

Ultra precision surface and form measuring for high accuracy inspection

Beginning in the 1930's with Talysurf 1, Taylor Hobson has led the industry with innovation and excellence. The Form Talysurf, launched in 1984, was the first instrument ever to measure surface texture, form and contour simultaneously and became the instrument of choice for precision manufacturers. Form Talysurf PGI continues the tradition of providing you with the highest possible measurement accuracy and integrity.

Outstanding range and resolution

With 8mm vertical gauge range and 3.2nm resolution the PGI 800 has the wide range necessary to measure form and contour while also providing the resolution required for surface finish

Unique patented calibration

Calibration is simple, quick and accurate using our patented and fully automated single trace measurement routine. A numeric and visual result gives the user confidence that the calibration and hence any subsequent measurements are correct.

200mm Horizontal traverse with 0.35µm straightness

A precision lapped datum bar provides the reference for all profile measurements; high accuracy straightness eliminates instrument error leaving the true form of the component

0.125µm High density horizontal data spacing

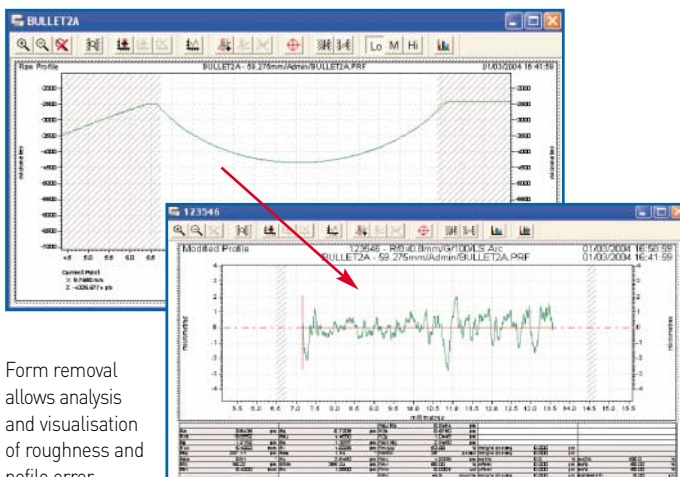
Accurate re-production of the part profile cannot be achieved without high-density data collection. With up to a maximum of 1,600,000 data points and 0.125µm spacing, exceptionally fine detail is assured on small and large components alike.

Low system noise 3nm

Low noise of the complete system gives roughness measurement capability unsurpassed on this type of instrument.

450mm Motorized Column

The motorized column provides high accuracy position control and capacity for even the largest components. It is controlled manually via the joystick or by the computer for full system programmability.



Form removal allows analysis and visualisation of roughness and profile error



Ultra Software for form and surface analysis

Form Talysurf PGI 800 is powered by Ultra software. Designed with the operator in mind, it provides ease of use, instrument control and measurement evaluation. Roughness and waviness parameters are included as well as form error analysis, feature zoom facility, feature exclusion tools and full programmability.

- **Form Analysis**
Measure and analyse Radius, angle and dimension
- **Simplified User Interface***
Combines with system programmability to deliver a true shopfloor solution; custom designs available
- **Dual Profile analysis***
Allows profile comparison to master components
- **Ultra-contour analysis**
A powerful software utility providing full dimensional capability, special features such as DXF comparison are also available
- **Talymap 3D Analysis**
Combined with a Y stage table this separate software utility provides the ability to analyse 3D topography

For more details of the Form Talysurf PGI 1100, please contact your local Taylor Hobson sales agent, or visit our website.

