CAD / CAM

COBUS Autorunner

Automatic Program Generation

COBUS ConCept

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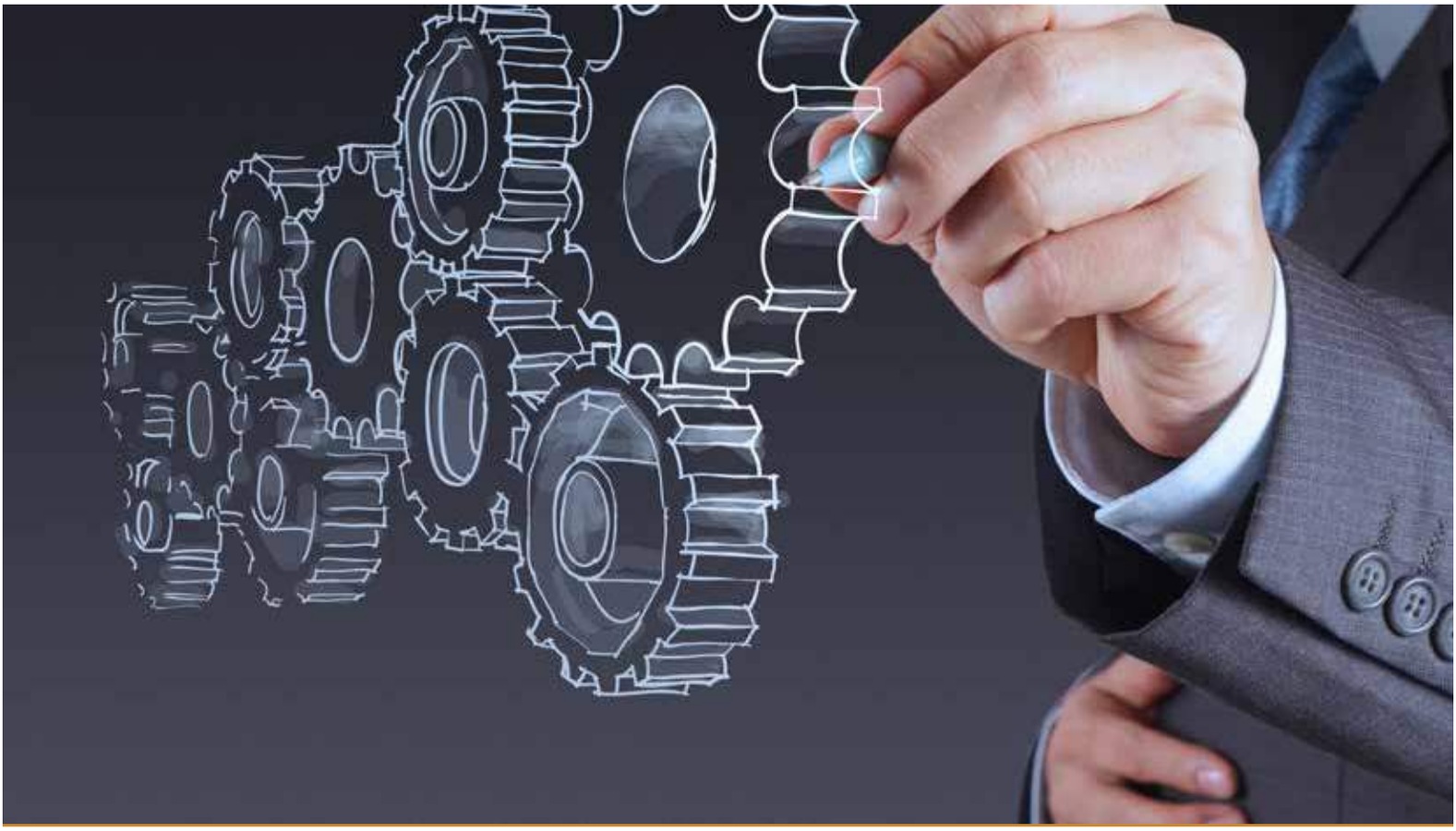

Contents

Preface

This documentation describes how to automate the creation of NC files based off of a partslist with variables.

