



# S.N.D.M.O

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# HEIDENHAIN

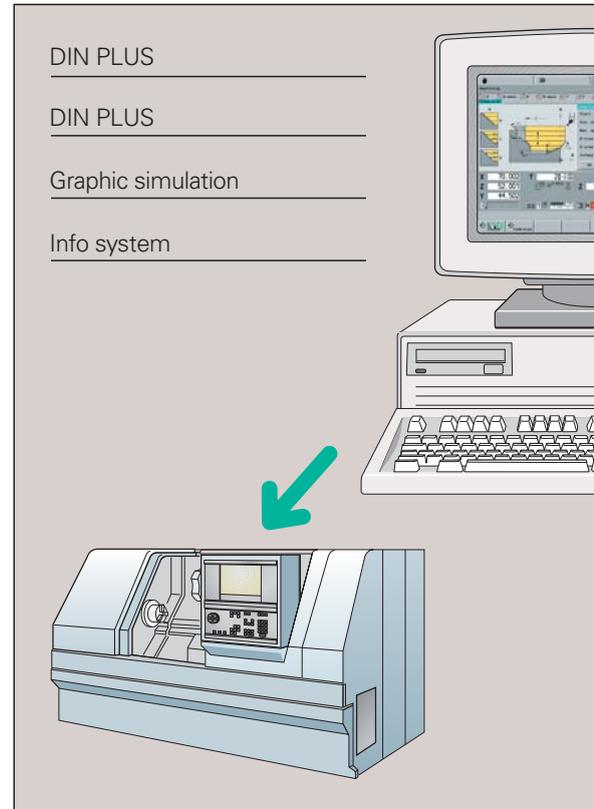
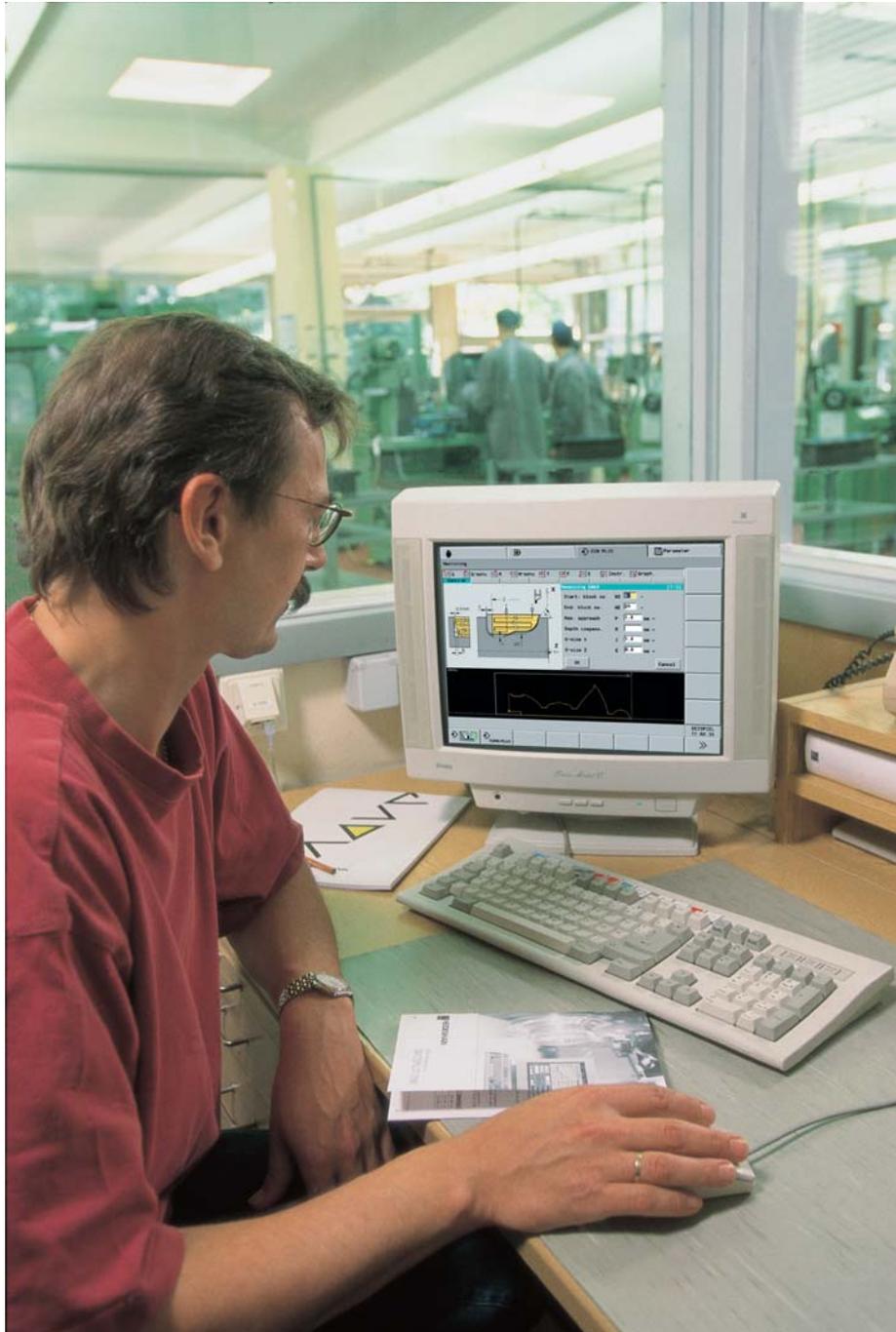
## DataPilot 4290

