Data Bus Tools

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ISIMO

Designated usage

ISIMO is an interactive tool to monitor and manipulate data buses.

It is designed to allow you a quick and easy access to the data buses to speed up the process of detecting and analyzing problems and improve the confidence in the tested system.

Existing tools are often expensive, heavy weight systems. They require a lot of support and are so complicated to use that engineers almost spend more time discovering the secrets of the test system than analyzing their system under test.

Although these systems obviously serve a purpose many tasks could also be solved with a more cost effective tool like ISIMO. This saves you money for heavy weight systems and reduces testing time. Haven't you encountered times when your testing was stuck because your existing test system was unavailable due to some problems and the support couldn't solve the problem fast enough?
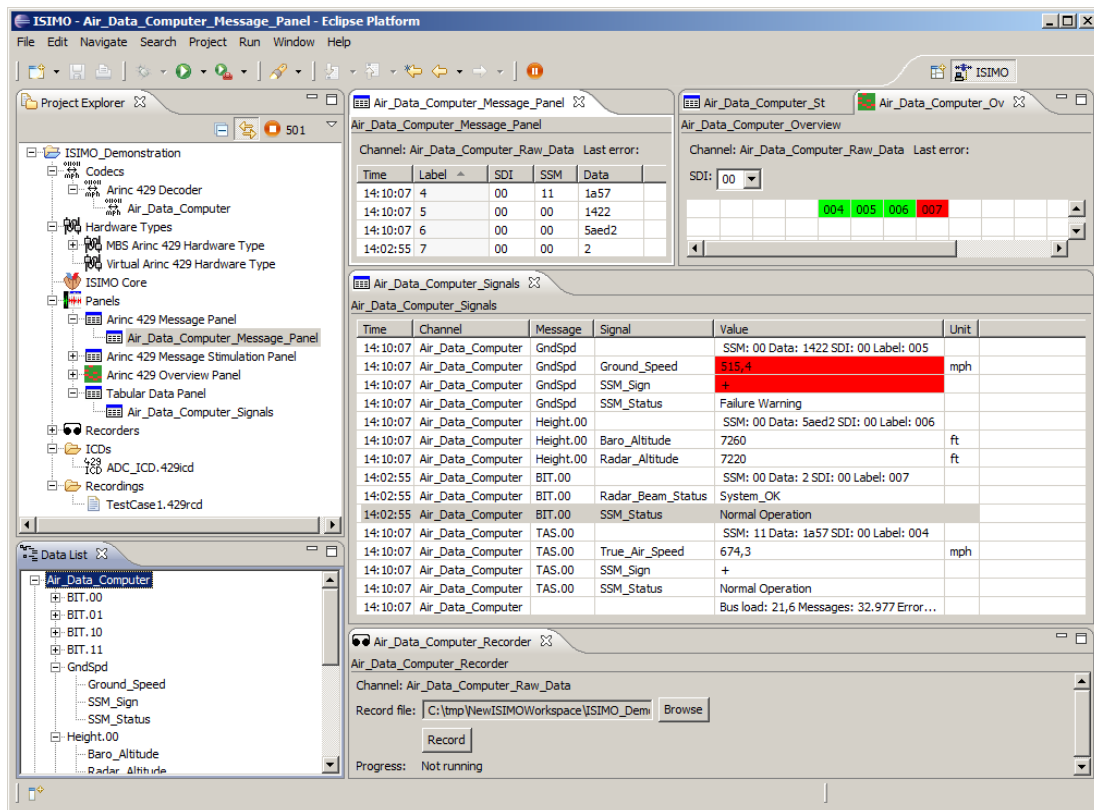
Windows screenshot

