

A Brief History of the Micrometer Part V: Advanced Micrometer Design

From Reading Gradations to Modern Displays

Not long ago, machinists needed to take time to carefully read and interpret line gradations. Over the course of tens or hundreds of readings per day, the process became very time consuming, leading to fatigue and error.

Eventually the market required a new micrometer design to measure dimensions in digits – a move away from reading gradations toward LCD displays. Earliest models were based on mechanical digital counters capable of resolutions up to 1/100mm. With the advent of new innovations, digital micrometers based on electronics became the standard.

Advancements in Digital Displays

Reading a micrometer is a delicate operation and machinists are trained to add one revolution to a micrometer reading based on turns of the thimble. However, a thimble reading could suggest either 8.23mm or 8.73mm – allowing room for misinterpretation and error.

The introduction of the digital micrometer eliminated this possible reading error, and became the preferred system. A new feature was added to all models to ensure readings were fast and accurate. However, classic line graduated models were still produced because some machinists didn't need the digital counter and were not satisfied with related accuracy limitations.

The birth of microchips and LCDs changed the industry, and demand steadily increased for these higher accuracy micrometers. The first LCD digital model with a resolution of 1/1000mm offered by Mitutoyo required three batteries and was rather heavy. One noteworthy feature of this early model was a plug-in connector to send data to other devices.

Merits of Data Output

Automation in the field of machine tools revolutionized the traditional method of production. In larger factories, total control systems were deployed through computer technology where data is stored and shared by many users. This required a flexible system of control to cope with a wide variety of products produced in small parts.

Today dimensional tolerances are much tighter and the products manufactured are more complex. Thus quality control and production methods have evolved and the expectations for a gage have progressed from simple hand-held micrometer to an input device for a total information system.

In the manufacturing sector, the ultimate goal of information technology is to build a climate of shared data throughout the entire organization. For this reason, Mitutoyo digital micrometers feature an output port to simplify report creation and quality control, placing them at the forefront of technology.

This white paper is based on an original publication by Mitutoyo.