RENISHAW
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Primo™ system



www.renishaw.com/primo

Specification

Primo system

Principal application	Workpiece set-up and tool setting on small to medium CNC machining centres.
Primo Credit Token	Allows the Primo system to function.
Transmission type	Frequency Hopping Spread Spectrum (FHSS) radio Radio frequency 2400 MHz to 2483.5 MHz
Radio approval regions	Radio approval regions: Europe (all countries within the European Union), Japan and USA. China is exempt from requiring radio approvals. For details about other regions, please contact Renishaw.
Operating range	Up to 10 m (32.8 ft)
Sealing	IPX8 (EN/IEC 60529)
Operating temperature	+5°C to +55°C (+41°F to +131°F)

Primo Radio Part Setter

Principal application		Used for workpiece set-up and inspection.	
Compatible interface		Primo Interface.	
Recommended stylus		M4 stylus with 50 mm (1.97 in) ceramic stem and 6 mm (0.24 in) ruby ball.	
Weight without shank (including battery and credit token)		350 g (12.35 oz)	
Switch-on/switch-off options		Radio on ⟶ Radio off Spin on ⟶ Spin off	
Battery types		½ AA (3.6 V) Lithium-thionyl chloride	CR2 (3 V) Lithium manganese dioxide
Battery life (½ AA (3.6 V) Lithium-thionyl chloride)	**Standby life**	270 days maximum	
	Continuous life	260 hours maximum	
Sense directions		±X, ±Y, +Z	
Unidirectional repeatability		1.00 µm (40 µin) 2σ *(see note 1)*	
Stylus trigger force *(see notes 2 and 3)* XY low force XY high force +Z direction		 0.50 N, 51 gf (1.80 ozf) 0.90 N, 92 gf (3.24 ozf) 5.85 N, 597 gf (21.04 ozf)	
Mounting		Taper shank in machine tool spindle.	

Continued on next page

Specification (continued)

Primo Radio 3D Tool Setter

Principal application		Tool measurement and broken tool detection on small to medium CNC machining centres.	
Compatible interface		Primo Interface.	
Recommended stylus		26 mm (1.02 in) diameter disc stylus, tungsten carbide	
Weight with disc stylus (including battery)		660 g (23.28 oz)	
Switch-on/switch-off options		Radio on ⟶ Radio off	
Battery types		½ AA (3.6 V) Lithium-thionyl chloride	CR2 (3 V) Lithium manganese dioxide
Battery life (½ AA (3.6 V) Lithium-thionyl chloride)	**Standby life**	270 days maximum	
	Continuous life	260 hours maximum	
Sense directions		±X, ±Y, +Z	
Unidirectional repeatability		1.00 µm (40 µin) 2σ *(see note 1)*	
Stylus trigger force *(see notes 2 and 3)*		1.30 N to 2.40 N, 133 gf to 245 gf (4.68 ozf to 8.63 ozf) depending on sense direction.	
Mounting		The tool setter is mounted on the machine table using a cap head bolt and T nut (not supplied by Renishaw).	

Primo Interface

Principal application		Used to communicate signals between the part setter or tool setter and the CNC machining centre.
Compatible probes		Primo Radio Part Setter, Primo Radio 3D Tool Setter and Primo LTS.
Weight (with 8 m (26.2 ft) cable)		950 g (33.51 oz)
Supply voltage		12 Vdc to 30 Vdc
Supply current		100 mA at 24 V peak, 30 mA typical
Output signal		Four machine outputs, comprising four solid-state relays (SSR) configurable normally open or normally closed to be used for probe status 1, 2, error and low battery / low credit; all of which can be inverted.
Input/output specification		SSR output is protected by a circuit which limits the current to 100 mA. M-code input: up to 30 V (10 mA at 24 V max) for part setter and tool setter. Power supply should be fused separately within the machine cabinet.
Diagnostic LEDs		Digital ‘credit days remaining’ and error codes display, part setter, start, low credit / low battery, probe status, error, signal, tool setter / length tool setter.
Cable	**Specification**	Ø7.5 mm (0.29 in), 15-core screened cable, each core 18 × 0.1 mm
	Length	8 m (26.2 ft)
Mounting		Directional mounting with optional mounting bracket or flush mounting (both available separately).

