INDEX

# VirtualLine

**VirtualPro**
**Programming support**
**with VPro Guide**

# Programming support for practical work

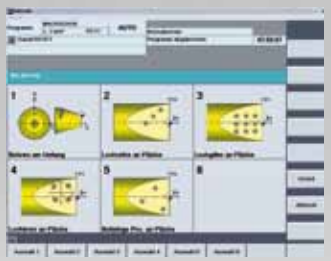

***VirtualPro with VPro Guide provides a new and particularly easy and powerful programming support for all INDEX turning machines*:***

*VPro Guide is an innovative programming method from INDEX guiding the operator consistently through all machining technologies such as turning, drilling, milling and even the automation of machines and workpieces.*

*The current machining situation – which of course also considers the machine configuration – is always graphically visualized in VPro Guide so that even difficult entries can be made easily and safely step by step. Even complex and elaborate program sequences are created quickly and correctly.*

** for machines with C200-4D/S840D control:*
*ABC, C42/C65, C100, C200, G200, G300, G160, G250, G400, R200, R300, V160C/G MS machines*

**VPro Guide**
**The new scale of programming**



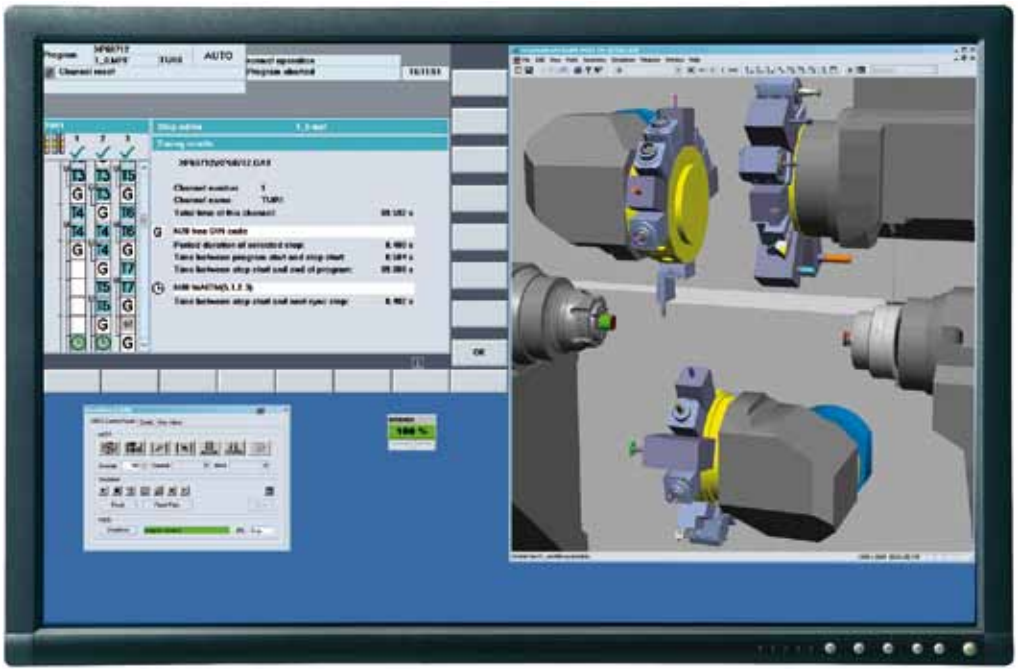
**More comfort**

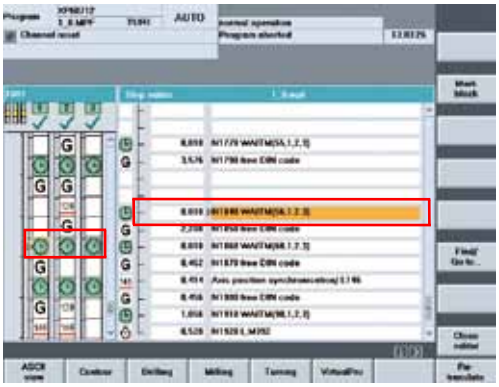
- Practice- and machine-oriented graphics for programming support
- All cycles and functions reconvertible
- Simple geometry definition by means of contour generator
- Read-in of complex geometries via DXF reader
- Quick access to your own created program templates
- Perfect integration into the INDEX C200-4D machine control
- Optimum addition for the Virtual Machine from INDEX

**Clearer view**

- All channels at a glance, even during programming
- Time-synchronous display for easy identification of optimization potentials
- User-specific display as NC code or as machining description
- Exact display of waiting times at WAIT-marks
- Easy-to-understand structuring of the cycles and functions according to technologies
- Quick access to programming instructions, cycle descriptions, and help documents

