	00000000100
14238	2676 14h 55m 10s 196186us	9	Rx	Selected Course #2	0	00000000	110	00000000110
14239	2676 14h 55m 10s 196705us	9	Rx	Selected Airspeed	0	00000000	103	00000000103
14240	2676 14h 55m 10s 199125us	9	Rx	Selected Vertical Speed	1	00000000	104	20000000104
14241	2676 14h 55m 10s 199485us	9	Rx	Flight Director - Roll	1	00000000	140	20000000140
14242	2676 14h 55m 10s 199845us	9	Rx	Flight Director - Pitch	0	00000000	141	00000000141
14243	2676 14h 55m 10s 200205us	9	Rx	Flight Director - Yaw	1	00000000	143	20000000143
14244	2676 14h 55m 10s 200565us	9	Rx	Distance to Go	0	00000000	251	00000000251
14245	2676 14h 55m 10s 200925us	9	Rx	Time to Go	1	00000000	252	20000000252
14246	2676 14h 55m 10s 201285us	9	Rx	FCC to Simulator Control Word - Simulator Use Only	1	00000000	276	20000000276
14247	2676 14h 55m 10s 201645us	9	Rx	Selected Course #1	0	00000000	100	00000000100
14248	2676 14h 55m 10s 202005us	9	Rx	Selected Course #2	0	00000000	110	00000000110
14249	2676 14h 55m 10s 208135us	9	Rx	Selected Course #1	0	00000000	100	00000000100
14250	2676 14h 55m 10s 208515us	9	Rx	Selected Course #2	0	00000000	110	00000000110

Receive & Monitor Displays

Current ARINC Label Value Tables

In addition to a chronological channel monitor Flight Simulyzer™ also provides the display of current and buffered data sorted by individual Label ID (or by Label ID and SDI). The Label data can be displayed as Hex, Octal, Decimal or Binary data in each display.

ARINC 429 Replay

Previously captured ARINC 429 data can also be easily replayed using Flight Simulyzer™. Data replay can be independently controlled for each ARINC 429 channel interface.