

# SKM DCAM

Offline programming system  
CNC and Robots

The specialist for your individual  
CAD/CAM processes

## MODULE BASED OFFLINE PROGRAMMING SYSTEM

FOR PATH DRIVEN PROCESSES WITH A FOCUS ON LASER MATERIAL  
PROCESSING AND ADDITIVE GENERATIVE MANUFACTURING PROCESSES  
WITH COMPLEX KINEMATIC SYSTEMS



Integrated CAM solutions and services

# SKM DCAM: THE EFFICIENT CAD/CAM SYSTEM FOR PATH DRIVEN PROCESSES WITH COMPLEX KINEMATIC SYSTEMS (UP TO 9 SIMULTANEOUS AXES)

SKM DCAM is the result of many years of development, testing and practical application. It offers various features for simplifying and speeding up CAM-oriented geometries and track planning with a high level of automation.

Our outstanding flexibility for the realization of integrated CAM solutions lies in the modular design, various interfaces and long-standing expertise.

## THE BENEFITS

### REDUCING THE MANUFACTURING COSTS THROUGH OFFLINE PROGRAMMING:

- ▶ Higher availability of the manufacturing cell through teach-in reduction
- ▶ Robot simulation, collision analysis and optimization in the machine model before running in reality
- ▶ Shorter processing and lead time for work preparation, in particular with complex geometry
- ▶ Improvement in program accuracy and process quality
- ▶ Customized solutions due to combinations of process-specific technology modules
- ▶ Security of investment thanks to 25 years of know-how and an extensive partner network

## TECHNOLOGY PARTNERSHIPS IN RESEARCH, DEVELOPMENT AND INDUSTRIAL NETWORKS SUCCESSFULLY LINKED - BEING AHEAD IN TECHNOLOGY

Our success is based on thriving, long-standing partnerships with technology partners and end customers. Also we engage in the form of intensive cooperation and active involvement in industrial networks and joint research projects.



## FEATURES AND BENEFITS

### EFFICIENT DATA ACQUISITION, PREPARATION AND OPTIMIZATION

- Integration of measuring and digitization technologies with direct coupling and import filter
- CAD functions for modelling curves and surfaces, as well as editing, adjustment and NC optimization
- Extensive CAD interfaces and add-in coupling for CAD systems (e.g. Autodesk Inventor)

### FLEXIBLE MODEL DEFINITION OF THE ENTIRE 3D MANUFACTURING CELL

- Modelling of the manufacturing cell, CAD import, robot as well as tool and equipment libraries
- Adjustment of devices and components, functions for plant modelling and commissioning (calibration)
- Kinematic with release definition, positioners, joint and TCP mode, dynamic layers, devices

### 5-AXES TRACK PLANNING WITH STRATEGIES FOR COATING, GENERATING, WELDING AND CUTTING

- Laser cladding with powder and wire
- Laser hardening, cutting and welding
- Laser remote cutting, material removal (ablating)
- Arc Welding (conventional, additive)
- Technology parameter database support
- Process-specific tracing including media instructions
- Exceptional performance in data processing during track planning and simulation
- Contouring and filling strategies: radial, planar, cylindrical, contour parallel, contour and surface offsets

- Strategies have a high level of automation due to parameter templates and macros, i. a. also for functional graded materials
- Toolpath editor for optimization of the starting points, orientations (beam axis, path tangent), grading, additional movements (loops, sky-writing), process stops and track sorting

### PROCESS ASSURANCE THROUGH SIMULATION, COLLISION DETECTION AND OPTIMIZATION

- Optimization and validation due to tool and machine simulation, including external axes (NC simulation with collision check up to 9 simultaneous axes for CNC and robots)
- DCAM integrated inverse kinematic and integration of external positioner (Easy-Rob-Kernel for all common robot systems, REIS-virtual robot controller)
- Reliability and efficiency due to collision detection and intelligent avoidance strategies
- Optional video output for visualization and coordination with customers and partners

