

# Intra touch

Precision shop floor solutions for  
surface finish and contour measurement



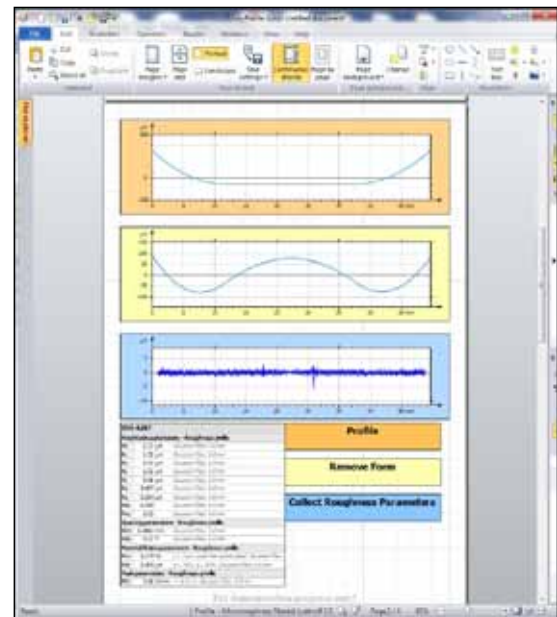
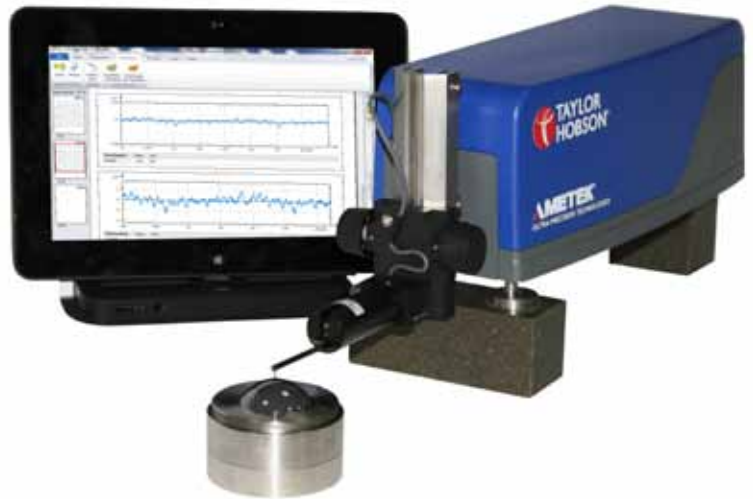
# Intra touch

Housed in a rugged enclosure, the Intra has a proven history of maintaining accuracy of measurement without the need for constant maintenance or support. Quality, flexibility and ease-of-use have enabled the Intra become a shop-floor standard across a wealth of different industries.

Intra touch is a perfect choice. It combines industry leading specification with simplicity of operation for unbeatable practicality and value.

## Intra touch features and benefits

- **1 mm vertical range / 16 nm resolution**  
Delivers form (contour) as well as surface finish measurement capability for precision metal forming and other applications.
- **50 mm horizontal traverse**  
Ideal for the majority of shop floor applications. The unit combines both accuracy and portability.
- **0.40  $\mu\text{m}$  / 50 mm straightness error**  
The high accuracy traverse datum makes possible skidless measurement of waviness, form and contour, even on large components.
- **0.5  $\mu\text{m}$  horizontal data spacing**  
Small components and features can be measured more effectively than ever before. Reduced run-up and run-down length further improve usability
- **Manual column**  
For large or tall components the available manual column provides a stable, dedicated work station for improved throughput.



## Talyprofile software – comprehensive surface finish analysis

The Intra touch system includes everything important to the measurement of surface finish. Fundamental roughness and waviness parameters are included, plus form error analysis, feature exclusion, zoom tool and full programmability for shop floor applications.

- **Form analysis**  
Measure and evaluate radius, angle (slope) and dimension
- **Simple user interface**  
Combines with system programmability to deliver a true shop floor solution; custom designs available.
- **Dual profile analysis\***  
Allows comparison of measurements for wear; tolerancing, etc.
- **Contour analysis†**  
Software utility for dimensional applications, allowing design data and measurements to be directly compared, and error results obtained. Special hardware is also available for wide-range applications.
- **TalyMap 3D analysis**  
Software utility for topography applications; special hardware is also required.

