Diverse and innovative – **New products 2025**

Greater process reliability, less waste

As your global quality assurance partner, we offer products and solutions that combine proven precision with high efficiency. Short measuring times and easy operation speed up work processes. Through a clever combination of different measuring procedures, multiple tasks can be carried out by a single system – and in one setup. At the same time, innovative software tools and a wide choice of interfaces ensure that Mahr metrology is in tune with modern manufacturing requirements. Ensuring the productivity of your quality assurance is our aim.

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Digital dial indicators with **unique connectivity**

The latest generation of digital dial indicators in the MarCator family boasts new, innovative features: Touch operating keys, extra hardened glass fronts, colored LEDs for measurement classification and unrivalled remote control and connectivity ensure unique convenience when measuring and setting the device.

Next level assistance: Thanks to the new features, the MarCator dial indicators are ideal companions in any working environment. The large display with hardened glass front, the extra-large numerical display and the touch operating keys with practical direct functions make recording measured values easier and more reliable than ever before.
The digital dial indicators are available for a wide range of measuring tasks, both for static measurements such as lengths, distances and length differences, as well as for dynamic measurements such as radial runout, straightness and flatness.
In addition, special versions meet particular requirements such as inner and outer comparative measurements, even higher accuracy or special IP protection.

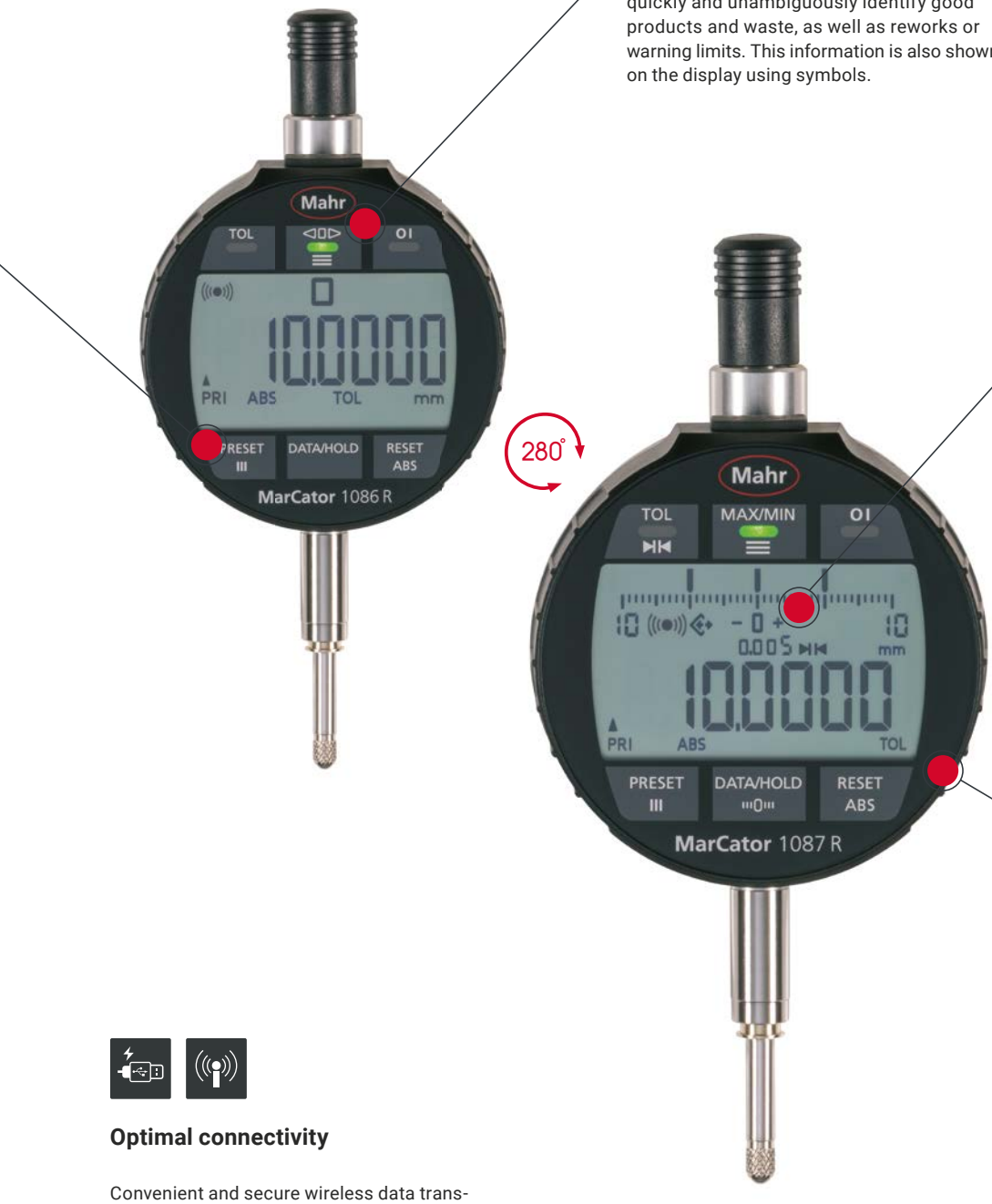
Touch operating keys

With the practical touch function, a gentle touch of the surface is enough to operate the dial indicator safely – ideal for sensitive measuring tasks.

1087 BRi
for dynamic comparative inner/outer measurements

Advantages

- Simple operation using touch function keys
- Settings, individual locking functions and remote control conveniently by PC using the free MarCom Professional software
- Preset: 3 PRESET and tolerance values possible
- A wide range of model variants for the most diverse applications, e.g. MarCator 1087 BR(i) for inner and outer comparative measuring instruments via reversing point search, other devices with even higher accuracy or with special IP protection



Unique measurement classification

The innovative colored LED display is used to quickly and unambiguously identify good products and waste, as well as reworks or warning limits. This information is also shown on the display using symbols.

For static and dynamic measuring tasks

The moving pointer of the additional analog scale display allows the dynamic measuring movement and tolerance limits of the MarCator 1087 models to be reliably visually identified. The MarCator 1086 models are designed for purely static measuring tasks.

Best protection

The robust hardened glass display with non-wearing touch operating keys makes the dial indicators even more durable and less susceptible to damage. In addition, the large LCD displays allow all measured values and symbols to be read off directly and at a glance.

Optimal connectivity