Version V.7

CNC Programming and  
Training on a PC

# From a Drawing to an Optimized NC Program

DataPilot 4290 is the programming station PC software for the CNC PILOT 4290 control. In addition, DataPilot 4290 is the ideal organization system for the workshop and the design office. Shifting the programming, program testing, and program optimization to the PC greatly reduces machine idle times. Because it has the same operation and range of functions as the contouring control, you can be assured that a program created with DataPilot can be run on the machine immediately.



## **DIN PLUS**

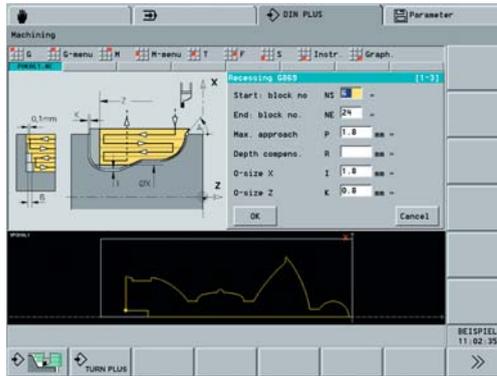
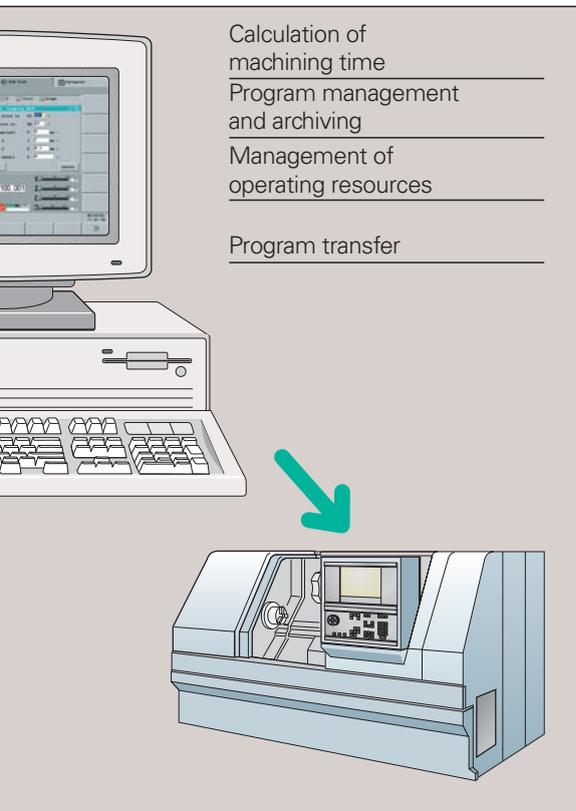
DIN PLUS supports structured NC programming. Under menu guidance you first generate the geometry of the blank and machined part, and then with the help of powerful cycles you can define the individual machining steps. The control graphics immediately display the programmed contour.