\* Included with Talyprofile Gold

† Included with Talyprofile Contour

## Taylor Hobson delivers an excellent investment

- Save money with flexible, modular system configurations
- Improve accuracy with our patented calibration routine
- Save time with multi-tasking measurement systems
- Increase productivity with automatic, unattended operation
- Prevent mistakes with programmed measurement routines

# Choosing the right product

Simple roughness parameters like Ra can be checked with our Surtronic series instruments. If you need advanced analysis, higher levels of accuracy or greater flexibility, Intra touch is the perfect choice. It combines industry leading specifications with simplicity of operation for unbeatable practicality and value.

## Analysis fundamentals

The measurable elements of a surface are dimension, form, roughness and waviness. Many high specification components require analysis of all four:

**Dimension** – the functional shape of a surface as defined by radius, angle, distance, and the linear relationship between features.

**Form** – deviations from the intended shape of a surface (flat, spherical, tapered, etc.); often caused by machine tool inaccuracies.

**Roughness** – a deliberate, controllable element of the component design produced by the action of the cutting tool or machining process.

**Waviness** – an undesirable machine tool effect resulting from vibration, lack of stiffness or other instabilities in the machining process.

## Skidless measuring system

Many roughness checkers use skidded pick-ups to guide the stylus over the workpiece, with the workpiece itself forming the datum for measurement.

Because the skid also acts as a mechanical filter, removing or altering general form and waviness characteristics, the collected data is not suitable for advanced analysis.

## Intra touch is the right choice

For correct data collection the gauge must pass over the component in a straight line such that only the stylus tip comes in contact with the surface under test.

Vertical stylus movement is relative to the traverse datum, a reference bar that has been lapped or precision ground to an extremely high flatness and straightness tolerance.

Intra touch is skidless and can be used for waviness, profile and other parameters such as material ratio with absolute confidence in the measurement results.

## For your industry

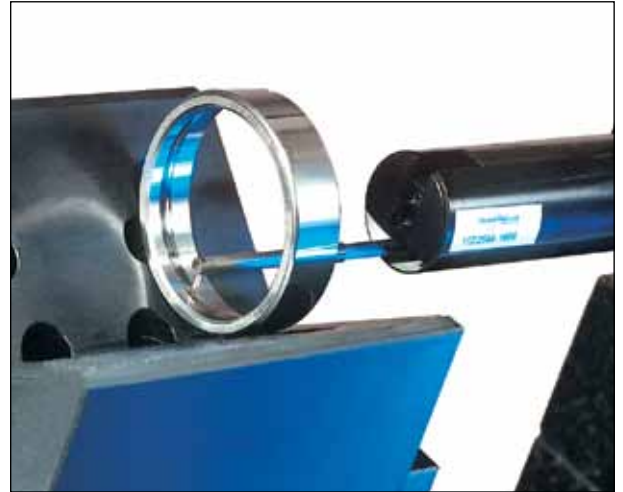
Intra touch offers exceptional productivity for a wide range of industries and applications.

## For your budget

For general purpose or for solving a specific application problem, Intra touch can be configured to perform within your budget.

## For your future

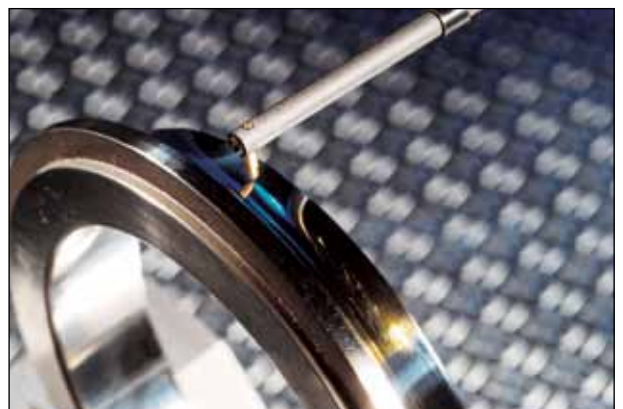
Unlike closed end systems that will be obsolete when your requirements change, Intra touch can be expanded to meet whatever the future brings.



Skidless tracing arms provide access to internal features such as ball tracks and ring grooves



High resolution skidless pick-up is necessary for straightness and waviness measurements



Measurable form features may be spherical, aspherical, concave, convex, internal or external

# Talyprofile

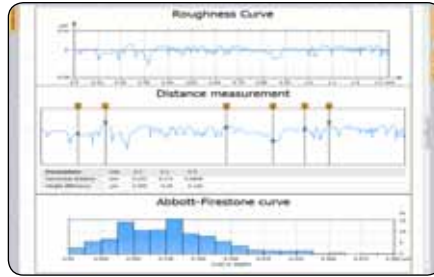
## Advanced surface finish and contour analysis

