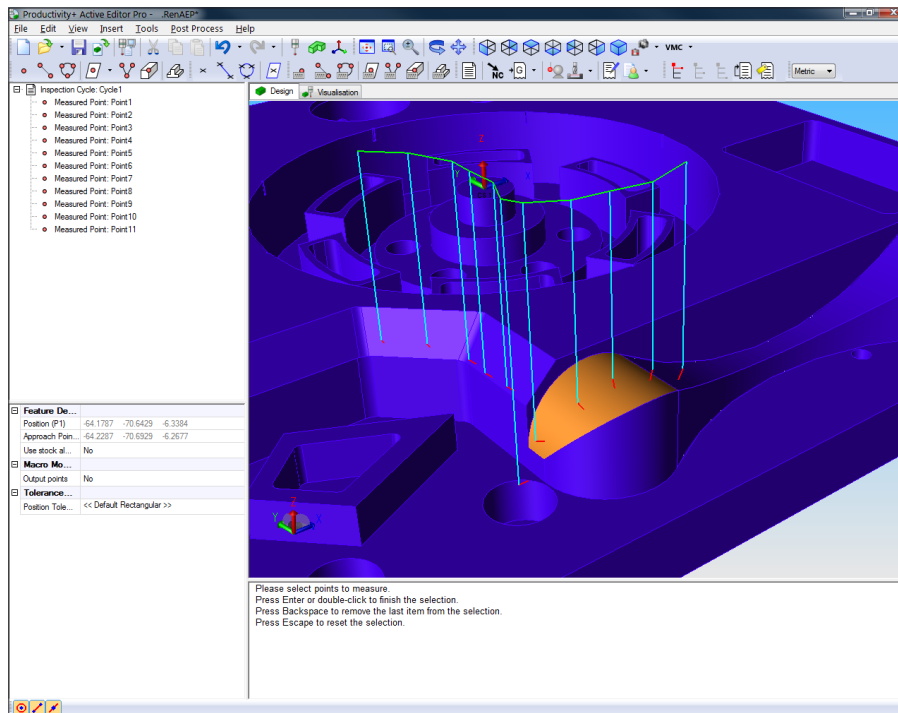


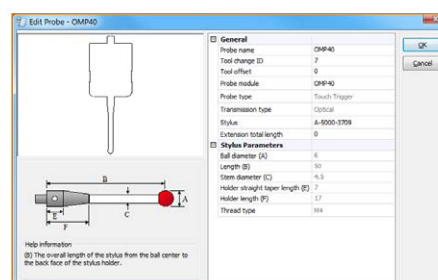
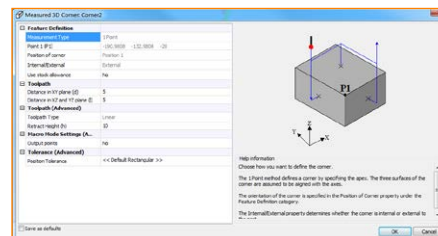
Productivity+™ Active Editor Pro probe software for machine tools

Productivity+™ Active Editor Pro is a PC based software solution which provides an easy-to-use platform for integrating measurement capability and advanced, intelligent process control functionality across the key stages of machining programs, encompassing predictive process setting, active in-process control and informative reporting.



Features and benefits

- Add intelligence to your process: cutting programs automatically adapt based on inspection results
- Point and click programming from solid models, or program manually without models
- Full multi-axis support for milling machines, including spindle orientating machine configurations
- Embed macro programs and custom calculations into the probe routine
- Integrated tool setting
- Comprehensive CAD/CAM compatibility
- Dynamic help, instructional dialogs and wizards
- Probe cycle simulation
- Extensive database of Renishaw probes
- Construct points, lines, circles and planes from measured features
- Data reporting via RS232/write to file (controller dependent)
- Automatic recovery from false triggers and reset errors



Data sheet

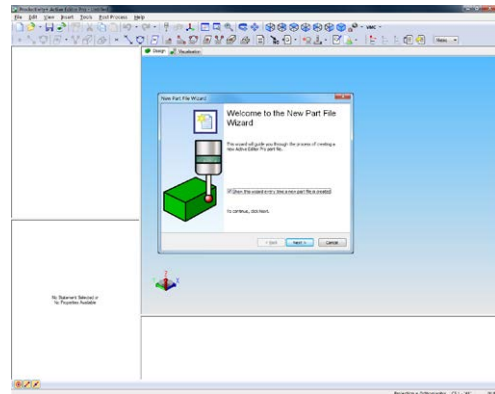
Productivity+™ Active Editor Pro probe software for machine tools

Creating a new part file

Productivity+ Active Editor Pro contains a New Part File Wizard that guides users through the steps required to create a new session, including, where necessary, measurement units, importing an existing NC machining program, and importing a solid model.

