m&h PROBING SYSTEMS
WITH RADIO-WAVE TRANSMISSION
MEASURING ON MACHINE TOOLS
FLEXIBLE – MODULAR – READY FOR THE FUTURE

The modular probing system RWP20.50 can be used for a range of applications. It can be easily modified by simply screwing in various measuring units. Extensions and cross-probes can both be used. The development of further measuring units and sensors which can be used on the same system basis is planned for the future.

- Reliable, secure radio-wave transmission
- ITE technology – pre-positioning with high-speed
- Safe, reliable activation methods
- Robust, flexible and future-proof

Innovative, customer-oriented thinking and actions create unparalleled measuring solutions
m&h offers two measuring units with different operating principles and a temperature measuring units, which ensure uncompromising precision under the harsh conditions in the machine tool.

**Your advantage:**
- Different measuring units for one system basis
- Cost-effective for various requirements
- Warehousing cost savings thanks to flexibility
- Very well preparation for the future

**m&h RWP20.50-PP**
The PP version is equipped with the PP41.00 measuring unit with its tripod system. The secure standard for universal use is best suited to the majority of measuring tasks. Cross-probes can be used, as well as setting the trigger force is possible.

**m&h RWP20.50-MY**
The MY version is equipped with the MY21.00 measuring unit with its patented hemisphere system. Its homogeneous probing behaviour makes it especially advisable for machines without rotation spindles.

**m&h RWP20.50-TP**
The TP version is equipped with the TP44.10 temperature measuring unit with patented temperature measuring technology. The right solution for consistent manufacturing quality or cost-intensive workpieces.
m&h RWR95.50

The compact radio-wave receiver RWR95.50 communicates with m&h radio-wave touch probes in the 2.4GHz range and can be easily mounted in the machine room. The spread spectrum transmission and a multiple transfer of the records ensure transmission reliability and a fast and trouble-free measurement process.

m&h RWR95.40

The compact radio-wave receiver communicates with m&h radio-wave touch probes in the 433MHz range and can be easily mounted in the machine room. While in operation, the environment is continuously checked for interference from transmitters (Self Channel Select - SCS).
# TECHNICAL DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>PP41.00 Measuring unit</th>
<th>MY21.00 Measuring unit</th>
<th>TP44.10 Measuring unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeatability at probing from one direction</td>
<td>2 Sigma ≤ 1 μm with 50mm stylus and 254 mm/min</td>
<td>2 Sigma ≤ 1 μm with 50mm stylus and 254 mm/min</td>
<td>-</td>
</tr>
<tr>
<td>Recommended probing feedrates</td>
<td>Max. 2000 mm/min</td>
<td>500 mm/min</td>
<td>-</td>
</tr>
<tr>
<td>Sensing directions</td>
<td>±X, ±Y, -Z</td>
<td>-Z</td>
<td>-</td>
</tr>
<tr>
<td>Maximum stylus overtravel</td>
<td>XY ± 12,5°, Z – 6 mm</td>
<td>XY ± 14°; Z – 4,5 mm</td>
<td>-6,9 mm</td>
</tr>
<tr>
<td>Trigger force</td>
<td>XY = 0,3 - 1,4 N; Z = 2,5 - 12,5 N (with 50mm stylus)</td>
<td>XY = 1 N; Z = 6 N (with 50mm stylus)</td>
<td>13N (Trigger force with 50mm sensor)</td>
</tr>
<tr>
<td>Extensions Ø 25 (0.98&quot;)</td>
<td>30mm (1.18&quot;), 50mm (1.97&quot;), 100mm (3.94&quot;), 200mm (7.87&quot;)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Power supply</td>
<td>1 x 9 V battery block, lithium: 1200 mAh, Alkaline: 550 mAh</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Battery lifetime in continuous operation (Probing every 2 seconds)</td>
<td>Up to 1000 hours</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Weight without shank</td>
<td>Approx. 920g</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Temperature range</td>
<td>Storage: 5 °C – 70 °C, Operation: 10 °C – 50 °C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Signal transmission</td>
<td>433 MHz / 2.4 GHz</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP68: EN60529</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
m&h RADIO-WAVE RECEIVER

The compact radio-wave receiver communicates with all m&h radio-wave probes and can be mounted anywhere in the machining area with ease. All necessary components are integrated into the stainless steel casing, so there is no additional interface required in the control cabinet.

