3D.SwivelScan –
For future-proof painting technology

Simple and precise position detection and component identification
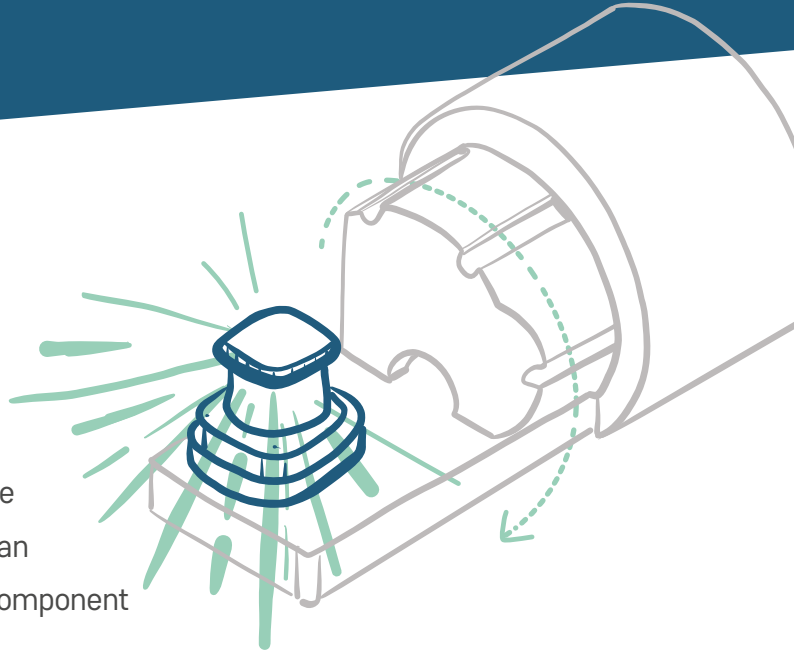
3D
aero

Flexible application in painting technology
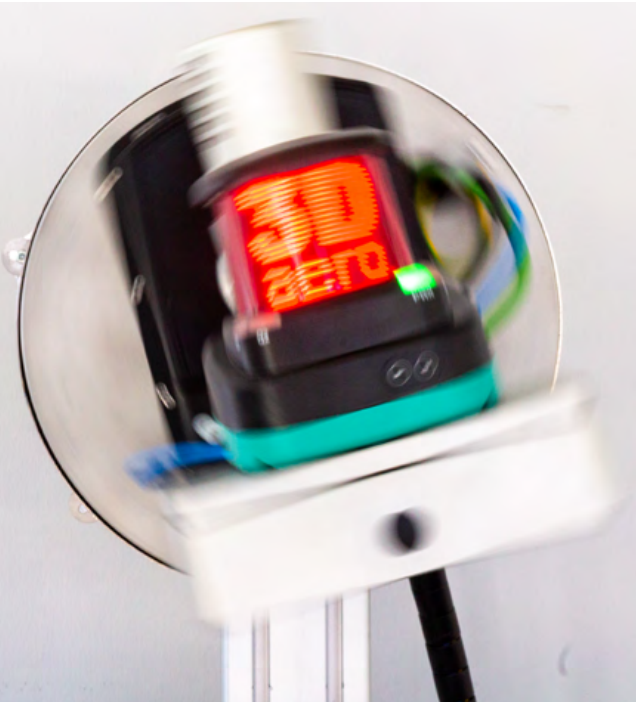
3D.SwivelScan

Introduction

The perfect interaction of the **3D.aero** software **3D.OS** and the **3D.SwivelScan** has resulted in an innovative Industry 4.0 position detection and component identification system.

Through simple handling in the commissioning and production phase without in-depth prior knowledge, the system impresses with its uncomplicated user-friendliness. The absolute measuring PXL+ sensor system with integrated color camera is significantly more economical than classic camera and image processing technology.

Simple programming, commissioning, maintenance and the easy setup of new components drastically reduce your costs.

Advantages of the Application

3D.SwivelScan - The innovation in scanning technology. Based on the latest 3D sensor technology, the system delivers calibrated, color 3D point cloud information.

• Fast ROI due to excellent price/performance ratio
• Simple and cost-effective commissioning
• Simple operation and easy setup of new components
• Insensitive to ambient light and reflective surfaces
• High resolution 3D point clouds with
  millimeter accuracy
• Large measuring range drastically reduces
  the number of sensors required
• ⟨Ex⟩ ATEX Certification

The system generates a 3D pixel cloud with color information using the PXL+ method.