### AUTOMATIC GENERATION OF CNC OR ROBOT PROGRAMS

- Optimized postprocessor output and flexible coupling of CNC machines and robots via free configurable postprocessor technology (postprocessor library for all common types)
- Back-reading of NC programs with analysis and visualization

## THE BASIS SYSTEMS

### DCAM basis system multi-axes robot

KINEMATIC MODULE FOR UP TO NINE SIMULTANEOUSLY INTERPOLATED AXES INCLUDING ADDITIONAL AXES AND ROBOT LIBRARY

### DCAM basis system multi-axes CNC

KINEMATIC MODULE FOR UP TO SEVEN SIMULTANEOUSLY INTERPOLATED AXES INCLUDING ADDITIONAL AXES

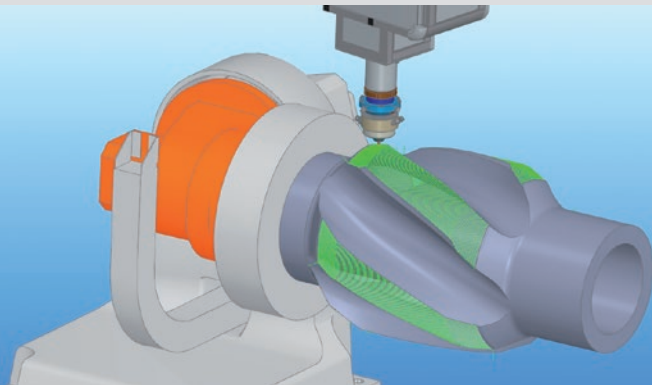
### DCAM basis system NC/CNC 2.5 D

SIMPLE 2.5 CAM FUNCTIONS

# THE TECHNOLOGY MODULES

## STRATEGIES FOR COATING, GENERATING, WELDING AND CUTTING

### LASER POWDER CLADDING



**Volume build-up in layers:**

calculation of slices, tracing of cutting contours, filling of defined areas. Support of functional graded materials (FGM) and management of different powder lines for material and media.

**Surface coating:**

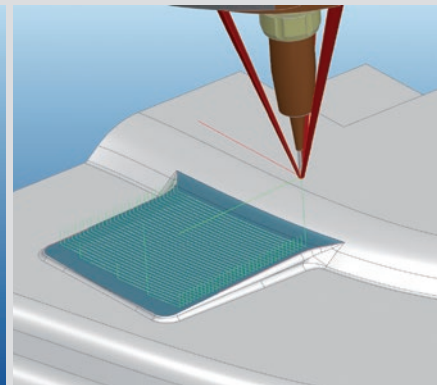
multi-layer coating within defined boundary

**Multi-axis machining:**

machining along vector curve or isolines of mesh nets

*(technology partner: Fraunhofer IWS, Laservorm)*

### LASER WIRE CLADDING



**Laser powder cladding process parameters:**

powder flow for up to 4 powder feeders, shielding gas, carrier gas, layer thickness (constant or variable), laser power (adjustable for each layer). The parameter records for contour tracking and surface filling can be selected separately.

**Laser wire cladding process parameters:**

wire feed, switch-on/off, delay for wire feed, shield gas, layer thickness (constant or variable), laser power, maximum critical angle of contour. The parameter records for contour tracking and surface filling can be selected separately (even for complex wire regime).

### LASER HARDENING



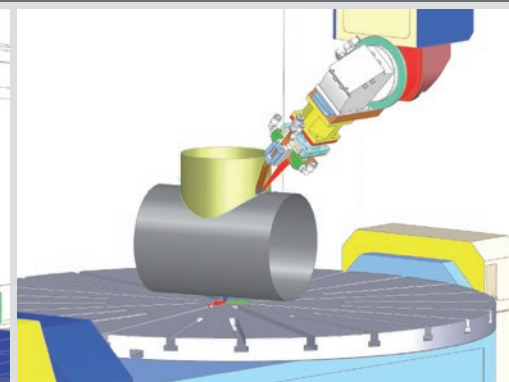
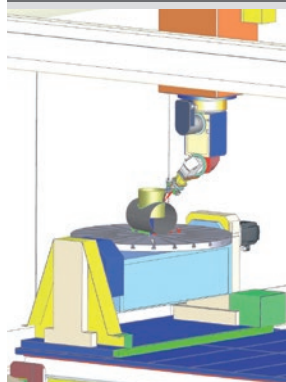
**Track hardening:** machining along defined vector curves, supports variable track width

**Edge/surface hardening:** coating along edges and within defined surface areas

**Process parameters:** process gas, laser power. The parameter records for contour tracking and surface filling can be selected separately.

