A revolution in surface measurement
THE NEW OPTIMAP™ MARKS A REVOLUTION IN THE CONTROL OF SURFACE QUALITY. FOR THE FIRST TIME SUBJECTIVE VISUAL ASSESSMENT CAN BE REPLACED WITH RELIABLE, REPRESENTATIVE MEASUREMENT.

For maximum consumer impact, high quality products require high quality finishes that are homogeneous, blemish and defect free.

Surface finish is currently assessed subjectively by visual inspection or measured by instruments that do not capture a full picture of surface quality.

The Optimap™ maps and measures surface quality.

In a single fast operation the Optimap™ maps the topography of a test surface displaying faults and texture in incredible detail. Mapped information is processed into objective surface measurements that can be used to effectively control product quality.

- Rugged and accurate the Optimap™ is suitable for laboratory, factory or on-site inspection.
- The soft touch measurement portal means the instrument can be used safely on the highest quality surfaces.
- Surface texture and defects can be assessed on a huge variety of surfaces: semi matt surfaces to polished mirrors, small & curved parts.
- A large area is mapped in a single operation (95 x 70mm).
- On screen 3-D Maps give instant access to surface topography.
- Objective measurements can be displayed in traceable SI units or selected industrial scales.
- Data and results are fully compatible with other analytical techniques and third party software.
- Optional software allows sophisticated texture/fault analysis and report generation.

APPLIcATIONS INCLUDE
- PLASTICS INDUSTRY – Mouldings, Extrusions, Composites.
- PAPER AND PACKAGING – Papers and Boards, Metal Boards, Inks.
- TEXTILES – Leather, Synthetic Materials.
- METAL FINISHING – Coil Coated, Polished, Etched, Bead Blasted.
- OTHERS – Ceramics, Polished Stone and Concrete.

QUICK, RELIABLE AND PORTABLE MEASUREMENT

The Optimap™ is rechargeable battery or mains operated and can be used in the laboratory, factory floor or remotely for on site inspection.

With no moving parts and rubberised measurement area the instrument is exceptionally rugged and safe to use on the highest quality surfaces.

HUGE RANGE OF TEST SURFACES AND APPLICATIONS

The Optimap™ measures using Phase Stepped Deflectometry. This flexible optical technique relies on surface topography distorting the reflection of a test pattern.

The instrument can be used on a wide range of surfaces from low gloss to mirror finish, large and small areas and with varying degrees of curvature*.

MORE REPRESENTATIVE SURFACE ANALYSIS

A 3-D topographical map of a measured test surface is captured in under 10 seconds.

The large measurement area (95 x 70mm) means results are much more representative than those from profilometers or other optical scanning devices.

TRACEABLE, COMPATIBLE MEASUREMENT

Optimap™ measurements are made in traceable SI units (m-1) and are compatible with other analytical surface techniques such as interferometry and profilometry.

3D MAPPING

3-D Topographical maps can be zoomed on the touch screen to show surface texture and local defects in incredible detail.
OBJECTIVE MEASUREMENT

The Optimap™ can objectively measure many aspects of surface quality including texture and the identification and the classification of local defects. Measurement results can be reported in SI units or industry specific units.

* Offline selection and processing of small areas available in optional Ondulo software.

HIGH RESOLUTION MEASUREMENT

With a high lateral resolution (<75μm) the Optimap™ has the power to capture surface defects that are invisible to the human eye. The large measurement area means that bigger defects that are visible from longer distances such as waviness and dents and inclusions are also captured.

The measurement port of the Optimap is rubberised for safe use on the highest quality surfaces.

MODULAR SOFTWARE WITH INSTANT RESULTS

The Optimap™ is available with user selectable modules that process the topographical information into surface quality measurements for different applications.

Modules can be purchased remotely and added to the instrument without the need to return or replace the hardware.

- TEXTURE MAP – Displays waviness information that has been filtered into bands commonly used in automotive and other high gloss applications. Results can be displayed as SI units or scaled equivalents to industry norms. (available now). Global texture value can be used to objectively assess the amount of visible texture for a number of applications including plastics, metals and textiles.
- DEFECT MAP – Identifies and counts local defects such as inclusions, pits, holes, deep scratches. (available 2012)
- SCRATCH MAP – Uses reflective information to identify and quantify fine scratches and areas of lower gloss in measurement area. (available 2012)

PORTABLE SENSOR FOR OFF LINE ANALYSIS

High resolution result maps can be easily exported for post processing in the Rhopoint Ondulo analysis software package or third party software such as MOUNTAINS.

- Power analysis tools in Ondulo mean that surface effects such as texture, flatness, number and size and shape of local defects can be isolated, mapped and quantified.
- Areas of interest within the 3D maps can be isolated and quantified.
- Profiles of curvature, slopes or amplitude can be displayed.

REFLECTIVE INFORMATION

The instrument also stores reflection amplitude maps of the test surface, analysing this data in Ondulo identifies and quantifies fine scratches or reflectance differences across the test area.

EASY DATA EXPORT

Exporting measurement data could not be simpler, results are stored in user defined folders on a USB memory chip, this can be removed and plugged into a PC/MAC for instant access to data.

Touch screen operation makes the Optimap™ simple to use.
Optimap PSD – The technology

Using an advanced measuring technique known as Phase Stepped Deflectometry (PSD) the Optimap is capable of making fast, objective, full field measurements over large areas requiring no movement over the surface.

PSD, a white light optical technique, uses a periodic pattern with a sinusoidal waveform to measure the profile or curvature (K) of a surface. This waveform is presented to the surface using a high resolution display and the reflected pattern captured by a high resolution camera. The sinusoidal profile acts as a ruler on the surface allowing the ordinates of the light source to be mapped as they are proportional to the spatial phase of the sinusoidal pattern profile.

By shifting or “stepping” the waveform phase it allows an accurate measurement of each point across the surface through the corresponding point per pixel on the camera.

Using the geometric relationship between the display, the objects surface and camera, light rays reflected from the surface are spatially modelled to calculate the direction of the normal at each point of the surface thereby allowing the profile at that point to be obtained.

By differentiating the data obtained the curvature field can be calculated allowing an accurate characterisation of surface defect. Using the sinusoidal pattern profile orthogonally across the surface, multi-dimensional profile and curvature information is obtained. Integrating this information allows the original 3D surface topology to be reconstructed.

Unlike other automated slope and curvature measurement methods PSD is a full field process requiring no mechanical translation from either the sensor or the surface; all angular and positional inaccuracies are therefore removed.

<table>
<thead>
<tr>
<th>Range</th>
<th>Wavelength (mm)</th>
<th>Curvature (m⁻¹)</th>
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</thead>
<tbody>
<tr>
<td>Ka</td>
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</tr>
<tr>
<td>Kb</td>
<td>0.3 – 1.0</td>
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<td>Kd</td>
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<tr>
<td>Ke</td>
<td>10.0 – 30.0</td>
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</table>

**INSTRUMENT SPECIFICATIONS**

- **Display**: 6.5 inch Colour VGA TFT Touch Screen
- **Camera**: 1.3 Megapixels, image resolution 1296 x 966
- **Measurement Area**: 95mm x 70mm
- **Lateral Resolution**: 75µm
- **Data storage**: 6GB Compact Flash – 200 readings
- **Power**: Lithium Ion Battery 4800mAH / 4-8 hour usage / charge
- **Weight**: 3.0 Kg
- **Dimensions**: H – 200mm, W – 218mm, D – 250mm
- **Repeatability**: Better than 1%
- **Reproducibility**: Better than 2%