# Optimization included





**See more –**
**Know more**

- Active recording of the program runtime at the real or Virtual Machine
- Status signals for displaying the current time
- WAIT-mark synchronized or runtime-proportional program display (following recording)
- Numeric output of the machining-step-related program runtime per channel
- Runtime-related, synchronized sequence display of all channels (of the workpiece program)
- Display of the total program runtime per channel (cycle time)
- Optimization support through output of the waiting times at WAIT-marks
- Far-reaching optimization options through program-run-related time analyses

# Programming using ready-to-use solutions

**B axis functions**

- Working in rotated coordinates
- Tool change including positioning
- Milling in an inclined plane

**Tool retraction**

- In 1, 2 or 3 axes
- With preset axis order
- To change position or freely defined

**Undercut contour**

- According to DIN 509x, DIN 67C
- Freely defined

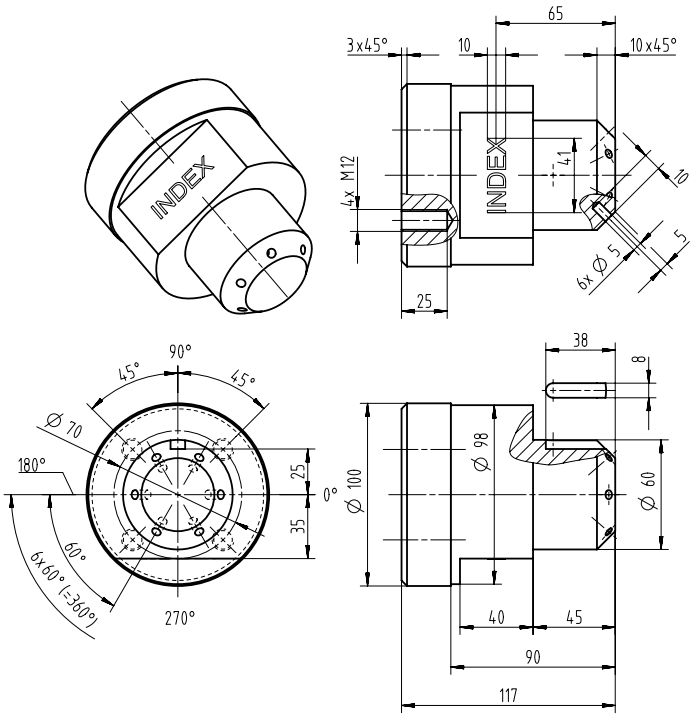

SINUMERIK
INDEX C 200-4D

# … VPro Guide gets you to your goal quickly and safely!

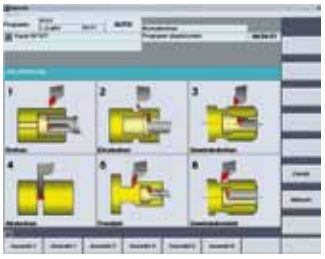
VPro Guide – the technology-assisted programming support from INDEX – allows you to program complex parts faster and safer.

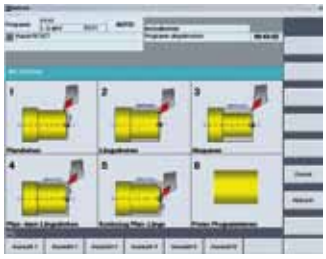
Thanks to the easy and practical programming assistance in VPro Guide, even inexperienced users are able to create complete, executable NC programs. VPro Guide follows clearly structured interactive screens that generate "step by step" complete NC program sequences of the individual steps – including approach and retract movements.
VPro Guide is part of the INDEX VirtualPro CNC Programming Studio and can be called directly from the workpiece editor.

**Example of a VirtualPro machining task**

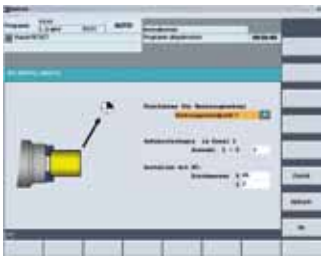



**Machining steps for turning**





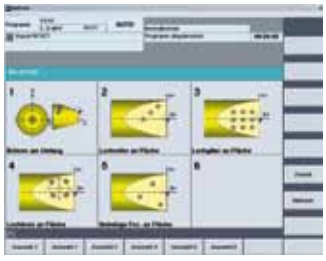



**Output CNC code**

```
MSG("Plandrehen")
GX73
GZ73
L184(0,0,0)
L187(40)
L235
T1 D101
SETMS(4)
G95 S4=980 M4=3 F0.1
G0 Z2
G0 X65
G96 S4=200
M4=97
M1=8
G1 X61 Z0
G1 X-1
G1 G91 Z1
G0 G90 X65
G0 Z2
G95
M1=9
GX73
GZ73
L184(0,0,0)
L187(40)
```