*(technology partner: ALOtec, Laservorm)*

### LASER WELDING

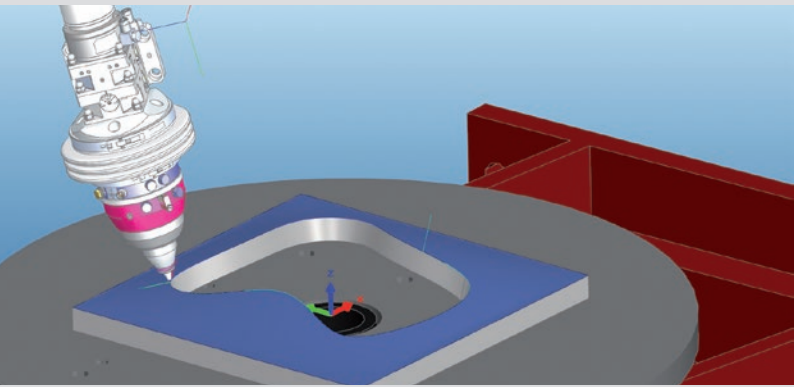


**Laser welding:** with path offset, various lead-in/lead-out options, weld position: push or pop, inclined fillet welds

**Process parameters:** shielding gas, filler wire, laser power, various head positioning and aligning options

*(technology partner: Arnold Laserzentrum)*

## LASER CUTTING



### Laser cutting in 2D-mode:

cutting clearance compensation, various lead-in options, automatic detection of outer and inner curves, automatic cutting from the inside to the outside, sky writing and loops.

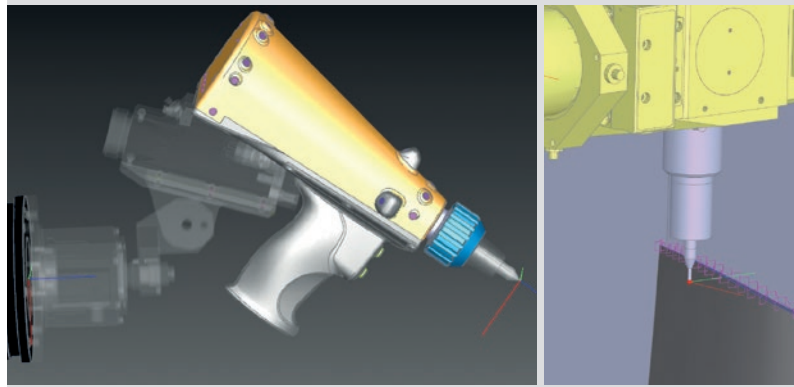
**Process parameters:** process gas, position control, transition angle for loop figures.

### Laser cutting in 5-axes-mode:

cutting clearance compensation, various lead-in and lead-out movements, inclined chamfer cutting, loop machining

**Process parameters:** process gas, laser power, position control, transition angle for loop figures, various head positioning and aligning options, including external axes.

## MEASUREMENT PROGRAMMING

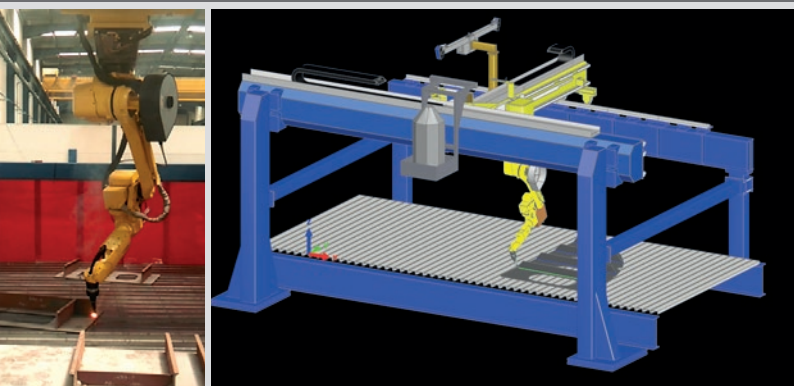


The measuring points are traversed in a predetermined order. The as-is positions will be transferred to the CNC-control for further use.

