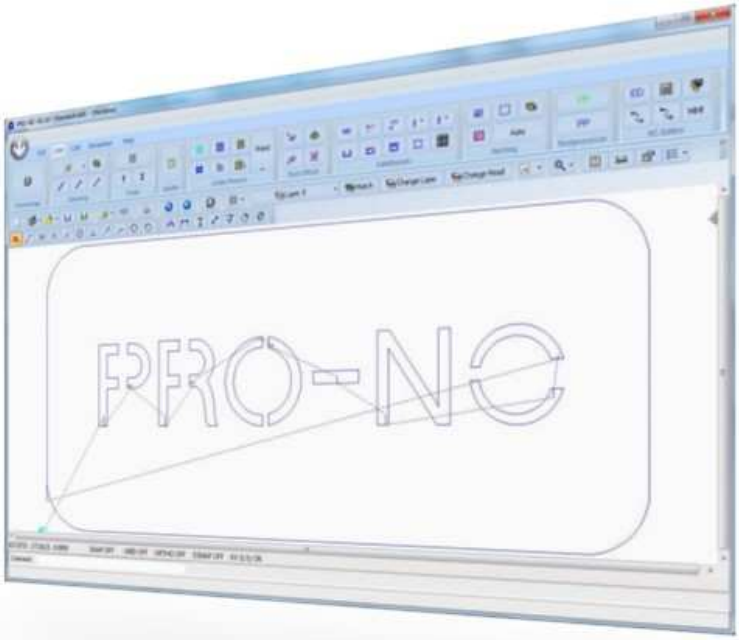
PRO-NC

Professional CAD/CAM-Programming



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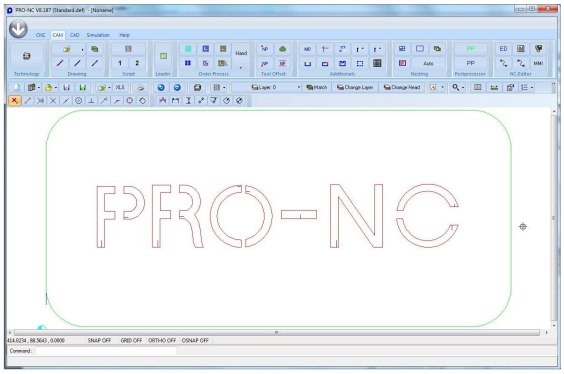
PRO-NC Overview

Description



PRO-NC is a CAD / CAM programming system (2D / 3D), for the following operations:

- Laser cutting
- Laser marking
- Laser welding

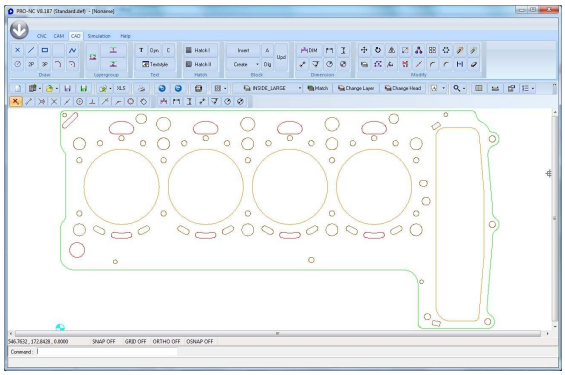
PRO-NC guaranteed by a full-marketability of the design (CAD) to manufacturing (CAM). Features such as contour analysis, automatic contour tracking, leadin, leadout, tool offset compensation, scripts, etc., complete NC programs, including technology, are generated by taking data from CAD drawings in a variety of formats:
(DXF, DWG, IGES, HPGL, STEP,...)

PRO-NC offers a number of features that allow recommend the comfortable CAD drawing preparation and quick creation of programs such as:

Import DXF and DWG files

The DXF/DWG - interface allows to read drawing files of different CAD systems. By the DXF/DWG - compatibility, it is possible to read CAD drawings directly in PRO-NC and / or further edit.
Other (optional) import formats are:
IGES, HPGL, STEP, STL, MCL...