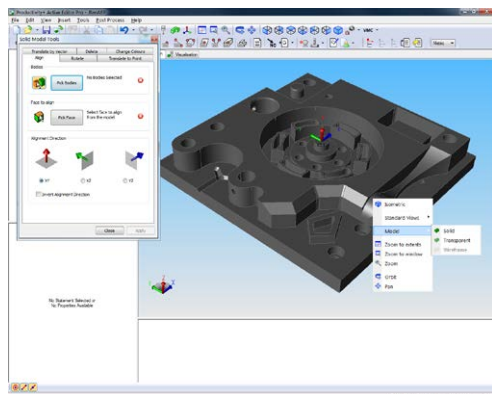
NC program files can also be imported (or pasted from the clipboard) during programming using the G-Code Block icon.

Any imported programs can easily be split or re-combined to accommodate the required probing strategy.



Solid models

A range of CAD model formats are supported within Productivity+ Active Editor Pro, some as standard, some as cost options.



Once imported, models can be aligned in XY, XZ or YZ, rotated, translated (along a vector or to a point), or deleted via the Solid Model Tools dialog.

Multiple solid models can be inserted into a single session, allowing fixtures, parts and machine geometry to be manipulated, providing the most realistic 'machine' environment for programming and simulation.

The Solid Model Tools dialog also allows the colour of imported models to be adjusted, particularly useful where multiple models exist in a single session.

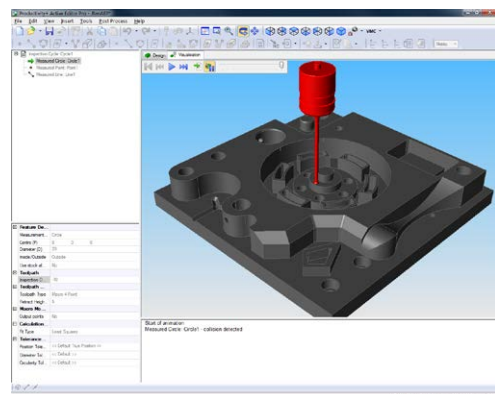
A further dialog allows users to select a feature on the solid model, create a new coordinate system and allocate this to a work coordinate system (WCS) including extended work coordinates on the machine tool.

The Model View menu (right click in the Model Viewer) allows selection of a series of predefined viewing angles – isometric, left, right, top, bottom, back, front – and model shading options – solid, transparent, wireframe).

Visualisation

The visualisation feature allows on-screen simulation of programmed probe cycles. When a probe/component collision is detected, the probe is highlighted in red and a collision log is generated (visible in the Prompt Viewer).

Choose to visualise an entire program, or select an individual program statement at which simulation will commence.



Measured features

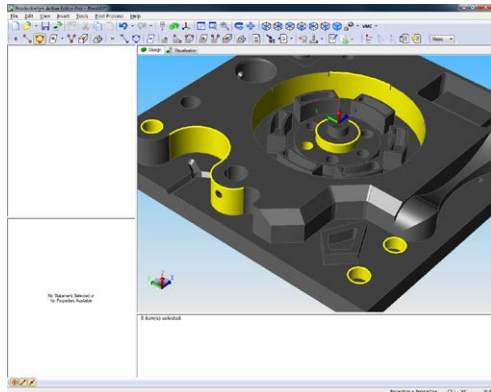
Two methods of component feature selection are available: Measured statements, used when working from a solid model, and Basic statements, used when no component model is available. When using Basic statements, all coordinate information for the required feature(s) must be entered manually.



