MICRO-EPSILON

automation**CONTROL**
Robot painting with ATENSOR LS1-Technology

automationCONTROL DPS 8005.T

automationCONTROL DPS8005.T is a system that can be fully integrated to different types of automatic paint robot. The different parts are scanned during the process. Subsequently for each object one or more individual robotic programmes are created and automatically transmitted to the processing robots.

Due to high programming effort, the limits of common automation systems are quickly reached in terms of different parts and types of component. Using the DPS 8005.T any objects can be painted using different versions of robots.

Precise proliferation of options

Automation in industrial environments is a challenge when it comes to processing different parts or components. Regardless of the number of single parts, components or finished products, the processing of these different objects requires extensive, accurate programming of the robots.

The innovative, high resolution scanning technology used by the DPS 8005.T system enables precise digitalisation and further processing of 3D data. Even the smallest details such as elements of a combustion engine can be detected reliably and considered during processing. Robot tracks are automatically generated and are adapted to the actual shape of the object on the basis of 3D data. Therefore, collisions are avoided and processing cycles can be optimised and automated.

Benefits

The automated paint robot process DPS 8005.T ensures the quality of the paint finish. Independent of the batch size, the automated paint process can be extended to an unlimited number of versions.

Geometry robot tracks have to be created and optimised in the case of common programming. This often results in idle time, as well as a reduction in capacity utilisation of industrial robots. automationCONTROL allows 100% capacity utilisation of any application.

Scan-technology based on Laser-triangulation

Laser   Camera
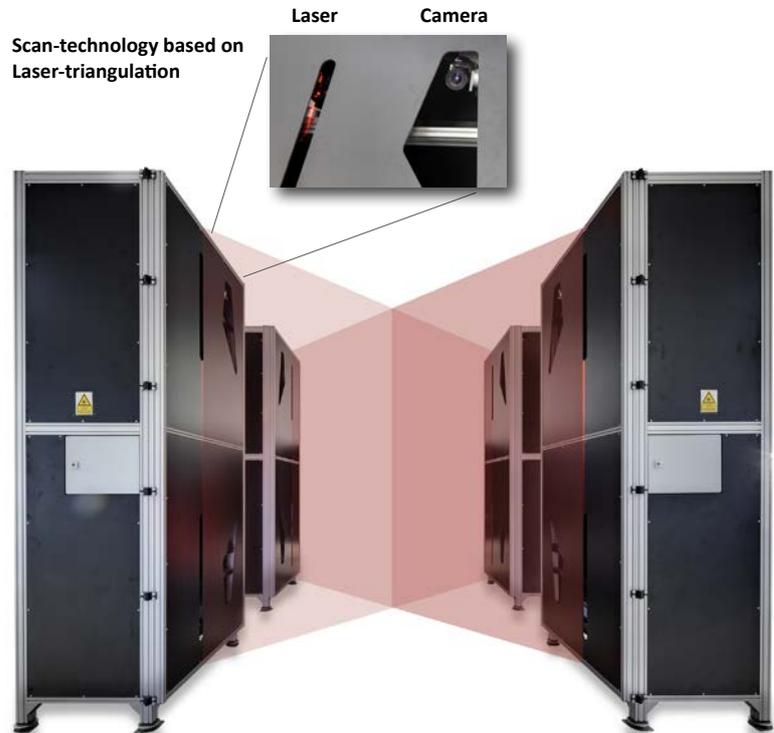
PROCESSING STEPS

The automated processing of the object to be painted is performed in two steps.

► **Area**

The development of paint tracks for each part is done automatically. The user can determine areas for different planning and processing strategies. Furthermore, global parameters can be set up. During track planning, the tracks are adapted to the actual surface and the robot movements in the processing area are optimised.