Independent drawing creation



PRO-NC supports following 2D / 3D objects:

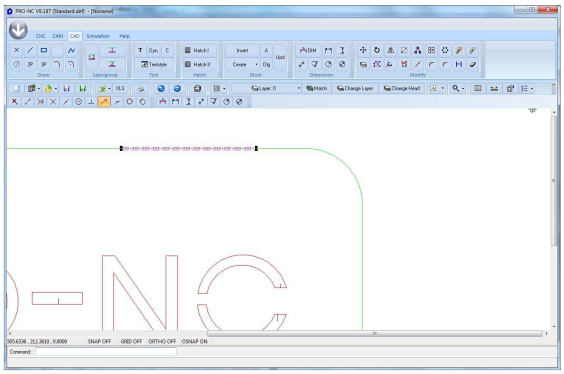
- Line
- Circle
- Arc
- Polyline
- Spline
- Ellipse
- Hatch
- Block
- Attribute
- Dimension
- Text (Truetype- and SHX-Fonts)
- Barcode
- ...

PRO-NC has extensive 2D/3D CAD capabilities: Move, Copy, Delete, Mirror, Scale, Trim, Fillet, Layer change, Change order, Moving, Stretching, Parts, etc.
In addition, "object snaps" such as Endpoint, Midpoint, Intersection, Quadrant, Tangent ... are supported.

With this CAD commands it is possible that drawings can be created directly in **PRO-NC** or change imported CAD files later and prepare complete drawings.

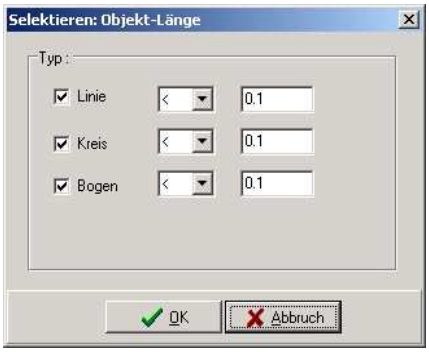
Shape analysis

Searching for "double" drawing objects



PRO-NC can search double line, circles, arcs, points, and text and delete them from the drawing, if the required processing this desirable. Therefor you have manual and automatic functions.

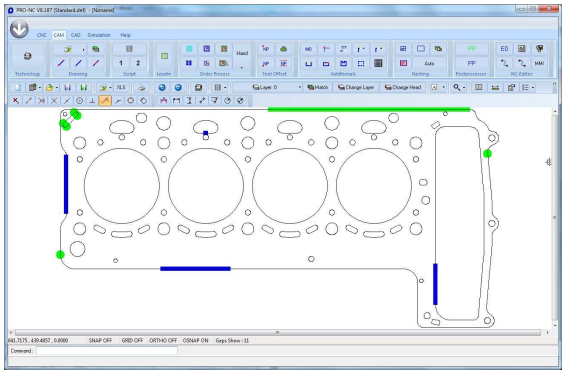
Searching for "small" drawing objects



The contour analysis allows the detection of very small, often drawing unwanted objects. By entering the boundaries all objects are found that match the filter conditions. The objects are marked and can be removed using the 'Delete' command.

Searching for contour gaps

PRO-NC will find contour gaps (tolerance is adjustable) and closes automatically. Contour gaps that are outside the acceptable tolerance may be indicated by markings.



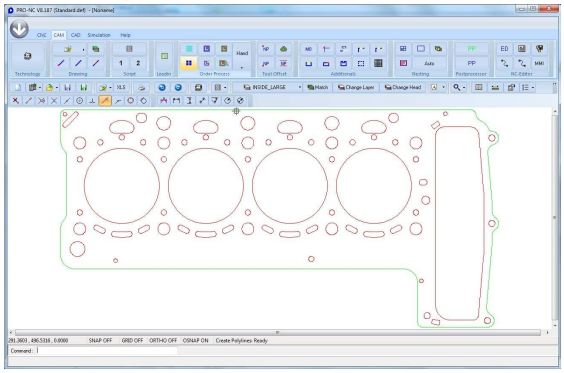
Searching for contour overlaps

PRO-NC cleaned contour overlap, that is, are, for example, several lines or arcs above the other, are the elements trimmed and changed so that remains a unique contour left.

Contour optimization by arcs

PRO-NC optimized contours with many small lines so that takes place a uniform course.

