ODA MCAD SDK

Native access to mechanical CAD files, without the originating application.

ODA MCAD SDK lets your application open SOLIDWORKS®, Autodesk® Inventor®, JT™ and CATIA® V5 files directly: exact geometry, assembly structure, properties and PMI. SOLIDWORKS files and Inventor drawings can also be written.

No CAD installation is required, and the format SDKs depend only on ODA Kernel SDK.

Supported formats

FORMAT	FILES	VERSIONS	READ	WRITE
SOLIDWORKS®	.sldprt, .sldasm, .slddrw	2011–2025; initial support for 2026	Yes	Yes
Autodesk® Inventor®	.ipt, .iam	2022–2026	Yes	—
Autodesk® Inventor®	.idw	2022–2026	Yes	Yes
JT™	.jt	8 to 10.5	Yes	—
CATIA® V5 beta	.CATPart, .CATProduct	R19–R32, R34	Yes	—

One API for more formats. Through the MCAD Common API the same code also opens STEP, IGES, PRC, QIF, OBJ, STL and 3DM files.

This datasheet describes ODA MCAD SDK as of release 2027.10.

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Core capabilities

Geometry and structure

- Exact B-Rep geometry: Parasolid® body streams from SOLIDWORKS, ACIS streams and B-Rep topology from Inventor, XT B-Rep from JT, the exact geometry model from CATIA V5
- Mesh data: stored tessellation of SOLIDWORKS mesh bodies, JT levels of detail, meshes of displayed CATIA bodies
- Assembly hierarchy with component transforms, suppression states and external references
- Configurations and display states (SOLIDWORKS), model states and design view representations (Inventor), feature tree (CATIA V5)

Properties and PMI

- Summary, custom and configuration-specific properties; cut-list properties for SOLIDWORKS parts
- Materials, colors and textures per body and per face (SOLIDWORKS)
- 3D annotations: dimensions, notes, feature control frames, datums and datum targets, surface texture symbols
- Mass properties of Inventor parts

Visualization

- Rendering through the ODA graphics pipeline, including drawing sheets
- Import into ODA Visualize SDK for SOLIDWORKS, Inventor, JT and CATIA V5 files
- GD&T symbols rendered with the Y14.5 font or a custom font

Conversion

- Any MCAD Common API format to STEP
- SOLIDWORKS to Parasolid (.x_b), to Revit® (.rfa, .rvt) and to ODA Visualize (.vsf)

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MCAD Common API

One API over the format SDKs. Each file stays in its own native database, with no intermediate representation, and the format-specific API of each SDK remains available alongside.

- Format detected automatically; read from a file path or a memory stream
- The same access for every format: model hierarchy, object properties, primary and alternative geometric representations, PMI, layers and styles
- Rendering through the ODA core and integration with ODA Visualize SDK
- Any Common API format can be converted to STEP

Formats available through the Common API

Native MCAD	SOLIDWORKS, Autodesk Inventor, JT
Exchange and mesh	STEP, IGES, PRC, QIF, OBJ, STL
Other	3DM, through the openNURBS library

Typical applications

- 3D model viewers and collaboration platforms
- CAD translation and conversion tools
- Design validation and quality inspection solutions
- Engineering data management systems

SOLIDWORKS®

Read, modify and write native SOLIDWORKS parts, assemblies and drawings.

Read

- Parts (.sldprt), assemblies (.sldasm) and drawings (.slddrw), from a file or a stream
- Files saved in SOLIDWORKS 2011–2025, with initial support for 2026; drawings saved in 2006–2014

Document model

- Component tree: path, parent, depth, virtual flag, exclusion from BOM, suppression state, transform
- Configurations, derived configurations and display states
- Summary, custom and configuration-specific properties; cut-list properties, including sheet-metal data
- Annotations: notes, dimensions, welding symbols, data tags, blocks, cosmetic threads, center marks and centerlines, with their display data
- Sketch entities, layers, units
- External references, OLE objects, design tables, decals, version history
- Drawings: sheets and drawing views with name, orientation, scale, position and the referenced model and configuration
- Thumbnails for documents, configurations and sheets; a preview can be generated when the file has none

SOLIDWORKS®: geometry, write and convert

Geometry and appearance

- Parasolid B-Rep bodies, convertible to ODA B-Rep
- Mesh bodies with their stored tessellation
- Materials, colors and textures at part, body and face level
- Drawing-view geometry projected from the referenced parts and assemblies by hidden-line removal (beta)