Measured statement toolbar



Basic statement toolbar

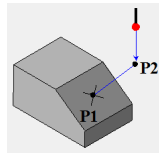
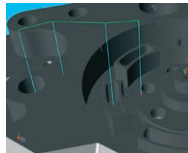
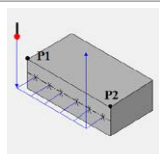
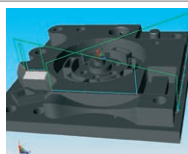
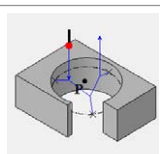
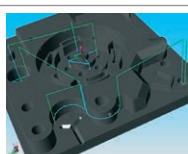
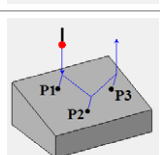
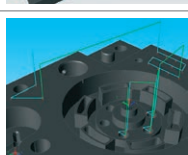
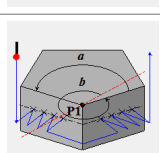
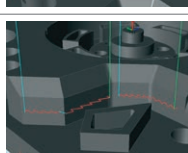
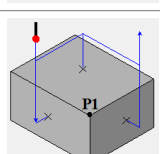
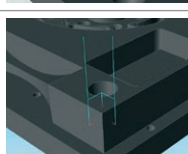
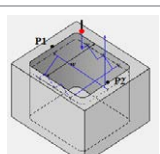
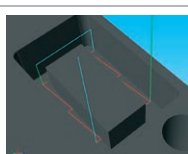


Whichever method is used, the range of selectable features is the same:

- Point
- Line
- Circle
- Plane
- 2D corner
- 3D corner
- Web/pocket

When working from a solid model, Productivity+ Active Editor Pro automatically identifies valid, available instances of the feature type selected, e.g. line, circle etc, and allows multiple instances of the same feature type to be selected in a single pass over the model.

Various inspection characteristics of each feature can be amended in the Property Viewer or the feature's dialog box.

<p>Point - use to add surface point features to an inspection cycle in a single axis or at any vector angle. Inspect free-form surfaces by creating an inspection cycle comprising multiple individual points.</p>		
<p>Line - use to create a series of parallel points across a uniform surface. Probing location and direction are automatically determined based on the model face and edge highlighted during selection.</p>		
<p>Circle - use to create probe cycles to inspect bore, boss and circle features. Productivity+ Active Editor Pro automatically detects whether selected features are a bore, boss or arc.</p>		
<p>Plane - use one of the available plane types (3-point, rectangular or radial) to inspect a uniform plane. The number of points required to select the plane, and the editable feature characteristics are dependent on the plane type selected.</p>		
<p>2D corner - use to select and inspect two faces that form a non right-angle corner. Productivity+ Active Editor Pro automatically detects whether the selected faces form an 'internal' or 'external' corner based on the angle between them.</p>		
<p>3D corner - use to select and inspect three faces that form a right-angle corner. Selections can be made from XY, XZ, or YZ planes with the orientation of the initially selected face determining subsequent selections.</p>		
<p>Web/pocket - use to select and inspect raised or recessed features that have parallel edges. After initial face and edge selection, Productivity+ Active Editor Pro automatically determines whether the feature is a web or a pocket, and only valid subsequent selections are highlighted when the mouse is moved across the model.</p>		

Data sheet

Productivity+™ Active Editor Pro probe software for machine tools

Feature characteristics

	Point	Line	Circle	Plane	2D corner (non right-angle corner)	3D corner (right-angle corner)	Web/ pocket
Feature definition							
Use stock allowance	toggle on/off; manually enter stock value						
Toolpath							
Inspection depth	n/a	manual edit		n/a	manual edit	n/a	manual edit
Measurement direction	n/a	toggle to reverse	n/a	n/a	toggle to reverse	n/a	n/a
Number of measurement points *	1	2 - 1000	3 - 1000	3-point plane: n/a; Rectangle: 2 - 500 per side (multiple ≤1000); Radial: 3 - 100	2 - 1000	n/a	2 - 1000 per side
Measurement offset (from axis or point)	n/a	manual edit: linear	manual edit: angular (except macro 4-point)	manual edit: linear or radial (dependent on toolpath type)	manual edit: linear		
Toolpath types	n/a	shortest distance; linear	shortest distance; linear; circular; macro 3 point; macro 4 point	shortest distance; linear			
Retract height	n/a	n/a	toggle on/off; manually add value (dependent on toolpath type selected)			manual edit	
Macro mode settings							
Output points (to printer or file)	toggle on/off						
Tolerance	position	position; angular	position; dimension	angular	position; dimension	position	angular; dimension
Automatic characteristics							
	n/a	measurement type; probing direction (approach)	measurement type; inside/outside flag (bore/boss feature type)	measurement type; probing direction (approach) [except radial plane]	measurement type; internal/external flag	measurement type; position of corner; internal/external flag	inside/outside flag (web/pocket feature type)