**Machining steps for drilling 6 x D5 on an inclined surface**







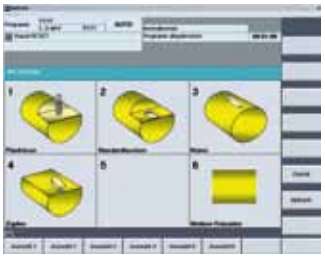


**Output CNC code**

```
 MSG("Bohren")
 L237
 GX73 Y0
 GZ73
L140(0,4,0)
 L170(3,5)
 GXYZ73
L184(0,1,-135)
L187(40)
L180(-45,20,0,0)
 SETMS(1)
 D503 G95 S1=3000 M1=3 F0.1
 G0 X2 Y0 Z-10
 M1=8
MCALL CYCLE82(2,0,1,,10,)
  C0
  C60
  C120
  C180
  C240
  C300
MCALL
 L181
 M1=9
 M1=5
 GX73 Y0
 GZ73
L184(0,0,0)
 L187(40)
```

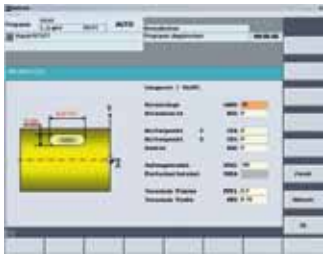
**Machining steps for grooving 8 x 5 x 38**











**Output CNC code**

```
 MSG("Längsnut")
 L237
 GX73 Y0
 GZ73
L140(0,4,0)
 L170(1,5)
 GXYZ73
L184(0,1,-90)
L187(4)
 SETMS(1)
 D501 G95 S1=3000 M1=3 F0.2
 G0 Z0
 G0 X64 Y0
 L138
 M1=8
SLOT1(32,30,1,,5,1,30,8,0,0,0,-90,,0.15,0.2,3,2,,11,,,,,)
 L135
 M1=9
 M1=5
 GX73 Y0
 GZ73
L184(0,0,0)
 L187(40)


 MSG("Werkstück aus GSP")
L132(190,30,0)
 M8=62
```

**INDEX VirtualLine**

**3D CAD data import**

VirtualLine PPx — **INDEX PostProcessors for NX CAM**

+

VirtualLine Pro — **INDEX VirtualPro CNC Programming Studio**

+

VirtualLine M — **INDEX Virtual Machine**

# Program creation made easy

**Multi-channel step editor**

- Optimum overview and navigation; easy channel (program) switchover
- Basis of multi-channel, parallel workpiece program creation
- Parallel WAIT-synchronized or runtime-related view
- Runtime-based display and optimization functions
- Direct change "Large" ASCII single program view and between channels

**List of functions/ cycles**

- Tabular overview of technological and functional cycles
- Logic structure by machining type and function
- Graphics-supported detail selection
- Explanatory text and graphics diagram for input parameters
- Directly reconvertible to the originally used parameterization mask
- Online programming instructions for program commands, cycles and functions

**Contour generator**

- Contour definition through geometric elements (Cylinder, cone, circle, etc.)
- Programming of continuous contour paths
- Insertion of form elements in and between the geometric elements
- Automatic calculation of open geometries (up to 5 unknowns)
- Reconvertible as contour path

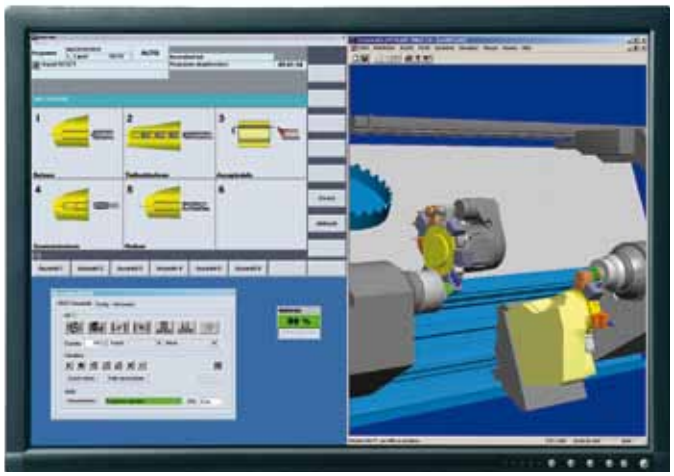
**DXF reader**

- 2D contour tracking including application of geometry to open workpiece program
- Coordinate definition, setting zero point, clean-up of measurement and auxiliary lines
- Reconvertible to geometry processor, for example for subsequent contour changes
- Direct access from (multi-channel) editor of the control

# Operating comfort made-to-order

The VirtualPro programming support makes a 1:1 copy of your individual machine configuration. The only machining operations to be offered are those that can actually be machined using the existing machine configuration.

