Powerful Test Data Analysis using ASAM ODS

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Senior Application Engineer
25 years of helping customers:

*eliminate unexpected structural failures and improve product lifecycle performance*

...... *through a unique combination of measurement instruments, software and services*
Product Range

**Acquisition**  
Rugged, mobile data acquisition  
*SoMat® eDAQ, eDAQ-Lite*

**Analysis**  
Desktop engineering software for test and CAE analysis.  
*ICE-flow® Analysis systems (GlyphWorks®, DesignLife™)*

**Automation**  
Web-based systems for automated engineering data processing.  
*ICE-flow® Automation systems*
GlyphWorks®

Graphical
Process Driven
Data Analysis
Provides the ability to process **gigabytes of data** – many channels, millions of data points.

Seamlessly work with a **wide range of data types** – no translation of formats needed.

Wide range of **analysis tools** – from basic filtering and spectrum analysis to advanced fatigue prediction and accelerated testing.

**Gain insight** from embedded GPS mapping and video.

**Both Test and CAE data** in one environment for better, faster overall analysis.
• Drag and drop creation of multi-step analysis processes with many steps and branches – no scripting required.

• Improve quality by using locked-down processes that capture corporate knowledge.

• Saved processes can be password protected.

• Distribute processes and deploy throughout organization.

• Incorporate links to external codes and even create glyphs using open-source Python.
• ‘One-click’ generation of results and reports. Go straight from raw data to finished document.
• Intuitive flow-chart interface is easy to learn.
• Build a complete process in minutes that would have taken days to code.
• Spend engineering time understanding the data not supporting scripts.
GlyphWorks delivers **Power, Process, Productivity**…

Gigabytes of data – many channels, millions of data points → Drag and drop creation of multi-step analysis processes → ‘One-click’ generation of results and reports → …to more quickly gain understanding and make decisions.
Common Data Problems

- Increasing volumes of data.
- Spending too much time looking for the correct data or manually distributing data.
- Repeating tests because data cannot be found or re-used with confidence.
- Limited or inconsistent electronic description of the data.
- Many different proprietary data formats causing inefficiencies in software and data usage.
ASAM ODS

- ASAM (Association for Standardization of Automation and Measuring System) family of standards originated in the European automobile industry in the early 1990’s as a method to increase standardization in the field of automated testing.

- ASAM ODS (Open Data Structures) is a part of the ASAM family of standards responsible for storing and maintaining persistent testing data. Reduces reliance upon proprietary data formats.
ASAM ODS Components

- **ASAM Base Model**
  - This is essentially a standard schema which defines the basic object types and attributes. Customers add their own Application Model to include additional elements to describe the data (such as “VehicleWeight”, “DriverName” etc.)

- **ASAM API**
  - This allows applications to find and access data via an ‘ASAM Server’ by executing standard calls.

- **ASAM ATF and XATF**
  - ATF is an import / export format of data and associated schema to move between applications. XATF is a newer XML-based version.
- GlyphWorks uses functionality available in ASAM ODS V4.1 and above.
- GlyphWorks uses CORBA to connect to the ASAM ODS server and has been tested with
  - HighQSoft Avalon 3.4d
  - AVL Santorin V5.0
Data Support

- Based upon established mime types in ODS standard, GlyphWorks supports
  - Time series data
  - Rainflow histograms
  - Time at level histograms
  - Multi-dimensional time at level histograms
- GlyphWorks data is “test” oriented, where a test is a single multi-channel data set. The corresponding base element type in ASAM ODS is AoMeasurement.
- The “channels” of the time series test are the AoMeasurementQuantity children of the AoMeasurement.
- Information from the ASAM Application Model can also be accessed within GlyphWorks using its powerful metadata system that passes additional information along with the test data.
Example Usage
Example Usage

Tree view to explore ASAM ODS data structure
  e.g. to view the tests and channels

Object level details and values

Object attributes and values
Example Usage

Directly edit attributes with required security
Example Usage

Required data is moved to Selected list for use in GlyphWorks
- An important requirement is to find the right data using search.
- Context sensitive pull downs show available options such as the attributes on each element.
- Multiple conditions can be combined using operators to build up sophisticated searches.
- Searches can be saved and restored for rapid future use.
Advanced Searching

- Additional filtering can be added to searches.
- This enables numerical calculations to be used such as where the range of a channel:
  \[(\text{Max} - \text{Min}) > 10 \text{ AND} \ Name == \text{“Oil Temperature”}\]
- This reduces the search results to only include tests (measurements) where this is true.
**Example: PSA Peugeot Citroën**

**Business:** Automotive OEM

**Challenge:** Process and manage over 800 gigabytes of data from different sources such as proving grounds, customer monitoring sites, and laboratory test rigs

**Solution:** GlyphWorks used corporately, interfacing with ASAM ODS database

**Value:** Productivity gains from accelerated testing and faster processing speed

- “nCode’s software provides PSA Peugeot Citroën with an easy-to-use, standard solution powerful enough to process and manage over 800 gigabytes of data.”

  Jacques Mercier, Manager, Customer Usage Synthesis Department.

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Together, GlyphWorks and ASAM ODS provide
- Ability to process large amounts of data.
- Graphical, easy to use analysis environment.
- Controlled analysis processes.
- Access to the right data through interactive browsing and advanced searches.
- Ability to share data with other applications through ATF / XATF.

Thus providing the means to save time, improve quality and reduce costs in the testing process.
ICE-flow Automation

- ICE-flow Automation takes test data management to the next level through:
  - Web-based system for engineering data processing.
  - Catalogue, process, analyse and distribute data and reports.
  - Used by leading engineering organizations to:
    - Automatically processing test data
    - Monitoring and analysing vehicle fleets

Desktop Browser

ICE-flow Automation

nCode
ICE-flow Automation applications

• Ground Vehicle OEMs and suppliers
  – Proving grounds
  – Test rigs
  – Multibody dynamic analysis
  – Customer correlation.

• Aerospace OEMs
  – Life cycle test rig programs
  – Engine test cell data
  – Flight loads

• Monitoring
  – Optimize maintenance.
  – Health usage monitoring
ICE-flow Automation Benefits

- Simplifies data and report distribution.
- Encourages corporate and global design collaboration.
- Automates the data processing.
- Enables detailed trend analysis.
- Streamlines remote monitoring exercises.
- Promotes data quality and analytical consistency.
Thanks for Your Attention!

Any questions?