The variables are written to the parts via a group file. This group file is set-up by the customer, the origin in many cases is the customer's ERP system.

The file is written in XML format.

COBUS AutoRunner is responsible for the execution of the group file. It finds and calls existing files (in Poll mode) and systematically works through the contents, creating, for each part, an FMC file and the corresponding machine file for the machine currently selected.

In addition, a template file is required. This template file reads in the parameters from the group file in order to create a unique parts piece based on those parameters.

The file structure, group file and set up of a template file are discussed in more detail on the following pages

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Group File

The group file is comparable to a parts list. It contains all of the information needed to create the required or specified parts.

The group file (GRP file) used by AutoRunner, in nature, is a CSV format file. The machine number, FMC file and src file can be defined therein. The new, upgraded format (GRPX) is defined as an XML file that additionally allows parameter names and values to be read into the FMC file before the NC file is generated.

Functionality

The goal of the new format is to change existing FMC files before the conversion takes place in order to take into account the given parameters and values.

In order to update the FMC file with the specified parameters, a "Variable FMC File" (VARFMC) file, with the specified parameters, needs to be generated, and passed to NCAD. The last step is to create the corresponding CNC program for the machine.

The name of the VARFMC file can be defined in the GRPX file. If this is not done then the name will be automatically geenrated based on the CNC file name.

File Construction

For legibility purposes, the parameters of the individual commands are passed as attributes.

Document

A DOCUMENT-node, needs to be defined at the highest level.

Attribute Name	Description
NAME	Part Name (optional)
FILENAME	Name of the XML File
CREATIONDATE	Date (tt.mm.jjjj hh:mm:ss)
GENERATOR	Name of the Generator Program
NCADVERSION	NCAD Version
KLD	KLD-Name from the CC.INI

The „GENERATOR“, „NCAD VERSION and „KLD“ attributes must be filled our correctly. If they are not, the import will not function properly.

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Part

A PART entry is defined for each CNC file. The source of the FMC file is transferred over to a target FMC file, into which all parameters are passed. The CNC file is generated from this target FMC file.

Attribute Name	**Description**
FMCFILENAME	File name of the source FMC file (If the name is not fully defined, the path of the FMC file is used in the CCini)
VARFMCFILENAME	File name of the generated target FMC file with the transferred paramater values. (optional) (If the name is not fully defined, the path of the FMC file is used in the CCini. If this entry is left blank, internally a temporary file name is generated)
CNCFILENAME	File name of the CNC file (If the name is not fully defined, the path of the machine is used in the CCini. If the entry “Format-BatchsrcName” is defined, then this will be used as the name
MACHINE	Maschine number from the CC.INI