DIN PLUS gives you constant access to tool and chucking equipment assignments, setup information, and organizational data in the NC program.

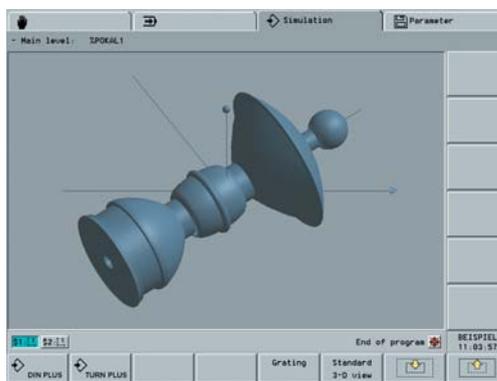
## **TURN PLUS**

TURN PLUS enables you to program your contour faster than ever before. The geometry for the blank and the machined part is described with interactive graphics. Then all you need to do is enter the desired material and the chucking equipment—and the machining plan will appear at a keystroke.

The individual machining steps are shown graphically on your screen. The result is a complete DIN-PLUS program—including all setup data and detailed comments.



Intelligent cycles



Graphic simulation

### Graphic simulation

DataPilot provides suitable test and verification functions for each phase of the programming. You can watch the entire machining process as it unfolds in the working space with simulated tool and chucking equipment. It shows the actual tool-tip contour with each cut and the resulting "machined" workpiece. In addition, the "measured workpiece" function serves as an additional check for accurate machining.

DataPilot's tool-path simulation shows the actual contour of the tool cutting edge, or of the milling, drilling or boring tool. In this way you can monitor exactly the machined range for slopes, curves, recesses or holes. The 3-D view function enables you to display a 3-D image of the workpiece blank, the finished part or the production status that has been updated during the simulation. You can enlarge or reduce the image of the workpiece or rotate it in any direction.

### Calculating the machining time

Let's assume that your customer urgently needs a quotation and you have to make an accurate cost estimate in the shortest possible time. DataPilot provides valuable help in such cases by calculating the machining times of your programmed workpiece. A table shows not only the total workpiece machining time, but also the machining time, idle time and total time for each tool.

This feature is invaluable for cost planning and provides information for program optimization.

### Program and operating resource management

TURN PLUS programs, DIN PLUS programs, cutting data and operating resources such as tools and chucking equipment are managed separately for each machine or each machine group.

Functions such as List, Copy, Rename or Delete NC programs ensure effective program and operating resource management.

Program and operating resource data can be updated at all times through the simple transfer of data to and from the machine.

### Info system

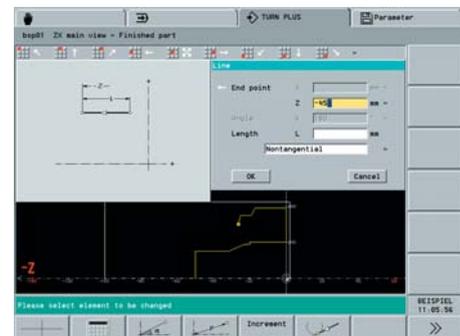
Program information is entered in clear-cut dialog boxes. The input fields are described in conversational form or with symbols, and help graphics indicate the required input values. If this support is not sufficient, press the Info key to call a detailed explanation of the currently selected function.

# Create an NC Program Faster than Ever Before

The workpiece is described geometrically with interactive graphics—without a single G code. You define the contour using the dimensions from the drawing—TURN PLUS automatically calculates missing data. Then just press the key for automatic machining plan generation and your NC program appears.