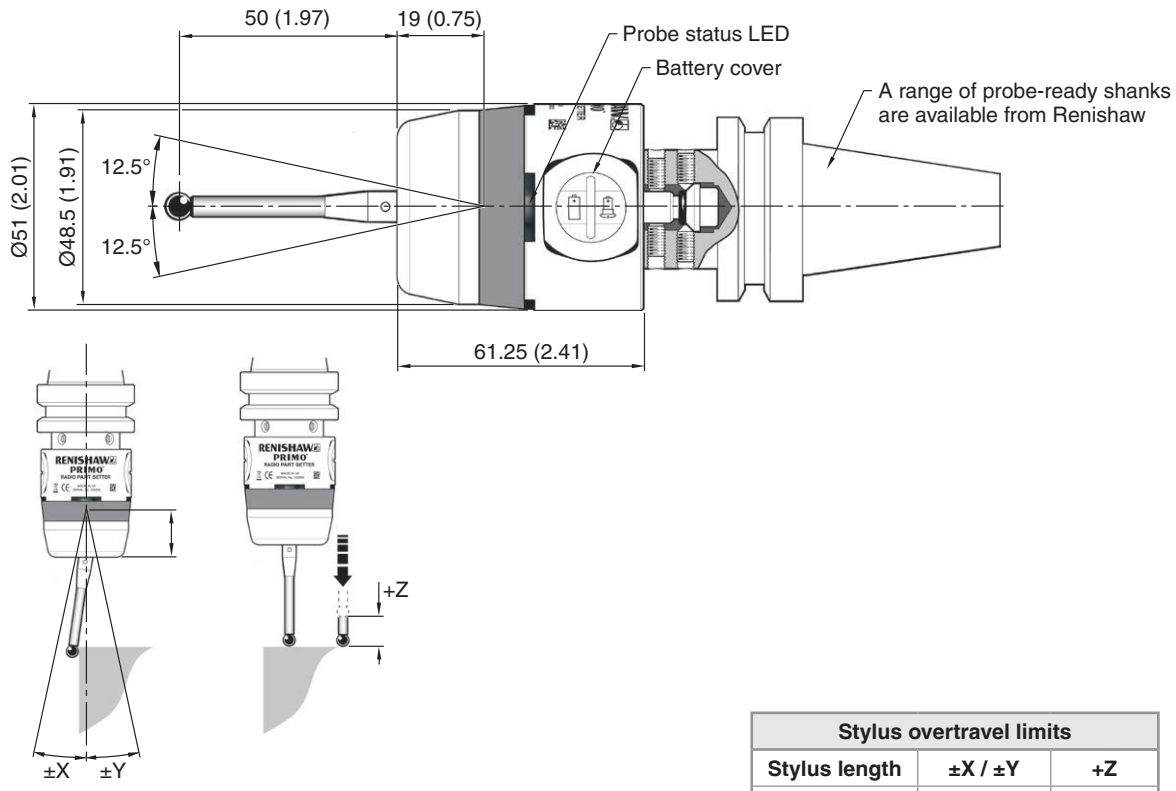
Note 1 Performance specification is tested at a standard test velocity of 480 mm/min (18.9 in/min) with a 50 mm (1.97 in) stylus for the part setter and a 35 mm (1.38 in) straight stylus for the tool setter. Significantly higher velocity is possible, depending on application requirements.

Note 2 Trigger force, which is critical in some applications, is the force exerted on the component by the stylus when the probe triggers. The maximum force applied will occur after the trigger point (overtravel). The force value depends on related variables including measuring speed and machine deceleration.

Note 3 These are the factory settings. Manual adjustment is not possible.