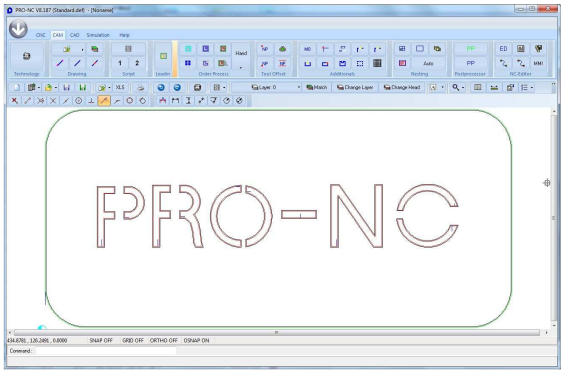
Automatic inner / outer contour detection



PRO-NC recognizes inner - and outer contours automatically and places them on different layers. Also small and large contours can be automatically detected.
Each layer can have different process strategies (leadin, order, direction, offset ...).

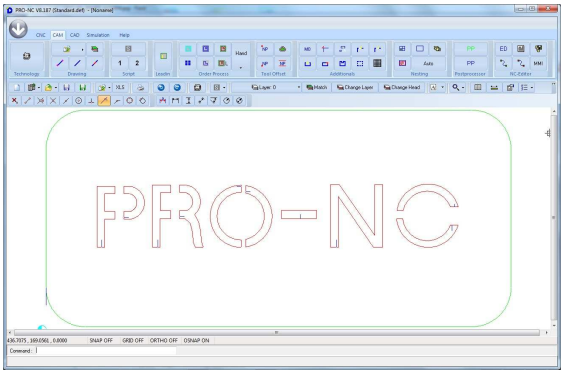
Process

Tool offset



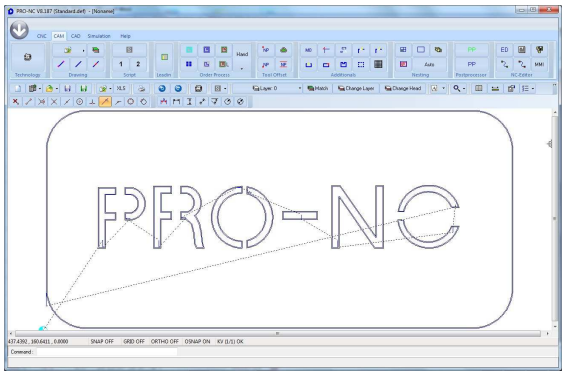
Taking into account the beam diameter the equidistant of the tool path is calculated for the drawn contour; applicable for CNC controls that do not have this function (G40 / G41 / G42) feature. Further characterized the calculation times can be minimized on the machine.

Leadin / Leadout



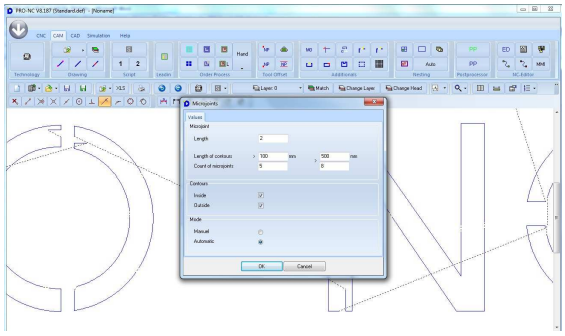
PRO-NC generates contour and technology-based leadins/leadouts. These can be set automatically or manually. The change of the length, position and rotation angle are always possible.

Contour tracing



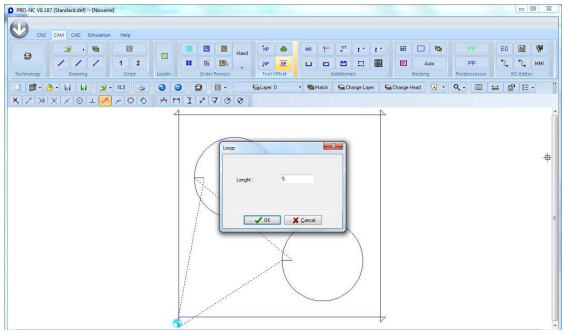
For the determination of the processing sequence different contour tracking strategies are available: Automatic, the shortest paths or Manual to determine the sequence of contours freely.