Any number of parameters can be defined per PART

Parameter

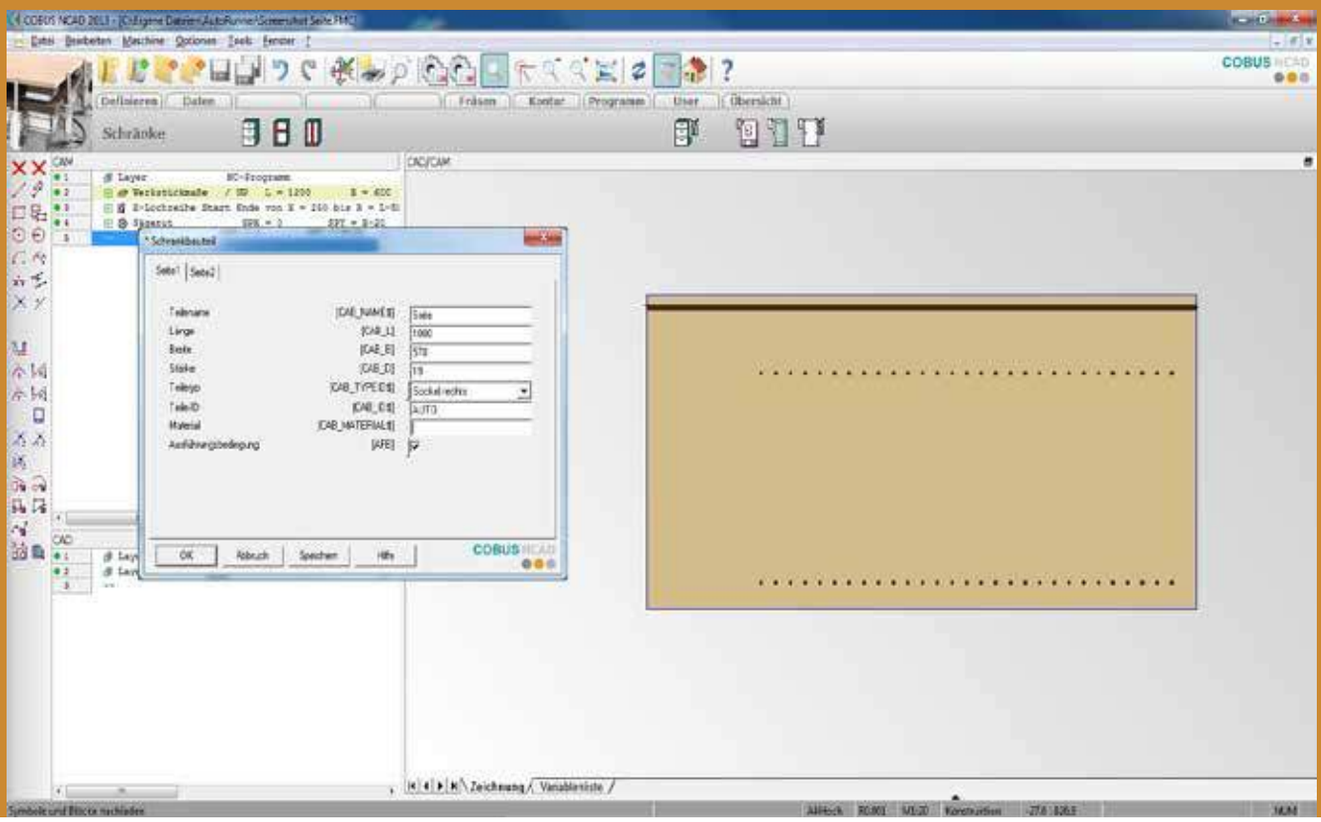
Parameters can be defined for each CNC file. The values are inserted into the target FMC file. Parameters that do not occur in the target FMC file are ignored and will not generate an error message.

Attribute Name	Description
NAME	Parameter name The name corresponds to an identification from the FMC file. The first occurrence of the Identifier is used.
VALUE	Parameter Value The value in the FMC file is replaced by the trasnferred value

