# PIONSYS

Products. Development. Solutions.

The Network oriented IEEE1394 Development Solution

The **Pionsys® 1394Devolyzer** is a software tool for the development, analysis, visualization and simulation of IEEE1394 (FireWire) based systems. With the **1394Devolyzer**, the entire IEEE1394 development takes place on a unified, Microsoft Windows based platform and the developer receives an extensive and complete system for IEEE1394 projects. Through the comfortable access to present IEEE1394 devices and buses, the **1394Devolyzer** enables a shortening of development time and therefore a significant reduction of development costs.

In order to guarantee highest flexibility, the **1394Devolyzer** is equipped with software interfaces that are used to extend the basic functionality of the program arbitrary. The user can develop proper modules (DLL plug-ins) with little effort and implement them into the program easily. The following draft shows the basic software layers of the **1394Devolyzer:**
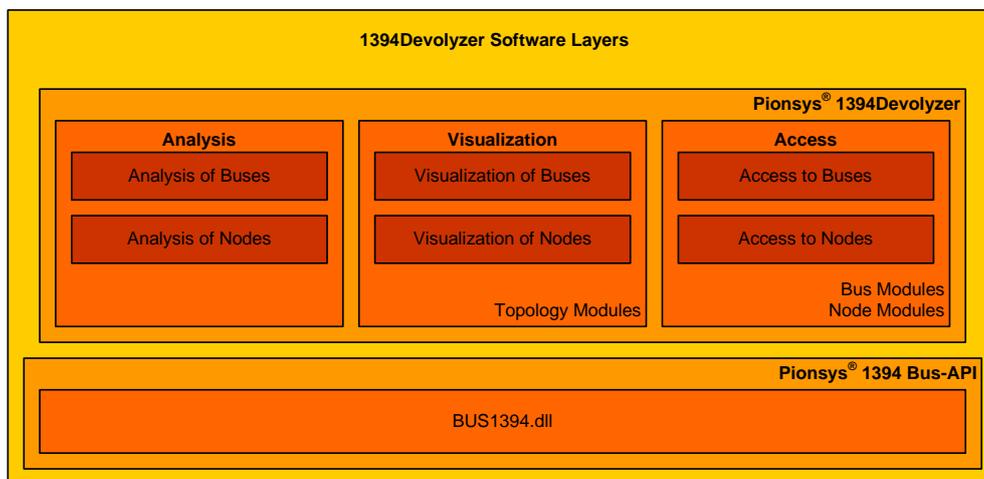
*The software layers of the **1394Devolyzer***

Due to its architecture and the possible extensions, the **1394Devolyzer** offers ideal preconditions for a successful IEEE1394 hardware and/or software development.

Areas of Application:

- introduction and training in IEEE1394
- PC-based prototyping
- development and test of IEEE1394 applications
- simulation and test of IEEE1394 devices
- functional device tests and conformity tests
- analysis and visualization of complex IEEE1394 networks
- preparation of diverse bus and device statistics
- monitoring of IEEE1394 buses and devices

The main tasks of the **1394Devolyzer** are shown below. They provide the basic functionality of the **1394Devolyzer** and are also part of the interfaces that are used for the extension of the program:

- extensive analysis of IEEE1394 buses and devices
- flexible visualization of the present IEEE1394 buses and devices
- arbitrary access to the present IEEE1394 buses and devices

Extensive Analysis

The basic task of the **Pionsys**® **1394Devolyzer** is the analysis of present IEEE1394 buses and devices. In order to pass detailed information to the user, the **1394Devolyzer** provides a large range of extensive and informative dialogs. All dialog boxes can be opened in parallel, which enormously simplifies the comparison between IEEE1394 buses and/or devices.
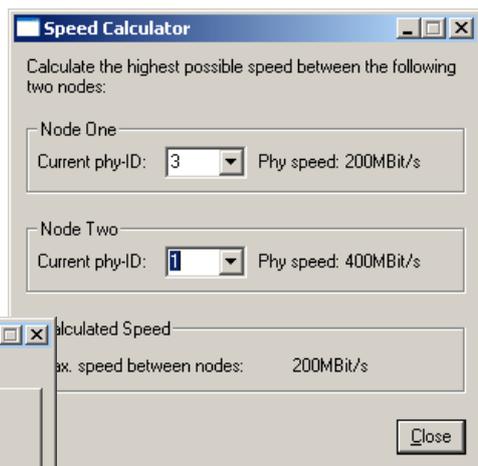
Available Information:

