Consistent production quality requires the use of reliable accurate tooling. A vital requirement is precise tool data. m&h touch probes for tool measurement and m&h Laser tool setters determine the length and radius of the tools directly on the machine.

The data is automatically transferred to the control's tool table. Periodic tool checks for breakage or wear provide additional production reliability. The tool setters from m&h will do this job, efficiently and dependably.

Tool measurement on the machine provides more precise and up to date tool data, since it takes into account the clamping situation in the tool holder and the thermal conditions in the machine.

With proven measuring cycles in the control or from m&h, measuring is both quick and reliable, this saves setup time, avoids non-machining time and ensures operation and the process are highly reliable.

Measuring tools on the machine tool provides substantial advantages:
- Measuring of exact tool diameter, taking the centrifugal forces into consideration
- No transmission errors caused by manual entry of tool data
- Immediate measuring in the machine environment ensures highest precision
- Production downtime and scrap are avoided by breakage control
- Cost and time-saving solution
- Compensation of the linear expansion of the measuring axis

> Avoid errors
> Exact, real-time data
> Highest precision
> Breakage control
Workpiece measurement
Shortening setup time – Reducing costs

Touch probes from m&h measure workpieces on milling machines, machining centres, lathes, turning/milling machines, grinding machines, special machines and robots. Both in small businesses and in middle or large-scale series production, workpieces are not only aligned, but geometries are inspected in the machine. Touch probes ease day-to-day work, reduce manufacturing time and costs, and help to exploit the features of modern machines.

Setting zero point
Before machining workpieces, the zero position must be set on the machine. Using touch probes from m&h, this task can be achieved much more precisely and faster than by conventional setting methods. There is a very broad range of possible applications that provide an optimum solution for every task. As a rule the following requirements exist: locate in a bore or boss, locate a workpiece corner or edge, or determine the center of a pitch circle.

Adjustment of workpieces
With m&h touch probes, angular positions of workpieces can be exactly determined and automatically compensated. As a result the time-consuming parallel adjustment of workpieces to the axes is no longer necessary and precision is increased.

By touching either on a workpiece edge or two bores or bosses the touch probe precisely detects any possible inclination error of the workpiece. Depending on the machine specification, the workpiece can be adjusted by rotating the coordinate system in the control, or by turning a rotary table, thus considerably shortening manual setup times.

> Optimally exploit the features of the machine
> Increase precision at the workpiece
> Prevent scrap and re-work
m&h touch probes are used both in one-off and series production to check workpieces while still clamped in the machine. Any deviations from the workpiece specifications are detected at once and can be reworked immediately. Specific machining results can be documented any time. Increasing quality demands, time constraints and the call for cost reduction make the use of touch probes for the measurement of workpieces a daily requirement.

Workpiece measurement
State-of-the-art controls and software packages are capable of measuring workpiece geometries such as edges, bores, bosses, grooves, lands, angles, corners and arcs. The information gained will not only flow into evaluations on workpiece quality and simple measuring records, but will also even define the subsequent processes necessary.

They make it possible to draw immediate conclusions in relation to the tooling and machining process and give machine operators more confidence in the quality of their work. Immediate automatic reworking avoids time-consuming, manual remedial work. Costly gauges become obsolete.

As well as shortening of non-machining time and increased precision, there is a whole series of other advantages, e. g.

- Simpler, cheaper fixtures
- Compensation for inaccuracies in pallet changers or zero point clamping systems
- Determination of thermal effects in the machine tool

> Shorten setup time
> Gain manufacturing time
> Increase quality
> Reduce costs
Software solutions for all measuring tasks

Software solutions from m&h permit the measurement of complex geometries like free-form surfaces, measuring with swivelled axis and the measurement of workpieces with a variety of different measuring objects. m&h ensures seamless and reliable interaction of touch probes, software, and application technology.

3D Form Inspect Software

3D Form Inspect software enables quick, simple on-machine measurement and reporting of critical geometries and shapes on all sides of the part using all machine axes, saving time, ensuring reliability, and enhancing quality.

- No need to send parts to the measuring machine
- Immediate reworking without renewed setup
- No machine downtime due to lack of information
- Documentation of the quality

Save costs – increase competitiveness

- Extensive import filters for CAD surface data
- Available for almost all CNC controls
- Intuitive user interface
- Familiar measurement functions, designed for the machine operator

> The original, a market leader since 2002!

PC-DMIS NC Gage Software

Developed for easy, quick and reliable usage of touch probes without requiring the operator to have programming skills or special knowledge of measuring technology. The unique “teach-in method” in manual operation permits a dialogue-based procedure. This process will immediately deliver the desired result. As a result operation of the machine during setup, manual measuring cycles as well as automatic measuring and logging are child’s play.

PC-DMIS NC Gage is available tailored to every need. The Basic Version permits the setup and measurement of basic geometries and programming using the „teach-in method“. The Advanced Version offers in addition numerous further functions for 3-axis machines, as well as options for 5-axis machines and kinematic setup.

> Measuring made easy!
m&h designs and manufactures precision made, high quality, dependable touch probe systems for use in machine tools. These touch probes feature the highest precision and process reliability. Technical innovation and the focus of our products on our customer’s manufacturing processes lie at the heart of our development process.

- Innovative touch probes and tool setters  
  – state-of-the-art technology and highest quality
- User-friendly software solutions
- Application-oriented measuring solutions
- Customer-oriented service worldwide

The Hexagon Metrology worldwide sales and service network offers qualified advice and local service, quickly and effectively. As a part of Hexagon Metrology, m&h stands for innovative metrology in the machine tool sector.

m&h touch probes and tool setters impress with:

**Operation suitable for the workshop**
- Very straightforward operation and setting by the operator
- Quick battery replacement without tools
- Easy stylus changes

**Highest precision and process reliability**
- Precise measurement by first probing
- No interruptions due to false triggering
- Wear-free measuring mechanics
- Dependable touch probe activation methods

**Durable touch probe design**
- Stainless steel touch probe housing
- Sealed to the IP68 standard
- Best possible protection of the measuring mechanics

**Reliable signal transmission**
- Transmission of measuring and temperature data to the control even under extreme conditions
- Interference-free infrared transmission by means of HDR technology (High Data Rate)
- Patented SCS-Technology (Self-Channel-Select) for reliable wireless transmission

**Compatibility**
- m&h touch probes are compatible with all earlier m&h touch probe systems
- All m&h touch probes support measuring software on the machine tool
- m&h infrared touch probes with "Chameleon function" are compatible with nearly all other IR touch probes on the market

**Application support**
- Customer-oriented standard solutions
- Powerful, user-friendly software
Measuring on machine tools
Applications

Tool control with laser tool setters and tool setters. Simple machine setup, measurement and control in one clamping arrangement using touch probes from m&h. This saves time, ensures reliability, and enhances quality – for many years leading companies from the following fields have been relying on it:

> Aerospace
> Automotive
> Mould & Die
> Mechanical Engineering
> Power Generation
> Precision Industry
> Medical Technology
> Domestic Appliances
m&h Inprocess Messtechnik GmbH is the technological leader in on-machine gauging. Today many well respected companies around the world can be found using m&h touch probe systems and measuring software. m&h is characterized by its strengths in: machine tool know-how, continuous technical innovation, focusing products on customer manufacturing processes, and application engineering. Individualized, customer focused advice and development of special applications are part of our commitment to excellence. A worldwide sales and support network ensures m&h products are available wherever your business takes you.

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