

Reliably Measure at the Push of a Button – The new, intelligent ZEISS O-SELECT digital measuring projector

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Abstract:

ZEISS O-SELECT allows you to quickly and reproducibly measure at the push of a button. The digital measuring projector autonomously selects the right distance, automatically eliminates blur at the edges and even chooses the right measurement program. O-SELECT independently recognizes features such as circles or lines and suggests characteristics such as distance and radius.

KEYWORDS: measuring projector, metrology

In production environments, optical and contact coordinate measuring machines are increasingly replacing manual equipment such as goniometers, gauges and profile projectors. However, the influence of the operator with these manual tools must not be disregarded. With O-SELECT, ZEISS is reducing this influence to a minimum. Thanks to its high level of automation and ease of use, complex measurements can be completed quickly, traceably and reproducibly. “Quickly and reliably obtaining ISO compliant, traceable and reproducible measured values was a key aspect for us in Product Development,” says Andrzej Grzesiak, Head of Metrology Systems at ZEISS. The result is an automated, intelligent optical measuring system – during the generation of measuring programs and the measurement itself. The latter occurs at the push of a button: the operator places the workpiece in the measuring field and launches the program (fig. 1). Within seconds, the camera captures the contours, analyzes the characteristics and documents them in ZEISS PiWeb analysis and statistics software.



Fig. 1. Placing the workpiece in the measuring field

It's all automated

Factors such as depth of focus and illumination play a key role in optical measurements. Operators can cause systematic measurement errors without noticing them simply by selecting the wrong settings. Depth of focus, for example: an imprecise configuration can result in deviations of several micrometers. Playing around with setting parameters, as well as measuring programs, not only costs time, but can also lead to flawed information and rejects. ZEISS O-SELECT therefore automatically eliminates blurriness at the edges even if the operator cannot see it. "Implementing and automating the complex interaction between optics and illumination make a measurement traceable, reproducible and therefore reliable", says Grzesiak. The ZEISS measuring projector therefore automatically selects the right distance of the camera to the object, focuses the workpiece edges and maximizes contrast. Furthermore, the measuring machine calculates the illumination intensity that can vary from workpiece to workpiece (fig. 2). Numerous processes run in the background for this, which do not require user input. The system even independently identifies features on previously unknown workpieces. Users also no longer have to waste time searching directories for the right program. The software compares existing programs with the current workpiece and then reliably opens the right program. The measuring system automatically detects the location of the part, manual alignment is not required.



Fig. 2. (1) Eight-segment double ring light for variable reflected-light illumination (2) Mounting block for optional coaxial light (3) Transmitted light for maximum contrast

Programmed in just a few clicks

The digital measuring projector does more than just simplify measurements. It also quickly measures single parts and can intuitively create entire programs. ZEISS O-SELECT sets itself apart from other systems not only through its ability to independently recognize features such as circles or lines, but also through its intelligent suggestions for characteristics such as distances, radii and connecting elements. With just a few clicks, operators select the necessary features (fig. 3). These are then merged in a measuring program. The programs are created in a self-explanatory process. ZEISS calls this new functionality Click & Pick. The display of dimensioning corresponds to what is shown in the drawings. Furthermore, an intuitive user interface helps operators navigate the software. It shows clearly which point it has reached and guides them through the entire run: from creating a new project to the measurement plan and specifying the measuring run, users are guided throughout the entire process up to the report. "In this way, programming not only takes less time, it also makes work more enjoyable. And this, of course, increases productivity," emphasizes Grzesiak.

