

# 3D Laser scan as basis for an individual system engineering

- Digitalization**
- Documentation**
- Visualisation**
- Validation**
- Dimensioning**
- Optimization**
- Integration**

### The task

The detailed planning aspect of investments is more and more focusing on, especially when considering very large projects. Regardless of whether it concerns a grant for a brownfield plant or the total budget for a greenfield project, a detailed concept study is more and more often requested. The precondition for this process step is that the alle required parameters are available or have to be prepared. This is especially playing an important role during the layout planning and stocktaking. Often the documentation for existing plants is insufficient.

### The solution

AZO offers the possibility to deliver the necessary documents in different engineering phases – specific to every customer. Here AZO combines its long-lasting experience in the automation industry with trend-setting technologies. For example, documentation and presentation of existing, and new systems, treated and processed with the latest techniques. Scanning, made by a 360° camera, enables the depiction of the actual situation, based on a documented three-dimensional photo. Additionally a coordinate based

point cloud be created. Based on this recorded and digitalised data, the optimum basis for further specific steps such as documentation, modelling, optimisation or visualisation can be created.

## SERVICES



### Benefits of the AZO solution

- Less time effort for a complete system specific (photo) documentation
- Digital as-built situation of the scanned object
- Risk minimisation when considering existing systems regarding completeness
- Automatic generation of 360° views as further derivation of the point clouds
- Planning safety with system expansions and modernisation
- Direct compatibility with modelling and visualisation tools (no transmission errors)
- Virtual tour through the scanned system with 3D glasses
- Comprehensive basis for documentation, planning and training purposes
- Optimum basis for presentation and marketing purposes
- A freeware solution enables the user to independently view scans that have been performed
- Three levels of triggering allow different levels of detail



## Technical data

### Laser Scanner

Laser-class:	1 (in accordance with IEC 60825-1:2014)
Protection class:	IP54 (IEC 60529)
Battery type:	Li-Ion battery
Wavelength scan:	830 nm
Field of view:	360° horizontal / 300° vertical
Visibility range:	0,6 - 60m
Number of points/second:	360.000 pts/sec
Accuracy:	~ 4 mm at 10m ~ 7 mm at 20m
Camera system:	15 Mpixel camera, 150 Mpx full dome capture, HDR
Ambient conditions:	Suitable for indoor and outdoor use
Temperature ranges:	+ 5°C to + 40°C

### Quality levels of the scan

Low resolution	Duration: ~ 5 min/scan point	~ 3 million points
Average resolution	Duration: ~ 8 min/scan point	~ 18 million points
High resolution	Duration: ~ 15 min/scan point	~ 65 million points

Depending on the system or component to be scanned, several scan points are required. For larger systems, more than 100 scan points may be required.

## Application example



Comparison between a scanned point cloud on the left and a resulting 3D model on the right



Point cloud of a complete building including plant engineering



Point cloud of a scanned room, which can be further processed in a CAD program



In addition to the point cloud, scanning also produces a complete image documentation with 360° images



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The design is subject to change due to our continuous improvement program.