IO-Scan

INTRAORAL 3D SCANNER
IO-Scan is the intraoral scanner developed by VOCO utilising a 3D scanning technique that is new in the field of dentistry. The holographic approach, based on infrared technology, makes it possible to "look below the surface", digitally supported by software. IO-Scan is thus able to calculate the subgingival tooth contour without the need to expose the tooth neck.

Furthermore, this is the only technique employed in dentistry that enables the actual surface of the tooth to be scanned intraorally so that error-prone corrections to the "light entry depth" can be avoided.

IO-Scan – a technical revolution

The revolutionary approach provided by IO-Scan consists in utilising infrared technology in combination with the physical measuring technique of digital holography. By combining the two methods, this procedure also enables reflections below the object surface. This makes software supported subgingival monitoring possible for the first time. With the digital intraoral scanning techniques currently used, the required "z distance" information is generated by calculation from the reflecting angle data of the irradiated light. In contrast, with the digital holographic approach employed by IO-Scan, the resolution-defining distance information is coded in the light beam itself. As a result, the data is collected in the z direction with an unprecedented degree of precision, to within just a few μm – irrespective of the size of the scanned image field.

A further advantage is the ability to detect the "lateral travel position" (displacement parallel to the dental arch), independently of the object site. This likewise permits significantly increased accuracy in the recording of these dimensions because the accuracy is not solely dependent on the mathematical combination of sequentially recorded 3D point clouds.
The intraoral 3D scan technologies currently used in dentistry are not capable of resolving and recording structures below a surface, in this case below the gingiva. Consequently, the only option is to expose the tooth neck using the double-cord technique and then take measurements on the exposed surface.

There is no such problem with the IO-Scan intraoral scanner. The high-resolution digital holography technique used by IO-Scan breaks new ground by recording the light which penetrates the gingiva and is reflected by the tooth neck. It then calculates this light into the required distance signal – here relative to the surface. At < 1 %, the signals detected are much smaller than the surface signal produced by the gingiva.

**Good handling – great flexibility**

The compact, lightweight handpiece of the IO-Scan device is ergonomically designed and enables one-handed scanning from various positions. The handpiece can be gripped in a similar way to a contra-angle handpiece. The slender, tapered tip makes for easier access to distal surfaces in the molar region. Once the scan field has been prepared, entire sections of the jaw can be measured quickly and accurately.

Data processing with IO-Scan is based on open STL data sets. The STL interface (STereoLithography, Standard Tessellation Language) is a standard interface used by many CAD systems. You can transfer open STL files to virtually any system within your practice’s digital workflow.

With IO-Scan, you have all of your equipment available in your practice as a mobile unit. The monitor of the mobile terminal shows you in real time the recorded oral situation and the progress of the scan. The scan data can be reviewed and corrected at any time. The entire mobile scanning unit is designed with a rounded shape for ease of cleaning and disinfection, so it meets your practice’s strict hygiene standards.
IO-Scan

INTRAORAL 3D SCANNER

Technical data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning technique*</td>
<td>Digital holography</td>
</tr>
<tr>
<td>Measuring accuracy in all three spatial directions</td>
<td>&lt; 5 µm</td>
</tr>
<tr>
<td>Distance from the tooth</td>
<td>2 - 12 mm</td>
</tr>
<tr>
<td>Powder-free</td>
<td>Yes</td>
</tr>
<tr>
<td>Camera grip / Diameter</td>
<td>42 mm</td>
</tr>
<tr>
<td>Overall camera length</td>
<td>260 mm</td>
</tr>
<tr>
<td>Camera weight</td>
<td>430 g</td>
</tr>
<tr>
<td>Camera power consumption</td>
<td>8 W</td>
</tr>
<tr>
<td>Interfaces**</td>
<td>STL export</td>
</tr>
</tbody>
</table>

* The procedure and product are not yet CE certified. Therefore, all data is provisional and without warranty
** The interfaces are not yet fully integrated into a dental workflow

Advantages

- Extreme precision within just a few µm (1/20 the diameter of a human hair) in all three spatial directions by means of digital holography
- Infrared technology enables separate "optical scanning" of the surface and the software supported calculation of structures below the surface (subgingival)
- Powder-free
- No mechanically moved components
- Compact handpiece
- So-called "false-colour imaging" of tooth and gingiva is possible (in spite of using infrared technology)

Available from:

VOCO GmbH
Anton-Flettner-Straße 1-3
27472 Cuxhaven
Germany

Tel.: +49 (0) 4721-719-0
Fax: +49 (0) 4721-719-140
info@voco.com
www.voco.dental