- output of current self-ID packets and topology map
- output of available isochronous resources
- output of information about the features of the used IEEE1394 OHCI host adapter
- output of available information about the chosen bus (e.g. output of the generation, gap count, current manager nodes (CM, IRM, BM), number of devices)
- determination of the maximum speed between any two nodes
- output of the complete configuration-ROM of each node with an active link layer
- execution of read-, write- and lock-transactions with each active node

In addition, the output and the behavior of the different dialogs can be adapted individually by the user. The defined settings are saved separately for each user and are automatically restored with the next start of the **1394Devolyzer**.

Some of the program's internal dialog boxes are illustrated and described by the following screen-shots. A detailed description of all dialogs and available functionalities can be found in the detailed HTML help system that is shipped with the program and available for free from www.pionsys.com.
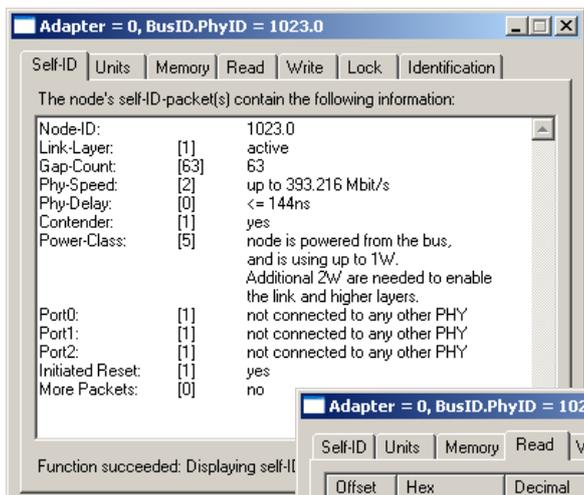
The **Speed Calculator** dialog box calculates the maximum speed between any two IEEE1394 nodes

The **Isochronous Resources** dialog box displays information about the currently available isochronous resources
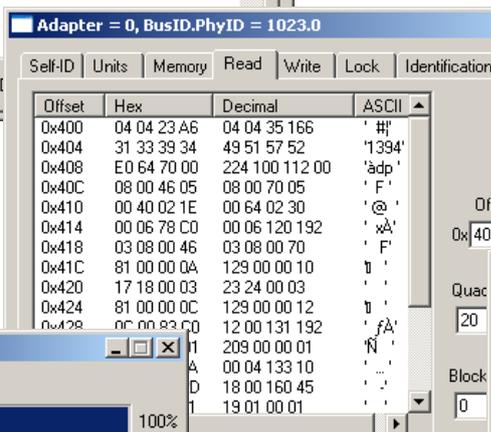
The three shown tabs of the **Information** dialog box contain information about the self-ID packets of the chosen node (above left) and parts of the configuration-ROM in two different kinds of presentation (in the middle and at the right).
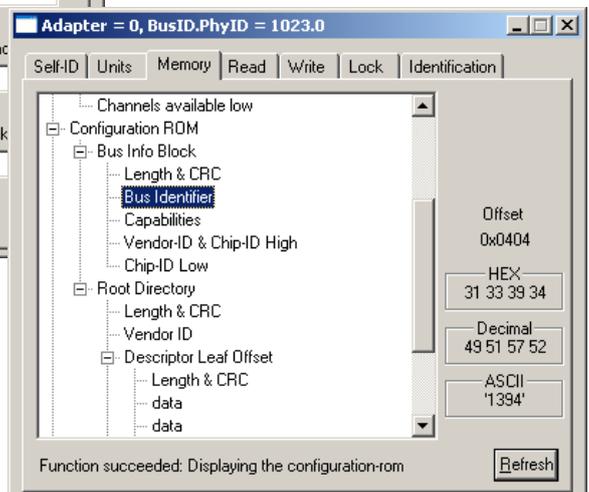
Flexible Visualization

