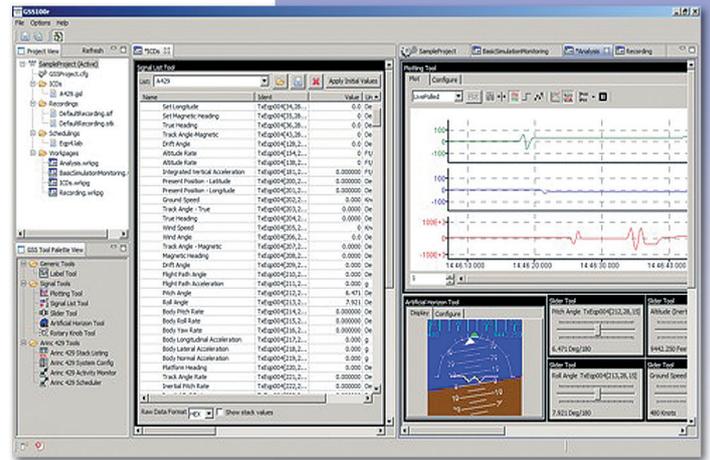


Comprehensive ARINC 429 Bus Analyser & Stimulator



Features

- freely configurable application dependent format definitions
- Multiple Tx/Rx channels supported
- 100% functional concurrency in any direction Tx and Rx
- static and dynamic transmit signals (Labels) settings
- graphical control and monitor widgets: slider, rotary knob, attitude indicator etc.
- real-time recording with 1 µsec time-stamping
- raw data and engineering data monitoring
- multi-signal graphical live plotting
- error detection and injection capability
- dynamic map display

General Overview

GSS100r is an extremely comprehensive and powerful tool to analyse and troubleshoot any kind of ARINC 429 communication. It allows the user to very easily setup scenarios and Tx/Rx configurations of ARINC 429 labels in either binary or hex notation, or using the integrated Label database for engineering interpretation in either direction. Protocol Errors are detected, and if required can be injected. The scenarios and configurations are stored in "Projects" that can be recalled at any time. The entire suite of functional entities of GSS100r operate concurrently – e.g. recording of data in parallel with stimulation and monitoring whilst using avionics instrument widgets is a standard situation within GSS100r.

GSS100r is the all-in-one tool for any ARINC 429 testing or monitoring application.

Supported Hardware

A wide range of the mbs ARINC 429 family of hardware is already supported by the GSS100r application, including the **AE-429-ET/EC** Gigabit Ethernet Interface and the **AE-429-USB** USB 2.0 device.

GSS100r is designed to support other avionics interfaces concurrently and there are future plans to support Mil-Std-1553 data bus testing using hardware from our partners GSS Avionics.



GSS100r – the Tools

GSS100r is a collection of various independent but closely cross-linked tool-objects. One common characteristic of all tools is the capability for on-line configuration/selection of display columns, making it very easy to select only the relevant information/data to display for a specific task.

Config-Tool

With the Config-Tool the overall physical and logical configuration parameters of the available ARINC 429 resources (Tx- and Rx-channels) are set. Each channel is individually assigned its bus-speed (HS or LS) and the associated equipment ID that allows for engineering interpretation of binary data.

Label Scheduler Tool

The Label Scheduler Tool is used to setup and execute a cyclic schedule of label Transmissions individually for each Tx-channel.

Signal List-Tool

One of the most powerful aspects of GSS100r is the use of Signals. Signals are engineering parameters e.g. Altitude, Air-speed and Valve on/off. The Signal List-Tool interprets raw binary ARINC 429 data into engineering units. The integral ARINC 429-15 Signal List provides a subset of BNR and BCD labels as defined in the official ARINC 429 specification. The list is organized with the EQID, identifying a specific LRU/LRM, at the top level. Below the EQID the assigned labels are listed, each of which incorporating one or more signals (parameters).

Name	Ident	Value	Unit	Format	Label
002 - Flight Management Computer	TxEq002[0,0,0]	0		ftNone	0
003 - Thrust Control Computer	TxEq003[0,0,0]	0		ftNone	0
004 - Inertial Reference Computer	TxEq004[0,0,0]	0		ftNone	0
Present Position - Latitude	TxEq004[8,28,21]	0.0	Deg:Min	ftBCD	10
Present Position - Longitude	TxEq004[9,28,21]	0.0	Deg:Min	ftBCD	11
Ground Speed	TxEq004[10,28,15]	0	Knots	ftBCD	12
Track Angle - True	TxEq004[11,28,15]	0.0	Deg	ftBCD	13
Magnetic Heading	TxEq004[12,28,15]	0.0	Deg	ftBCD	14
Wind Speed	TxEq004[13,28,11]	0	Knots	ftBCD	15
Wind Direction - True	TxEq004[14,28,11]	0	Deg	ftBCD	16
Set Latitude	TxEq004[33,28,21]	0.0	Deg:Min	ftBCD	41
Set Longitude	TxEq004[34,28,21]	0.0	Deg:Min	ftBCD	42
Set Magnetic Heading	TxEq004[35,28,11]	0	Deg	ftBCD	43

Any individual signal is described by type (BNR, BCD, enumeration,...), significant bits, range and units. Predefined ARINC 429 Labels can be modified and extended or application specific new Labels are created, offering the maximum of flexibility that ARINC 429 allows theoretically.