Graphic programming



Separate input of basic contour ...

## Simple contour description

You program the basic contour using line segments and circular arcs. Then you superimpose form elements like chamfers, curves, undercuts, recesses, threads, etc. The number of entries is reduced because common form elements and fits can be selected from tables stored in the control.

## Programming from the drawing

Program the contour using the dimensions from the drawing. Each coordinate can be entered either in the Cartesian or polar system, in absolute or incremental form. Incomplete elements are kept open until the geometrical solution is possible. If the entered data permits more than one geometrical solution for a contour element, the possibilities are displayed consecutively on the monitor for your selection.

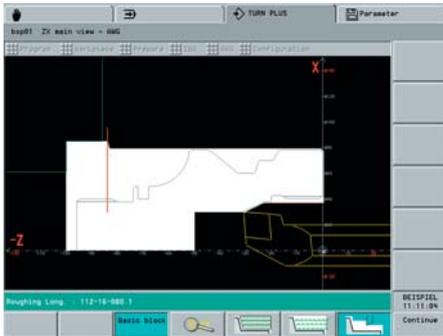
The contour develops on the screen as it is being defined—errors can be seen immediately.

## The part program at a keystroke

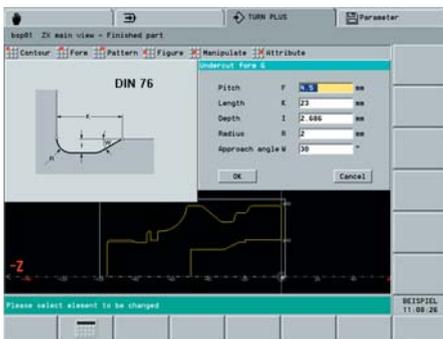
With TURN PLUS you can create NC programs in a very short time. After you have entered the geometry for the blank and machined part you only need to select the material and clamping devices. TURN PLUS does everything else automatically.

TURN PLUS selects the machining strategy, generates the work plan, selects the tools and cutting data, and generates the NC blocks both for turning operations as well as for face and lateral-surface machining.

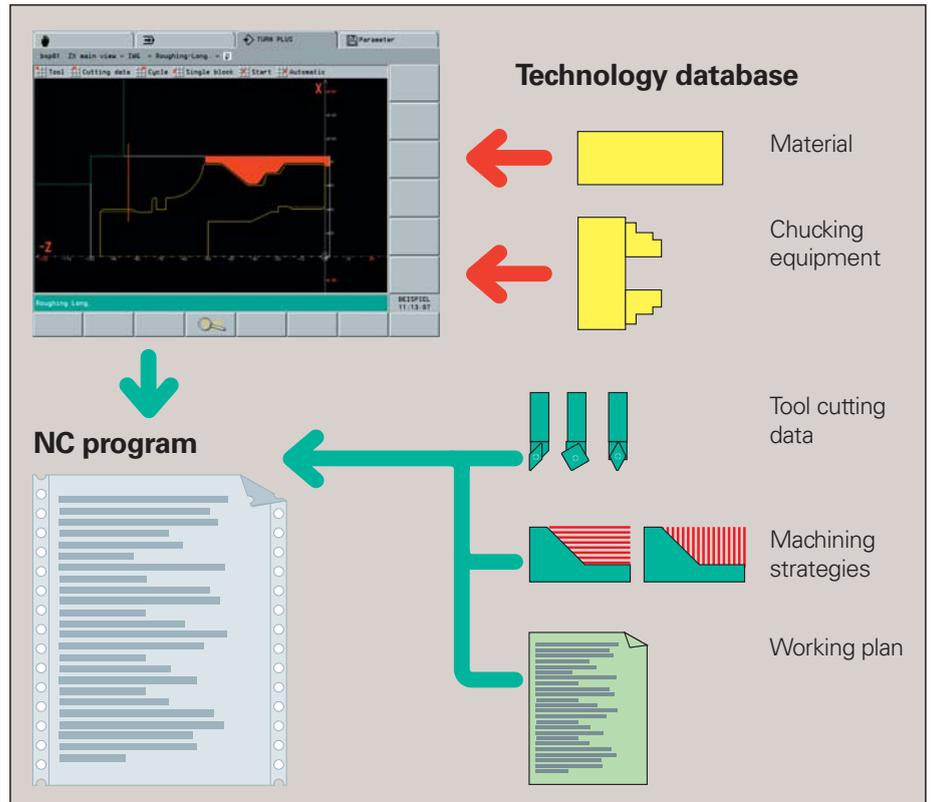
You can check each individual step in the control graphics. TURN PLUS uses a reasonable sequence of possible operations. You can also adapt this sequence yourself to suit specific tasks.