In order to provide highest flexible visualizations, interchangeable *Topology Modules* were developed for the **P**ionsys® **1394D**evolyzer.
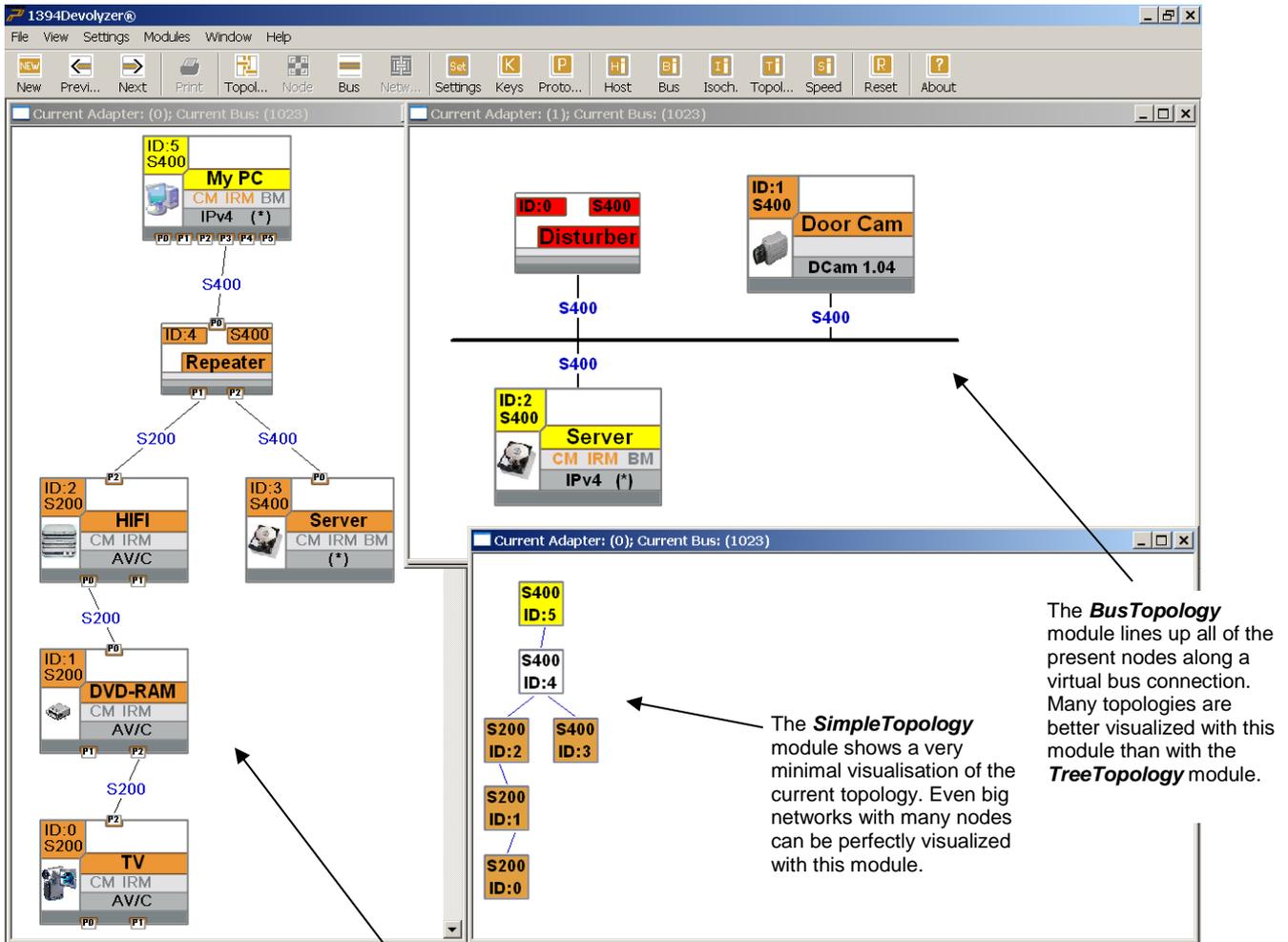
Topology Modules:

A *Topology Module* is always implemented as DLL plug-in and visualizes a specified IEEE1394 bus and all of its currently connected IEEE1394 devices. In addition, it performs graphical tasks for the main program, like zoom and scroll operations.

During runtime, *Topology Modules* can be loaded, changed and closed by the user at any time. Together with the **1394D**evolyzer a module wizard for Microsoft Visual C++ 6.0 is shipped. This module wizard can be used by a programmer to develop additional *Topology Modules* very easily. A detailed documentation of *Topology Modules* with many links and cross references to further topics is available in HTML format.