Convenient and secure wireless data transmission (Ri models) or USB data cable with bidirectional data transfer (R and Ri models). You can also benefit from the handy option of setting the dial indicator very easily and clearly by PC and the remote control option in conjunction with the free MarCom Professional software.

Further information on the product, product variants and accessories can be found on our website:

metrology.mahr.com/marcator-digital-dial-indicators

Digital 3-point inside measuring device **with lever retraction**

The Micromar 844 EWR(i) digital 3-point inside measuring device for measuring inner diameters boasts an ergonomic handle with release lever for fast, self-centering measurements over the entire measuring range and a rotating display with touch operation.

With the Micromar 844 EWR(i) inside measuring device, you can quickly measure diameters of different sizes with the flick of a wrist. The stroke path covers the entire application range of the respective measuring head.
You can use the red operating keys in the lever to either trigger a data command or activate the hold function – ideal for situations in which you do not have a direct view of the device display (e.g. in the machine). The spring-loaded measuring force guarantees high reproducibility of the measuring results for measurements such as through holes or blind holes.
But the lever retraction is not the only new feature: The integrated display module boasts features such as the touch operating keys with handy direct functions, an extra-hardened glass front, colored LEDs for measurement classification and unparalleled connectivity and remote control capability.

Outstanding connectivity and remote control capability

Benefit from the USB and Integrated Wireless functionality and the option of setting up your measuring instrument easily and clearly by PC or operating it remotely. You can use the free MarCom Professional software for this.

Advantages

- Measuring pistol with lever retraction for fast and self-centering measurement of different diameters
- Integrated measuring system with conveniently rotating display module
- Wide range of sizes for measuring ranges from 6 to 100 mm
- Preset: 3 PRESET and tolerance values possible
- Connectivity: Model available both as 44 EWR with bidirectional data output (cable) or 44 EWRi with Integrated Wireless
- Remote control via the free downloadable MarCom Professional software
- Available as an individual instrument or as a set

Wear- and corrosion-resistant measuring heads

The measuring heads from 6 to 30 mm are optimally protected for allworkshop requirements thanks to their satin chrome surface. The measuring heads from 30 mm (manufactured with a lightweight aluminum body) are now black anodized and feature noncorrosive front panels for optimum durability and cleaning properties.

Further information on the product, product variants and accessories can be found on our website:

metrology.mahr.com/micromar-3-point-inside-measuring-devices

Ergonomic handle with lever retraction

Quick measurements in one motion. The lever stroke covers the entire application range of the self-centering measuring head.

IP 65 TOL

Rotating screen with touch operation and integrated tolerance display

The particularly large display makes for reliable readings, while the integrated tolerance display provides a clear and direct overview of tolerances, including colored LED measurement classification. The display can also be rotated, allowing you to work in all directions.