Write

- Save to a file or a stream, in the version the file was opened with
- Edit summary and custom properties; configuration names, descriptions and comments
- Add components to an assembly; insert a part into a part as a derived-part reference
- Relink component paths in assemblies, derived parts and drawings

Convert

TO	DETAILS
Parasolid .x_b	Parts and assemblies
Revit .rfa / .rvt	Geometry as DirectShape; requires ODA BimRv SDK
ODA Visualize .vsf	With annotations, materials and textures
BMP	Rendered without ODA Visualize SDK

Autodesk® Inventor®

Read native Inventor parts, assemblies and drawings, and create Inventor drawings.

Read

- Parts (.ipt), assemblies (.iam) and drawings (.idw) saved in Inventor 2022–2026
- Assembly traversal: component definitions, occurrences and sub-occurrences, with transforms
- Geometry: ACIS streams and B-Rep topology (bodies, shells, faces, edges, vertices) with surface and curve geometry
- Document properties, including Summary Information, Design Tracking and User Defined properties
- Model annotations: dimensions, hole and thread notes, general and leader notes, feature control frames, datum identifiers, datums and datum targets, surface texture symbols
- Mass properties of parts; unit conversion
- Model states and design view representations
- Drawings: sheets, views and annotations

Write

- Create an .idw drawing from scratch, with base, detail, projected and section views
- Read an .idw drawing and save a copy

JT™

- Reads and renders JT files, versions 8 to 10.5
- Logical scene graph, shape levels of detail, XT B-Rep (Parasolid) elements and PMI
- Import into ODA Visualize SDK with the model hierarchy, including a B-Rep-based mode

CATIA® V5 beta

CATIA V5 support is published as a beta and is read-only.

- Reads parts (.CATPart) and assemblies (.CATProduct), from a file or a stream; files saved with R19–R32 and R34
- Exact geometry model: bodies, shells, faces, loops, edges and vertices, with the surface or curve under each
- Feature tree: every feature with its name, type, parent and children
- Product structure: components, part numbers, instance names and placements
- Displayed bodies with color and opacity; meshes ready to draw; saved view; preview image
- 3D annotations (PMI) with type, text, values and attachment
- Import into ODA Visualize SDK

Not read: .CATDrawing and standalone .cgr files.

Platforms

C++ API.

	WINDOWS	LINUX	MACOS	IOS	ANDROID
SOLIDWORKS, Inventor	Yes	Yes	Yes	Yes	Yes
JT, CATIA V5	Yes	Yes	Yes	—	—

Windows x64, x86 and ARM64; Linux x64, x86 and ARM64; macOS Intel and Apple silicon.

Sample applications

Here you can find an overview of the MCAD 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.

SOLIDWORKS

NAME	DESCRIPTION
SwReadEx	Reads SOLIDWORKS data, thumbnails and sketch entities.
SwWriteEx	Modifies and writes SOLIDWORKS files, including component relinking and derived parts.
SwParasolidExtractionEx	Extracts Parasolid geometry, materials and textures, and mesh tessellation.
SwDirectShapeImportEx	Converts SOLIDWORKS files to Revit RVT and RFA.
SwCustomFontEx	Renders GD&T symbols with the Y14.5 font or a custom font, with BMP output.
Sw2Visualize	Visualize filer module that loads SOLIDWORKS files into ODA Visualize.

JT and CATIA V5

NAME	DESCRIPTION
OdJtView	Views the content of JT files.
CatReadEx	Console report over the whole CATInterop public API.

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Sample applications, continued

Autodesk Inventor

NAME	DESCRIPTION
IptReadEx	Reads an Inventor part (.ipt) file.
IamReadEx	Reads an Inventor assembly (.iam) file.
IdwReadEx	Opens an Inventor drawing (.idw) file.
IdwWriteEx	Creates an Inventor drawing (.idw) file from scratch.
IdwCopyEx	Reads an Inventor drawing (.idw) file and writes it to a new file.
InvDocumentProperties	Opens an Inventor file and shows its document property streams.

Availability

ODA MCAD SDK is an Extension to ODA membership, available to Sustaining members and higher.

You can find all pricing details on our website.

More about the product: opendesign.com/products/mcad-sdk

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