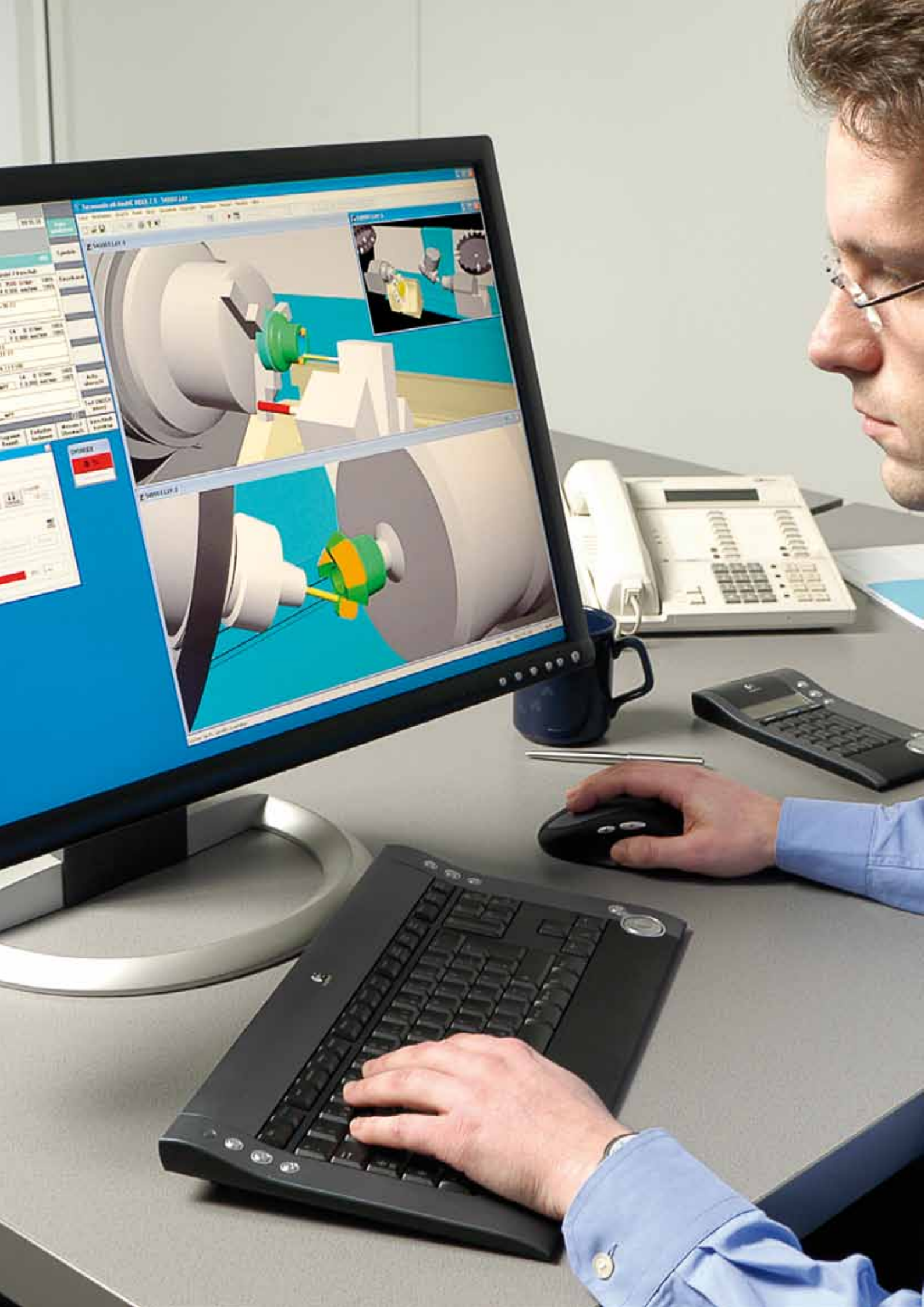
VirtualPro is available in three application versions:



