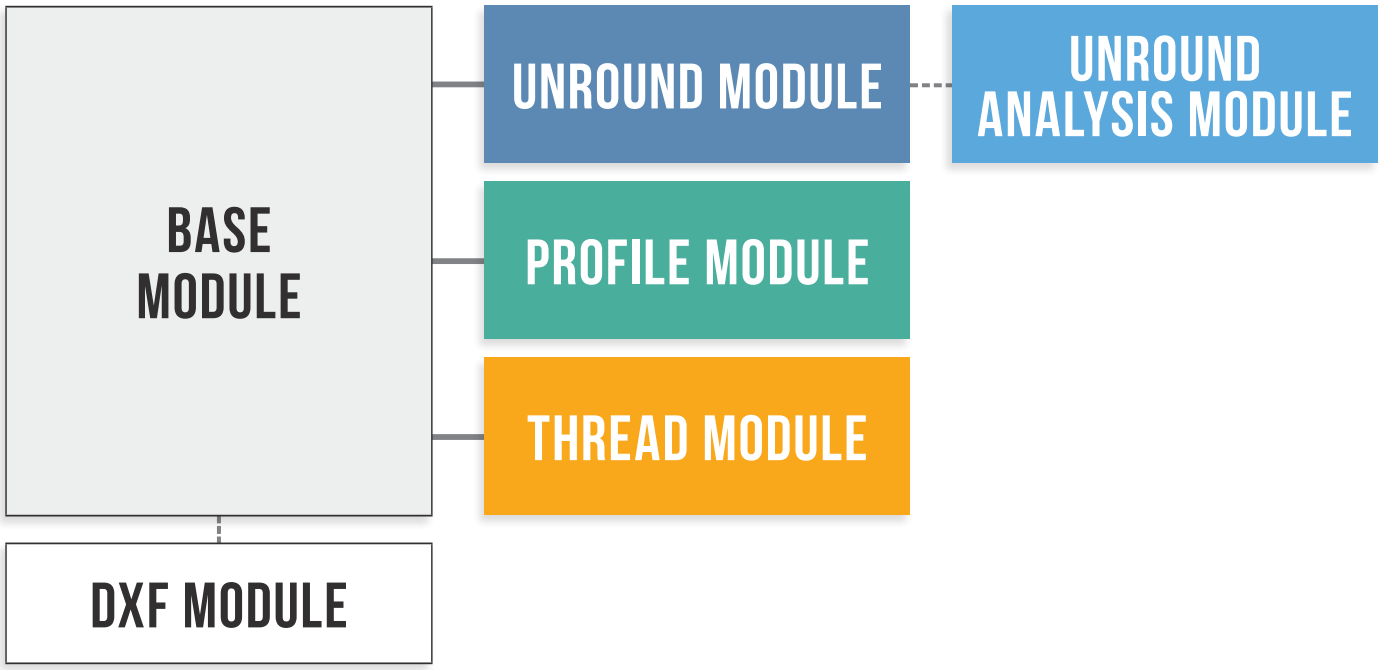
KELLENBERGER

BLACK CAM SOLUTION

BLACK CAM SOLUTION MODULE AT A GLANCE



The BLACK CAM® Solution is a modern CAD/CAM software for the simple creation of out-of-round, contour and dressing programs. With extensive CAD drawing functions, profiles for out-of-round and contour grinding, as well as profiles for dressing, reprofiling profile and thread grinding wheels can be designed easily and quickly. It is even easier and faster to import profiles from existing CAD data for further use. Of course, the most common formats such as STEP, IGES or DXF are supported for this purpose. Various intelligent tools detect and correct profile defects such as gaps, inside corners or overlaps. Several analysis functions for out-of-round and thread grinding help to check the grinding result for possible form deviations even before the first contact with the machine.

With the program animations, travel movements and speed ratios of the grinding and dressing operations can already be shown at the workstation. Especially for non-circular machining, the speed behavior of the grinding point can be decisive for the grinding stock removal and the resulting shape accuracy. The determined machining times support the planning of long processes, such as the clearing or reprofiling of grinding wheels, as early as the quotation phase. The integrated document management ensures that all documents belonging to the project, such as workpiece drawings, photos of superstructures, etc., can be stored centrally in a file. This means that the documents are also available when the project is opened at another workstation.

BLACK CAM SOLUTION FEATURES

BASIC MODULE

Software package with CAD core
Only in combination with Unround Module, Profile Module and Thread Module

UNROUND MODULE

Software package for creating any non-round contours and corresponding non-round programs

- Generation of out-of-round programs
- Import / Export of 2D and 3D CAD data and stroke value tables (DXF data only in combination with BLACK CAM Solution - DXF)
- Full CAD drawing functions incl. dimensioning
- Various algorithms for corrections of faulty contours
- Simulation of axis movements
- Integrated document management for the maintenance of entire projects
- Contour macros for the creation of a multitude of non-circular contours such as rectangle, polygon, eccentric, ellipse, polygon profile, bi-edge, flattening, key surfaces, ground square and parameter curve