Automatic machining plan generation



... and form elements



### DXF import of contours

Why should you painstakingly enter contour elements when now the data already exists in the CAD system? TURN PLUS makes it possible to import contours in DXF format directly into DataPilot 4290. Not only does this save time otherwise spent on programming and testing, but you can also be sure that the finished contour is exactly according to the designer's specifications.

DXF contours can describe workpiece blanks, finished parts, contour trains and milling contours. They must exist as two-dimensional elements in a separate layer, i.e. without dimension lines, wraparound edges, etc. Since the DXF format is fundamentally different from the TURN PLUS format, the contour is converted from DXF to TURN PLUS format during the import. It can then be treated as a normal TURN PLUS contour, and is available for roughing, recessing and milling cycles.

### Automatic program generation for the second setup

TURN PLUS knows the contour of the clamping devices when it generates the working plan. It automatically limits the tool path to a safe distance from the clamping device.

When the program for the first setup is completed, you can "rechuck" using interactive graphics. TURN PLUS then automatically generates the program for the second setup using the workpiece geometry that has already been entered.

### Program optimization in TURN PLUS

The automatically generated part program can later be altered or optimized in TURN PLUS. You simply watch all the machining steps and stop at the point at which you would like to optimize.

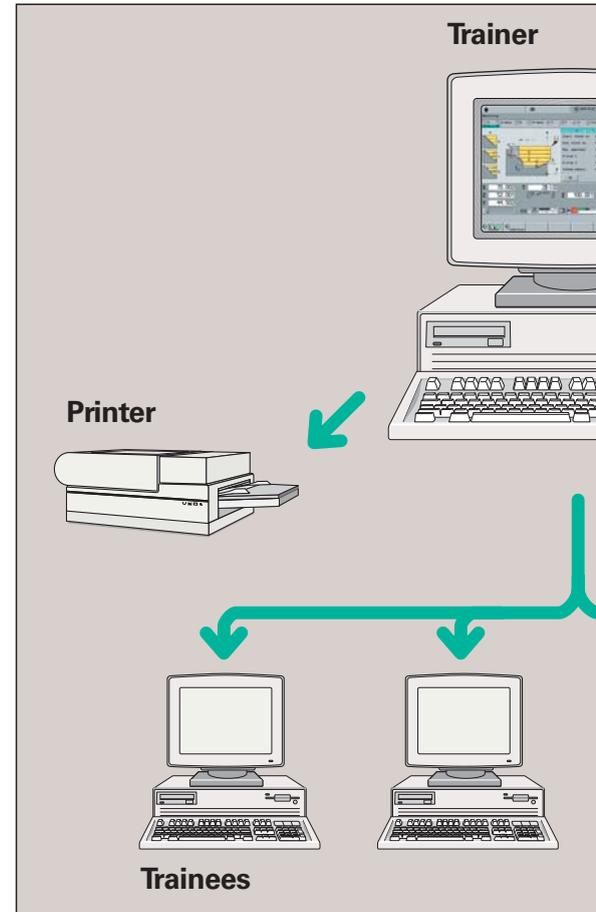
You edit the program using the interactive graphics, choosing the sector for machining and the appropriate fixed cycle. TURN PLUS provides proposals for tool and cutting data. Following that, TURN PLUS automatically generates the new machining step.