Example

A simple example:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<DOCUMENT NAME="Test18.07.2011 13:55:15"
 FILENAME="YSeite_Daten_2011_07_21.grpx"
 CREATIONDATE="18.07.2011 13:55:15"
 GENERATOR="TEST_DATEN"
 NCADVERSION="12.0"
 KLD="PRONORM1">
  <PART
   FMCFILENAME="C:\ccw2011\grp\Vorlage\Bauteil.fmc"
   VARFMCFILENAME="C:\ccw2011\grp\FMC_Ergebnisse\Bauteile\AB123_Seite_L.fmc"
   CNCFILENAME="C:\ccw2011\grp\CNC3\AB123_Seite_L.mpr"
   MACHINE="3">
    <PARAMETER NAME="TYP$" VALUE="SEITE" />
    <PARAMETER NAME="ANS$" VALUE="L" />
    <PARAMETER NAME="VLAENGE" VALUE="820" />
    <PARAMETER NAME="VBREITE" VALUE="420" />
    <PARAMETER NAME="VLSTAERKE" VALUE="19" />
    <PARAMETER NAME="LREIHE" VALUE="1" />
    <PARAMETER NAME="RNUT" VALUE="1" />
    <PARAMETER NAME="ABSVORNE" VALUE="65" />
    <PARAMETER NAME="ABSHINTEN" VALUE="100" />
    <PARAMETER NAME="ABSLRU" VALUE="200" />
    <PARAMETER NAME="ABSLRO" VALUE="100" />
  </PART>
  <PART
   FMCFILENAME="C:\ccw2011\grp\Vorlage\Bauteil.fmc"
   VARFMCFILENAME="C:\ccw2011\grp\FMC_Ergebnisse\Bauteile\AB123_Seite_R.fmc"
   CNCFILENAME="C:\ccw2011\grp\CNC3\AB123_Seite_R.mpr"
   MACHINE="3">
    <PARAMETER NAME="TYP$" VALUE="SEITE" />
    <PARAMETER NAME="ANS$" VALUE="R" />
    <PARAMETER NAME="VLAENGE" VALUE="820" />
    <PARAMETER NAME="VBREITE" VALUE="420" />
    <PARAMETER NAME="VLSTAERKE" VALUE="19" />
    <PARAMETER NAME="LREIHE" VALUE="1" />
    <PARAMETER NAME="RNUT" VALUE="1" />
    <PARAMETER NAME="ABSVORNE" VALUE="65" />
    <PARAMETER NAME="ABSHINTEN" VALUE="100" />
    <PARAMETER NAME="ABSLRU" VALUE="200" />
    <PARAMETER NAME="ABSLRO" VALUE="100" />
  </PART>
  <PART
   FMCFILENAME="C:\ccw2011\grp\Vorlage\Bauteil.fmc"
   VARFMCFILENAME="C:\ccw2011\grp\FMC_Ergebnisse\Bauteile\AB223_Seite_L.fmc"
   CNCFILENAME="C:\ccw2011\grp\CNC3\AB223_Seite_L.mpr"
   MACHINE="3">
    <PARAMETER NAME="TYP$" VALUE="SEITE" />
    <PARAMETER NAME="ANS$" VALUE="L" />
    <PARAMETER NAME="VLAENGE" VALUE="1220" />
    <PARAMETER NAME="VBREITE" VALUE="320" />
    <PARAMETER NAME="VLSTAERKE" VALUE="19" />
    <PARAMETER NAME="LREIHE" VALUE="1" />
    <PARAMETER NAME="RNUT" VALUE="1" />
    <PARAMETER NAME="ABSVORNE" VALUE="65" />
    <PARAMETER NAME="ABSHINTEN" VALUE="100" />
    <PARAMETER NAME="ABSLRU" VALUE="200" />
    <PARAMETER NAME="ABSLRO" VALUE="100" />
  </PART>
</DOCUMENT>
```



The Variable Template File

The template file is created in an NCAD FMC file.

A template file should be created for each significantly different part. The variables in the group file control the processes in the template file. A specific FMC file is generated, as defined by the variables, from the overall template.

It is theoretically possible to have a single template file that can control every part, however, it is best to do this with restraint. The best approach is to reduce the number of template files as much as possible but maintain clarity without getting too complex.

A Simple Example

In the image above, a simple example of a cabinet end is depicted. The parameters in the dialog window are specified by the group file. These parameters determine the actual construction of the part.

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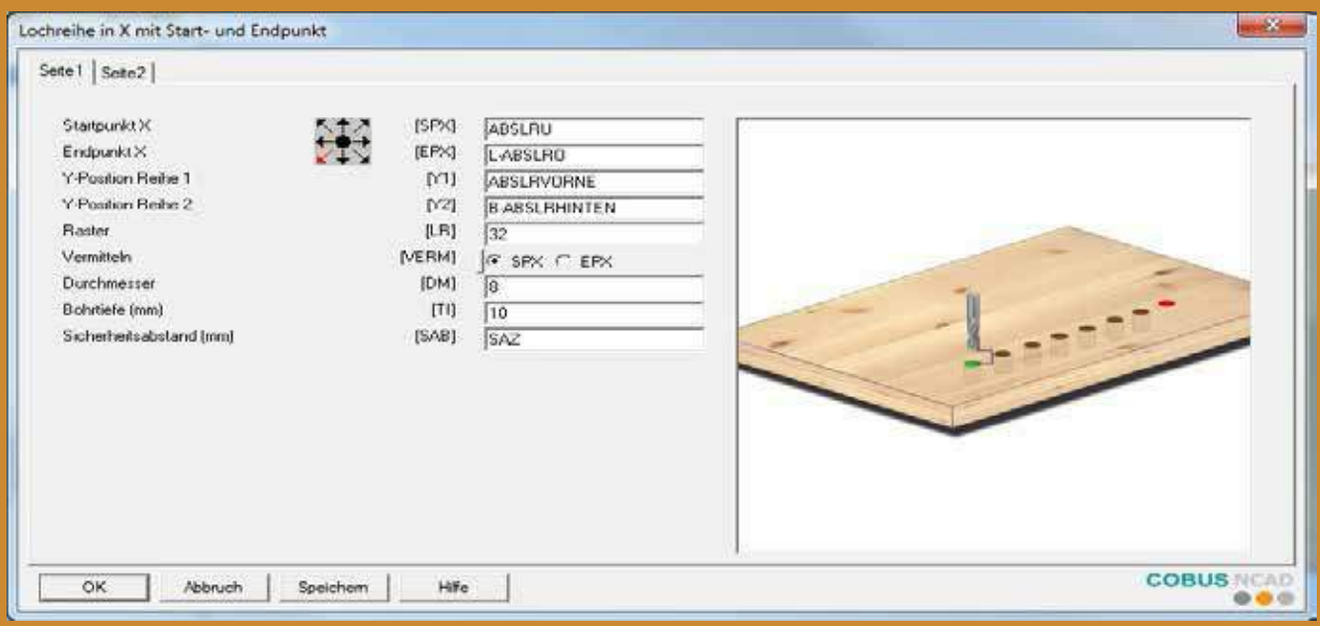
The actual construction revisions
are handled in the “Seite” block.

