

Use case

Data management for  
compliance purposes:  
Ensuring data integrity  
with ASAM ODS and  
ASAM MDF

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## 1. Executive Summary

### Motivation

Test data management is more than a routine task which can be met by structured data repositories. When properly designed, it can guarantee long-term data access and lay the foundation for tomorrow's information needs. Using established standards for data storage and retrieval allows teams to use off-the-shelf tools and avoid costly in-house developments and maintenance.

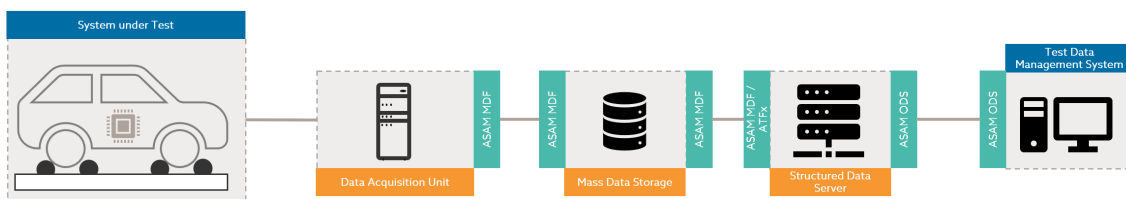


Figure 1: ASAM MDF and ASAM ODS in a test data management application

### Introduction

ASAM MDF, a standardized data format for storing measurement data, and ASAM ODS, a data model and API for open data services (Figure 1), provide OEMs and suppliers with a transparent and traceable foundation for test and measurement data. This ensures that certification and environmental compliance requirements are met and sudden crisis issues can be avoided. Adhering to standards for capturing, storing, and accessing measurement data across development organizations makes it much easier to demonstrate to regulators, customers, and internal stakeholders exactly what was tested, under what conditions, and with what results – even many years after the SOP.

### Audits

Where such a foundation is missing, certification or environmental compliance investigations can quickly turn into ad-hoc firefighting: data recovery, repeated measurements, and even shipment stops can severely impact business performance. Investing in data integrity and traceability with ASAM MDF and ASAM ODS is therefore not just “insurance” but actively reduces the likelihood and impact of such situations, protecting long-term competitiveness in global markets.

### Features

At the same time, a properly designed ASAM MDF and ASAM ODS system does far more than support audits (Figure 2). The same standardized data format and interfaces immediately enhance day-to-day development efficiency, enable reuse of data across departments and organizations, and create a robust foundation for future initiatives, such as AI-based analysis and optimization. For this reason, building a company-wide test data foundation should be treated as a management-level initiative, rather than a small, bottom-up IT project.

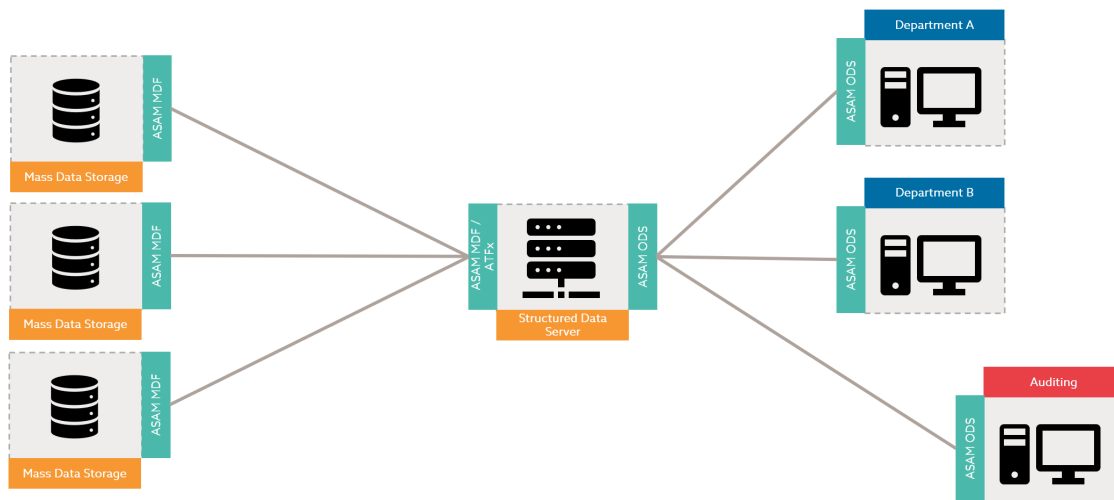


Figure 2: Universal availability of different data sets through standardized interfaces

