

# Toolmaster TM250

## Tool Presetters

Quick tool changes result in measurable success



Simple, rapid, accurate

**pub**  
SWISS

**The Toolmaster 250 optimizes tool presetting through its ideal combination of functional performance, quality and price.**

The Toolmaster 250 optimizes tool presetting through its ideal combination of functional performance, quality and price.

Designed as a compact, rugged bench-top unit, the Toolmaster 250 requires little space. The base plate is made of thermally stabilized cast-iron and provides maximum rigidity.

The measuring column is machined from high-tensile and stress-relieved aluminium alloy – it runs on needle bearing guides and can be traversed to the measuring point without operator fatigue.

Pre-loaded recirculating ball guides on all axes ensure a long life and lasting accuracy. Bellows protect the guides, fine adjusting spindle and measuring system from pollution in harsh workshop environments.

The measuring electronics TC 100 are user-friendly with dialogue guide and require no operator training. All function keys are simple and well arranged. Measuring reliability is additionally enhanced by the electronic axis parallelism compensation.

And of course the TC 100 measuring control can be integrated into your DNC system through the serial interface.

**Option:**  
with CMOS camera/image processing.

## Design features of Toolmaster



- Single-handed operation
- Ergonomic positioned operating elements
- Pneumatic locking of axes
- Infinite fine adjustment with micron accuracy
- Pre-loaded linear guides, protected by bellows guarantee long life with constant accuracy



### Patented Tool Spindle

- Plastic cage protects tool spindle from damage
- Runout accuracy within microns
- Alternatively ISO40 or ISO50 taper
- Prevents measuring errors if tool holders are not brand new (dirty or damaged)
- Long-lasting, reliable performance
- Adapters for all commercially available tool holders

## TM250-P Projector



- Projector «swiss made» providing high contrast, minimum distortion and even illumination for non-tiring and error-free measuring
- Diameter 110 mm (4.33")
- Magnification 20X
- Fixed and rotatable reticule with fine, strong-contrast measuring lines
- Extended life of halogene illumination thanks to automatic shutdown
- Ideal for additionally establishing radii and angles

## TM250-SMART Image

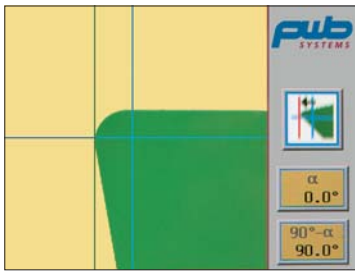


TM250-SMART optimises tool presetting by using a fully electronic profile projector. The SMART image processor replaces the optical profile projector.

The digital CMOS-camera with telecentric objective probes the tool tip and transmits the live image to a transfective 3.5" TFT-colour display. The electronic maximum search allows the tip to be rotated through the maximum diameter (vertex). The measuring process is supported by positioning flags which appear when optimum congruence is achieved between tool contour and an axis of the reticule. Measurements can therefore be performed to a repetitive accuracy of  $\pm 2$  microns without operator involvement. The measuring process is extremely simple and is no different from the use of a profile projector. The operator consequently has no influence on the measuring result, thereby ensuring highest possible measuring reliability.

Any desired radius or angle can be displayed on the screen by means of a knob.

# Processing



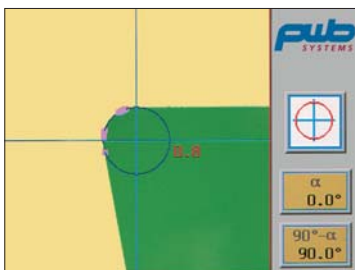
Maximum search facility. Largest diameter is indicated with a green line