Specification PGI 800



Horizontal Performance		Environment Storage temperature 5°C to 40°C (41°F to 104°F) Storage humidity 10% to 80% Relative, non condensing Operating temperature 18°C to 22°C (64°F to 72°F) Temperature gradient < 2°C (< 3.6°F) per hour Operating humidity 45% to 75% Relative, non condensing Maximum RMS floor vibration 2.5µm/s (100µin/s) at < 50Hz 5.0µm/s (200µin/s) at > 50Hz Electrical supply Supply type Alternating supply, singlephase with earth (3-wire system) Instrument and computer voltage 90V - 130V or 200V-260V (switch selectable) Frequency 47Hz to 63Hz Supply voltage transients - width EN 61000 - 4 - 4 : 1995 Power consumption 500VA Safety EN 61010 - 1 : 2001 EMC EN 61000 - 6 - 4 : 2001 EN 61000 - 6 - 1 : 2001 Laser classification Class 1 product to EN 60825-1 (2001) Continuous wavelength (CW) output < 1mW Max power for the laser < 50µW Max power for the product The above technical data is for measurements taken in a metrology laboratory controlled environment: 20°C ± 1°C (68°F ± 1.8°F), draft free, and isolated from low frequency floor borne vibration. Uncertainties and maximum permissible errors (MPE's) are at 95% confidence in accordance with recommendations in the ISO Guide to the expression of uncertainty in measurement (GUM:1993). All errors are expressed as MPE's.
Traverse length - X Max / Min	200mm / 0.1mm (7.9in / 0.004in)	
Measuring speeds ¹	0.1mm/s, 0.25mm/s, 0.5mm/s & 1mm/s (0.004in/s, 0.01in/s, 0.02in/s & 0.04in/s)	
Traverse speeds	0.1-10mm/s (0.004-0.39in/s)	
Data sampling interval in X (high)	0.125µm (5µin)	
Maximum number of data points	1,600,000	
Straightness error [Pt] (X = length) ²	0.35µm/200mm (14µin/7.9in)	
Datum correction	Optional	
Vertical Performance		
Nominal measuring range (Z)	8mm [60mm stylus arm] (0.32in [2.36in]) 16mm [120mm stylus arm] (0.64in [4.72in])	
Resolution (Z) ³	3.2nm @ 8mm range (0.12µin @ 0.32in) range	
Range to resolution ratio ³	2,500,000 : 1	
Stylus arm length, tip size, force	60mm arm, 2µm radius conisphere diamond stylus, 1mN force 120mm arm, 0.5mm radius ball, 20mN force	
Z axis nonlinearity (Z=gauge displacement)	(0.07 + 0.03 Z [mm]) µm (3 + 30 Z [inches]) µin - after calibration ⁴	
Repeatability of Z axis indication (flat surface - diamond stylus)	0.1µm (4µin) ⁵	
Repeatability of Z axis indication (curved surface - diamond stylus)	0.08µm (3.2µin) ⁶	
Repeatability of Z axis indication (curved surface - ball stylus)	0.12µm (4.5µin) ⁶	
System Performance ³		
Calibration Pt ⁷	0.15µm (6µin)	
Spherical calibration artifact [accuracy]	80mm (3.15in) nominal radius glass standard [5µm (197µin)]	
System noise - Rq ⁸	Typically 3nm (0.12µin)	
Radius measurement uncertainty ⁹	0.1 - 80mm (0.004 - 3.15in) = 1 to 0.005% of nominal 80 - 1000mm (3.15 - 39.4in) = 0.005 to 0.1% of nominal 1000 - 2000mm (39.4 - 78.7in) = 0.1% of nominal	
Inclination measurement uncertainty	0.5 arc minute uncertainty (+ / - 35° maximum range)	
Dimensions L x D x H (granite base)	760 x 500 x 120mm (30 x 20 x 4.7in)	
Dimensions L x D x H (traverse unit)	470 x 130 x 225mm (16 x 5.2 x 8.9in)	
Weight (traverse unit)	15Kg (30lbs)	
Motorized column	450mm (17.7in) vertical traverse	

1 For surface texture measurements, speeds of 0.5mm/s (0.02in/s) and less are recommended.

2 Measured over a glass flat nominally parallel to the traverse datum using a 60mm arm with a diamond stylus (speed = 1mm/s, LS Line analysis, primary filter λs = 2.5mm).

3 Using a 60mm arm with a diamond stylus.

4 Measurements up and down a 35° angled slope over 80% of the gauge range, using a 60mm arm with a diamond stylus.

5 Repeated measurements over a glass flat that is nominally parallel to the datum [10mm traverse length, primary filter λs = 0.025mm].
- results valid when measured in environmental enclosure (optional)

6 Repeated measurements over an 80mm radius glass standard [primary filter λs = 0.25mm].
- results valid when measured in environmental enclosure (optional)

7 From a repeat measurement on the calibration artifact over 75% of the gauge range (LS Arc analysis, primary filter λs = 0.25mm).

8 Measured over a glass flat nominally parallel to the traverse datum using a 60mm arm with a diamond stylus (speed = 0.1mm/s, Gaussian roughness filter, 0.08mm cut-off, 30:1 bandwidth).

9 Assumes a calibration artifact of perfect radius.

NOTE: Taylor Hobson pursues a policy of continual improvement due to technical developments. We therefore reserve the right to deviate from catalog specifications.