# FARO® As-Built™ for AutoCAD® Software
Versatile Reality to CAD Solutions

Enhance AutoCAD Software with Evaluation Tools for 3D Laser Scanner Data

FARO As-Built for AutoCAD Software offers all the functionality that AEC professionals need to evaluate 3D laser scanner data directly in AutoCAD with the highest precision. This software extends AutoCAD tooling for point cloud modeling and analysis, photogrammetry processing, total station control and data evaluation captured from a variety of mobile mapping systems and handheld laser scanners. A high level of automation efficiently creates 2D plans and 3D models for BIM purposes.

Industry-specific functions enable users to create deliverables customized to clients' needs, company constraints and stakeholder specifications. Numerous export options and analytical tools ensures that the required CAD deliverables meet client expectations.
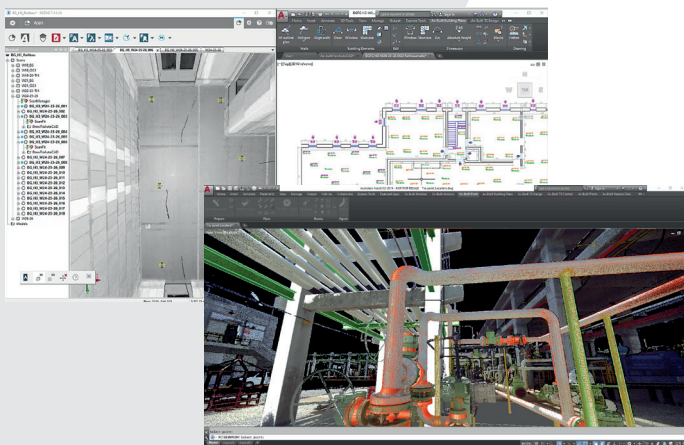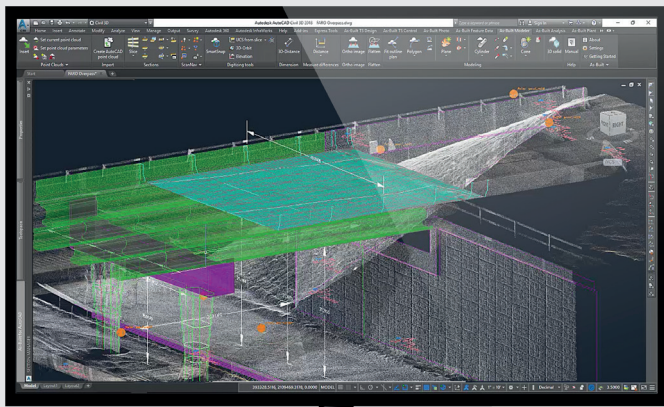
Easy Management of Large 3D Scan Projects
As-Built integrates seamlessly into th AutoCAD user interface. With an efficient data management system and an extended viewing option, scan navigation is simplified and provides a much clearer view of native point cloud data compared to native AutoCAD.

Powerfull Tools for Fast and Easy Extraction of 2D Plans and 3D Models for BIM
Best-fit line extraction paired with optional angular restrictions can be automatically fitted to point cloud slices. Commands and drawing and dimensioning of building elements ensure quick and easy analysis.

Intelligent Piping and Steel Models for use in Plant Software and BIM
Results of automated but user controlled workflows for modelling piping systems and steel construction are high accuracy models of pipe-runs and stacked steel, that satisfy design constraints of plant design software.

Analyzing Tools for Tolerance Checkup, Clash Detections and Volume Computation
Deviations of as-built CAD models with point cloud are visualized in configurable heatmaps, elevation plans or lists and used to verify the accuracy of modeling. Other analyzing tools include tank analysis, calculate masses and volumes.

Use Photogrammetry Features in AutoCAD
Photogrammetric functions complement evaluation of data captured by laser scanners, drones or cameras and complement the evaluation with precise and easy data extraction from images.