# DataPilot for Real-World NC Training

The use of CNC-controlled machine tools, personal computers and IT systems in all areas of production requires a practice-oriented system for apprentice and advanced training. The modular setup of DataPilot makes it ideal for NC training.

## Training and follow-up courses

The operation and programming of DataPilot is identical with that of a CNC machine. DataPilot even simulates axis and spindle movements and the execution of NC programs. In this way you can train students how to operate a lathe and familiarize them with NC programs for workpiece machining on a readily available PC.



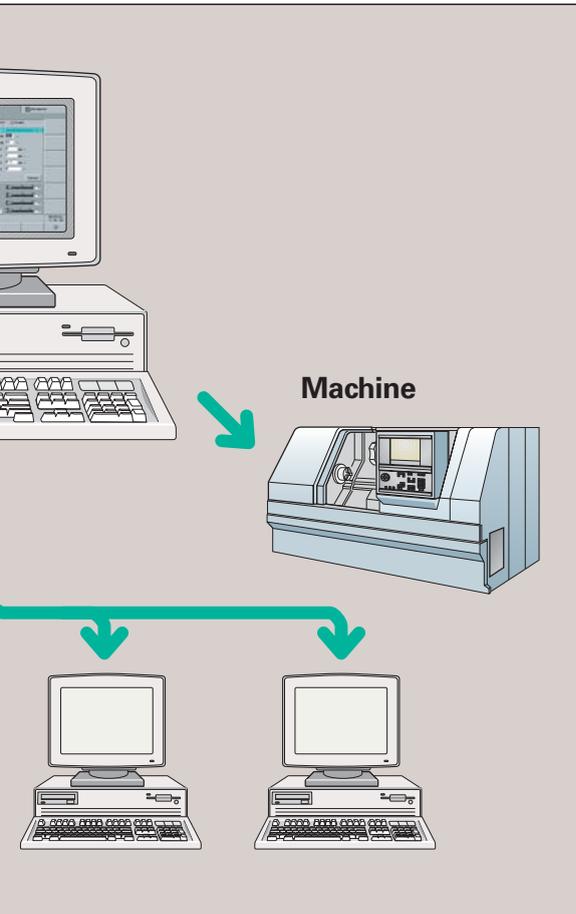
## Teaching with DataPilot

Modern user guidance, graphic information in TURN PLUS and structured programming in DIN PLUS ensure quick comprehension. With the realistic simulation feature, it is possible to graphically represent and monitor each programming step.

While the NC program run is being simulated the machine display shows the actual values, tool data, etc. The block display feature shows the commands that are currently being executed. You can set the block display so that both the programmed cycle **and** tool movements (G0, G1, G2 or G3 commands) are shown at the same time.

With DataPilot you can convey to the trainee the whole programming sequence from generation of program blocks with TURN PLUS, to conversion to DIN PLUS and execution on a CNC control.

# Conversational Languages System Requirements



## Learning with DataPilot

The automatic working plan generation feature in TURN PLUS suggests a sequence for the machining of the workpiece that is technologically correct. The result is a structured and commented DIN PLUS program with setup information, contour descriptions and the individual machining blocks.

The graphic simulation feature and the simulated NC program run in automatic mode allow the operator to view the entire machining process and finished result realistically, with all of the geometrical and technical details included.

## Conversational languages

You can install DataPilot 4290 with several languages and switch among them during operation. The following languages are available:

- German
- English
- French
- Italian
- Spanish
- Swedish
- Dutch
- Danish
- Czech
- Polish

## System requirements

DataPilot runs on PCs with one of the following operating systems:

- Windows 98 SE
- Windows ME
- Windows 2000
- Windows XP

A USB interface is required for connecting the software protection dongle. An Ethernet interface enables fast data exchange with CNC machines.

Depending on the installed languages, DataPilot requires approx. 30 to 50 MB of hard disk space.