For further information and the best possible application and performance support please contact Renishaw or visit **www.renishaw.com/primo**

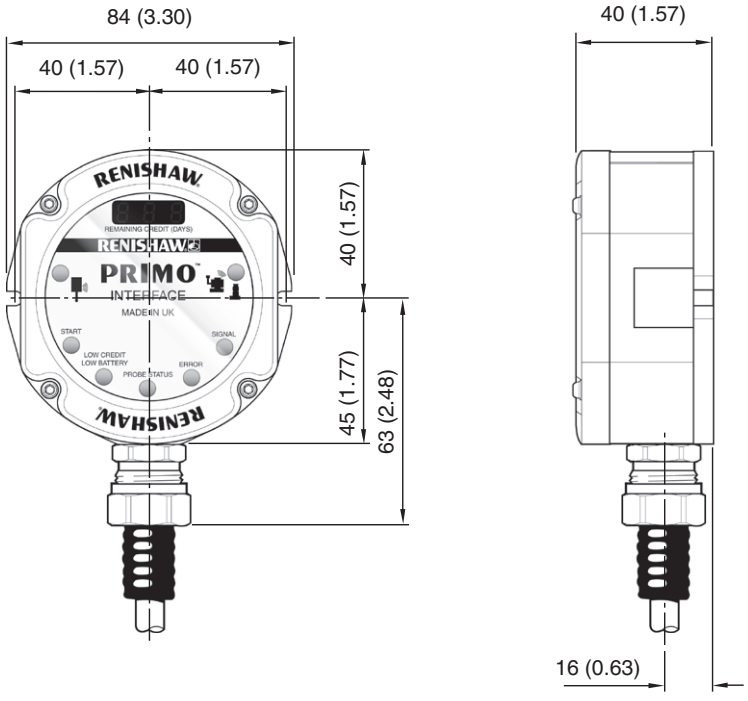
Part setter dimensions



Stylus overtravel limits		
Stylus length	**±X / ±Y**	**+Z**
50 (1.97)	12 (0.47)	6 (0.24)
100 (3.94)	22 (0.87)	6 (0.24)

Dimensions given in mm (in)

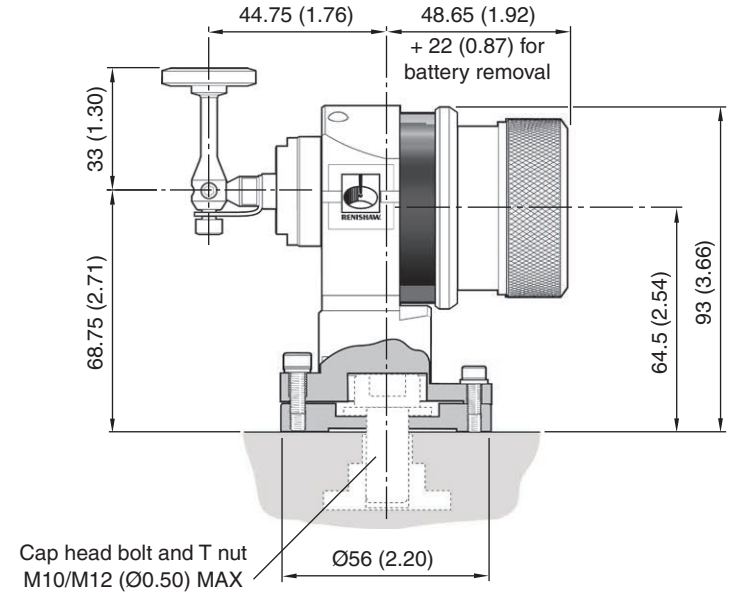
Interface dimensions

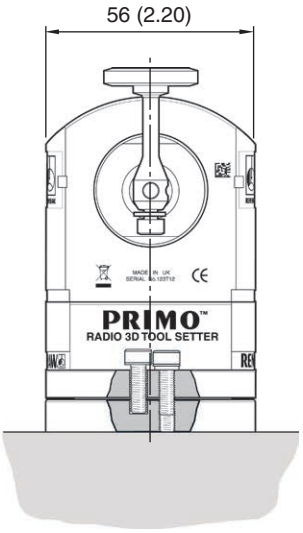


Dimensions given in mm (in)