General features

- **Eclipse integration**: ISIMO runs in the free, open-source Eclipse platform. Many other tools for Eclipse or variants of this platform exist and ISIMO could be integrated in existing company Eclipse systems.
- **Platform independence**: Eclipse platforms exist for a variety of systems like Windows, Linux, Macintosh and Solaris. ISIMO has been tested with Linux and Windows.
- **Modular design**: ISIMO shall offer several plug-ins for different interfaces in the future (ARINC 429, Mil-1553B, AFDX, Discrete/analogue I/O …) and different features (monitoring / stimulation, raw/decoded data …). You save money and limit complexity by choosing the features that you need.
- **Mobility**: ISIMO doesn't need any heavy weight VME crates. It can be used on a notebook.
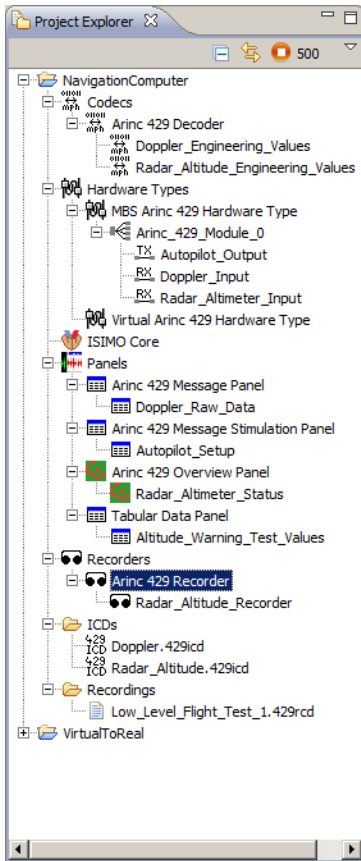
- **Version management**: You can select a version management plug-in (possibly free like SVN or CVS) for your version management system from a third-party market. This enables Eclipse version management also for ISIMO.

- **Unified, easy user interface**: You have the same interface handling like for other Eclipse tools.

- **Online help:** Manual is accessible from the GUI. Also context sensitive help exists.

- **Support for multi processors / multi cores**: ISIMO is a multi threaded application that makes use of existing processor resources to increase the possible workload.

- **XML** files are used to store all ISIMO related configuration.

- **Individual modules**: Modules that fit exactly your individual company's needs can be developed and integrated. If the required features are of general interest the cost can be shared.

- **Reduced obsolescence problems**: By the use of Java technology it is very likely that you have no trouble to find computers to run ISIMO on also in the future. This is also supported by the use of the Ethernet interface connection to the MBS interface modules. Ethernet has been around for years and is available on almost any computer platform.

- **Simultaneity**: The monitoring and recording and stimulation features of the other plug-ins can be used simultaneously for several channels and modules.

- **Copy protection**: Commercial modules will be locked on a specific computer (i.e. network adapter). Transferring the license to other computers is possible.

Features by plug-in

ISIMO core (free)

Current Version: 1.2.2
This plug-in provides the "glue" for the integration of the other plug-ins and is always needed. There are also some very specific features:

- Live display of the current values of selected data of any kind in a Tabular Data Panel
- Browser for all data defined in the system

MBS Arinc 429 (free / commercial)

Current Version: 1.3.0   **Depends on:** ISIMO core, Basic Arinc 429

- Monitoring and stimulation support for MBS ARINC 429 modules of the AESyBus series.
- Hardware time stamping: Common time stamp base for all channels of one module in microseconds granularity.
- Error detection as far as provided from the hardware: Parity-, Long Word-, Bit error.
- Two channels on one module for free. More are available in commercial licenses.
- Periodic and asynchronous transmission of ARINC 429 messages (commercial license required)

Basic Arinc 429 (free)

**Current Version:** 1.3.0   **Depends on:** ISIMO core

- Live monitoring of ARINC raw data with messages decoded to their SSM, SDI, Data and Label, accompanied with a time stamp and error display. Various filtering options exist.
- Live display of the bus state to visualize which messages are currently available and which messages are required but are not transmitted. Various filtering options exist.
- Set up of ARINC 429 raw data for stimulation. Definition of initial values and manual changes during test execution are possible for the elements SSM, SDI, Data and Label.

- Recording of an ARINC 429 bus with filtering options.
- Export of an ARINC 429 recording to a CSV file to analyze the recording in tools like Microsoft Excel or the free Open Office. Various filtering options exist.