Talyprofile is a dedicated Windows tablet-based software package designed for use with Intra touch. Two versions are available. Talyprofile "Silver" has all functions typically used for a shopfloor inspection, including R&W parameters, a statistics module and full report printing. Talyprofile "Gold" has all the benefits of Talyprofile "Silver" with the addition of complete laboratory analysis functions:

	Silver	Gold
Intra touch acquisition	✓	✓
Desktop publishing templates	✓	✓
Multi-language support	✓	✓
EN, FR, DE, ES, IT, PL, CN, KR	✓	✓
Levelling	✓	✓
Symmetries	✓	✓
Zoom	✓	✓
ISO 4287	✓	✓
Material Ratio Curve	✓	✓
Area of a hole/peak	✓	✓
Profile parameters & curves	✓	✓
Roughness & waviness curves	✓	✓
Distance measurement	✓	✓
Multiple file format reports	✓	✓
Report printing	✓	✓
Form Talysurf data import	✓	✓
Tolerance limits (pass/fail)	✓	✓
Data file explorer	✓	✓
ISO 13565 Automotive	✓	✓
Interactive MR curve	✓	✓
Step height measurement	✓	
Form removal	✓	
Filtering by FFT	✓	
Thresholding	✓	
Frequency spectrum	✓	
Power spectrum density	✓	
Retouch profile point	✓	
Rk parameters	✓	
Rk Parameters curves	✓	
ISO 12085 R&W motifs	✓	

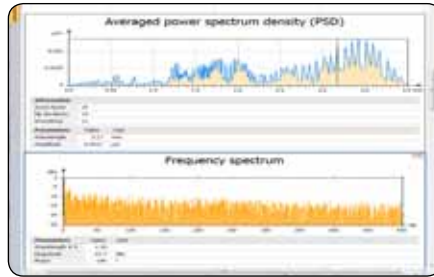
## Outstanding graphics

The software is visually advanced and provides clear on screen profile images. Talyprofile allows the user to take a basic measurement and create a full measurement report using the software's detailed analysis options and desktop publishing function (see screen displays opposite for examples).



## Advanced time-saving analysis templates

A 'template' can be created whereby a sequence of analysis functions can be saved and applied to future measurements, turning detailed reporting tasks into routine documents.



## Desktop publishing facility

Talyprofile offers a comprehensive desktop publishing function which allows clear presentation of measurements, results and profiles. Graphs, profiles and results can be arranged from within the Talyprofile software or copied into other word processing documents giving complete flexibility in reporting.

## In depth analysis

Profiles can be levelled and zoomed to remove unwanted features or defects from the analysis. Distance measurement between features of a profile are easily achieved and the information can be displayed graphically and numerically. Step height and the area of a valley or peak can also be calculated.

## Full compatibility

Surface finish results from other Taylor Hobson surface roughness instruments can be imported to Talyprofile software, allowing a uniform report style to be used throughout your workshop or laboratory

## Windows tablet specification

	Minimum
Operating system	Windows 8
Screen size	10.1 inch
Screen resolution	1366 x 768
Memory (RAM)	2 GB
CPU speed	1.8 GHz
Hard disc	64 GB
Weight	658 g

## Talyprofile parameters

**Roughness parameters obtained by filtering:** Ra, Rq, Rt, Rp, Ry, Rku, Rsk, RSm, Rz, RΔq, RTp, RHTp, Rlo, RΔq, RPC, RzJS, R3z.

**Parameters on the raw profile (unfiltered):** Pa, Pq, Pt, Pp, Pv, Pku, Psk, PSm, Pz, PΔq, PΔq, PTp, PHTp, PLo, PPc.

**Parameters obtained by double filtering (DIN 4776):** Rk, Rpk, Rvk, MR1, MR2, A1, A2, Rpk, Rvk

**Parameters obtained by the motifs method ("R&W"):** R, AR, Pt, Rx, SR, SAR, Nr, Kr, W, AW, Wte, Wx, SW, SAW, Nw, Kw, Rke, Rpk, Rvke, Trc, HTrc.

# Correlation of results

Manufacturers who outsource expect their suppliers to deliver parts that meet specification. You know the parts are good but the instrument your customer uses to inspect them says they are bad. Lack of correlation can occur even when the instruments are configured the same way as to filter, cut-off and length of trace.

## Different suppliers, different results

In the case of mating pieces, one supplier makes part A, another makes B. Both say the roughness is acceptable but the end user may find that neither part meets the spec.

Some of the lack of correlation between different brands of instruments or even between instruments of the same brand can be partially attributed to three factors:

- Speed of traverse
- Condition of the stylus
- Gauge linearity

## Speed of traverse

Most roughness checkers are time based, collecting data for a fixed period of time instead of a precise, constant distance.