Data sheet

Tool setter dimensions

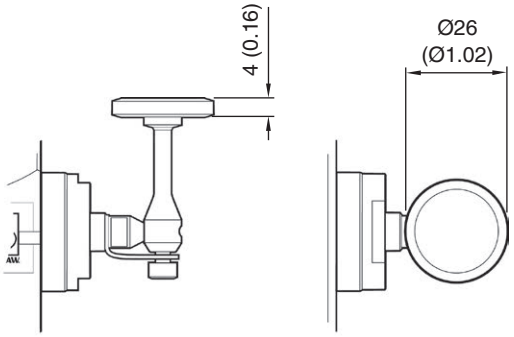




Stylus overtravel limits	
±X / ±Y	+Z
3.5 (0.14)	6 (0.24)

Dimensions given in mm (in)

Disc stylus



Dimensions given in mm (in)

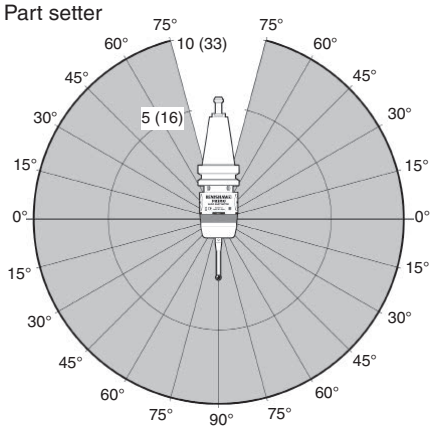
Transmission performance envelopes

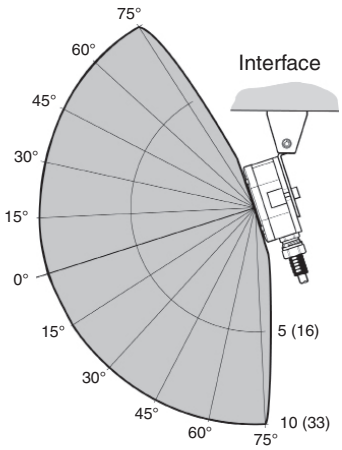
Primo system performance envelopes and ranges are shown below.

System components should be positioned so that the optimum range can be achieved over the full travel of the machine's axes, taking into account likely part positions on a moving machine table.

The front cover of the interface should be facing in the general direction of the machining area.

Performance envelope for part setter

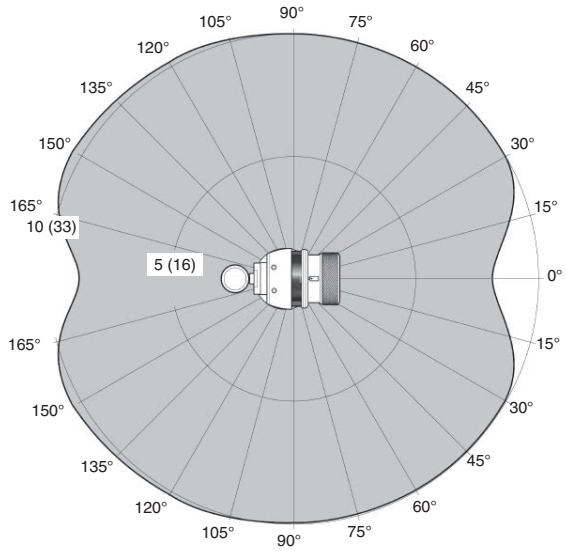




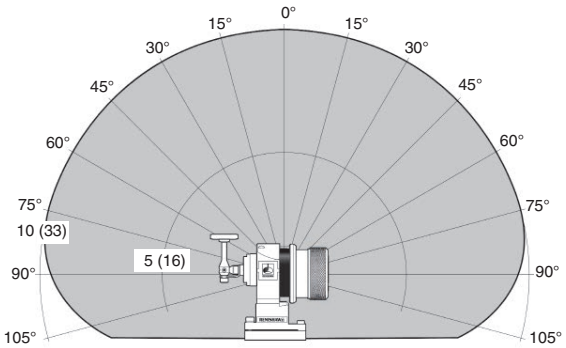
Operating and switch-on / switch-off

Typical plot at +20 °C (+68 °F)
360° transmission around probe axis in m (ft)