Arinc 429 Codec (commercial)

Current Version: 1.0.2   **Depends on:** ISIMO core, Basic Arinc 429, MBS Arinc 429
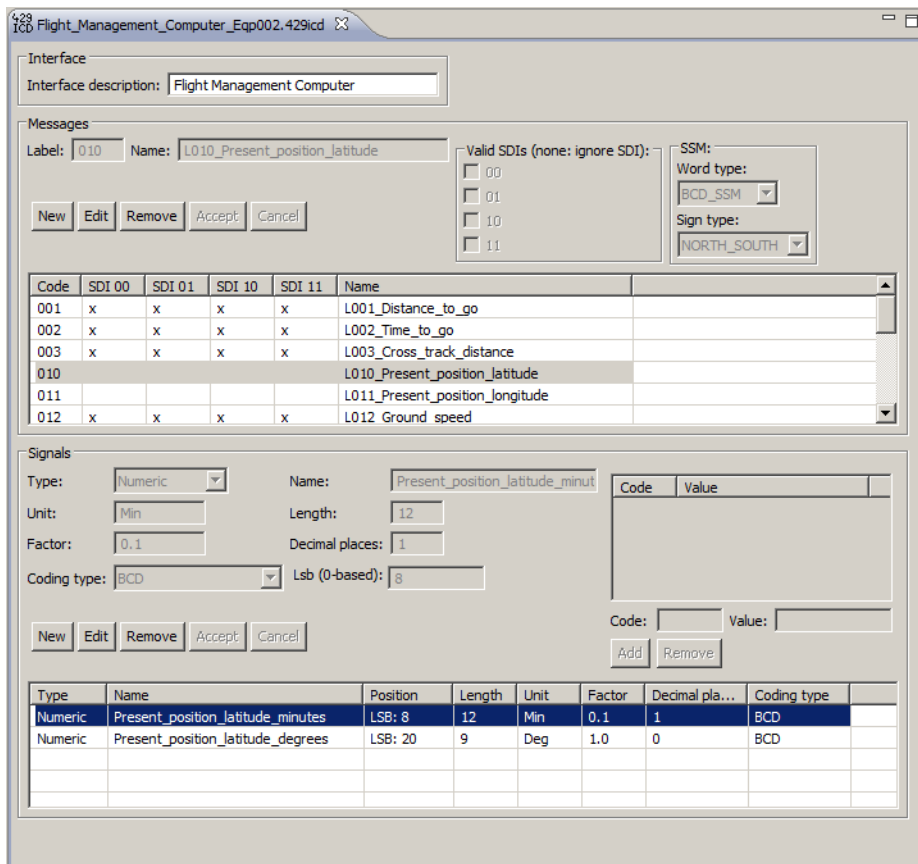
ICD Editor

- Decoding of ARINC 429 messages to engineering values. Supported data types are enumerations, character data and numeric data with various options
- Manual definition of decoding with a separate ICD editor
- ICD storage in XML files
- Description of ICD XML format with an XML schema file to support customers to create ICD generator tools using their internal company database. Individual generators can also be ordered.

Virtual Arinc 429 (free)

Current Version: 1.2.2   **Depends on:** ISIMO core, Basic Arinc 429
- A virtual ARINC 429 hardware is supported that generates configurable random data. This can be used for exploring ISIMO, or validating your test setups.

Individual modules

ISIMO is designed for flexibility. It allows integrating individual customer requirements in separated modules. Examples could be:
- Import of customer databases with decoding definitions for ARINC 429 messages
- Decoding of ARINC 429 lines that do not follow the common practices

Modules like this can be ordered and will be much cheaper compared to an in-house development since existing ISIMO components can be used. If the modules are of more general use the development costs can even be shared.

System requirements

ISIMO has been fully tested on Windows (Vista) and Linux (Kubuntu) with Eclipse 3.5.2 and a Java 6 Runtime Environment.

The used technology should also run on Solaris and MacOS and other Windows or Linux versions and newer Eclipse or Java releases although it has not been tested there (limited test have been run on other combinations too). There are too many possible combinations to test. You can use the basic features for free so you can try it out if you are not sure about your specific system configuration.