The **1394D**evolyzer is able to load and visualize several *Topology Modules* simultaneously. As a result, it is possible to visualize and analyse different views of buses and/or different views of different buses at the same time. Apart from a few given interfaces, there are no limitations for *Topology Modules.* E.g. it is possible to load a *Topology Module* which visualizes only the present AV/C devices and ignores all other devices. Also the order of the displayed IEEE1394 devices on the screen and the used painting functions can be independently chosen by each *Topology Module.*

The **1394D**evolyzer is shipped with three different *Topology Modules*, one of them also with the entire source code. The following screen shot shows the three *Topology Modules* and also briefly describes each module.

The ***TreeTopology*** module visualizes the physical tree topology. The essential information about the node's phy-IDs, the highest possible speed of the nodes, the supported protocol(s), the usage of ports, the model string from the configuration-ROM and a user-defined bitmap are visualized for each active node.

The description of the node and the outlined bitmap can be assigned to each node individually or to an entire device group by the user.

Devices without an active link layer (*Repeater*) are visualized by smaller bitmaps and include less information, as they do not own a configuration-ROM and therefore cannot be identified.

The **1394D**evolyzer detects non standard conform devices and visualizes them as *Disturber* (red). Consequently, such devices can be detected within the network and they can be removed if required.

Arbitrary Access

In addition to the already described *Topology Modules*, two further types of modules were developed for the **P**ionsys® **1394D**evolyzer*: Bus Modules* and *Node Modules*.

Bus Modules:

Bus Modules always are implemented as DLL plug-ins and are connected to a certain IEEE1394 bus by the user during runtime. Their task is to perform operations which are in concern of the entire IEEE1394 bus, like counting of bus resets, gathering of information about the connected devices, collecting of common bus statistics or the optimisation of the gap-count.

Several *Bus Modules* can be loaded and used simultaneously for each IEEE1394 bus.

Node Modules:

Node Modules always are implemented as DLL plug-ins and are connected to a certain IEEE1394 device (= node) by the user during runtime. A *Node Module* always is linked to „its" IEEE1394 device, even after bus resets and when the device was detached from the bus for a while. The re-linking to the according node is performed by the **P**ionsys® **1394 B**us-**A**PI automatically and takes place in background, without any additional effort for the programmer.

Several *Node Modules* can be loaded and used simultaneously for each IEEE1394 device.

The **1394D**evolyzer is shipped with two *Bus Modules* and two *Node Modules.* The source code and extensive documentations of all four modules is also included in the package. The following screen shots briefly describe two sample modules.
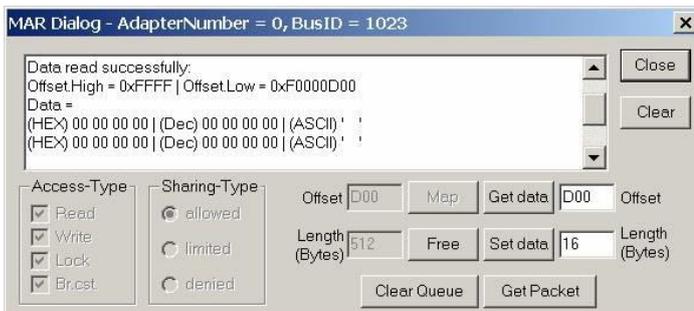
The *MAR* module is a typical *Bus Module*. Its task is the creation and administration of an address range. When the created address range is accessed by a node, the module displays detailed information about type, source and data of the transaction.

The *Camera* module is a *Node Module*. Its task is the visualization of pictures from IEEE1394 cameras.

On the **P**ionsys® homepage www.pionsys.com, demo versions and documentations of all products are available as free downloads. There also the latest development information as well as the latest news and update information of our products is found.

Requirements

The following requirements must be fulfilled for the operation and usage of the **P**ionsys® **1394D**evolyzer:

- PC or Laptop with at least one IEEE1394 (FireWire) OHCI host adapter
- Microsoft Windows XP or higher
- Microsoft Visual Studio 2005 or higher

The **P**ionsys® **1394 B**us-**A**PI is part of the **1394D**evolyzer and already included in the package.

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