Performance envelope for tool setter



Tool setter top view



Tool setter side view

Operating and switch-on / switch-off

Typical plot at +20 °C (+68 °F)
360° transmission around probe axis in m (ft)

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PRIMO™ system



Low-risk investment
for fast payback

Exceptional
ease of use

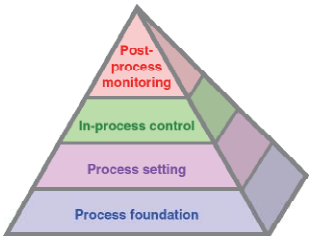
Outstanding
performance for increased yield and shorter cycle times

WARRANTY

Primo Total Protect (PTP)
includes protection against accidental damage during use

PRIMO™ system – innovative process control

Introduce automated workpiece setting and tool setting to your machine shop and reap the benefits



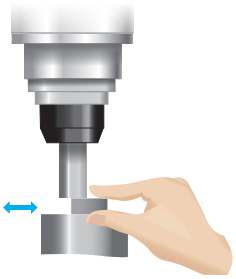
Productive Process Pyramid™

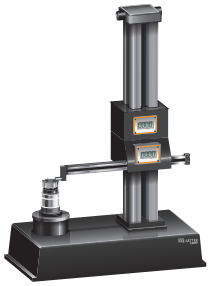
The higher the degree of human involvement in the manufacturing process, the higher the risk of error.

When setting workpieces and cutting tools on your machine tool using manual processes, you run the risks associated with some common problems:


Dial test indicator


Edge finder


Slip gauge on table


Off-line presetter

- Non-productive time – most machine tool users take more than ten minutes to set each part and more than five minutes to set each tool
- Operator error and subsequent variation
- Errors due to manual calculation and transfer of data

All of which lead to reduced profits.

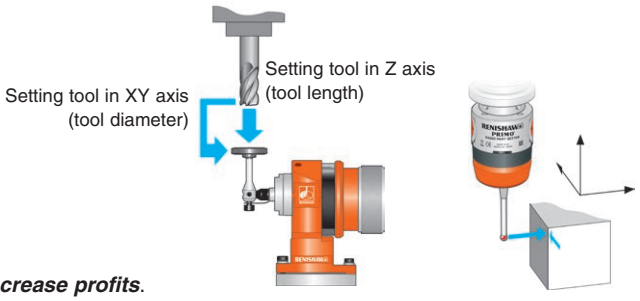
The Renishaw Primo twin-probe system can facilitate the following measures for enhanced management of your process setting, leading to an ***increase in your profits***.

Process setting

Automated measurement of component position and automated on-machine tool setting eliminate manual setting operations and:

- Improve setting accuracy
- Enable fast, consistent setting times – up to 90% time saved when compared to manual methods
- Eliminate manual setting errors and data entry
- Reduce non-productive time and scrap

All of which increase productivity, improve quality and increase profits.



For further details regarding the benefits of all levels of process control within the Productive Process Pyramid, please refer to *Metrology solutions for productive process control* (Renishaw part no. H-3000-3038) or visit **www.renishaw.com/processcontrol**