```
//  Bearbeitungen als Block
SEITE
[ Wenn TYP$ == "SEITE"                    //ich bin eine Schrankseite

//  mit Nut ?
[ Wenn NNUT == 1                        //es soll eine Nut gemacht werden
| Sägenut              SPX = 0          SPY = B-10      EPX = L          EPY = B-10      LGE = 0.0        TI = 6
] Blockende     //Ende Nut

//  mit Lochreihe ?
[ Wenn LREIHE == 1                     //mit Lochreihe

[ Wenn ANS$ == "L"                      //linke Seite
| X-Lochreihe Start Ende von X = ABSLRU bis X = L-ABSLRO DM = 5
] Blockende     //Ende linke Seite

[ Wenn ANS$ == "R"                      //rechte Seite
| X-Lochreihe Start Ende von X = ABSLRU bis X = L-ABSLRO DM = 5
] Blockende     //Ende linke Seite

] Blockende     //Ende Lochreihe


Horizontale Bohrungen
[ Wenn VBREITE >=  280 AND VBREITE <=310
| Horizontal-Bohrbild in Y bei X = 0 Y = 30 DM = 8 Z = S/2
] Blockende

[ Wenn VBREITE >=  311 AND VBREITE <=370
| Horizontal-Bohrbild in Y bei X = 0 Y = 30 DM = 8 Z = S/2
] Blockende