Microjoints



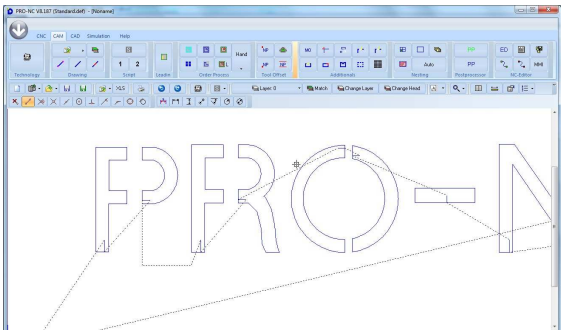
Microjoints can be placed manually or automatically. These can be provided without / with leadins / leadouts.

Loops



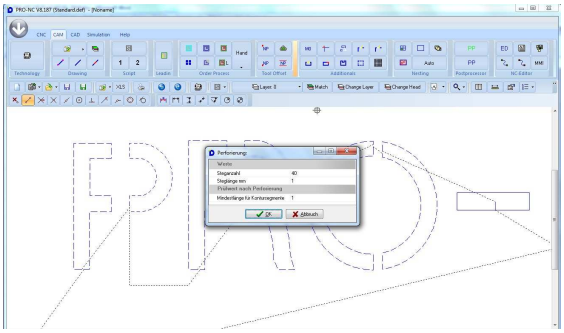
Loops can be set by various parameters in contour corners that exceed a certain angle change.

Additional rapids



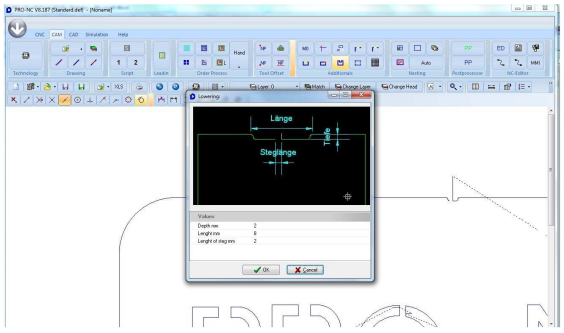
Any number of additional rapid movements can be placed.

Perforation



Perforations can be created with different parameters for each contour.

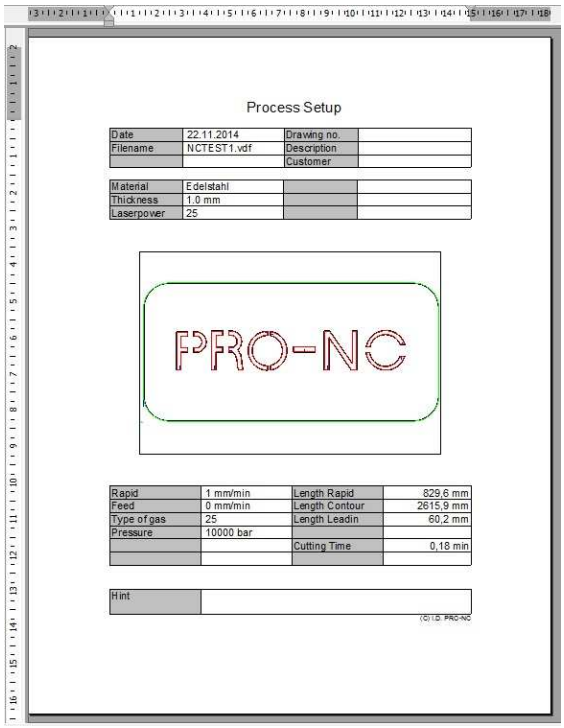
Leadin lowering



Special lowerings during leadin/leadout can be placed automatically.