Benefits

- Evaluate data captured from common devices such as; laser scanners, drones, mobile mapping systems, cameras and total stations.
- Integrate and evaluate as-built data within AutoCAD, AutoCAD Plant 3D®, AutoCAD Civil 3D® or other AutoCAD variants
- Use a wide range of functions designed for a variety of applications such as: architecture, civil/survey, construction QA/QC, facility/asset management, historic preservation, industrial plant/process, MEP and specialty trades

- Share deliverables in a standard CAD format as well as exports that meet industry specific requirements
- Benefit from the integration in AutoCAD and the best price/performance ratio in its class
- Utilize the advantages from a FARO system solution to ensure the most straightforward interoperability to create trusted deliverables

Key features

Easy viewing & management of large 3D scan projects

- Import various data formats collected from common 3D capture devices
- Efficient Data management: Isolation, sectioning, slicing, organized in a flexible tree structure; Image management
- Intuitive navigation of 3D scan projects in a realistic bubble view

Evaluation of basic geometries

- Automatic fitting of polylines, 3D contours, planes, cylinders, truncated cones and bent cylinders from point clouds
- SmartSnap: Accurate Snapping of corners, edges, planes, highest and lowest point directly in point clouds
- Automated profile and geometry extraction supports the creation of contour-, fracture edge- and surface models.

Extraction of 2D plans from 3D laser scan data

- Fast and precise construction of 2D plans from one or more point cloud slices (for straight and free formed contours) as well as constrained perpendicular walls
- Drawing commands for building elements: windows, stairs, doors, profiles…
- Automatic alignment of walls: rectangular/parallel/aligned

Pipe runs and steel beams

- Automatic recognition of pipes, bends, flanges, valves, reducers, tee-pieces, etc. (automatic pre-calculation accelerates user-controlled workflow) based on industry standard catalogues
- Extract stacked steel with catalog driven pattern recognition
- Export intelligent AutoCAD Plant 3D® and Advance Steel® objects, 3D solids or a labelled centerline layout
- Determine the tie-in points on flanges for alterations and extensions without modeling

Analysis tools for controlling tolerances, clash detections and volume computation

- Verify models to clouds, export deformation reports including heat maps and elevation plans
- Implement given stakeholder tolerances or industry standards from e.g. USIBD® or BuildingSMART®
- Analysis of vertical tanks includes shell deformation and volume calculation including deadwood subtraction.
- Extract terrain, perform flatness analysis or solid modelling (2.5D meshing, terrain model) for volumetric calculations
- Collision analysis between scan and CAD design objects
- Quality control of built structures based on given tolerances and standards (LOA)

Photogrammetry features in AutoCAD Software

- Draw easily CAD sections and façade plans by using detailed, true to scale image plans.
- Construct flexible 3D models from point cloud and photo integration from laser scanners or AgiSoft PhotoScan® and Autodesk® ReCap Photo® project importation
- Create True Orthophotos with high quality textures from images and point clouds
- Unwrap point clouds or rectify photos for true-to-scale image plans e.g. towers, vaulted ceilings, facades, roofs.

Combine feature data with CAD objects and structured room schedules

- A convenient database for feature management
- Room polygons and additional spatial information are managed in a clear and freely adaptable tree structure
- Creation and visualization of a list of floor areas at the press of a button
- Automatic recording of bounding polygons, calculation of surface areas, room information blocks and bill of materials supported by intelligent pattern recognition
- Numerous functions for asset- and feature data capture and exporting of data in a database suitable format (Excel, ASCII tables, XML, HTML, AutoCAD blocks, CAFM suitable polygon, Shapefile…)

Total Station Connectivity to AutoCAD On-Site

- Connect and control via As-Built for AutoCAD with most common total stations/robotic stations
- Draw complete floor plans, sections and elevations directly on-site
- Setup a closed-loop traverse and 3D network, which is later used as framework for the positioning of laser scans.
- Stake out referenced or modeled CAD geometry to reality

Industries

Architecture | Civil/Survey | Industrial Plant/Process | Construction QA/QC | MEP | Facility/Asset Management | Historic Preservation | Specialty Trades

Technical Requirements	
Platform	AutoCAD Software 2015 and above. Also compatible with associated products e.g. Civil 3D, Architecture®, Map 3D®. Users of elder Autodesk products please contact FARO.
Operating system	Dependent on the version of AutoCAD Software, 64-bit systems only .
Recommended hardware requirements	Computer: Graphics card as recommended by Autodesk, RAM at least 8 GB, better 32GB and more, processor at least 2.5 GHz, better 3-4 GHz and 4-8 cores, SSD for larger projects.
Data requirements	Registered scans (and images).
Supported scan data formats	E57, ASCII, LAS, FARO (LSPROJ, FLS, FWS), Leica (PTZ, PTS, PTX), Zoller&Fröhlich (ZFS, ZFPRJ), Topcon (CL3, CLR) Leica (PTG) and Riegl RiScanPro-Projects (RSP).

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