A method that combines 3D geometry data with additional information. This creates a wide range of novel application possibilities.

3D Position Detection in Painting Technology

Until now, determining the position
of large components during automatic painting
has required complex camera technology and image processing.
Changing surfaces, different component dimensions and tolerances in the conveyor system
regularly result in time-consuming and costly acquisition and commissioning. In subsequent
production operations, the setup of new components by experts with image processing
know-how results in additional costs and interruptions to production.

The challenges and disadvantages of current systems are summarized:

• Large components require many cameras and mean high acquisition costs
• Costly commissioning, programming and calibration
• New components mean large commissioning and setup effort
• Extraneous light and painted double rotors lead to process abortions
• Application requires in-depth knowledge of image processing and
  coordination measurement technology

Based on our many years of experience in automation and quality assurance,
we know that automation potentials are not seized by many customers.
This is due to high initial investment, installation effort, training effort and
ongoing costs in operation.

The groundbreaking sensor solution 3D.SwivelScan from 3D.aero now provides a remedy.

3D Position Detection in Painting Technology

The world novelty of **3D.aero** is based on the application of a **3D.SwivelScan** - sensor in connection with the "Drag+Drop" user-friendly **3D.OS** software. This can generate 3D point clouds accurate to the millimeter in short distance (>1m) and also in long distance (up to 60m). Typical interferences caused by extraneous light or differently reflecting surfaces are no problem for the **3D.SwivelScan**.

The **3D.OS** software developed by **3D.aero** allows the teach-in of parts by e.g. simple loading of CAD workpiece data. The system documents traceably every single measuring result and can be coupled to every common industrial interface dialog led.

The software is capable of measuring several components simultaneously and determining their position. This is relevant if there are many components on one carrier/frame. **3D.OS** can process multi-coordinate systems, so that you as a user can always design and produce in the familiar component coordinate system. The software meets the highest requirements in terms of availability, process monitoring and logging and has been tried and tested in automotive engineering for decades.
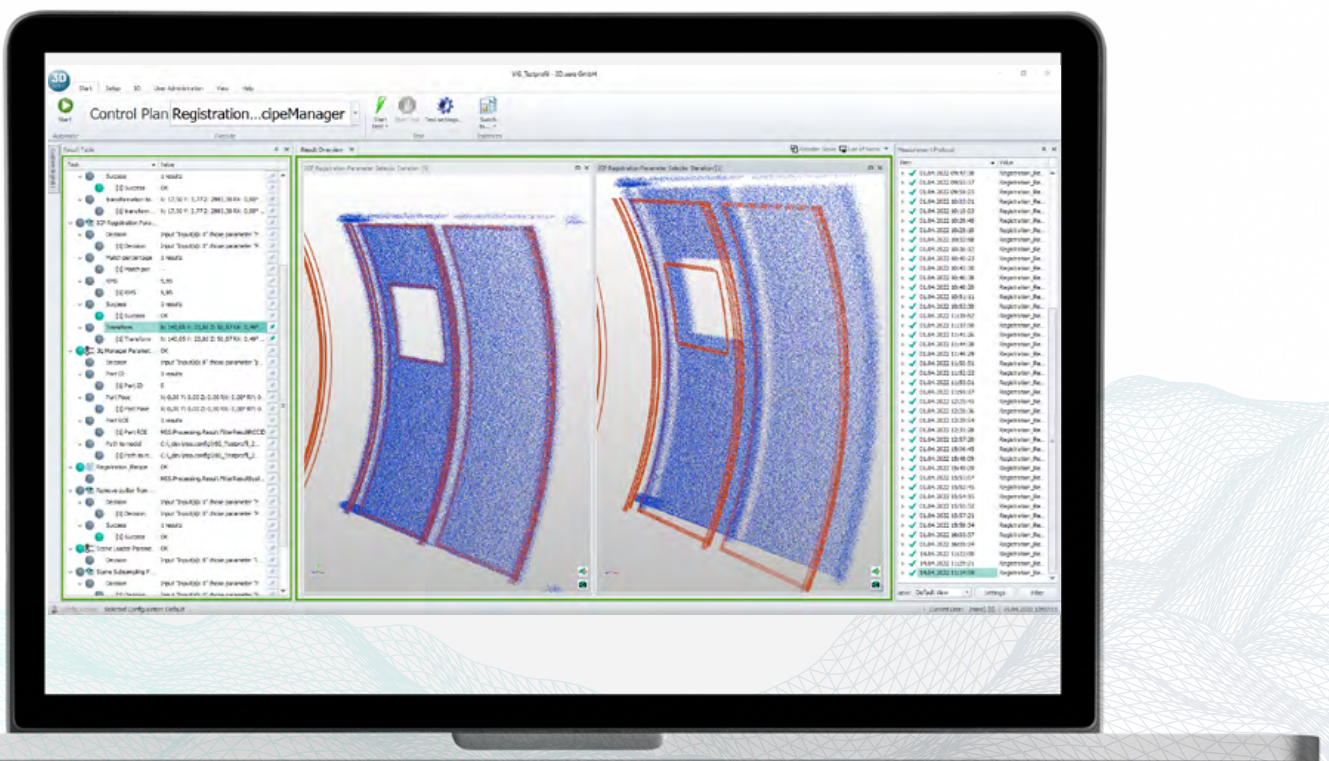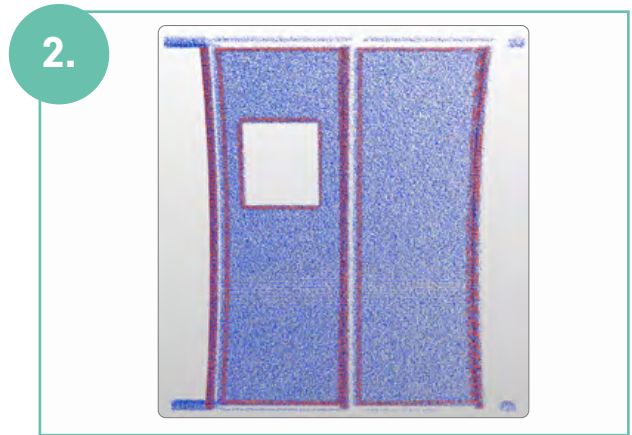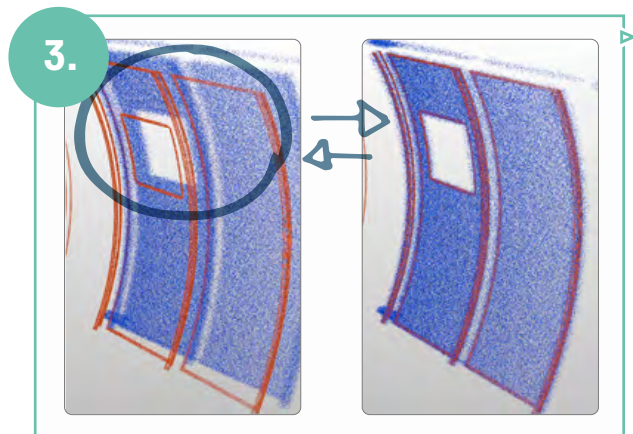
Process flow