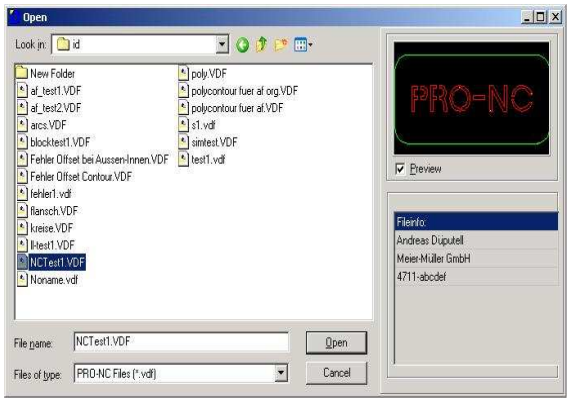
Management

Reports



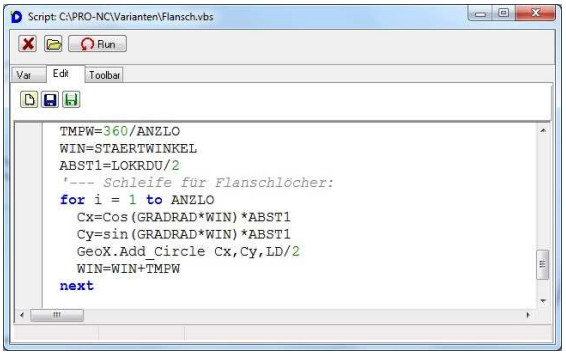
A user- definable graphic report can print operations and settings:
customer data, laser parameters or file information.

File management



A clear file management with graphical preview and display (adjustable) Additional information, such as Date, Name, Customer, Material, Number, Date ...) support the finding of existing drawings / NC programs for data transfer to the machine or for nesting of parts on a sheet.

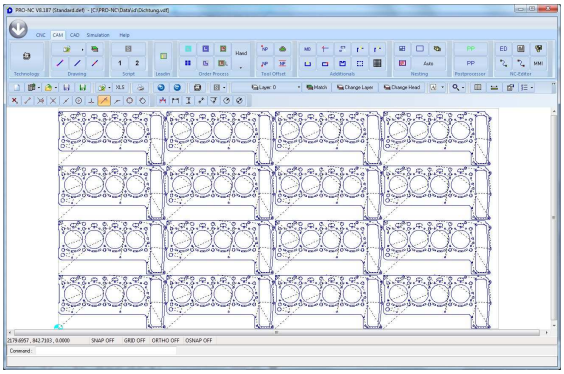
Can be automated through integrated scripting language



Using the built-in script language recurring processes can be automated, for example, Inside / Outside detection, tool compensation and setting the leadins/leadouts.

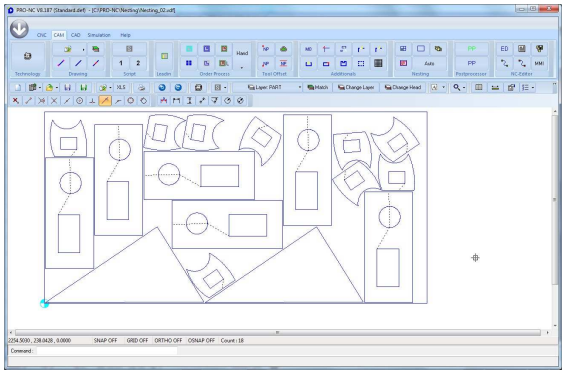
Nesting

Nesting – Palletizing



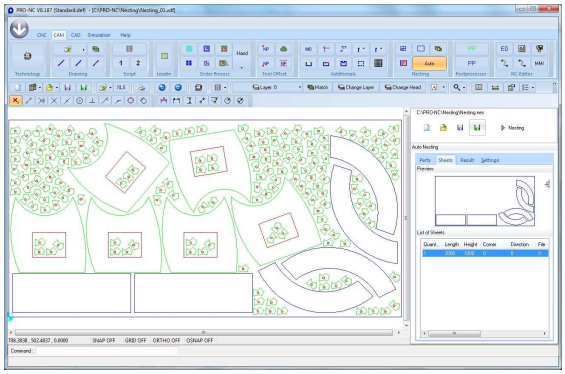
The palletizing is a very fast and easy way to show a sheet with a parts more than once; after input of sheet length, width and the parts intervals calculated **PRO-NC** the maximum number of the current component in X and Y. This number can be confirmed or changed.

Nesting – Manuell



After defining the sheet dimensions, different parts with the convenient file management can be selected. The selected component is visible at the mouse cursor, it can be rotated, flipped, moved and thus best placed.