Anything that affects speed of traverse – wear, dirt, slippage, etc. – affects the quantity and spacing of the collected data points which in turn affect the measurement results.

Intra touch utilises a glass scale and reading head to assure that data collection is accurate and consistent. Every measurement on every instrument is calculated from the exact same quantity of identically spaced data points.

## Stylus condition

With many surface measuring systems, the size, shape and condition of the stylus tip are assumed to be constant in terms of data processing. In practice the stylus tip may vary due to manufacturing tolerance, routine wear or physical damage.

During calibration with a Intra touch the stylus is traversed over the spherical artifact to make contact at all points along the radius of the conisphere tip in the measurement direction.

By this method, the user can detect effects due to stylus damage or deviations of size and shape.

## Gauge linearity

Intra touch is calibrated over a ball to check linearity of the entire 1 mm gauge range. Most other systems use a step master or an Ra patch that calibrates only over a very narrow band. The assumption is that if the gauge is linear over that band it is linear over the full range.

Unless your measurements are all taken within the same vertical position of the gauge range and never exceed the amplitude of the step height master; the data you collect may be non-linear which will cause incorrect results.



Calibration over a ball checks stylus condition, gauge range and linearity



Form errors cause assembly problems, inefficient operation and premature failure of the component



Measure dimension, form and texture at once with a single traverse over curved or straight surfaces

# Expanding capability

Intra touch includes an inductive gauge which is suitable for most tasks. For contour measuring applications we also offer a wide range pick-up.

## Inductive gauge

This traditional gauge head leads the industry with a full 1 mm (0.04 in) of range and an outstanding range to resolution ratio of 65,536:1. It has a pivoted and balanced beam to allow measurement in any attitude. (standard – code 112/2564)

Range / resolution

1.0 mm / 16 nm (0.04 in / 0.64  $\mu\text{in}$ )  
0.2 mm / 3.0 nm (0.008 in / 0.12  $\mu\text{in}$ )

Right angle attachment

Code 112/2022 (Skidless applications)

Code 112/2040 (Skid applications)

Stylus stop attachment – code 112/2098

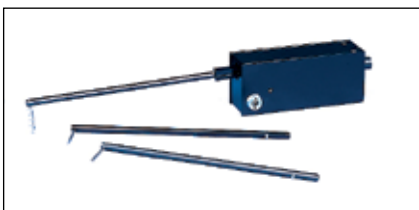
## Wide range pick-up

Available as a plug-in accessory, the wide range pick-up provides 28 mm (1.1 in) of range with 426 nm (17  $\mu\text{in}$ ) resolution. Suitable for form and contour measurements.

Wide range pick-up – code 112/2628

Includes three interchangeable stylus arms

- Conical tip with 30° included angle
- Ball tip with 0.5 mm (0.02 in) radius
- Chisel tip with 15° included angle



Wide range pick-up for contour applications

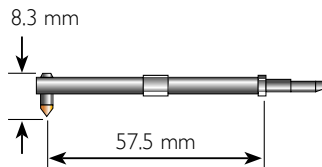
Note: All stylus arms have 90° conisphere diamond styli with 2  $\mu\text{m}$  nominal radius tips unless otherwise stated.

Additional stylus arms

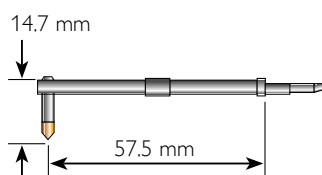
The stylus arms shown on these pages represent just some of the standard configurations. In addition, Taylor Hobson can provide customized stylus arms for specific applications.

## Intra touch Pick-up Stylus Arms

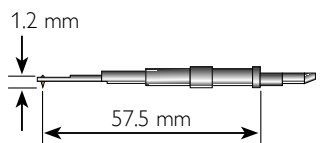
Standard Stylus Arm – code 112/2009



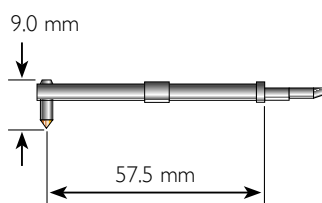
Recess Stylus Arm – code 112/2011



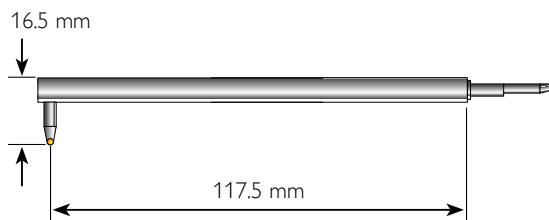
Small Bore Stylus Arm – code 112/2012



Chisel Edge Stylus Arm – 2  $\mu\text{m}$  x 750  $\mu\text{m}$  chisel diamond stylus – code 112/2013



Ball Stylus Arm, nominal range 2 mm (0.078 in) 500  $\mu\text{m}$  radius sapphire ball stylus – code 112/2010



# Accessories

All the accessories you need to begin using Intra touch are supplied as standard. However, for more demanding measuring requirements, we have a range of accessories which may be ordered separately.