Measuring process with position flag



Angle measurement



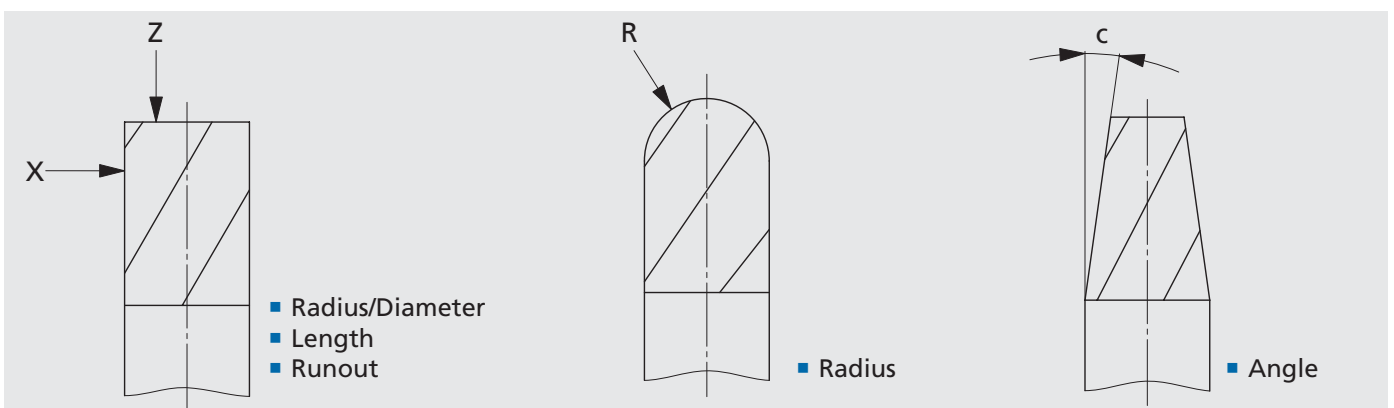
Radius measurement



## Measuring Electronics TC 100

Compact intelligence

- Glass scales AcuRite (Heidenhain), resolution 0.001 mm (0,00004")
- 6" LCD display
- Extremely simple operation
- Dirt resistant soft key pad
- Dialogue in English/German/French/Italian/Spanish
- 99 reference point memory for different adapters and machine zero points
- Designation and counting direction freely selectable for each reference point
- Tool library for 500 tools
- Absolute, difference and incremental measurements
- Hold function
- R/D switchable
- Circle measuring 3-100 points by reticule
- Angle measuring 2-100 points per line
- Axis parallelism compensation – corrects guide alignment
- Linear and section compensation
- Formats for label and tool list printing
- Serial interface RS 232 for PC and other applications
- Parallel interface Centronics for printer
- Simple set-up program
- Password protection





# TM250-TCAM2 Image Processing



TM250-TCAM2 is the entry model for tool measuring with electronic image processing. It is the intelligent combination of a digital CMOS-camera and evaluation electronics with a 6.4" TFT-colour monitor.

TM250-TCAM2 can be used to align and position profile contours in X- and Z-axis as well as for manual measuring. Mouse operation makes it very easy to use. No time-consuming operator training is necessary.

The system possesses a high degree of built-in intelligence. Its automatic contour recognition recommends the most suitable measuring method to the operator and automatically displays the measuring lines and coordinates of the tip on the monitor.

Tool tip angles and radii are automatically displayed. An alpha-numerical keypad can be displayed on the screen and used by mouse click. As an option, a standard keyboard can be connected.

RS-232 interface for program updates and the documentation of measuring results in a computer network. As an option it is possible to transfer machine tool program-compatible measuring data to a CNC control via RS-232 interface.

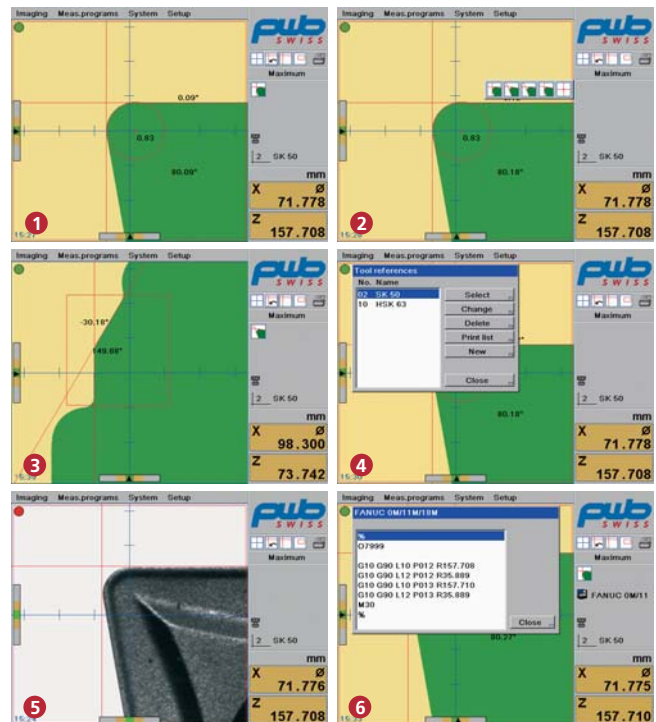
TM250-TCAM2 provides the operator with all data required for direct tool presetting. A PC is not required.