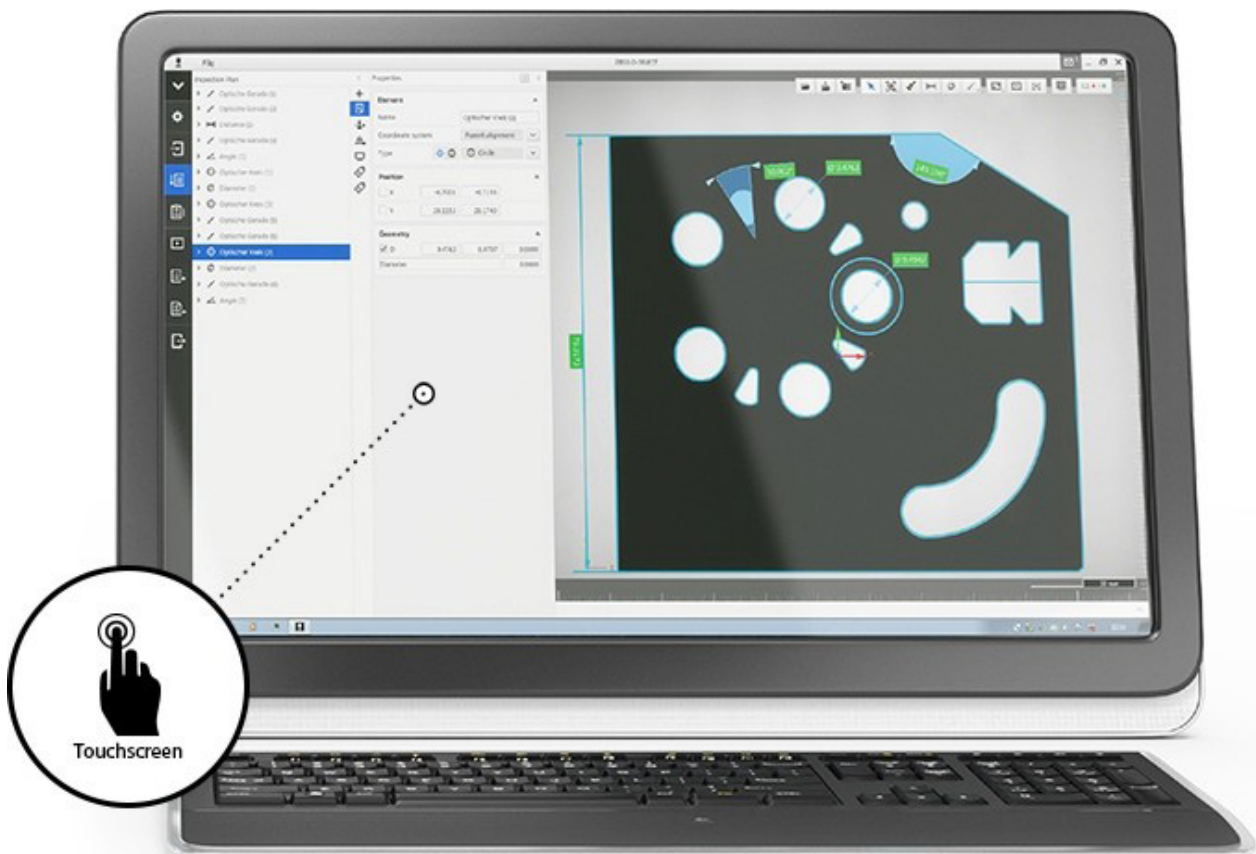


Fig. 3. ZEISS O-SELECT software offers clear operator guidance and reduces his or her workload

Part of the optical family

The digital measuring projector is ZEISS' solution for a wide range of industries – from automotive to electronics to plastics. The optical measuring system is ideal for fast checks of the dimensional accuracy of distances, radii and angles. Examples include punched and formed parts, injection-molded and laser-cut workpieces (fig. 4). However, the system is selected based on the application in most cases. For example, if a measurement of complex, 3D structures is necessary, the ZEISS O-INSPECT multi-sensor system is a great choice. Thanks to the outstanding compatibility of ZEISS PiWeb software, the results of all ZEISS systems can be transmitted and analyzed jointly. Variable report templates with statistical parameters are available with all systems. According to Grzesiak, "This is the secret to the superior comfort of the ZEISS portfolio."

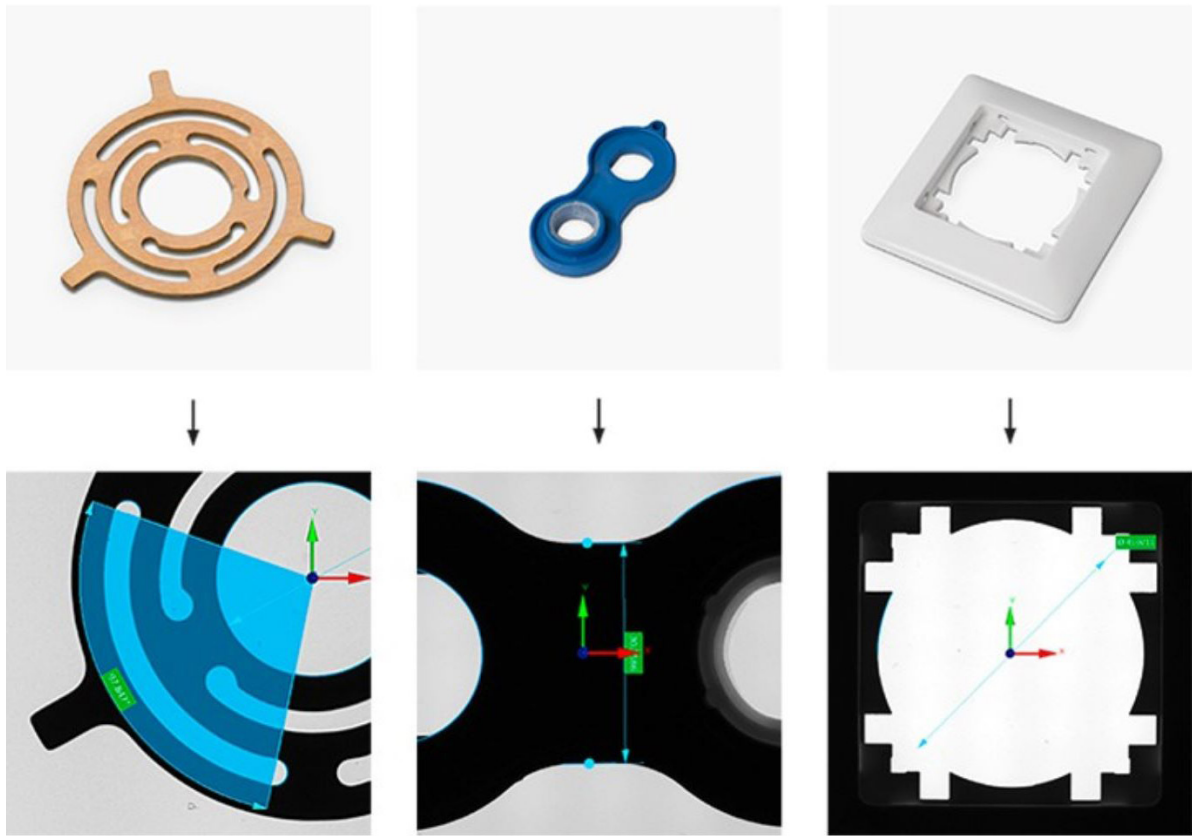


Fig. 4. Fields of application