Nesting - Automatically (Option)



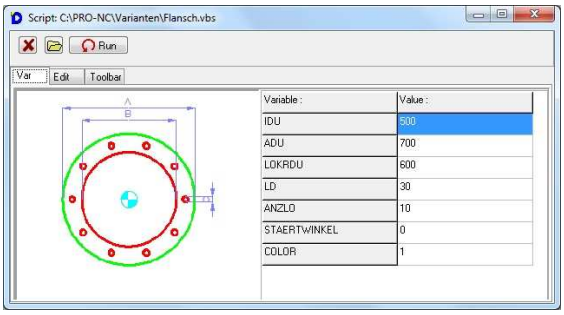
This module is based on a "true-shape nesting", ie automatically be nested sheets the predetermined arbitrarily shaped parts / drawings according to their number to one or multiple (n). Adjustable groups include sheet number, sheet dimensions, priorities, angular positions and strategies. It takes into account also the surfaces of the inner contours that can be filled with matching parts. PRO-NC also manages remaining sheets:
Interactive remaining panels are defined and stored after the nesting, which can then be used later for further nesting.

Automation

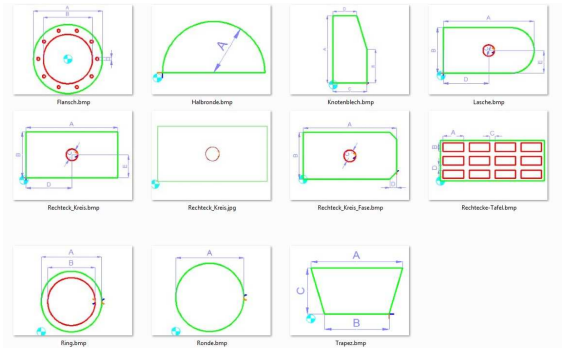
Individual adjustments

Because of the integrated script interface PRO-NC is adjustable.The options are:
Menus, Dialogs, Postprocessors, Edits and command sequences for automation.

Parametric shapes

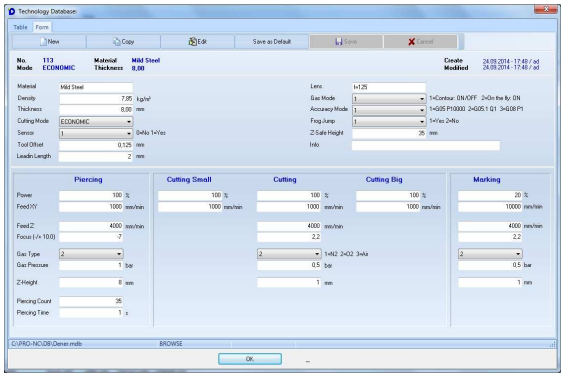


Because of the built-in script function parametric shapes are possible.
With the help of a standard dialog box, the variable values are queried:
The creation of the parametric construction is then automatically.

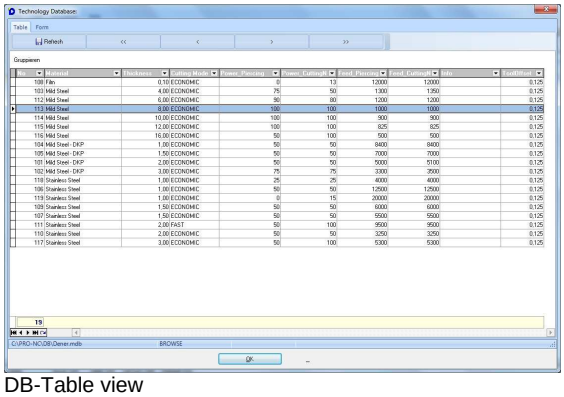


Simple geometries such as circles, rectangles or flanges can be easily defined and edited, but also more complex figures such as spirals, unfolds can be defined with a script.
The integrated scripting language has all relevant programming functions:
Loops, Jumps, Labels, Variables, Queries, etc.
Also calculations of any kind can be performed: addition, subtraction, multiplication, division, squaring, Radi-decorated, and calculating the trigonometric functions and their inverses.