] Blockende     //Ende Seite
```



The variables are passed and the corresponding manipulations are carried out by using simple conditions (see image above).

It is not absolutely necessary to define a parameter ahead of time and tie the edits to the parameter. An evaluation can be carried out directly with each parameter:

(ANS$==L)?ABSLRU:ABSLRO

When ANS$ = L, take the value of ABSLRU, otherwise use ABSLRO

Constructing seperate evaluations for each edit or manipulation makes reading these files much more legible.

Every symbol does not need to be called in order to see which parameters are used and when.

From the earlier example file, several possibilites can be determined. The more generic the template file is defined,

- the more conditions and variables will be needed
- the harder it is to find transparency in the files
- the harder it is to track down errors
- the more complicated it is to make changes

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The Resulting FMC File

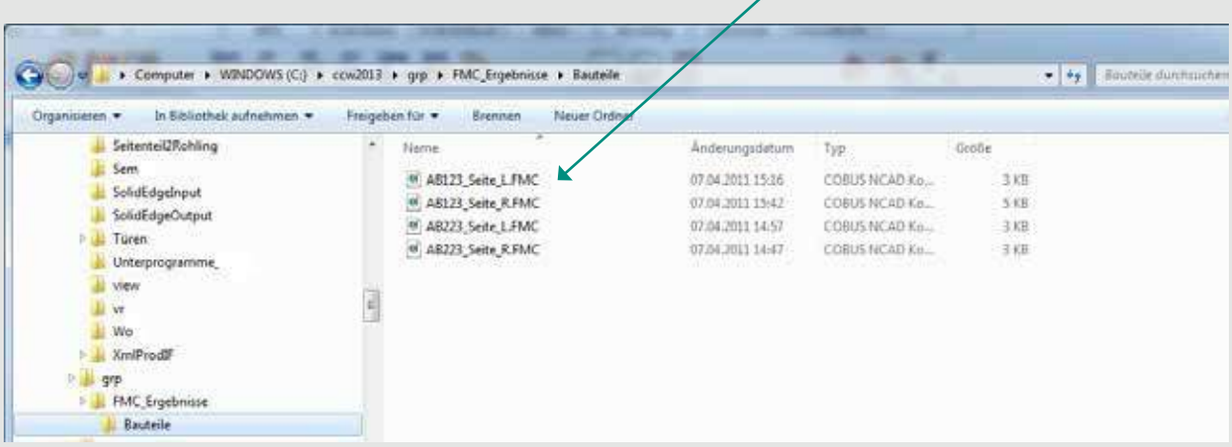
From the overall template file which is called by the group file with parameters,

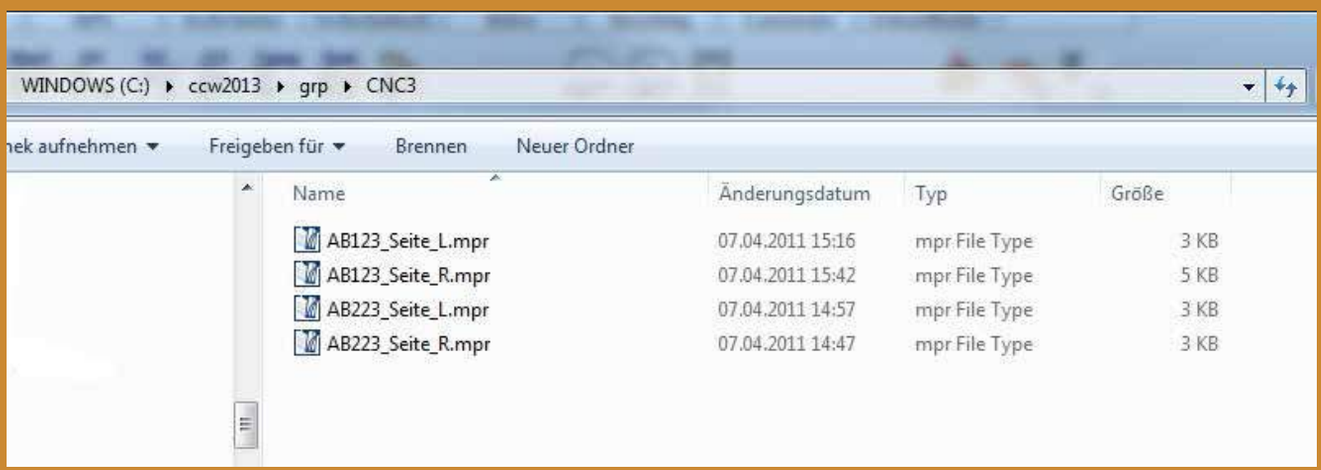
FMCFILENAME="C:\Kunden.ver\Pronorm\ccw2011\grp\Vorlage\Bauteil.fmc"

VARFMCFILENAME="C:\Kunden.ver\Pronorm\ccw2011\grp\FMC_Ergebnisse\Bauteile\AB123_Seite_L.fmc"