## 2. Benefits

- Robust, role-based access control and auditability ensure consistent protection and traceability, including the ability to access and review historical data.
- End-to-end automation, from data acquisition to storage, minimizes manual handling and thereby reduces the risk of human-induced data alterations.
- A standardized data model across products, domains, and sites enables unified access to both current and historical data from a single environment.
- Since data is standardized and tool-independent, it remains directly accessible without conversion, even beyond typical vehicle lifecycles.
- ASAM ODS products expose standardized APIs, allowing server implementations to be added or replaced with minimal impact on existing data and client tools. No large-scale data conversion is required when upgrading or modifying the backend.

## 3. How it works



Figure 3: From a large set of data sources to standardized data access

### Analyze how data is defined in each test area and department

Identify how measurement data is produced, which tools and loggers are used, and in which formats the data is provided. If the data is already in ASAM MDF, a significant portion of your standardization work is already done.

### Standardize terminology and naming conventions across the company

Use common vocabulary for components, signals, and test objects, and define measurement units

consistently for the same parameter. This is partially supported by ASAM ODS concepts, but it still requires clear rules and agreements from the organization.

### **Leverage ASAM standards for internal and external collaboration, avoiding data silos**

By adopting ASAM ODS and ASAM MDF as common standards, development sites can more easily share a common understanding with headquarters, partner companies, and authorities, and handle interactions with international business partners and regulators in a consistent and systematic way. Examples showcasing how this works with ASAM ODS and ASAM MDF are available on the ASAM website: [ASAM MDF and ODS application stories](#).

### **Extend to new domains by defining only the differences**

When applying the system to new fields (e.g. new powertrain types or ADAS domains), the existing data model can easily be extended, by adding or modifying only the parts that differ. This way, the system design and implementation workloads are significantly reduced.

### **Collect data systematically from diverse devices**

Configure data loggers and test benches to export measurement data in the standard ASAM MDF format whenever possible. The system can accommodate different MDF versions, additional file formats, and multiple logger manufacturers for each measurement target.

### **Automate the path from data acquisition to storage**

Implement end-to-end automation that

- detects new ASAM MDF (and other supported) files from loggers and test benches.
- registers them in the ASAM ODS server with the correct metadata
- links related documents (test requests, procedures, reports) where necessary.

The more the process is automated, the less manual copying is required reducing human errors like data loss, overwriting, or storing files in the wrong location.

### **Restrict and monitor access to stored data**

- Limit access to measurement data based on roles and responsibilities (e.g. development team, quality assurance team, external partner).
- Configure logging and audit trails to record critical operations, allowing for later review if necessary.

This combination of standardized storage (in ASAM MDF + ASAM ODS) and controlled access provides a strong technical basis for protecting data integrity, supporting internal governance, and demonstrating traceability during audits and investigations.

## **Investigating legacy data**

### **Access from any ASAM ODS-compliant software via the standard API – years after recording**

You can use any ASAM ODS-compliant client to access the data via one of the the standard's APIs. There is no need to keep legacy licenses solely for reading data stored in proprietary format. Differences in client software and versions can be handled within the common ODS interface.

### **Consistent access even with multiple ODS servers.**

Even if multiple ODS servers from different vendors are deployed (for example, one per department or business unit), they can all be accessed using the same ASAM ODS API. Integration with other internal systems can be implemented independently of the specific ODS product, which simplifies long-term system evolution.