Only in combination with Basic Module

UNROUND MODULE ANALYSIS

Software package for:
- Grinding analyzes to calculate form errors with center height and calibration errors as well as wheel wear
- Contour analyzes to examine curvatures and angle transitions as well as to compare contours

Only in combination with Basic Module and Unround Module

PROFILE MODULE

Software package for the creation and editing of any contour and dressing profiles and corresponding NC programs
- Generation of contour grinding and dressing programs
- Import / export of 2D and 3D CAD data (DXF data only in combination with BLACK CAM Solution - DXF)
- Full CAD drawing functions incl. dimensioning
- Various algorithms for corrections of faulty contours
- Simulation of axis movements
- Integrated document management for the maintenance of entire projects

Only in combination with Basic Module

THREAD MODULE

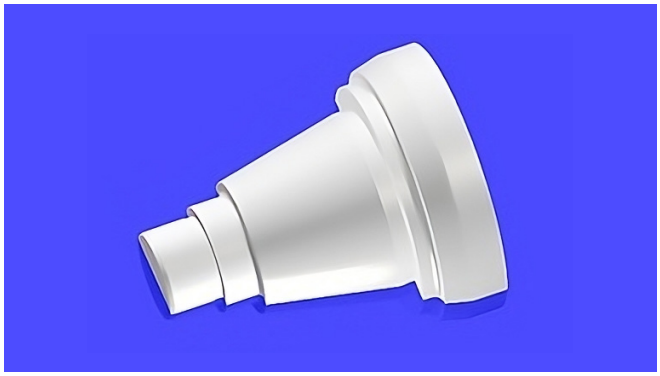
Software package for creating and editing thread profiles and their dressing programs.
- Creation of thread profiles only via contour macros (standard threads according to ISO 68/DIN and UN inch thread)
- Calculation of thread distortion for the dressing profile
- Thread Analysis for calculation of form errors on the thread
- Special threads only possible in combination with Profile Module or Unround Module

Only in combination with Basic Module

DXF MODULE

Software extension for import / export of DXF data
Only in combination with Basic Module

BLACK CAM SOLUTION MODULE IM DETAIL



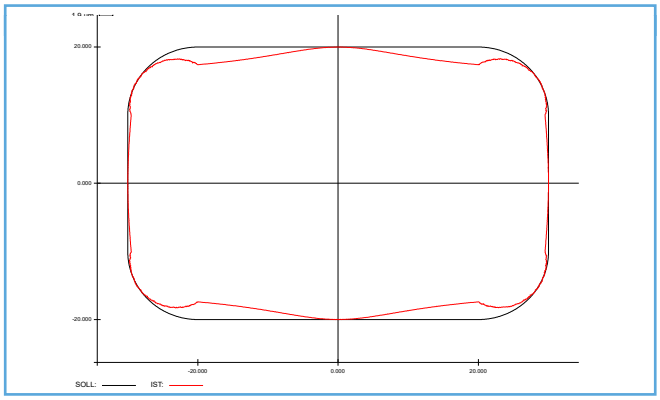
3D-IMPORT

Import of a 3D CAD rotational body for contour grinding. The blue area shows the cutting plane with which the body is to be cut.



PROGRAM ANIMATION

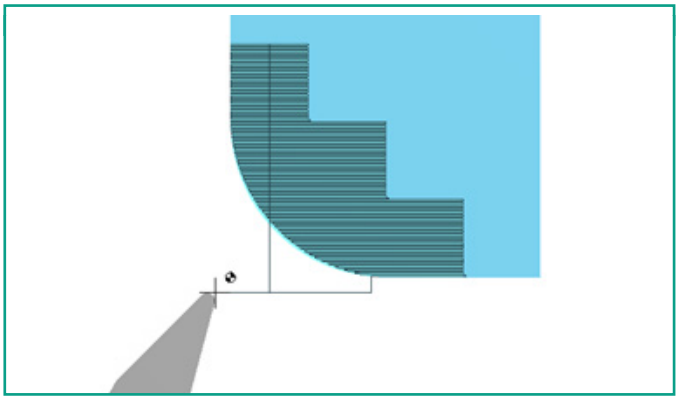
3D program animation of an out-of-round machining inside, with simultaneous highlighting of the current program line. The machining can be simulated in 3D as well as in 2D. simulated. Switching is also possible during the animation.



DEVIATION CALCULATION OUT-OF-ROUND MACHINING INSIDE

The figure shows the calculated theoretically expected error to be expected when grinding with a grinding wheel diameter is too small than the diameter defined in the control.

Dimension:_____60x40mm
Dss_Control:_____18mm
Dss_Real_____17.99mm



CLEARING OUT / REPROFILING

Reprofiling of a profile grinding wheel from a profile with corner radius to a step profile.

THREAD DISTORTION AND SHAPE DEVIATION

Due to not being in the pitch of the thread inclined grinding wheel, the thread profile must be up of the grinding wheel are dressed in a distorted way, so that this can be ground without any shape deviation on the workpiece.

The picture shows the analysis of a thread profile which can only be ground with a smaller shape deviation. The necessary distortion of the thread profile is shown in blue, the expected deviation in red.