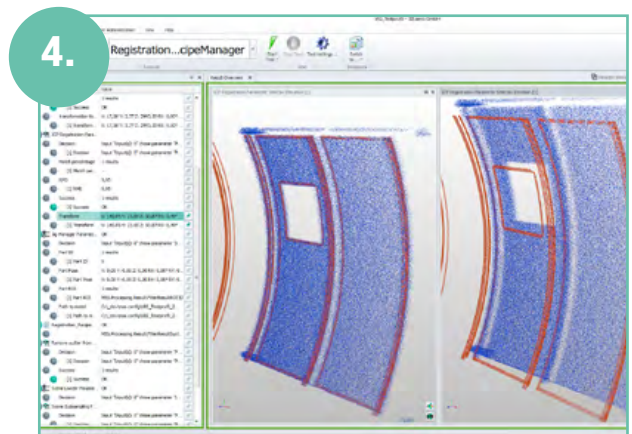The process flow of position detection and component identification works as follows:
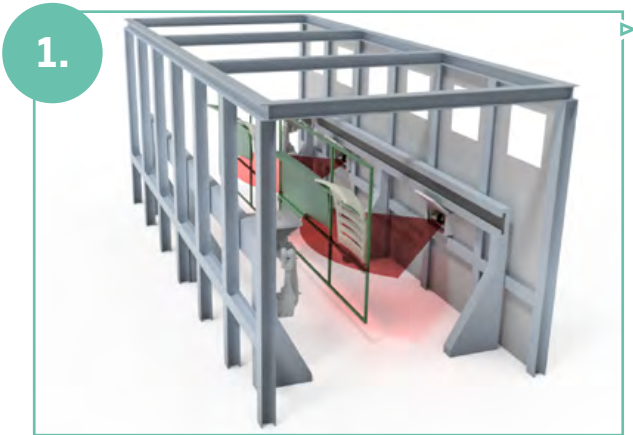
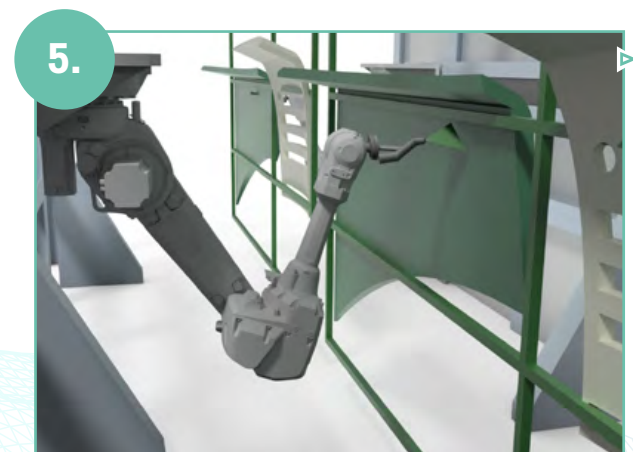**1.** Component scan before or inside the paint booth.