ISIMO delivered a very good performance on computers on the lower end of the price scale of the current market. These computers exceeded the needed resources a lot.

A look ahead

ISIMO is continuously enhanced. The above features are already available. The next planned feature set will be the encoding of engineering values to ARINC 429 messages for stimulation. ISIMO shall then be extended to other interface types like MIL-1553B or discrete / analogous I/O. Test automation and advanced graphical visualization are also goals for the future.

The intention is to keep the basic modules for each interface free and have commercial modules for the more advanced features.

The development of individual modules for companies is possible.

Time	Channel	Message	Signal	Value	Unit
12:26:23	Flight_Management_Computer			Bus load: 28,8 Messages: 89.504 Errors: 0	
12:26:23	Flight_Management_Computer	L001_Distance_to_go.00		SSM: 00 Data: 132 SDI: 00 Label: 001	
12:26:23	Flight_Management_Computer	L001_Distance_to_go.00	Distance_to_go	13,2	N.M.
12:26:23	Flight_Management_Computer	L001_Distance_to_go.00	SSM	+	
12:26:23	Flight_Management_Computer	L002_Time_to_go.00		SSM: 00 Data: 30 SDI: 00 Label: 002	
12:26:23	Flight_Management_Computer	L002_Time_to_go.00	Time_to_go	3,0	Min
12:26:23	Flight_Management_Computer	L002_Time_to_go.00	SSM	+	
12:26:23	Flight_Management_Computer	L003_Cross_track_distance.00		SSM: 01 Data: 42 SDI: 00 Label: 003	
12:26:23	Flight_Management_Computer	L003_Cross_track_distance.00	Cross_track_distance	4,2	N.M.
12:26:23	Flight_Management_Computer	L003_Cross_track_distance.00	SSM	No computed data	
12:26:23	Flight_Management_Computer	L272_Discrete_data_3.00		SSM: 00 Data: 40000 SDI: 00 Label: 272	
12:26:23	Flight_Management_Computer	L272_Discrete_data_3.00	1500_FPM_climb_limit	Can_Climb	
12:26:23	Flight_Management_Computer	L272_Discrete_data_3.00	2500_FPM_climb_limit	Cannot_climb	
12:26:23	Flight_Management_Computer	L272_Discrete_data_3.00	Enable	Zero	
12:26:23	Flight_Management_Computer	L272_Discrete_data_3.00	SSM_Status	Normal Operation	

A panel with decoded data

Sales References

When you order ISIMO modules you need to provide a sales reference as identification of the exact configuration that you need.

Sales reference	Module	Version	Options
ARINC429Codec-1-4	ARINC 429 Codec	1.x	4 decoded channels
ARINC429Codec-1-8	ARINC 429 Codec	1.x	8 decoded channels
MBSARINC429-1-4-1	MBS ARINC 429	1.x	Support for one hardware module with 4 receive channels
MBSARINC429-1-8-1	MBS ARINC 429	1.x	Support for one hardware module with 8 receive channels
MBSARINC429-1-8-2	MBS ARINC 429	1.x	Support for two hardware modules with 8 receive channels on each module
MBSARINC429-1-4-1-TX	MBS ARINC 429	1.x	Support for one hardware module with 4 receive/transmit channels
MBSARINC429-1-8-1-TX	MBS ARINC 429	1.x	Support for one hardware module with 8 receive/transmit channels
MBSARINC429-1-8-2-TX	MBS ARINC 429	1.x	Support for two hardware modules with 8 receive/transmit channels on each module

Other configurations are possible on request.

Further information

You can find out more about ISIMO in the internet on the *Data Bus Tools* website:

www.databustools.de

ISIMO supports the ARINC 429 modules from *MBS Electronic Systems.* These offer a new technology of integrating the interface hardware in an external module that is connected via Gigabit-Ethernet. This is ideal for platform independent solutions like ISIMO since it doesn't need any operating system specific drivers.

You can find out more on the MBS website:

www.mbs-electronics.com