## Measuring methods:

- fixed and floating axes
- reticule - centre

## Measuring process:

- automatic recognition of measuring process by contour evaluation
- alternative manual determination of measuring process by mouse click



- 1 Measuring function with floating reticule
- 2 Manual selection of desired measuring process
- 3 Determination of measuring window
- 4 Management of adapter zero points
- 5 Frontal illumination for tip inspection (optional)
- 6 Control compatible data output (PP) (optional)

## Measuring functions:

- line/angle/radius

## Display and operating features:

- Adjusting aid for both axes
- Variable evaluation area, definable by mouse click
- Switchable live image, colour or black/white (tip inspection)
- Display hardcopy via RS-232 for documentation of measuring result
- Glass scales AcuRite 0.001 mm
- Memory for 99 adapter zero points
- Memory for 500 tools, 12 digits, alpha-numerical
- Internal tool library
- Absolute, difference and incremental measurements
- Switchable radius and diameter
- Switchable mm-inch
- Hold function
- Parallelism and linear compensation
- Password protection

## Measurement output:

- Label and tool list via USB and RS-232
- Data output for 1 machine tool (optional)

## Dialogue selection:

- English/German/French/Spanish/Italian (other languages on request)

# TM250-EPRO Image Processing



EPRO is the electronic measuring system for the future. It is the intelligent combination of a CMOS camera, a 10.4" TFT flat screen and a dirt/wear resistant soft key pad.

The EPRO is used to align and position profile outlines in X and Z axes as well as for manual measuring. Operating it is greatly simplified through the use of the mouse. No operator training is required.

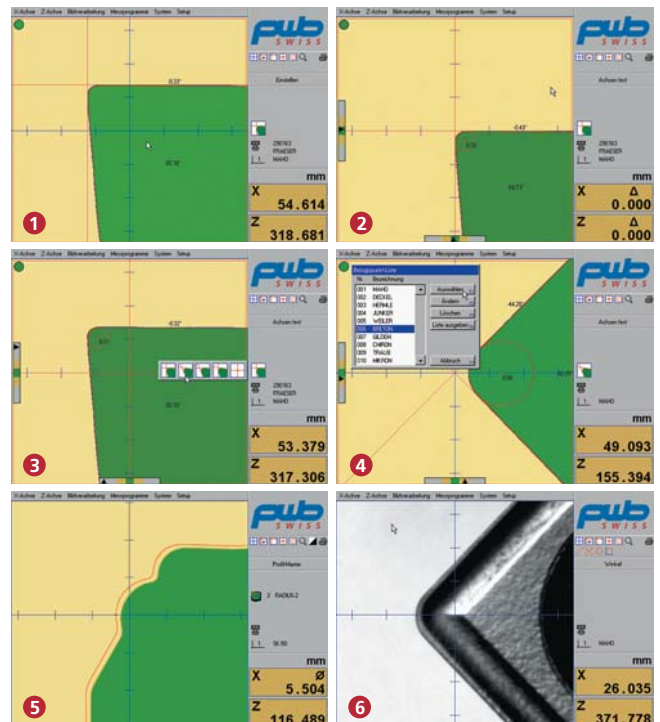
The system possesses a high degree of built-in intelligence. It recommends – by automatically identifying the cutting edges – the suitable measuring method and displays without further key actuation the edge coordinates on the screen.

Edge angle, position and radius are automatically displayed.

The measuring program MAXIMUM allows the working contour of radii and angles on form tools to be measured by manually rotating the spindle.

Ethernet interface for program updating and documenting measuring results in DNC mode.

As an option, measuring data outputs for 5 different machine control types are possible through RS232 or Ethernet interface.



## Image Processing

- 1 MAXIMUM measuring function with floating reticule for quick and easy measurements. The tool to be measured is swivelled past the viewing field of the camera. The cutting edges are automatically identified and measured by the suitable method. (Determination of largest dimension).
- 2 Measuring with fixed reticule for high precision measurements. The cutting edge to be measured is positioned to the electronic reticule using the infinite fine adjustment supported by the graphic adjusting aid for each axis.
- 3 Manual selection of desired measuring method, e.g. line-line to determine intersection coordinates by mouse click.
- 4 Up to 99 adapters and 1000 tools can be managed alpha-numerically.
- 5 PROFILEMASTER for storing contour lines for comparative measuring.
- 6 EPRO includes frontal illumination as standard. The 20X respectively 40X magnification permits visual inspection of the tool tips for wear or cracks. The mouse cursor is used to move around the screen.