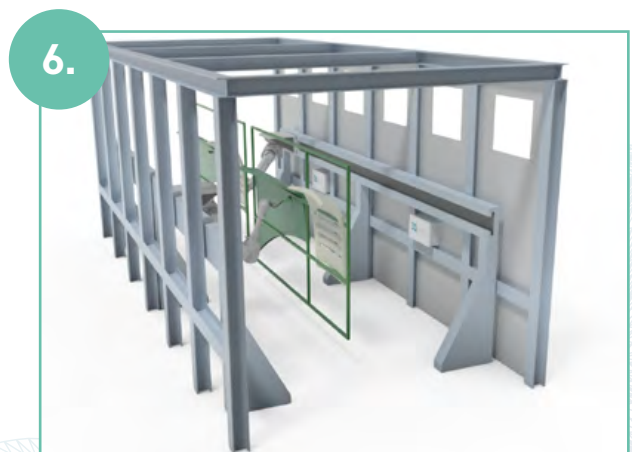**2.** Automatic pre-processing of the point cloud.

3. Automatic 3D matching with CAD model.

4. Calculation of position correction in the part or beam coordinate system.

5. Transmission of real workpiece coordinates to robot control.

6. Start of painting process.

3D.SwivelScan

Application areas

The sensor system provides you with the greatest cost and productivity advantage for large components, as painting is very efficient with just a few sensors. In addition, the system can also be used for small parts painting if components are to be identified before painting or if missing parts are to be detected. Regardless of the type and size of the components, you benefit from the very simple commissioning and user-friendly component setup.

In summary, the following application can be realized with the system:

APPLICATIONS

- Component identification
- Component position identification
- 3D measurement
- completeness control
- perimeter monitoring

INDUSTRIES

- Agricultural machinery production
- Construction machinery production
- building industry
- Rail vehicle production
- Aerospace industry
- Security and surveillance

The application possibilities are manifold. The painting of large components is a particular focus. These include, for example, agricultural machinery and construction equipment production. Furthermore, aerospace and rail transport are industries that particularly benefit from the advantages of the sensor solution.

In addition to painting technology, various industrial sectors can draw benefits from the advanced and efficient technology. For example, digitization and progress monitoring in the construction industry or large structure measurement in shipbuilding offer further potential for productivity increases.

Why should you choose 3D.aero?

YOUR CUSTOMER BENEFIT:

- High productivity through intelligent and innovative automation solutions
- Comprehensive software framework **3D.OS** that has been proven for many years in the aerospace and automotive industries: sensor integration, image processing, artificial intelligence, visualization, soft PLC, comprehensive communication interfaces, logging and audit trail, user management, remote control, user-friendly HMI
- High ergonomics through sensible arrangement of operating elements and ergonomic design of the workspace
- Avoidance of operating errors and cleaning effort by adhering to the poka yoke philosophy
- Maintenance- and TPM-friendly design
- Use of well-known, reliable and durable components
- Satisfied operators through influence in the design process, unbureaucratic support in daily operation as well as premium documentation

As a long-standing partner of the aerospace industry and the associated expertise in the field of large component measurement, we know your challenges and quality requirements.

You have another application in mind? Then challenge us and benefit from our know-how in the field of measurement technology and quality assurance.

Contact

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