## ① Universal Worktable

Complete stage assembly to provide X, Y, Z, rotary and tilting positioning moves. Includes vee block and location plate for mounting to the T slot in the granite base.

code 112/3064

## X axis Stage Assembly

Simple stage assembly with X axis positioning, vee block and location plate for mounting to the granite base.

code 112/3067

## Manual Column and Base

Granite base 800 x 400 mm (32x16 in) with Tee slot and manual granite column with hand wheel for 350 mm (14 in) height adjustment.

code 112/3116 (cradle mount)

code 112/3117 (fixed mount)

## Leveling Foot

Used on granite base 112/3117 for leveling the traverse unit

code 137/2157

## ② Ball Joint Vise

Provides universal positioning via 360° rotation and 180° tilt; especially for lightweight or small components

code 112/2695-01

## ③ Adjustable Worktable

Provides fine adjustment for rotational [± 3°] and lateral [± 10 mm (0.4 in)] positioning of the workpiece. Work surface with T-slot = 120 mm x 120 mm (4.7 in x 4.7 in)

code 112/1644

## ④ Vee Blocks (Pair)

For the support of large, cylindrical components

code 112/1645

## Ra and 3 Line Standard

An Ra verification patch with step height standard can be supplied with a Form Talysurf unit for calibration when surface texture only is to be analysed.

code 112/557

## Radius Calibration Standard

For systems using form software, spherical calibration artifacts are a requirement.

## 80 mm (3.15 in) Radius

A glass artifact for systems using a wide range pick-up.

code 112/2028

## 22 mm (0.86 in) Radius

A mounted precision ball for systems using long stylus arms.

code 112/1844

## 12.5 mm (0.49 in) Radius

A mounted precision ball for standard Intra systems.

code 112/2062 (standard)

## ⑤ Ball and Roller Unit

Special fixture rotates ball or roller over stationary stylus for circumferential inspection of surface finish. Includes set of (4) plates for ball diameters

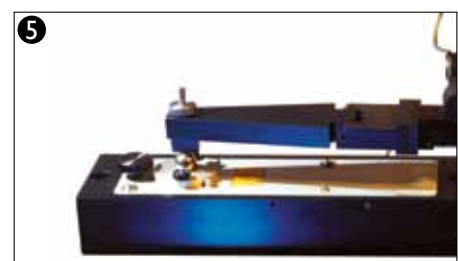
1 - 25 mm (0.04 - 0.98 in)

code 112/3219

## Roller Plates

Set of (3) for 1 - 16 mm (0.04 - 0.63 in) diameter rollers

code 112/3248



## Serving a global market

Taylor Hobson is world renowned as a manufacturer of precision measuring instruments used for inspection in research and production facilities. Our equipment performs at nanometric levels of resolution and accuracy.

To complement our precision manufacturing capability we also offer a host of metrology support services to provide our customers with complete solutions to their measuring needs and total confidence in their results.

## Contracted services from Taylor Hobson

### Sales department

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Tel: **+44 (0)116 246 2034**

- **Design engineering**  
special purpose, dedicated metrology systems for demanding applications
- **Precision manufacturing**  
contract machining services for high precision applications and industries

### Service department

Email: [taylor-hobson.service@ametek.com](mailto:taylor-hobson.service@ametek.com)

Tel: **+44 (0)116 246 2900**

- **Preventative maintenance**  
protect your metrology investment with an Amecare support agreement

### Centre of Excellence department

Email: [taylor-hobson.cofe@ametek.com](mailto:taylor-hobson.cofe@ametek.com)

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- **Inspection services**  
measurement of your production parts by skilled technicians using industry leading instruments in accord with ISO standards
- **Metrology training**  
practical, hands-on training courses for roundness and surface finish conducted by experienced metrologists
- **Operator training**  
on-site instruction will lead to greater proficiency and higher productivity
- **UKAS calibration and testing**  
certification for artifacts or instruments in our laboratory or at customer's site



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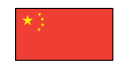


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