# Spindle K (Option)

## Measuring methods:

- Fixed and floating axis
- Maximum (radius end mills)
- Center point

## Measuring mode:

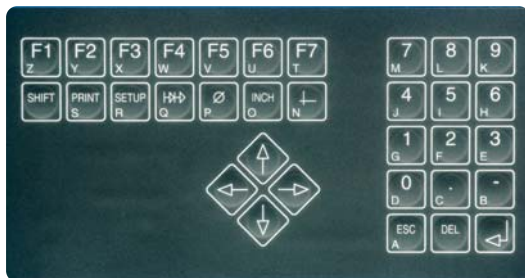
- Automatic recognition of measuring mode by contour analysis
- Alternative manual selection of measuring method by mouse click

## Measuring functions:

- Line/Angle/Radius
- Angle and radius nominal value with tolerance circle
- Movable reticule

## Display and operating elements:

- Adjustment aid for both axes
- Variable analysis window, definition by mouse click
- Switchable colour or black/white (tip inspection) display
- Inverse tool
- Zoom 20X or 40X
- Display hardcopy by Ethernet for documentation of measuring result



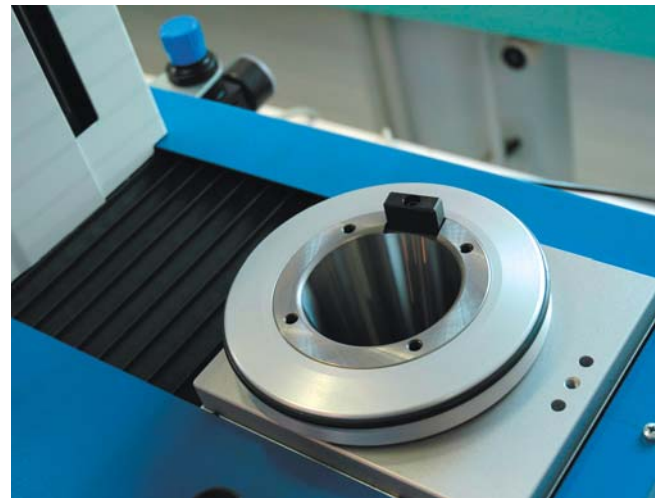
- Glass scales AcuRite, resolution 0.001 mm (0,00004")
- 99 reference point memory
- Tool library for 1000 tools, 12 digit alpha-numeric
- Internal tool management
- Optional external tool management (Ethernet)
- Absolute, difference and incremental measurements
- R/D switchable
- Switchable metric- inch measuring
- Hold function
- Compensation of axes parallelism
- Password protection

## Measurement output:

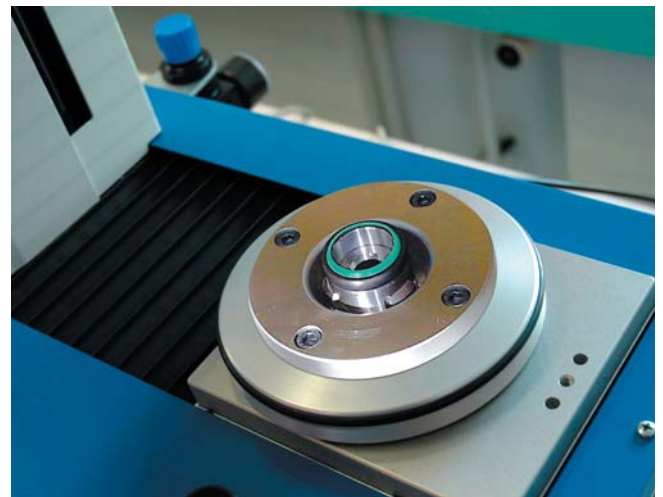
- Labels and tool lists
- Optional NC compatible data output

## Dialogue languages:

- English/German/French/Spanish/Italian/Swedish/Dutch



*Tool spindle ISO 40 or ISO 50*



*Pneumatic clamping adapter for HSK tools*

## Spindle bearing with/without vacuum pull-in.

Tool spindle ISO 40 or ISO 50 (optionally with vacuum pull-in) with precision bearing. Runout with micron accuracy provided by pre-loaded precision ball bearings. Rotation of tool can be clamped in any position for ease of tip presetting on fine boring heads

## Accessories:

- Pneumatic clamping adapter for HSK tools
- 4 x90 degree VDI indexing
- All standard ISO adapters can be used



# TM250-EPRO 2 Cameras



This device essentially corresponds to the tool presetting and measuring device TM250-EPRO, but is additionally equipped with a second camera that can be swivelled through 90°.