* software may be unable to calculate dimensional/positional information when using a large number of measurement points (circle and plane feature types)

Constructed features

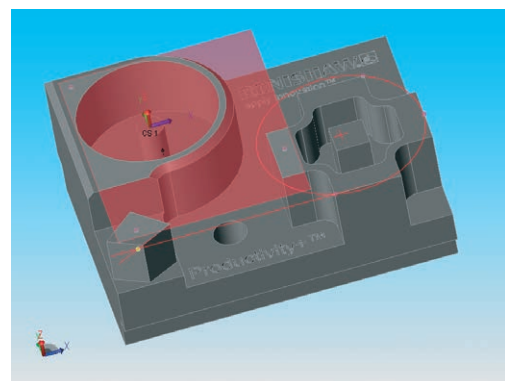
Constructed feature functionality allows the generation of 'virtual' point, line, circle and plane features using previously determined position data. These constructed features may then be reported on or used within logic conditions and to perform update operations.

The number of 'child' features required to create a constructed feature is dependent on feature type and construction method.

The most flexible of these elements, Constructed Points, can be created using nine different methods, the most simple being 'Offset from origin', creating a point at a user defined X, Y, Z offset from the coordinate system (0, 0, 0) position.

Other available Constructed Point methods are:

- Offset from position
- Midpoint between positions
- Line line intersection
- Intersection of 3 planes
- Line plane intersection
- Closest position on line
- Closest position on plane
- Line line intersection on plane

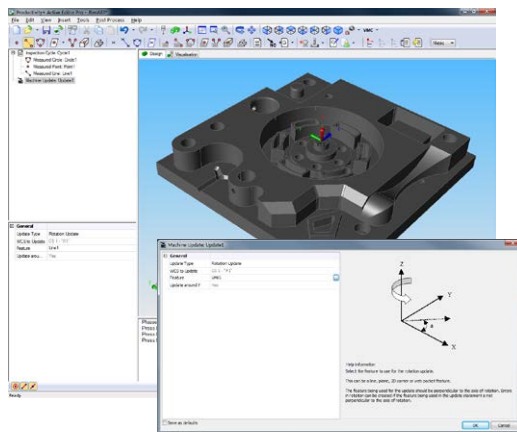
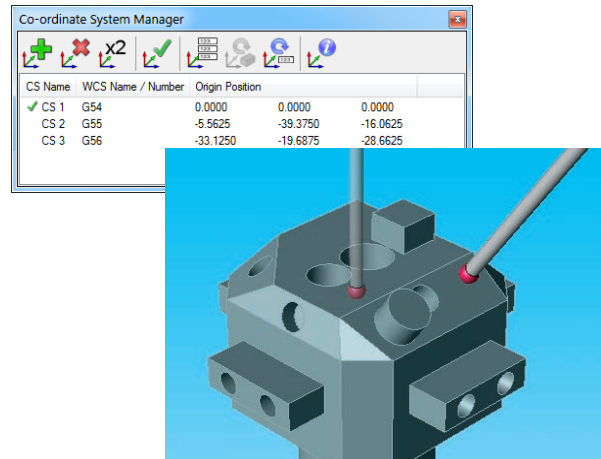


Multi-axis programming

Inspection programs can be generated for multi-axis milling machines, including machine configurations which modify spindle orientation.

Machine tool controls which support specific multi-axis commands such as PLANE, CYCLE800 and G68.2 are able to utilise Feature Coordinate Systems (FCS) whereby multi-axis inspection routines can be programmed using a single coordinate system. Where the use of FCS is not supported, it is necessary to create a coordinate system for each orientation in which inspection is required..