PRIMO system – new and revolutionary

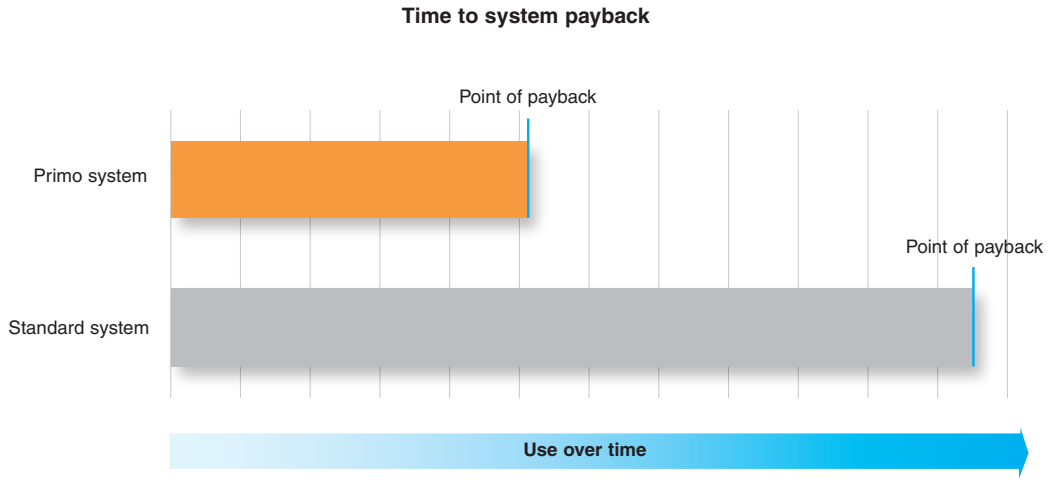
With the Primo system's lower initial investment you can quickly realise the benefits of automated part and tool setting

Here's how:

- Lower initial investment in hardware
- Top-up cost that you only pay if you continue to use the system after the first six months by purchasing a Primo Credit Token
- You can choose between 6-month or Upgrade (unlimited use) credit tokens
- In the unlikely event that you see no benefit, you can stop using the system and incur no further costs



The Primo system offers significant production enhancements at a very attractive price, which means very fast payback and an increase in profits against a low risk investment ...



... and with daily running costs equal to just "loose change", choosing the Primo option is easy.

PRIMO system – get the measure of your money

Everything you need is included

Primo Radio Part Setter
Automatically sets the workpiece datum prior to cutting and takes in-process measurements of the roughed or finished dimensions of the workpiece.



Primo Radio 3D Tool Setter
Automatically sets the length and diameter of a tool. It can also perform in-process broken tool detection.



Primo Interface
Communicates between the part setter, tool setter and the machine tool controller using Renishaw's highly reliable frequency hopping spread spectrum (FHSS) radio transmission.





Primo Credit Token
Enables system operation. Each Primo kit comes with the first 6-month token included.



GoProbe software and training kit
Probing cycles for part setting and tool setting, plus everything you need to learn them easily.



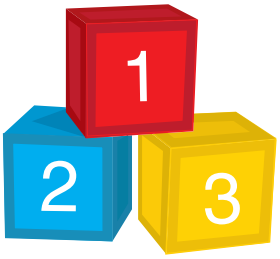
Primo Total Protect (PTP)
Protects your Primo system against accidental damage during use.
* Terms and conditions apply. For more information, visit **www.renishaw.com/primotandc**

Primo is available in many different kits, so you can choose the one that best suits your needs. To find out more, visit the Primo website at **www.renishaw.com/primosystem**

PRIMO system – as easy as 1-2-3

Designed for ease of use

Every Primo system includes the unique GoProbe software, a simple ‘all-in-one’ probing solution for part setting and tool setting using single-line command cycles. The self-study training kit makes it easy to use for inexperienced operators.

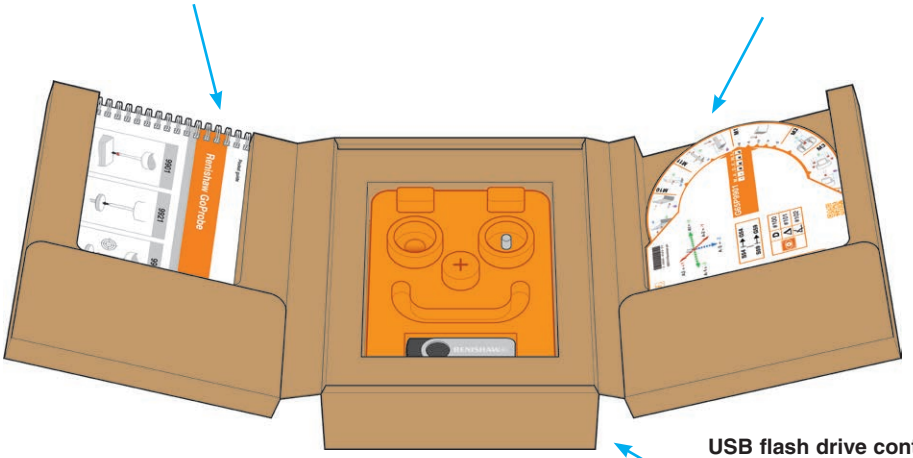


What is the GoProbe training kit?