### m&h RWR95.50

- Communicates with m&h touch probes in the 2.4 GHz frequency range
- Secure transmission via MDR (Multi Data Rate) and AFS (Automatic Frequency Select)
- The reception quality is immediately visible by the status LEDs
- Processes measurement and temperature data

### m&h RWR95.40

- Communicates with m&h touch probes in the 433 MHz frequency range
- Proven and reliable SCS technology (Self Channel Select)
- Processes measurement and temperature data

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<table>
<thead>
<tr>
<th>Description</th>
<th>RWR95.50</th>
<th>RWR95.40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission Frequency</td>
<td>2400-2483.5 MHz (2.4GHz)</td>
<td>433.075 - 434.650 MHz</td>
</tr>
<tr>
<td>Transmission/Reception Range</td>
<td>Up to 18 m</td>
<td>Up to 18 m</td>
</tr>
<tr>
<td>Number of Channels /Channel Spacing</td>
<td>–</td>
<td>64 / 25 KHz</td>
</tr>
<tr>
<td>EMC-tested</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Power Supply</td>
<td>12 - 32 VDC, max. 100 mA</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1450g = RWR95.50-A (with cable)</td>
<td>1500g = RWR95.50-A (with cable and protection tube)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>Operation: 10° - 50°; Storage: 5° - 70°</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>Sealing</td>
<td>IP68: EN60529, IEC529/DIN40050</td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>2x Cap head screw M5</td>
<td>7 mounting configurations</td>
</tr>
<tr>
<td>Connecting Cable</td>
<td>15 m with strands</td>
<td>–</td>
</tr>
</tbody>
</table>
FLEXIBLE MEASURING SOLUTIONS
IN THE MACHINE TOOL

Latest-generation m&h touch probes offer the widest range of options in the machine tool. Reliability and precision are the key to consistently high quality with optimized processing times. Due to the fact that the RWP20.50 can be used both as a probe as well as a temperature sensor, the warehousing costs for replacement devices are much lower than for separate device types. This is another advantage, particularly in lean production.

m&h touch probes fulfil all requirements in the machine tool in tried and tested fashion. Extreme accelerations, high positioning speeds, constant vibrations, hard tool changes, increased temperatures and coolants pose no problems for m&h touch probes. m&h’s precision mechanics can continue to switch without wear and extremely precisely for years under all these conditions.

Robust and durable
• Glass ring to protect the transmitter unit
• Housing made of stainless steel
• All seals made of viton
• Measuring unit protection by means of chip guard plate
• Probe completely sealed (immersion-tight) in acc. with IP68

Fast, safe and precise
• Pre-positioning with high-speed (up to 50 000 mm/min) thanks to ITE technology (Intelligent Trigger Evaluation)
• One-touch strategy for fast, precise probing (up to 2000 mm/min)
• Safe and reliable probe activation methods

Workshop-oriented handling
• Very easy handling and setting by the operator
• Fast battery change (standard batteries) without tools
• Easy stylus change and runout adjustment
PRODUCTIVITY IN SERIES PRODUCTION

The high productivity in series production requires flexible and effective measurement solutions. As an experienced supplier in the measuring technology area for machine tools, integrating the current requirements of our customers into our developments is among our core competences.

**m&h RWP20.50-TP**

Measures fully automatically the workpiece temperature both before as well as during machining (patented). This allows the control of production processes and the adaptation of machining parameters during production. Temperature-dependent parameters can be reliably determined before the workpiece goes to the next machining step with tolerance specifications. This way, consistently high production quality is ensured.
PATENTED TECHNOLOGY

m&h Temperature Sensor
Fully automatic workpiece temperature detection.

m&h Activation Methods
Pullstuds and water activated switches.

HSK Shanks with Thermo-Lock® Technology
Prevents heat expansion of the shank to the probe body.

m&h Tool Setter with adjustable positions
Fast changeover to a pre-mounted, magnetic base plate.
DIFFERENT FREQUENCY RANGES IN RADIO-WAVE TRANSMISSION

The m&h RWP20.50 radio-wave touch probe is available in two different frequency ranges. The RWP20.50-M is still compatible with previous devices in the 433 MHz frequency range. Alternatively, the m&h RWP20.50-G is available with the new radio-wave transmission system in frequency ranges from 2.4 to 2.4835 GHz.

Proven SCS radio-wave transmission in the 433 MHz range
An interference-free signal transmission between probe and receiver is the main criterion for the process-reliable measuring in the machine tool. The radio transmission takes place in the 433 MHz frequency band. 64 channels can be freely set on a digital display on the probe and at the receiver. The patented SCS Technology (Self-Channel-Select) of the microprocessor-controlled receiver responds by continuously checking surroundings for interfering signals. The receiver blocks interfering frequencies for further use.

Reliable radio-wave transmission by MDR and AFS in the 2.4 GHz range
The MDR (Multi Data Rate) technology makes it possible to transmit high data rates and large data sets in the shortest possible time. The spread spectrum transmission and a multiple transfer of the records ensure transmission reliability and a fast and trouble-free measurement process, as one expects from m&h. In AFS (Automatic Frequency Select) technology, the frequency ranges of the radio bandwidth are continuously scanned and partial frequencies free from interference are automatically selected. This technology not only ensures fast and interference-free independent transmission, but also prevents interference from WLAN systems or other radio sources. Measurement signals are transmitted extremely quickly to the control upon contact of the probe at the measurement point, in order to achieve the shortest possible delay and ensure consistent measurement accuracy.
STATE-OF-THE-ART

ITE-technology
ITE technology (Intelligent Trigger Evaluation) allows you to pre-position at high speed (up to 50 000 mm/min). Fast and precise probing (up to 2000 mm/min) through the m&h one-touch strategy makes maximum precision possible. This means that the m&h radio wave probe RWP20.50 moves at top speed to the measuring point, so that it can reliably probe at constant measuring speed with only one touch. This considerably accelerates the measuring process and saves valuable production time.