Once all necessary coordinate systems have been established, select the appropriate one for the required features, and program the probing cycle as normal.



Machine update

The machine update command provides the ability to automatically update offsets and parameters from probed features.

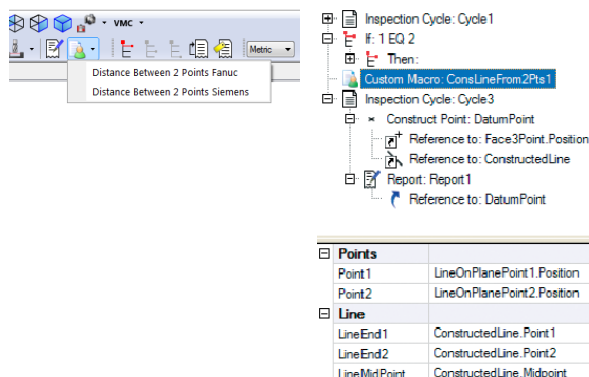
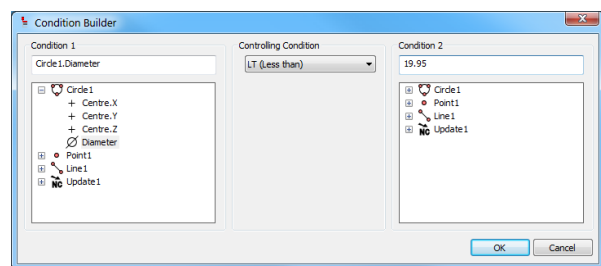
Available updates are:

- WCS update
- Tool length
- Tool diameter
- Machine variable
- Rotation update

Condition builder

The Condition Builder function allows the addition of logic statements incorporating defined conditions such as If...Then, Else and Else...If to probing programs. The machine tool can then make intelligent decisions about subsequent machining operations and updates based on the results returned.

Goto and Label elements allow the combined, posted program to 'jump' to a specific, identified location within the program to, for example, re-machine a feature or raise an alarm and reject the component.



Custom macros

Custom macros extend Productivity+ capability by integrating bespoke on-machine functionality with programmed probing cycles. Data can be passed to a macro on a machine tool, and results used in reports and for constructing logic statements.

Custom macros can be generated to solve a wide range of customer requirements that are not possible with Productivity+ alone, and can utilise either measured data inputs, such as Line1.Midpoint, or manually entered numerical (integers, rational, irrational) and text data.

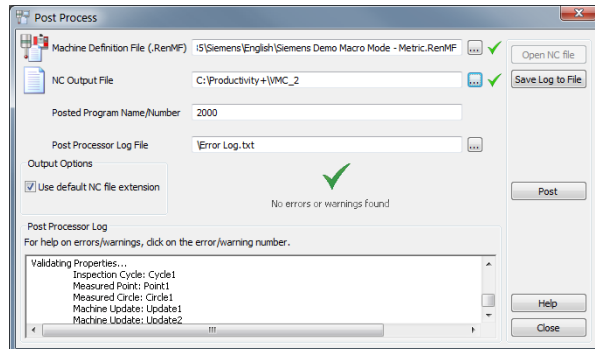
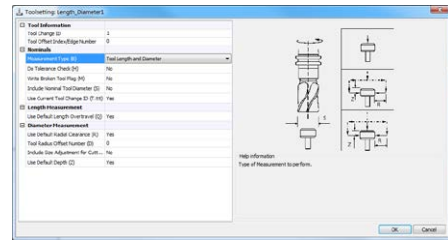
Data sheet

Productivity+™ Active Editor Pro probe software for machine tools

Tool setting

Utilisation of the tool setting option within Productivity+ Active Editor Pro requires tool setting macros to be installed on your machine controller.

Both contact and non-contact methods of tool setting are supported.



Post processing

Productivity+ Active Editor Pro uses a post processor tool to generate a program that can run on a machine tool.

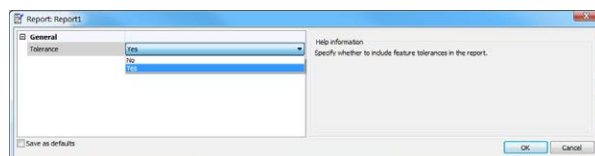
The resulting program contains machining and inspection commands, and all necessary macros. Once generated, simply load the program onto the machine tool, select the correct program name/number, and run as usual.

