ODA MCAD SDK

MCAD SDK provides unified access to the most widely used mechanical CAD formats — including SolidWorks, CATIA, Inventor, and more — through a single, consistent API. It is developed under the ODA's Strategic Interoperability Group (SIG) program to deliver open access to native MCAD data, including core geometry and Product Manufacturing Information (PMI) without relying on external dependencies or original software.

Supported Formats

- SolidWorks® (.SLDASM, .SLDPRT, .SLDDRW)
- CATIA® V4/V5/V6
- Autodesk® Inventor (.IAM, .IPT)
- NX
- Parasolid®
- JT
- Creo®
- Solid Edge®
- Rhino®
- CADDS
- ProE
- PLMXML
- CGR
- 3ShapeDCM
- Procera

Note: Some file formats related to mechanical industry are included in the ODA Core Package: STEP, IGES, STL, OBJ, 3DS and FBX.

Core Capabilities

MCAD SDK provides a unified, object-oriented API for data extraction and interoperability across all supported formats.

Geometry & Structure

- **Full B-Rep Access:** Provides access to exact geometry (Boundary Representation).

- **Tessellation:** Includes mesh geometry generation.

- **Assembly Management:** Access to the assembly hierarchy and part structure.

- **Component Status:** Support for handling hidden, suppressed, and reference components.

Metadata & PMI

- **PMI Data:** Supports access to **Product Manufacturing Information** (PMI).

- **Properties:** Access to materials, colors, layers, and names.

- **Custom Data:** Supports custom object properties and attributes.

Visualization & Publishing

- **Optimized 3D Viewing:** Seamless integration with ODA Visualize SDK for high-quality rendering and export.

- **Advanced Views:** Supports section views, exploded views, and object isolation.

- **Data Export:** Supports export to standard formats like **STEP, 3D PDF** (using PRC), and **OBJ**.

SolidWorks® Support (SWInterop)

The SolidWorks Interoperability (SWInterop) provides detailed access and modification capabilities for native SolidWorks files, developed in progress since 2023.

Data Access (Read)

Feature Category	Capability	Details
File Support	Formats and Versions	Read access to **.SLDASM, .SLDPRT, and .SLDDRW** files. Supports loading versions from **2011 to 2025**.
Component Access	Structure and Geometry	Access to the hierarchical structure of assembly/part components. Provides access to associated 3D geometry.
Component Properties	Status and Location	Access to **Virtuality status** (external or embedded stream), **Suppression status**, **Exclude from BOM** flag, Name, Configuration Name, and **3D transformation matrix, Unit(metrics), Parent Component, Depth**.
Configurations	Management	Access to **all configurations**, ability to detect the **active configuration**, and detect **inserted child configuration** in a parent instance configuration.
Custom Properties	Part & Assembly	API access to **Document Custom Properties**, **Configuration Custom Properties**, and **Sheet Metal Properties**.

Feature Category	Capability	Details
External References	Associated Files	Access to references including other SW files, Inventor files, Excel files, Decal files (*.TIF, .PNG*), and OLE objects (*.DOCX, .PDF*).
Drawing Data	Sheets and Properties	Access to all sheets in a *.SLDDRW* file, including the **active sheet**. Access to sheet properties (name, paper size, scales, angle, etc.).
Annotation	Display Data	Supports reading and access to **Display Data of Annotations** (curves, texts, colors, line types).
Standard (Summary) properties	Part & Assembly& DRW	Reading standard (summary) properties(Author, Keywords, Comments, Title, Subject and others) for 2D Drawing(.SLDDRW), Assembly(.SLDASM), Part(.SLDPRT) SW format file.
Thumbnails	Display Data	Reading of the thumbnails, including thumbnails for: ● specific sheets in a .slddrw file. ● specific connfiguration in a .sldprt file. ● .sldprt, sldasm file.

Data Modification (Write)

Feature Category	Capability	Details
File Save	Versioning	Supports **saving (editing) to the same opened version**. This feature is available since release 26.0.
Assembly Creation	Component Insertion	Allows adding one or more component instances (parts or sub-assemblies) to an **Assembly** document (*swDocASSEMBLY*).
Custom Properties	Writing and Validation	Ability to change and write Document and Configuration custom properties. Includes **input validation** for string, integer, date, and boolean types.
Configuration Properties	Renaming/ Updating	Ability to change and write the Configuration Name, Description, Comment, and Alternative Name.
Standard (Summary) properties	Writing	Changing and Writing standard(summary) properties for 2D Drawing(.SLDDRW), Assembly(.SLDASM), Part(.SLDPRT) SW formats

Sample Applications

Here you can find an overview of the Drawings Sample applications available to all ODA Members, including trial users. If you're interested in any of these, links to the documentation will become available immediately after applying for a free trial.

Name	Description
SwReadEx	Reading a drawing file and displaying all information about the entities and object types located in the file.
SwWriteEx	The sample app that modifies input data, prints and writes it to a runtime stream, reads it back, and optionally saves it to an output file

Autodesk® Inventor Support
To be released - November 2025

The Inventor SDK provides access to native **.IPT** and **.IAM** files.

Key Features

- Read and interpret part and assembly geometry

- Extract component and configuration data

- Access model and material properties

- Planned support for new Inventor versions and enhanced metadata

CATIA® Support
To be released - December 2025

MCAD SDK provides support for **CATIA V4**, **V5**, and **V6** file formats, enabling access to model geometry, product structures, and metadata.

Key Features

- Import and visualization of CATIA part and assembly structures

- Access to geometric and parametric data

- Extraction of product metadata for integration and analysis workflows

- Planned support for additional V6 features and annotation data

Typical Use Cases

- 3D model viewers and collaboration platforms

- CAD data translation and conversion tools

- Design validation and quality inspection solutions

- Engineering data management systems

Availability

The MCAD SDK is available as an Extension for Sustaining ODA members and higher:
https://www.opendesign.com/pricing

It is actively developed and regularly updated to support the latest file versions.

Learn more:

☞ https://www.opendesign.com/products/mcad-sdk