The GoProbe training kit helps you to learn and use all of the GoProbe cycles. It includes:

GoProbe pocket guide – to guide you through the five steps of probing, perfect for initial training and everyday use.

GoProbe quick-reference tool – a simple reference tool for the single-line commands, perfect for when you are more familiar with the GoProbe cycles.



GoProbe training part – contains many features common to automated part setting. It is used in the e-learning course practical exercises.

USB flash drive containing:

- **GoProbe e-learning course** – a self-study PC-based training course featuring practical exercises to build confidence in using GoProbe cycles.
- **GoProbe programming manual** – shows you the more advanced features of GoProbe cycles.



Also available

GoProbe app – an interactive app for your smartphone. Simply select your part’s features and variables to generate your single-line command.

Available for iPhone or Android™ smartphones.

PRIMO system – peace-of-mind probing

Primo Credit Token activates the Primo system

Easy payment options:

1. Six-month activation period – enables use of your Primo system as often as you want while the credit token is active.
2. Unlimited activation period – provides indefinite use of the Primo system with a one-off payment.
3. When the six-month activation period runs out, simply choose between six months or unlimited usage, and buy your token.

For more information, visit **www.renishaw.com/primodownloads**

Also available as part of the Primo range

The Primo LTS is a single-axis tool setter that can be used independently or as part of a Primo system. Without the need for alignment it enables:

- Tool length setting
- Tool wear and tool breakage detection
- Compensation for thermal changes
- Probe-on-probe calibration



The LTS works independently from the Primo credit system.

For more information, visit **www.renishaw.com/primolts**

Primo Total Protect (PTP)

Primo Total Protect (PTP) is an enhanced warranty that protects your investment whenever a credit token is activated. If your Primo probe is accidentally damaged during that period, your Renishaw representative will supply a free-of-charge replacement.

Primo Total Protect (PTP) is another Renishaw innovation that gives you peace of mind and leaves you free to concentrate on controlling your process and your costs.



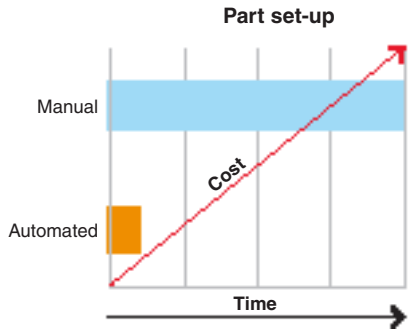
* Terms and conditions apply. Registration required.
For more information, visit **www.renishaw.com/primotandc**

Probing pays ...

Machine tools that are optimised to cut metal more reliably and more accurately will quickly ***maximise productivity, profits and your competitive edge***.



Scrap and rework reduce productivity and profits. Renishaw probes help guarantee “right first time” parts, which means ***reduced waste and increased profits***.



It is widely accepted that the higher the degree of human involvement in the manufacturing process, the higher the risk of error. Automated setting using the Primo probe system can help ***eliminate the risk***.

Ultimately, by improving the efficiency and performance of your machine tool processes, a Renishaw Primo probe system can help to ***increase your profits***.

Primo system key features

- Compact design with radio transmission for small to medium machining centres
- Full system enables automated part setting and tool setting
- Kinematic design – proven and patented
- Delivers interference-free transmission via the frequency hopping spread spectrum (FHSS)
- Globally recognised 2.4 GHz waveband – compliant with radio regulations in all major markets

... the Renishaw way

Renishaw, an established world leader in metrology solutions invented the touch-trigger probe in the 1970s.

