

Automated Functional Data Exchange in the Automobile Industry

prostep ivip White Paper

Automated Functional Data Exchange in the Automobile Industry (FDX)

A new data exchange format based on existing standards

FDX Project Group

Date: October 2022

Abstract

This prostep ivip / VDA White Paper has been devised by the FDX Working Group. The document presents a new standardized machine-readable data format for the exchange of functional data between OEMs and suppliers. Functional data refers to characteristic values, characteristic curves and characteristic fields for different parts and components. They are usually determined by physically or virtually created measurements.

The new standard enables parties to exchange their functional data in a highly structured way. The main goals of the standard are

- Harmonization of exchange of functional data between OEMs and suppliers.
- Improved quality and availability of functional data for CAE/simulation purposes
- Elimination of discrepancies in functional data between ordered and delivered data
- Reduction of misinterpretation of data during exchange and lifecycle
- More extensive automation in data generation, exchange, and processing

The FDX format is based on proven industry standards such as ASAM ODS, the corresponding data exchange format ATFX and the open-source Eclipse openMDM® application model.

Disclaimer

prostep ivip documents (PSI documents) are available for anyone to use. Anyone using these documents is responsible for ensuring that they are used correctly.

This PSI documentation gives due consideration to the prevailing state-of-the-art at the time of publication. Anyone using PSI documentations must assume responsibility for his or her actions and acts at their own risk. The prostep ivip Association and the parties involved in drawing up the PSI documentation assume no liability whatsoever.

We request that anyone encountering an error or the possibility of an incorrect interpretation when using the PSI documentations contact the prostep ivip Association (psi-issues@prostep.org) so that any errors can be rectified.

Copyright

- I. All rights to this PSI documentation, in particular the right to reproduction, distribution and translation remain exclusively with the prostep ivip Association and its members.
- II. The PSI documentation may be duplicated and distributed unchanged in case it is used for creating software or services.
- III. It is not permitted to change or edit this PSI documentation.
- IV. A notice of copyright and other restrictions of use must appear in all copies made by the user.

Table of Contents

1 Introduction	3
1.1 Definition of Functional data	3
1.2 Meta Data Concept	3
1.3 Use of Functional data	3
2 Prototype Development	5
2.1 Evolution: From Real Prototype to Prototype-free Development	5
2.2 Protype Processes	5
2.3 Virtual Development	6
2.4 Requirements & Needs	6
3 FDX Format as the Solution	9
3.1 Technical Details of FDX	9
3.2 Use Cases	12
3.3 Harmonizing Data Exchange	13
3.4 High Process Quality	15
3.5 Link to prostep ivip standards	15
3.6 Reference Implementation of FDX Standard	16
4 About prostep ivip	18
5 Contact us	18
6 References	18
Figures	
Figure 2-1: RFLP architecture applied to the V-model	6
Figure 2-2: Loss of information from reality to usage	7
Figure 2-3: Standardized exchange along the development process	7
Figure 2-4: Requirements for data exchange	8
Figure 3-1: FDX Zip Container Structure	9
Figure 3-2: FDX ATFX Data Structure	10
Figure 3-3: Example plot (Force against Displacement)	12
Figure 3-4: FDX order and delivery process	14
Figure 3-5: Digital Twin	16