Enhanced activation options
In addition to the proven, reliable mechanical activation options, the m&h RWP20.50 also offers the option of bidirectional activation. This is done using separately coded signals and is therefore not inferior to mechanical methods with regard to reliability.
• Patented pullstud activation
• Patented water-switch activation
• Mechanical HSK activation
COMPACT AND BIDIRECTIONAL FOR VARIOUS APPLICATIONS

m&h has other radio-wave touch probes with different operating principles for different applications and machine sizes, as well as a manually changeable radio-wave touch probe system, which can be used alongside any radio-wave touch probe.

**m&h RWP38.41**

The compact radio-wave touch probe RWP38.41 is ideally suited for use on machine tools with limited maximum tool diameter and restricted height of the Z axis, particularly with 5-axis heads. It can be extended in a modular way and is the perfect solution for complex measurements. Thanks bidirectional communication the RWP38.41 can be combined with the radio-wave tool setter RWT35.50 and the receiver RWR95.40. Equipped with a patented THERMO-LOCK® Technology shank, the touch probe delivers precise results even with large temperature differences.

- Proven, reliable SCS radio-wave transmission
- THERMO-LOCK® Technology (patented)
- Flexibly and modularly extendable

**m&h RWT35.50**

Position-variable radio-wave tool measuring system RWT35.50 for milling machines and machining centers. Through use of a magnetic mount, the tool setter can be placed in wide range of table positions. Our patent pending system delivers highly accurate and repeatable re-positioning of the tool setter. Tool measurement and tool breakage detection can therefore be flexibly carried out with only one device, even on machines with pendulum machining.

- Quick mounting on optional base plate
- Proven, reliable SCS radio-wave transmission
- Can be shared between machines

**THERMO-LOCK® TECHNOLOGY**

- Prevents heat transfer from the spindle to the probe
- Eliminates uncontrolled expansion of the shank and probe body
- HSK shanks with THERMO-LOCK® technology are available in various sizes
**OVERVIEW**

**Description**

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<th>RWT35.50</th>
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<tr>
<td><strong>Sensing directions</strong></td>
<td>±X, ±Y, ±Z</td>
</tr>
<tr>
<td><strong>Max. stylus deflection</strong></td>
<td>X/Y ±12,5°; Z – 6 mm</td>
</tr>
<tr>
<td><strong>Max. stylus overtravel</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Trigger force</strong></td>
<td>X/Y = 0,3 - 1,4 N; Z = 2,5 - 12,5 N, with 50 mm stylus, adjustable</td>
</tr>
<tr>
<td><strong>Recommended probing feeds</strong></td>
<td>Max. 2000 mm/min</td>
</tr>
<tr>
<td><strong>Smallest tool</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Battery lifetime in continuous use</strong></td>
<td>Up to 325h</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Approx. 460 g (without shank)</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>Battery 2x 3,6 V ½ AA</td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td>Storage: 5 °C – 70 °C, Operation: 10 °C – 50 °C</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Stainless steel</td>
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</tr>
<tr>
<td><strong>Number of channels</strong></td>
<td>64</td>
</tr>
<tr>
<td><strong>Channel spacing</strong></td>
<td>25KHz</td>
</tr>
</tbody>
</table>
CUSTOMER STORIES

m&h’s high-quality measurement systems are specially designed and made for use in machines tools, impressing with their maximum precision and reliability. Here are extracts from testimonials by users of m&h probing systems with radio-wave transmission.

BBG GmbH & CO. KG, Germany

m&h radio touch probes on the 433 MHz band still set the benchmark on the market. For all cases where local conditions require an alternative solution, the new industry frequency band around 2.4 GHz was selected, which is already widely used for industry applications. Thanks to new technologies, m&h was able to create secure connections in this frequency band.

The probe initially installed on a machine provisionally worked perfectly from the outset. The second machine was then soon converted to the new 2.4 GHz m&h technology.

“We haven’t had a single false measurement since the conversion”

enthuses Michael Späth

Weingärtner Maschinenbau GmbH, Austria

Right from the start, m&h has used the protected 433 MHz industry band with 64 selectable channels. Advanced, continuously improved electronics result in high transmission and receiving performance to ensure secure data transfer in even extreme conditions and avoid unnecessary machine downtime due to inadequate signals or similar issues.

However, what the Weingärtner team especially values about m&h’s new touch probes is the removable measuring unit and the modular structure.

“Reliable radio signals ensure precision in large machines”

Weingärtner Maschinenbau GmbH
Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity. For more information, visit HexagonMI.com.

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