Decades of customer focus and investment in development, coupled with our own manufacturing experience enables us to provide ***innovative*** and ***exceptional products*** that are unmatched for technical excellence and performance.



Customer comment

“I firmly believe in the principle of building quality in, not inspecting to achieve it. Renishaw probing is central to that manufacturing philosophy and throughout our use of CNC machines we have had a close relationship with Renishaw – the flexibility and willingness to assist has always been outstanding.”

Castle Precision (United Kingdom)

“Since we started using Renishaw probes and software ... there has been a reduction of 66% in set-up time and we have stopped talking about component rejections and manual errors.”

Associated Tools (United Kingdom)

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About Renishaw

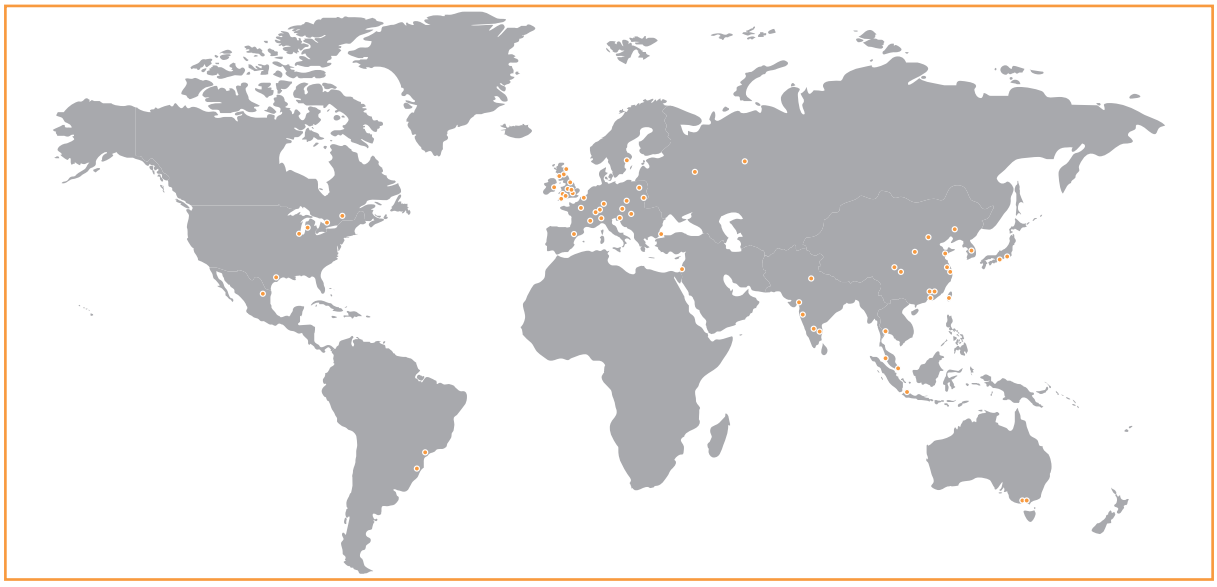
Renishaw is an established world leader in engineering technologies, with a strong history of innovation in product development and manufacturing. Since its formation in 1973, the company has supplied leading-edge products that increase process productivity, improve product quality and deliver cost-effective automation solutions.

A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Products include:

- Additive manufacturing and vacuum casting technologies for design, prototyping, and production applications
- Dental CAD/CAM scanning systems and supply of dental structures
- Encoder systems for high accuracy linear, angle and rotary position feedback
- Fixturing for CMMs (co-ordinate measuring machines) and gauging systems
- Gauging systems for comparative measurement of machined parts
- High speed laser measurement and surveying systems for use in extreme environments
- Laser and ballbar systems for performance measurement and calibration of machines
- Medical devices for neurosurgical applications
- Probe systems and software for job set-up, tool setting and inspection on CNC machine tools
- Raman spectroscopy systems for non-destructive material analysis
- Sensor systems and software for measurement on CMMs
- Styli for CMM and machine tool probe applications

For worldwide contact details, visit www.renishaw.com/contact



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