► **Detail**

If there are special processing steps required for particular geometries, these are achieved through detailed processing. Examples here include dirty locations or undercuts which are very difficult to access. Areas that need to be cleaned or painted are processed with predefined movements. Therefore, setting specific paint parameters is possible. The actual geometry of the total part is considered during the processing.
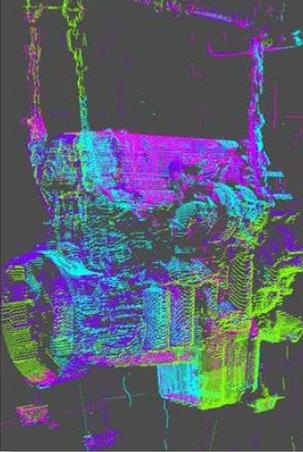

Area: Automatic track planning
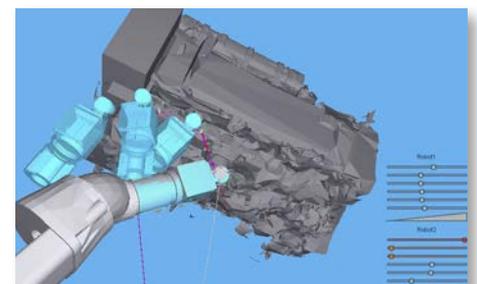
Detail: Movement planning

processing with ATENSOR LS1-Technology

SCAN

► Laser-triangulation
► 3D-data
► Position determination

PLANNING

► Development of tracks
► Detailed planning
► Programming

PROCESSING

► Cleaning
► Paint
► Preserve

Complex geometries

Even in the case of complex geometries, applying robots has its limitations. Due to many different versions and add-on pieces, common track planning becomes difficult. Therefore, the effort required to ensure safe robot processing increases considerably. Often the only alternative here is manual processing.

The scanning technology of the DPS 8005.T can be adapted to complex geometries such as the chassis of a truck. Furthermore, each detail is digitalised. The measurement results are therefore reliably displayed in their total 3D data structures. Robot tracks are automatically produced and adapted to the actual shape of the object in 3D. Therefore, collision is avoided and as a result, the processing can be optimised and automated.
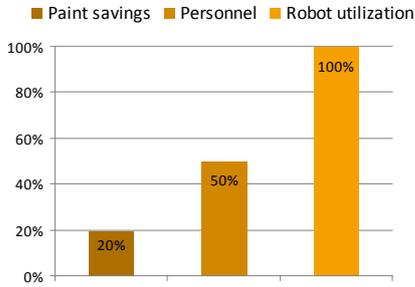

Manual paint

Layer thickness

The layer thickness of 100% that is achieved with area processing is attained for complex geometries at approx. 70% of the surface area. Areas that are difficult to access such as undercuts are painted using detailed processing. Therefore, even complex geometries can be painted automatically. Only in exceptional cases where the robot paint guns are restricted will special, manual paint touch up guns be required.
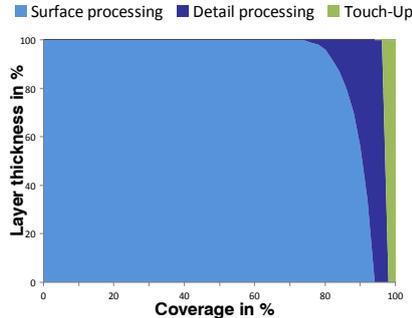
Degree of covering compared with layer thickness during automated paint

Savings potential

Saving potential of automationCONTROL

Robot-based paint systems that use automationCONTROL enable savings in paint usage of more than 20% compared to manual painting.

Furthermore, automated systems allow reductions in the applied load, as well as reducing the number of paint staff by an average of 50% in shift work.

Compared to common robot programming where often production must be interrupted, by applying automationCONTROL the robots are fully utilised.

BENCHMARKING DATA

The DPS 8005.T system for the automatic development of robot programmes for the cleaning and painting of compression ignition engines features the following benchmarking data:

Scan area:	1,500 mm x 1,500 mm	High availability:	yes
Resolution:	1 mm	Remote support:	yes
Number of scanners:	8	Line integration:	ProfiNET
Hardware:	Industrial standard	Program transfer:	FTP
Order management:	Datenbase	Scan speed:	2.7 m/min
User management:	3-stages	Scan duration:	25 s during the process
Program parameter:	configurable	Programming time:	180 s

Further applications

automationCONTROL is based on the ATENSOR LS1 technology and can be used for non-contact and contact applications.

Amongst these applications are:
- ► Grinding
- ► Shot blasting
- ► CO_2 cleaning
- ► Painting
- ► Preserving
- ► Polishing

automationCONTROL is typically applied in production environments that are equipped with processing robots and corresponding automated handling/conveyor techniques.

Example: shot blasting

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