Reporting

After completion of a probe routine, reports detailing measured feature parameters and providing information on machine updates performed can be generated.

Report information for line, circle and plane features also include Material Condition, the error value in the probing direction between nominal and actual values.

Inclusion of an optional tolerance check provides a simple pass/fail conformance statement.



	ACT	DEV	LOWER	UPPER	INTOL
MEASUREDPOINT MPT					
POINT 1					
POSITION X	-60.02540	-0.0254	-0.05	0.05	YES
POSITION Y	-96.583	0	-0.05	0.05	YES
POSITION Z	-16.929	0	-0.05	0.05	YES
MATERIAL CONDITION	0.0254				
MEASUREDCIRCLE MCL					
CIRCLE 1					
CENTRE X	-120.0211	-0.0211	0.125	-0.125	YES
CENTRE Y	119.9826	-0.0174	0.125	-0.125	YES
CENTRE Z	0	0			
DIAMETER	18.888	-0.112	-0.05	0.05	NO
MATERIAL CONDITION	0.056				
MEASUREDPLANE MPL					
PLANE 2					
VECTOR NORM TO PLANE X	-0.0002	-0.0002			
VECTOR NORM TO PLANE Y	-0.0002	-0.0002			
VECTOR NORM TO PLANE Z	1	0			
POINT ON PLANE X	12.1631	0.0011			
POINT ON PLANE Y	-86.0245	0.0005			
POINT ON PLANE Z	0.0524	0.0524			
ANGLE ERROR IN A AXIS	0.013	0.013	-1	1	YES
ANGLE ERROR IN B AXIS	-0.0132	-0.0132	-1	1	YES
ANGLE ERROR IN C AXIS	0	0	-1	1	YES
MATERIAL CONDITION	0				

Feature properties suitable for machine variable updates and logic

Feature	X, Y, Z position	Dimensions	Angle around X/Y/Z axis	Feature angle	Surface vector
Measured point	✓ touch point position				✓ material condition
Constructed point	✓ offset point position				
Measured line	✓ start, mid and end point positions				
Measured circle*/arc/ constructed circle	✓ circle centre point	✓ diameter or radius			
Measured 3-point plane	✓ centroid of points		✓		✓ X, Y, Z position
Measured rectangular plane	✓ centroid of points		✓		✓ X, Y, Z position
Measured radial plane	✓ centroid of points (3 points only)		✓		✓ X, Y, Z position
Constructed plane	✓ centroid of points (3 points only)		✓		✓ X, Y, Z position
Measured 2D corner	✓ corner position at line intersection			✓ between lines	
Measured 3D corner	✓ corner position at surface intersection				
Web/pocket (no ends)	✓ midpoint between 2 sides + midpoint at start and end points	✓ width			
Web/pocket (measured ends)	✓ midpoint between 4 sides + measured start and end points	✓ length and width			
Custom macro [†]	✓	✓	✓	✓	✓

Feature properties suitable for WCS setting and updates

Feature	Axes available for WCS setting and updates [‡]					Position reference
	Single axis	X and Y	X and Z	Y and Z	X, Y and Z	
Measured point	✓	✓	✓	✓	✓	✓ touch point
Constructed point	✓	✓	✓	✓	✓	✓ offset point
Measured line	✓	✓				✓ midpoint
Measured circle*/arc/ constructed circle	✓ X or Y only	✓				✓ centre point
Measured 3-point plane	✓	✓	✓	✓	✓	✓ centroid of points
Measured rectangular plane	✓	✓	✓	✓	✓	✓ centroid of points
Measured radial plane	✓ Z only					✓ centroid of points
Constructed plane	✓	✓	✓	✓	✓	✓ centroid of points
Measured 2D corner	✓ X or Y only	✓				✓ line intersection point
Measured 3D corner	✓	✓	✓	✓	✓	✓ surface inspection point
Web/pocket (no ends)	✓ X or Y only					✓ midpoint between 2 sides
Web/pocket (measured ends)	✓ X or Y only	✓				✓ midpoint between 4 sides