PreciTrack3D IR-Tracker for contour capture, 6DOF, wireless, large work area, customizable tips.

*(technology partner: PreciTrack3D)*

## ARC WELDING AND JOINT WELDING

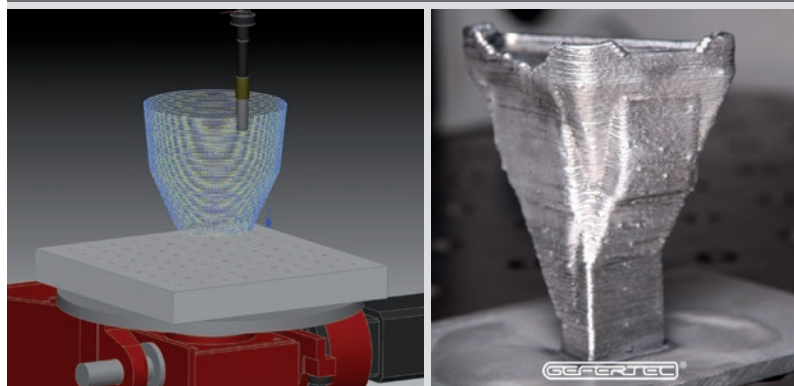


### Welding of mini panels in shipbuilding with assisted operations

CAD + Scan Fitting: Base for path planning

*(technology partner: MARTEC)*

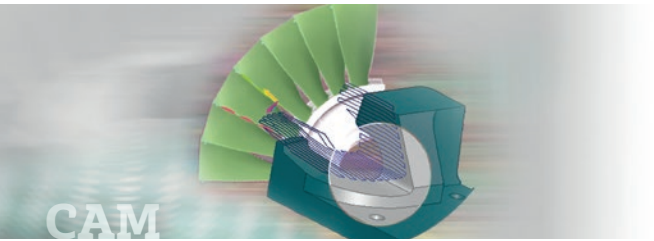
## ARC WELDING AND GENERATING



### Additive generative manufacturing of large-scale components with CNC.

Offline programming based on the jointly developed 3DMP® technology module.

*(technology partner: Gefertec/ Scansonic Group)*



## CAM SOLUTIONS

▶ Laser material processing and robotic with SKM DCAM, offline programming for CNC and robots



## CAD/PDM SOLUTIONS

▶ Application development and CAD automation in the mechanical engineering and manufacturing area



## IT SOLUTIONS

▶ IT Consulting, professional implementation of IT concepts and process-oriented IT service management



## TRAINING

▶ Consulting and training in IT/CAD/CAM, services and personnel leasing

## THE IT SYSTEM HOUSE WITH 25 YEARS OF EXPERIENCE.

The S.K.M. Informatik GmbH was founded 1990 in Schwerin (Germany) and supports companies worldwide with IT/CAD/CAM/CAE technologies. We develop individual solutions and help our customers to keep up with the changing digital world of work. Because of the wide range of manufacturers and software providers in the field of CAM, we are realizing individual solutions for integrated manufacturing processes together with our partners. Therefore, SKM DCAM can connect with different technics for measurement and digitization and supports a lot of CNC manufacturers and robot types.

S.K.M. Informatik GmbH  
Eckdrift 95, D-19061 Schwerin  
Phone +49 385 4883654  
Fax +49 385 4883611  
DCAM-Sales@skm-informatik.com

Aus Ideen **Lösungen** machen.

[www.skm-dcam.com](http://www.skm-dcam.com)