Laser parameter database



DB: Form view

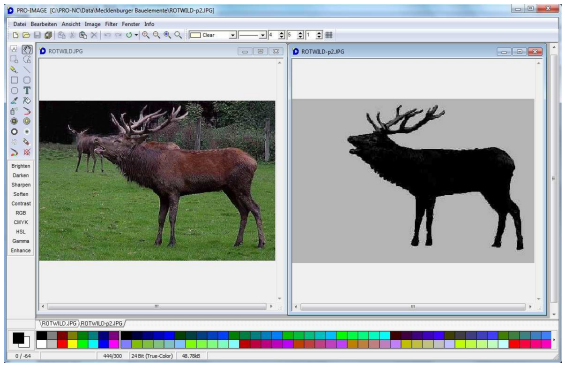


DB-Table view

The integrated technology database allows the storage and retrieval of any number of laser parameter sets.

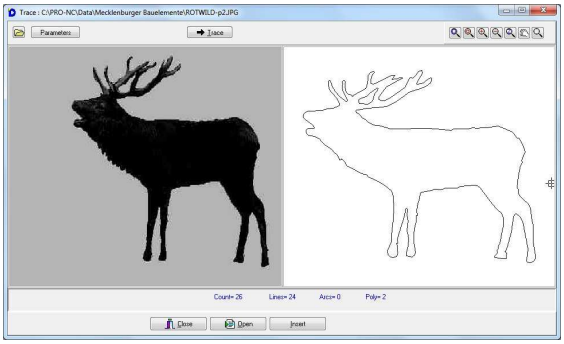
Pixel processing

Image-Modul



An integrated Image module allows editing pixel images. With features such as drawing, filling, text or delete individual changes of image files or scanned images can be realized. These so-processed images can then be vectorized using the integrated trace module.

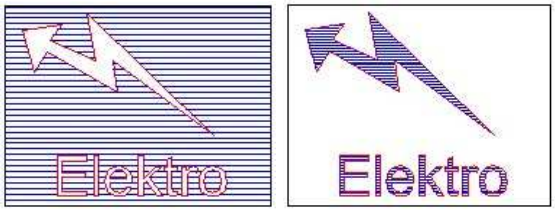
Trace-Modul



PRO-NC calculated from pixel images vectorized contours which then can be used for cutting, welding or marking.

Fill / Hatch

Strategies



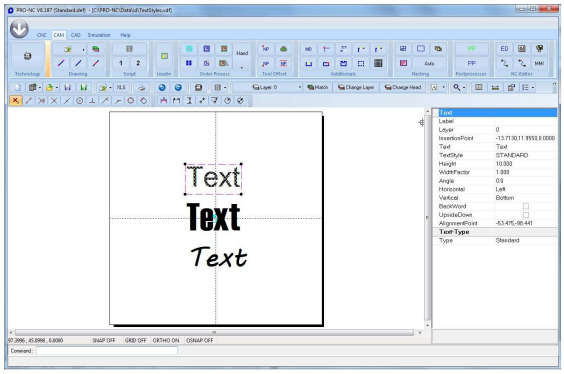
PRO-NC filling any contours and texts with different strategies:

- Parallel hatching
- Contour-parallel hatching
- Angle hatching
- Zigzag hatching
- Meander hatching

Distance, angle, edge distances etc. can be freely defined. Also, various laser parameters per hatch level can be also taken.

Text

Marking functions



PRO-NC has all relevant functions for text caption: Standard text, variables, serial numbers, time / date text.
It can be used all texts with TrueType or SHX fonts.

TrueType-Fonts

TrueType

In **PRO-NC** TrueType fonts can be written without conversion, be used for marking or cutting. Optionally the texts with a definable hatching provided.

TrueType

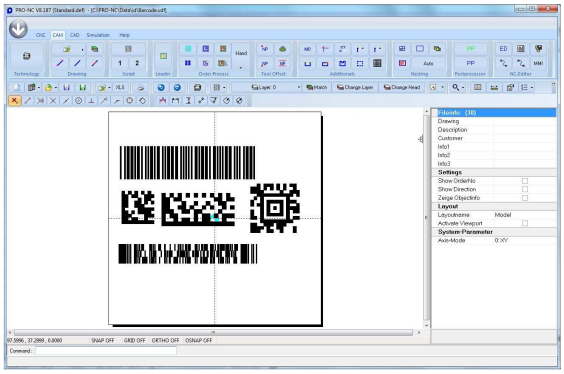
To edit the text, they can be explode into lines and arcs to eg set leadins and leadouts

SHP/SHX Fonts

PRO-NC understood apart from the Windows TrueType fonts also SHX fonts. These fonts can also be used directly for laser marking or cutting.