*2. As extension of the INDEX Virtual Machine software on the PC*

*1. Directly on the control of the machine (excluding simulation)*

*3. As extension of the INDEX Virtual Machine directly next to the machine control (including simulation)*



# Technical specifications (excerpt)

| VirtualPro Guide | Examples |
|---|---|
| Turning operations | Face turning / longitudinal turning (outside, inside, center) |
| | Cutting / contouring |
| | Grooving (outside, inside, on face) / cutting off |
| | Undercut (outside, inside) / thread undercut (outside, inside) |
| | Threading |
| Drilling | Drilling radial / axial / included plane / deep-hole drilling |
| | Finishing / Tapping / Reaming |
| Milling | Milling radial / axial / inclined plane |
| | Face milling / Groove-milling / Spigot-milling |
| | Milling standard pockets / Thread milling / Engraving |
| Handling | Workpiece handling (manually, with feeding) |
| | Removing workpiece (manually, with gantry type discharger, WHU) |
| | Workpiece in counter spindle / workpiece in main spindle |
| | Pulling workpiece / regripping / counter spindle back |
| | Counter spindle as tailstock |
| Miscellaneous | WAIT markers / zero offsets / free entry |
| | Force and velocity (moving against hard stop) |
| | Tool breakage monitoring |
| | Axis coupling / spindle coupling |
| | INDEX feeders / UNIMAG |

| VirtualPro functions | Examples |
|---|---|
| Macro functions | Select turning/milling, slinging, tool retraction |
| Workpiece handling | Workpiece from counter spindle, remnant from main spindle |
| Drilling | Drilling and facing, deep-hole drilling, tapping |
| Drilling patterns | Row of holes, circular hole, point grid |
| Turning | Groove, undercut, metal-cutting, extended metal-cutting |
| Milling - standard | Slot on circle, circular slot, rectangular pocket, face milling |
| Milling - advanced | Ellipsis milling, polygon milling (axial or radial) |
| Counter spindle machining | Pulling workpiece forward, counter spindle as tailstock |
| Transformations (face/circumferential surface machining) | Cylinder track milling, machining on the circumference |
| Spindle and C-axis | Spindle functions positioning, coupled spindles electronically |
| B-axis machining | Rotated coordinates, mooving B-axis, tool change and approaching |
| Other machining types | Engraving cycle, cross hole deburring, cutting off |

| VirtualPro Template | Description |
|---|---|
| Insertion | Inserting predefined program templates (including multi-channel ones) |
| Organization | Memory location for filing and organizing templates |
| Creation | Easy creation of templates using the program editor |

**VirtualPro contour generator**

| | |
|---|---|
| Contour start | Start coordinates (diameter/length), definition of name |
| Contour elements | Cylinder, circle, cone, chamfer, rounding, fits |
| Contour path | Straight line, circle, chamfer, rounding |
| Shapes | Thread undercut, groove (radial and axial) |
| Correction | Undo item |

**VirtualPro DXF reader**

| | |
|---|---|
| Contour acquisition | Files in 2D format, definition of the machine axis names |
| Selecting the machining plane | Zero point definition |
| Contour elements | Definition of start element, definition of end element,<br>Individual tracking of contour sequence,<br>Selection of drilling patterns, saving contour |
| Transfer folder | File storage without VirtualPro being open after "TRANSFER"<br>or direct access to "TRANSFER" folder from CAD reader |
| Auxiliary functions | Cleanup of measuring and auxiliary lines, zoom ±,<br>Fitting and rotating contour |

**VirtualPro multi-channel step editor**

| | |
|---|---|
| Multi-channel (workpiece) editor | Machining of workpieces ("workpiece" view),<br>Presentation of all workpiece programs in parallel,<br>View single program "large" |
| Synchronized program view | Normal view (concatenated sequence of steps),<br>WAIT markers synchronous view, run-time synchronous<br>view (by program run), machining time display for<br>machining blocks and overall view |
| Step sequence display | Structuring into machining blocks, compressed or<br>expanded representation, working steps/ASCII view,<br>Navigation help |
| Functions | Recording machining times, On-line programming instructions,<br>Display of total cycle time, syntax check via synchronous marks |

**VirtualPro Tool ID sheet output**

| |
|---|
| When used as extension of the INDEX virtual machine, the tools created by the tool manager for simulation can be output as tool ID sheets |
| Functions: Insertion of your own company logo, parts list for individual tool components, diagram for tool insertion, Remarks, Summary Sheet, Print/Export |

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LY9002.4519 – 04.14 AD Printed in Germany Subject to change without prior notice

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