CNCFILENAME="C:\Kunden.ver\Pronorm\ccw2011\grp\CNC3\AB123_Seite_L.mpr"

a seperate, part specific file is generated, the construction of which is determined by the parameters.





The Resulting NC File

A parameter in the group file
determines the machine number
for which the program should be created.
The path and the name are also determined
in the group file.

CNCFILENAME="C:\Kunden.ver\Pronorm\ccw2011\grp\CNC3\
AB123_Seite_L.mpr"

MACHINE="3">

<PARAMETER NAME="TYP$" VALUE="SEITE" />

Each machine, that uses a post processor, is
assigned a unique number in the NCAD
Installation. The machine that the NC file
will be generated for is communicated to
NCAD via AutoRunner.

The result are machine-ready NC files placed
into the defined folder location.

AutoRunner

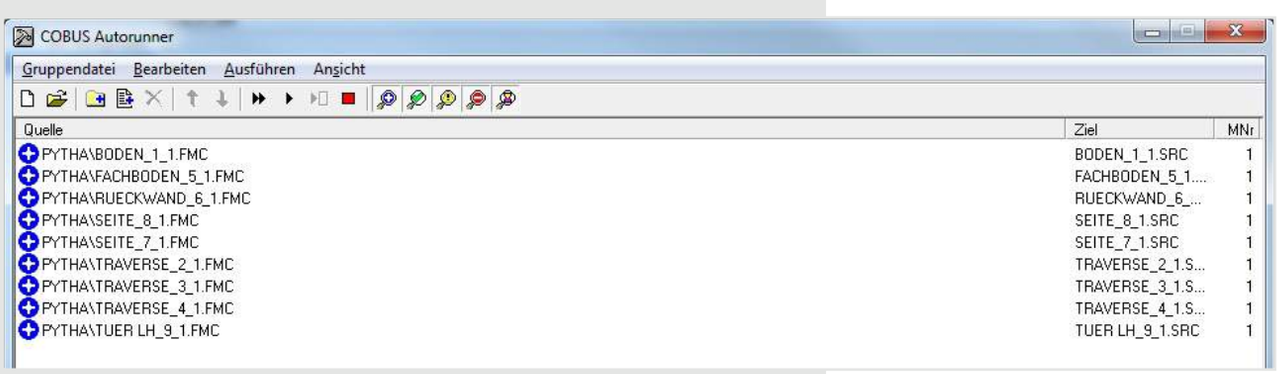
AutoRunner is a seperate module that when added to COBUS NCAD is used to automate the creation of NC files.

It can be used in polling mode to independently and automatically work its way through job files. If run manually, specific files can be selected and called.

Tasks

AutoRunner performs the following tasks:

- Interpret the contents of a batch file
- Start NCAD with the template file
- Pass the parameters from the template file to NCAD
- Generate a single part
- Generate the related NC file



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