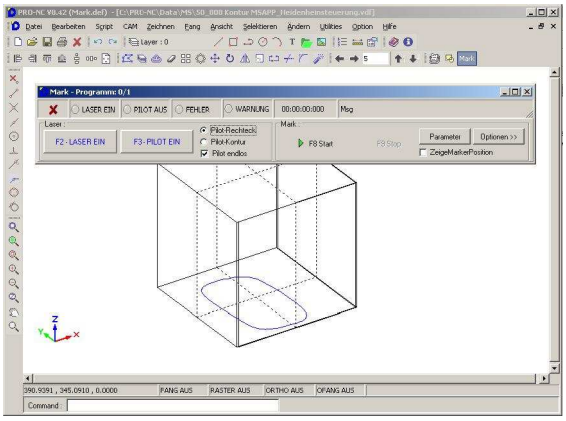
Barcode

Types of barcode



PRO-NC supports all popular bar code types (bar code, data matrix):
CODABAR, CODE11, CODE128, CODE39, CODE39EXT, CODE93, CODE93EXT, EAN128, EAN13, EAN8, IND25, INTERLEAVED25, MAT25, MSI, POSTNET, UPCA, UPCE, DM-E_ASCII, DM-E_AUTO, DM-E_BASE256, DM-E_C40, DM-E_NONE, DM-E_TEXT, PDF417, MicroPDF417Atztec.

3D processing (optional)



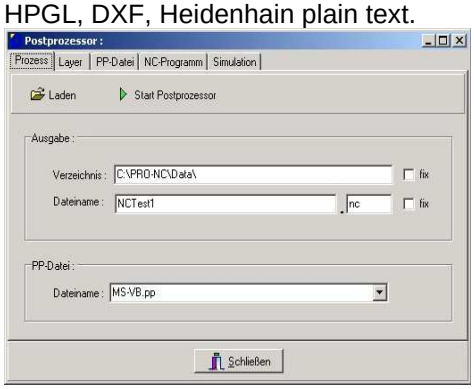
PRO-NC support 3D control.

CNC-Control

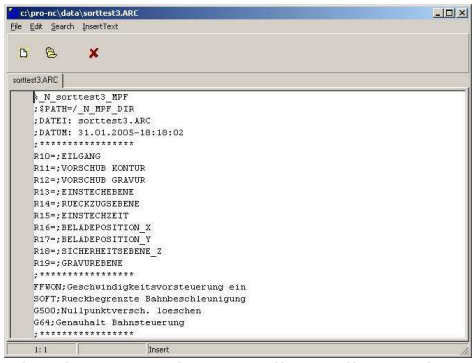
NC programs can be generated with the integrated postprocessor for marking, cutting or welding.

Postprocessor

The configurable postprocessor generates a complete NC program with all the geometry and technology Informa-tion for any CNC control formats:
e.g. Mitsubishi M700/M800, DIN 66025, ESSI, HPGL, DXF, Heidenhain plain text.

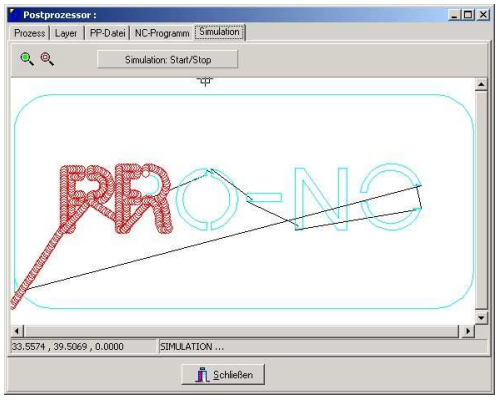


NC-Editor



The integrated NC editor allows the view or modify the generated NC programs.

Simulation



In the simulation offers the possibility to check the execution of the NC program prior to production.