A Signal List can be used to monitor an Rx-channel, or stimulate a Tx-channel. All that is needed is to associate each channel with the required Equipment ID using the Config Tool. As well as displaying the live values of Signals, it is also possible to use this tool to display the values of Signals at any point in a recording. Signal Lists can also be used to select individual Labels/Signals to be included in the so-called Watched List which is used to display recorded data within the Stack List-Tool.

Stack List-Tool

Device	Index	Time	Label	Name	Raw Message	Value
	128	18:24:29:526.574	325	Roll Angle	600000AB	0.000
	129	18:24:29:526.711	4	Roll Angle	00000020	0
	130	18:24:29:527.711	3	Roll Angle	000000C0	0
	131	18:24:29:536.574	324	Pitch Angle	6155402B	14.996
	132	18:24:29:536.574	325	Roll Angle	600000AB	0.000
	133	18:24:29:536.574	361	Altitude (Inertial)	6009C38F	152.375
	134	18:24:29:541.574	314	True Heading	63D20033	42.9785
	135	18:24:29:546.574	324	Pitch Angle	6155402B	14.996
	136	18:24:29:546.574	325	Roll Angle	600000AB	0.000
	137	18:24:29:546.711	3	Roll Angle	000000C0	0
	138	18:24:29:547.711	4	Roll Angle	00000020	0
	139	18:24:29:556.574	324	Pitch Angle	6155402B	14.996
	140	18:24:29:556.574	325	Roll Angle	600000AB	0.000

ARINC 429 data is recorded from selected Rx-channels and stored in a Stack List file. The Stack List-Tool is the utility to analyse and explore Stack List files.

This tool allows you to see the Labels from all channels together in one chronological list. The list can be easily searched and filtered to enable you to concentrate on the labels important to you. As mentioned previously, it is possible to select signals from the Signal List Tool to be displayed as columns adjacent to each entry. The resulting data can be exported for further analysis.

Label Monitor-Tool

The Label Monitor Tool is used to monitor the Activity across all receive channels. It can display either Raw Labels, or it can use the Signal definitions from the Signal List tool to display the names and engineering values. As well as displaying the number of times each label is observed, this tool also displays detailed timing information for each Label.

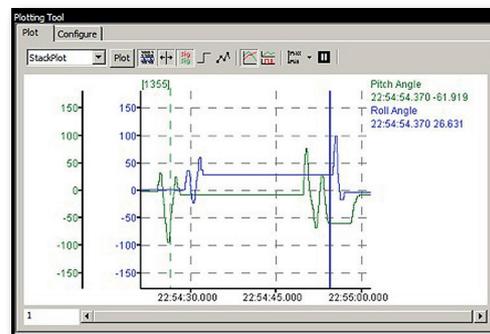
Name	Count	Label	Data/Signal	Raw Message	Period
004 - Inertial Reference Computer	578811				
Ground Speed	8944	12	480	01200050	250.0
Magnetic Heading	8944	14	131.2	04C48030	250.0
Pitch Angle	223570	324	-51.119	1874C02B	10.0
Roll Angle	223567	325	10.800	00F5C0AB	10.0
Altitude (Inertial)	111786	361	12588.000	0189608F	20.0
R1[0,0,0]	0				

Transmit Function List Tool

Signals can automatically change over time according to functions like:

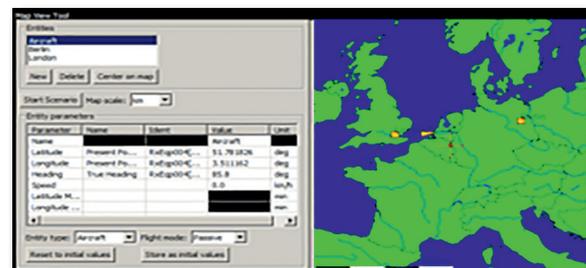
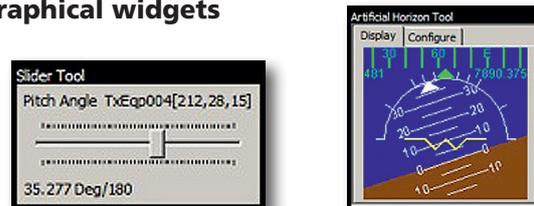
- Sine: Definable with various parameters
 - Ramp: Definable with various parameters
 - List: A list of values each stimulated over a definable period of time
- The same signal can be changed by several functions in different time segments.

Signal Plot-Tool



From a Signal List individual parameters can be dragged & dropped into the Signal Plot-Tool where they can be plotted live. Multi signal plotting and numerous setting possibilities like scaling, timing analysis graphics options and much more are supported.

Graphical widgets



A number of widgets are available to visualize or manipulate signals.

Error Detection and Injection

Parity, Bit Error and Long Word Errors can be detected at a port level and can be injected on any simulated Label.