The horizontal camera can be used to measure the tip either by frontal illumination or translumination. Automatic tool tip recognition makes operation extremely easy and enables all required measuring functions such as:

- Diameter / Length
- Angle contour
- Radius contour
- Runout
- Point – point measurements
- Tip inspection, 20+40 X magnification
- and much more

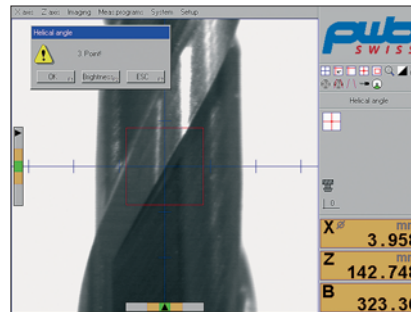
The following measurements can be performed on cutting tools with the swivellable camera and the high precision rotary resolver in the adapter:

- Helix lead and angle
- Chamfer width
- Circular pitch
- Flute depth

The entire screen area can also be used as a measuring surface. Each searched measuring point can be pinpointed by mouse cursor and calculated.

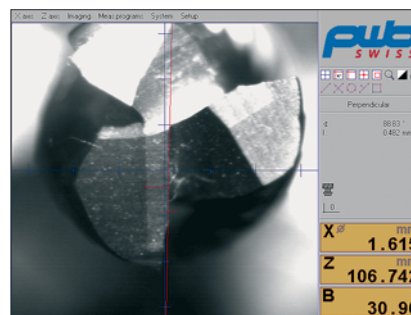
The K type tool adapter (see page 7) ensures high runout accuracy. As an option, this adapter can also be fitted with a vacuum pull-in system.

Tool diameter: TM250: 170 mm (6,7")  
TM250-X4: 320 mm (12,6")



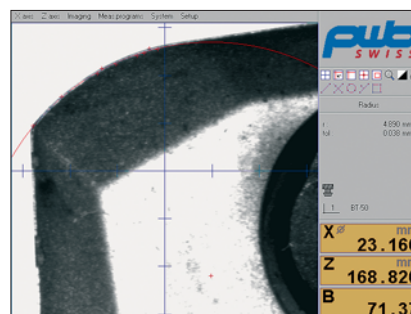
Frontal illumination:

- Edge inspection with 20 or 40 X magnification
- Horizontal (90° to tool axis)
- Chamfer width with vertical alignment function
- Helix angle with "line" function
- Helix angle with rotary encoder in adapter spindle (B axis)



Frontal illumination:

- Vertical (0° to tool axis)
- Chamfer width with vertical alignment function
- Edge pitch measured by rotary encoder in B-axis
- Relief angle
- Rake angle



Frontal illumination:

- Edge inspection with 20 or 40 X magnification
- Wear measurements, Radius and angle measurements



## Technical Data

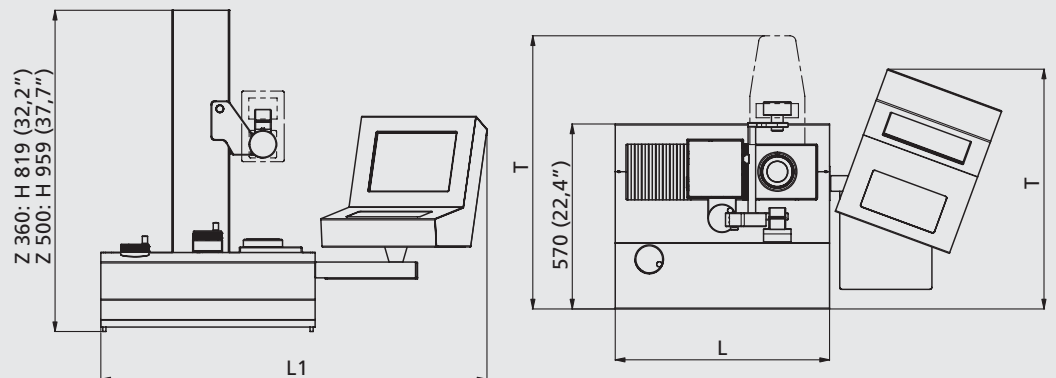
Designation	Measuring range		L	L1	T	Weight kg/lbs
	X-Axis (Ø)	Z-Axis (L)				
Toolmaster 250-P	300 (11,8")	360 (14,17")	546 (21,5")	-	698 (27,5")	70/154
250X4-P	400 (15,8")	360 (14,17")	621 (24,4")	-	698 (27,5")	80/176
Toolmaster 250-SMART	300 (11,8")	360 (14,17")	546 (21,5")	-	-	80/176
250X4-SMART	400 (15,8")	360 (14,17")	621 (24,4")	-	-	90/198
Toolmaster 250-TCAM2	300 (11,8")	360 (14,17")	546 (21,5")	866 (34,1")	460 (18,1")	80/176
250X4-TCAM2	400 (15,8")	360 (14,17")	621 (24,4")	941 (37,0")	460 (18,1")	90/198
Toolmaster 250-EPRO	300 (11,8")	360 (14,17")	546 (21,5")	985 (38,7")	615 (24,2")	80/176
250X4-EPRO	400 (15,8")	360 (14,17")	621 (24,4")	1060 (41,7")	615 (24,2")	90/198