### Logging and traceability of operations.

By retaining access and operation logs, deletions, modifications, and other critical actions can be recorded and reviewed, providing evidence of legitimacy when required. In contrast, simple file servers make it difficult to implement complete access control and are more prone to user errors and undocumented changes.

## 4. System Components

Measurement device > (directly or via MDF file) > ASAM ODS server > Analysis tools and web management applications

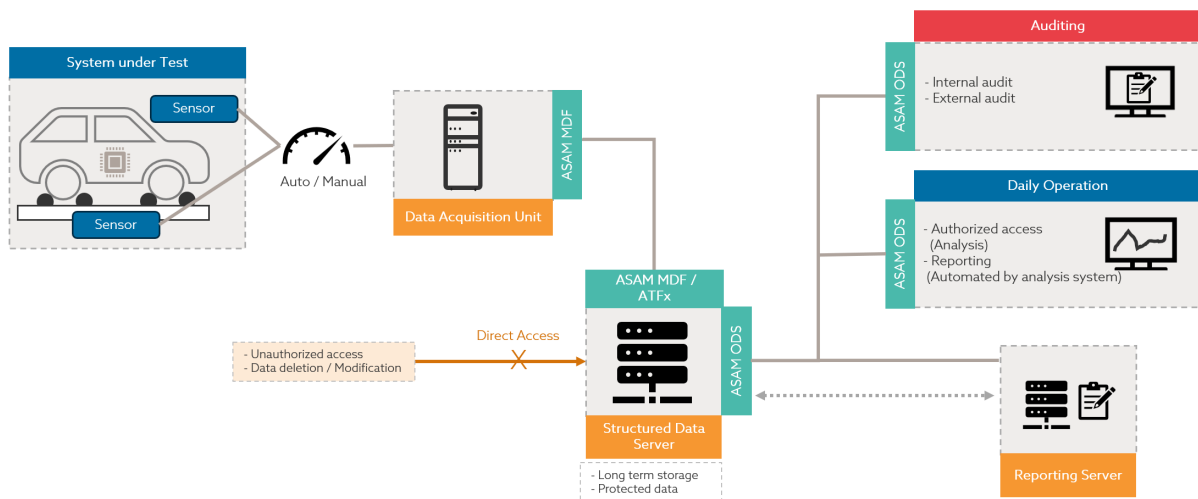


Figure 4: System layout overview

## 5. Requirements

When implementing a system for data integrity and compliance, it is less important to have a deep understanding of every detail of the ASAM MDF or ASAM ODS specifications. It is much more critical to design robust data workflows and maintain proper access governance. The key questions are who generates the data, how is it validated and registered, who is allowed to use or modify it, and how long must it be retained to comply with internal rules and external regulations.

Additionally, responsibilities for maintaining naming conventions and units must be clearly assigned within the organization, so that data remains consistent and interpretable over the years. When integration with other business systems (e.g., PLM, quality systems, data lakes) is required, it is essential to define in advance which data must be exchanged, in which direction, and at what frequency, as well as the expected functional behavior on both sides. Clear requirements at this level are far more important for project success than knowing technical details of standards.

## 6. Conclusion

Like other core business systems, such as accounting, ERP, or PLM, an ASAM ODS-based test data management system does more than satisfy management and compliance requirements. Once established, it improves day-to-day operational efficiency, reduces duplicated data handling and tool-specific workarounds, and enables consistent reuse of test data across departments and sites.

By adopting ASAM MDF and ASAM ODS, companies establish a long-term, vendor-independent foundation for transparent, traceable, and compliant test data. This not only supports immediate engineering work but also future initiatives such as global collaboration, regulatory audits, and AI-based analysis.

This first part of our whitepaper explains how ASAM ODS and ASAM MDF provide the basis for ensuring data integrity and regulatory compliance. In part two ("Development Data Transformation (DX): Leveraging the power of AI with structured data"), we explore how AI applications in particular benefit from the structured approach of ASAM ODS.