* macro 3 point and macro 4 point

[†] available properties are subject to custom macro functionality

[‡] dependent on probing direction; axes refer to machine orientation

Data sheet

Productivity+™ Active Editor Pro probe software for machine tools

Feature properties suitable for machine rotations and tool updates

Feature	Rotation update	Tool length update	Tool diameter update
Measured point		✓ when measured in Z	✓ when measured in X and/or Y
Constructed point			
Measured line	✓ single axis, dependent on feature orientation	✓ when measured in Z	✓ when measured in X and/or Y
Measured circle*/arc/ constructed circle			✓
Measured 3-point plane	✓ all axes: one per update	✓ when measured in Z	✓ when measured in X and/or Y
Measured rectangular plane	✓ all axes: one per update	✓ when measured in Z	✓ when measured in X and/or Y
Measured radial plane	✓ around X and Y: one per update	✓ when measured in Z	✓ when measured in X and/or Y
Constructed plane	✓ all axes: one per update	✓ when measured in Z	✓ when measured in X and/or Y
Measured 2D corner	✓ around Z only		
Measured 3D corner		✓	
Web/pocket (no ends)	✓ around Z only		✓
Web/pocket (measured ends)	✓ around Z only		✓

Feature properties available in reports

Feature	X, Y, Z position	Dimensions	Angle error around X/Y/Z	Other
Measured point	✓ touch point position			Material condition
Constructed point	✓ offset point position			
Measured line	✓ start, mid and end point positions		✓	
Measured circle*/arc/ constructed circle	✓ centre point positions	✓ diameter or radius		Material condition
Measured 3-point plane	✓ centroid of points		✓	Material condition Reports 'normal vector'
Measured rectangular plane	✓ centroid of points		✓	Material condition Reports 'normal vector'
Measured radial plane	✓ centroid of points		✓	Material condition Reports 'normal vector'
Constructed plane	✓ centroid of points		✓	Reports 'normal vector'
Measured 2D corner	✓ corner position at line intersection	✓ internal angle	✓ angle from X-axis	
Measured 3D corner	✓ corner position at surface intersection			
Web/pocket (no ends)	✓ midpoint between 2 sides + midpoint at start and end points	✓ width	✓ angle from X-axis	
Web/pocket (measured ends)	✓ midpoint between 4 sides + measured start and end points	✓ length and width	✓ angle from X-axis	
WCS update	✓ measured deviation of feature selected for update			Also reports update type, WCS updated, reference WCS and feature used
WCS set from feature	✓ machine position of selected feature			Also reports update type, WCS updated, reference WCS and feature used
WCS set manual	✓ machine position of reference WCS and any offsets			Also reports update type, WCS updated and reference WCS
Rotation update			✓ angle error	
Machine variable update		✓ value written to variable		Also reports variable number
Tool length update		✓ error used for update		Also reports tool offset ID and offset register
Tool diameter update		✓ error used for update		Also reports tool offset ID and offset register
Custom macro†	✓	✓	✓	Can report any string as specified by the custom macro functionality

* macro 3 point and macro 4 point

† available properties are subject to custom macro functionality

Supported controllers, CAD formats and languages

Most machine tool controllers that support probing run this software, including:

- Brother
- Fanuc
- Haas
- Heidenhain
- Hitachi Seicos
- Hurco
- Makino
- Mazak
- Mitsubishi Meldas
- Mori Seiki
- Okuma
- Siemens
- Yasnac

Work to support additional controllers is on-going.

Productivity+ Active Editor Pro operates with the following CAD formats:

- IGES
- Parasolid
- STEP
- ACIS*
- AutoDesk Inventor*
- CATIA*
- Creo Elements/Pro (Pro/E)*
- SolidWorks*
- NX/Unigraphics*

* Cost option

Continuous development work means other formats may be available - please contact productivityplus.support@renishaw.com for details.

Productivity+ Active Editor Pro software is supported in the following languages:

- English
- Czech
- French
- German
- Italian
- Japanese
- Korean
- Simplified Chinese
- Spanish
- Traditional Chinese

Recommended probing systems

Renishaw recommends the use of non-lobing probes such as the OMP400 or RMP600, for the best metrology performance. Use of Renishaw probes that do not contain strain-gauge technology will result in decreased performance. Renishaw does not support the use of non-Renishaw probes with this software.