Tool adapter available for ISO 40 or ISO 50

Measuring length Z = 360 (14,17") and 500 (19,68") available

All dimensions in mm (inch)

## Dimensions



## Power Supply

Electrics: 90-264 V AC / 50-60 cycles

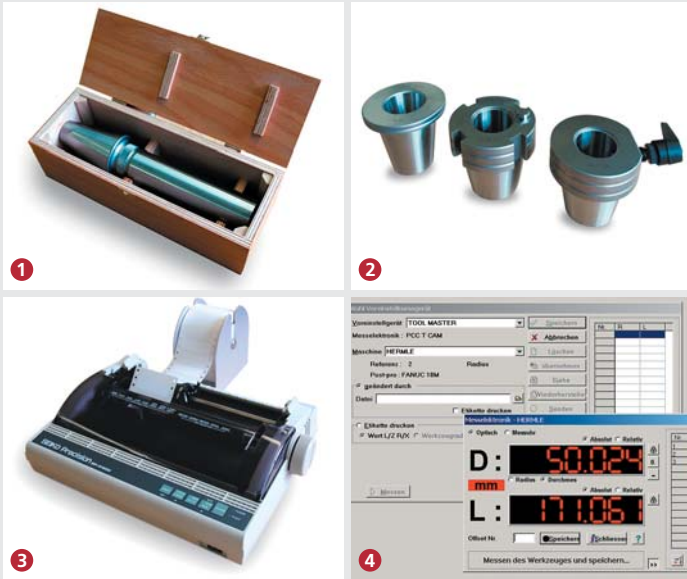
Compressed air: 4-6 bar, pre-filtered

## Extent of Supply

- Basic unit, ready for operation
- Tool spindle ISO40 or ISO50
- Connecting cable
- Operator's manual
- Test certificate
- Guarantee certificate
- Dust cover
- One-way packaging

## Accessories

All tool spindles, master mandrels and adapters are made of rust-resistant, vacuum hardened steel.



### 1 Master mandrel/wooden case

Master mandrels are for zero calibration and electronic error compensation of the guides (parallelism). Zero calibration is possible at any desired working height.

### 2 Adapter

Adapters are available for ISO/HSK/VDI and other tool systems.

### 3 Printer

- Needle printer for labels and tool lists
- Parallel printer cable 3 m (9,85 ft)
- Roll holder
- Labels 60 x 20 mm (2,36"x0,787") (2000/roll)

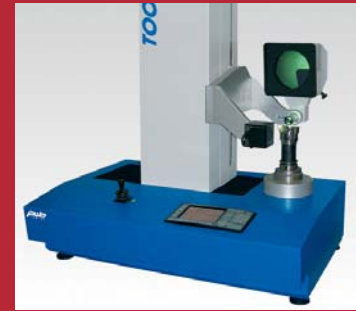
### 4 WINPRESET

External PC software for evaluation and storage of measuring data from the presetter. Data transfer direct to machine tool, tool management system or DNC.

We reserve the right to make technical improvements.

## Contact

## Other Products



### Toolmaster

- with pneumatic clamping
- with motorized adjustment
- with frontal illumination measuring functions
- with double camera systems
- special executions



### Toolboy

Ergonomic tool assembly without reclamping – prevents tool and spindle damage



### Touchsetter

Easy determination of machine spindle reference point

**pwb**  
SWISS

www.pwb-swiss.com