System requirements

Recommended PC specification	
Operating system	Microsoft Windows 7 (64-bit) or later
Processor	2.0 GHz Intel Core 2 Duo (or equivalent)
Memory	4 GB RAM and 1 GB hard disk space
Graphics card	NVIDIA GeForce 5 series (or later)
Other	DVD drive for software installation

Please note that due to the constantly changing nature of PC specifications, this information is given as a recommendation only of the system and hardware requirements. In general we recommend a 'CAD ready' PC – one that is specified as capable of running CAD/CAM software.

For larger CAD files, a faster processor, more RAM and a more powerful graphics cards will provide better performance.

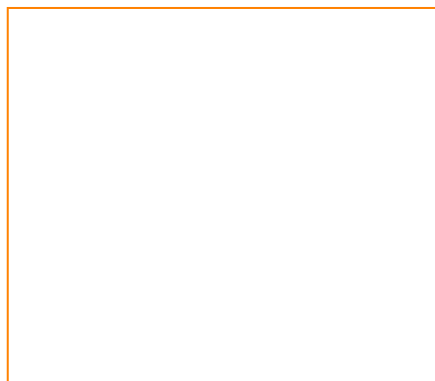
Part numbers for Productivity+™ Active Editor Pro probe software for machine tools

Parts list – please quote relevant part number(s) when ordering

Part number	Description
Software	
A-4007-1400	Productivity+ Active Editor Pro software
Software packages	
A-5226-5001	Productivity+ Active Editor Pro + Fanuc Macro B post
A-5226-5002	Productivity+ Active Editor Pro + Haas post
A-5226-5003	Productivity+ Active Editor Pro + Hitachi Seicos post
A-5226-5004	Productivity+ Active Editor Pro + Makino post
A-5226-5005	Productivity+ Active Editor Pro + Mazak ISO post
A-5226-5006	Productivity+ Active Editor Pro + Mitsubishi Meldas post
A-5226-5007	Productivity+ Active Editor Pro + Yasnac post
A-5226-5010	Productivity+ Active Editor Pro + Heidenhain i530 post
A-5226-5013	Productivity+ Active Editor Pro + Okuma OSP200 post
A-5226-5016	Productivity+ Active Editor Pro + Mori Seiki post
A-5226-5017	Productivity+ Active Editor Pro + Siemens 810D and 840D post
A-5226-5026	Productivity+ Active Editor Pro + Hurco Winmax post
A-5226-5027	Productivity+ Active Editor Pro + Brother post
A-5226-5028	Productivity+ Active Editor Pro + Heidenhain 426/430 post
A-5226-5029	Productivity+ Active Editor Pro + Mazak Integrex multi-tasking post
A-5226-5030	Productivity+ Active Editor Pro + Heidenhain 6xx post
A-4007-8999	Free 90-day trial software - English

Part number	Description
CAD importers	
A-5226-0007	Creo Elements/Pro (Pro/E) CAD importer
A-5226-0008	CATIA CAD importer
A-5226-0009	NX/Unigraphics CAD importer
A-5226-0010	ACIS CAD importer
A-5226-0011	SolidWorks CAD importer
A-5226-0012	AutoDesk Inventor CAD importer
A-5226-0020	3 or more CAD importers†
Post processors	
A-4007-5100	Fanuc Macro B post
A-4007-5200	Haas post
A-4007-5300	Hitachi Seicos post
A-4007-5400	Makino post
A-4007-5500	Mazak ISO post
A-4007-5600	Mitsubishi Meldas post
A-4007-5700	Yasnac post
A-4007-5900	Brother 32B post
A-4007-6000	Heidenhain i530 post
A-4007-6300	Okuma OSP200 post
A-4007-6600	Mori Seiki post
A-4007-6700	Siemens 810D and 840D post
A-4007-6800	Hurco Winmax post
A-4007-6900	Heidenhain 426/430 post
A-4007-7100	Mazak Integrex multi-tasking post
A-4007-7200	Heidenhain 6xx post

† This is the most economical option when working with multiple CAD formats, and supports the use of all listed CAD formats



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