Handy DATA/HOLD keys in the lever

Measure and record value with the flick of a wrist: Either trigger a data command or activate the hold function (freeze the current measured value). Ideal for situations in which you do not have a direct view of the device display. The arrangement of the keys means that you can always trigger them with your index finger, regardless of the position in which you are operating.

Set 20–50 mm

Digital 3-point inside micrometer **with unique compact measuring element**

The Micromar 44 EWR(i) digital 3-point inside micrometer for measuring inner diameters boasts a lighter and more compact measuring element than its predecessors – for even more sensitivity and clarity when measuring.

The latest generation of Micromar micrometers offers some exciting new features with the 44 EWR(i) model. The housing of the new measuring element is made of plastic, which offers enormous advantages when measuring; not only is the micrometer unit very light and compact, this ergonomic lightweight also offers maximum sensitivity during operation. The smooth ratchet stop enables extra precise measurements and the large, high-contrast display also contributes to additional safety when reading off the measuring results and symbols.
The measuring heads from Ø 30 mm now feature a black anodized surface and stainless steel front panels which, thanks to the hardened surface and material properties, offer improved wear and corrosion protection and are also easier to clean. Another new feature is the 3-value PRESET function, which allows you to preset dimensions and tolerances for 3 reference values at once.

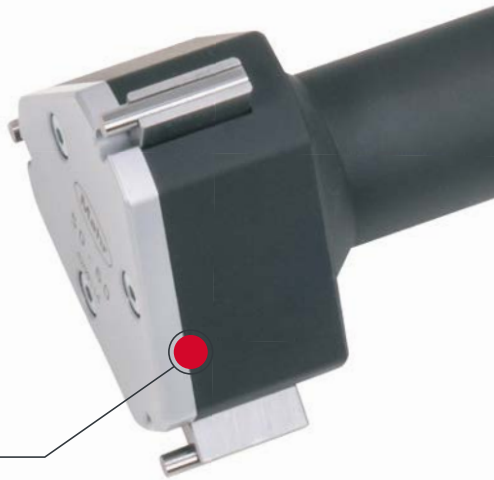
IP 65

Compact plastic measuring element

The new plastic measuring element is ergonomically optimized and significantly lighter than comparable measuring elements – giving you maximum sensitivity when measuring.

Advantages

- Lightweight and compact plastic micrometer unit
- Corrosion- and wear-resistant measuring heads
- Wide range of sizes for measuring ranges from 6 to 200 mm
- Preset: 3 PRESET and tolerance values possible
- Connectivity: Model available both as 44 EWR with bidirectional data output (cable) or 44 EWRi with Integrated Wireless
- Download free MarCom Professional software
- Available as an individual instrument or as a set



Wear- and corrosion-resistant measuring heads

The measuring heads from 6 to 30 mm are optimally protected for all workshop requirements thanks to their satin chrome surface. The measuring heads from 30 mm (manufactured with a lightweight aluminum body) are now black anodized and feature non-corrosive front panels for optimum durability and cleaning properties.

Set 20–50 mm

Outstanding connectivity and remote control capability

Benefit from the USB and Integrated Wireless functionality and the option of setting up your measuring instrument easily and clearly by PC or operating it remotely.

Smooth ratchet stop

The extended ratchet offers you even more sensitivity during operation and thus ensures more precise measurements.

Large screen with integrated tolerance display

The particularly large display enables error-free reading and offers sufficient contrast to quickly read the 10 mm digits at a glance. The tolerance and warning limits function provides a clear and direct overview of tolerances.

Tried and tested function keys

The proven 3-key functionality offers a clear and intuitive operating philosophy and ensures additional safety when measuring.

Further information on the product, product variants and accessories can be found on our website:

metrology.mahr.com/micromar-3-point-inside-measuring-devices

Your robust partner for **production and workshop**

Practical measuring modes and measurement options:
The new Digimar 814 C makes typical measuring tasks easy.

Whether measuring distances, inner or outer diameters: With the new Digimar 814 C, common measuring tasks in production can be completed with ease and in no time at all. Its measuring slide is simply moved to the desired position using a handwheel. The electronic height measuring instrument enables measurements to be carried out safely and is intuitive to operate thanks to its six function keys. Here you can select the desired measuring modes and options, set the display to zero or the preset value and transfer the data at the touch of a button.
The Digimar 814 C is available in sizes 300 mm and 600 mm and with a steel base and granite table.

Clear, intuitive operation

Six keys and a high-contrast display with clear symbols make it easy to use.

Advantages

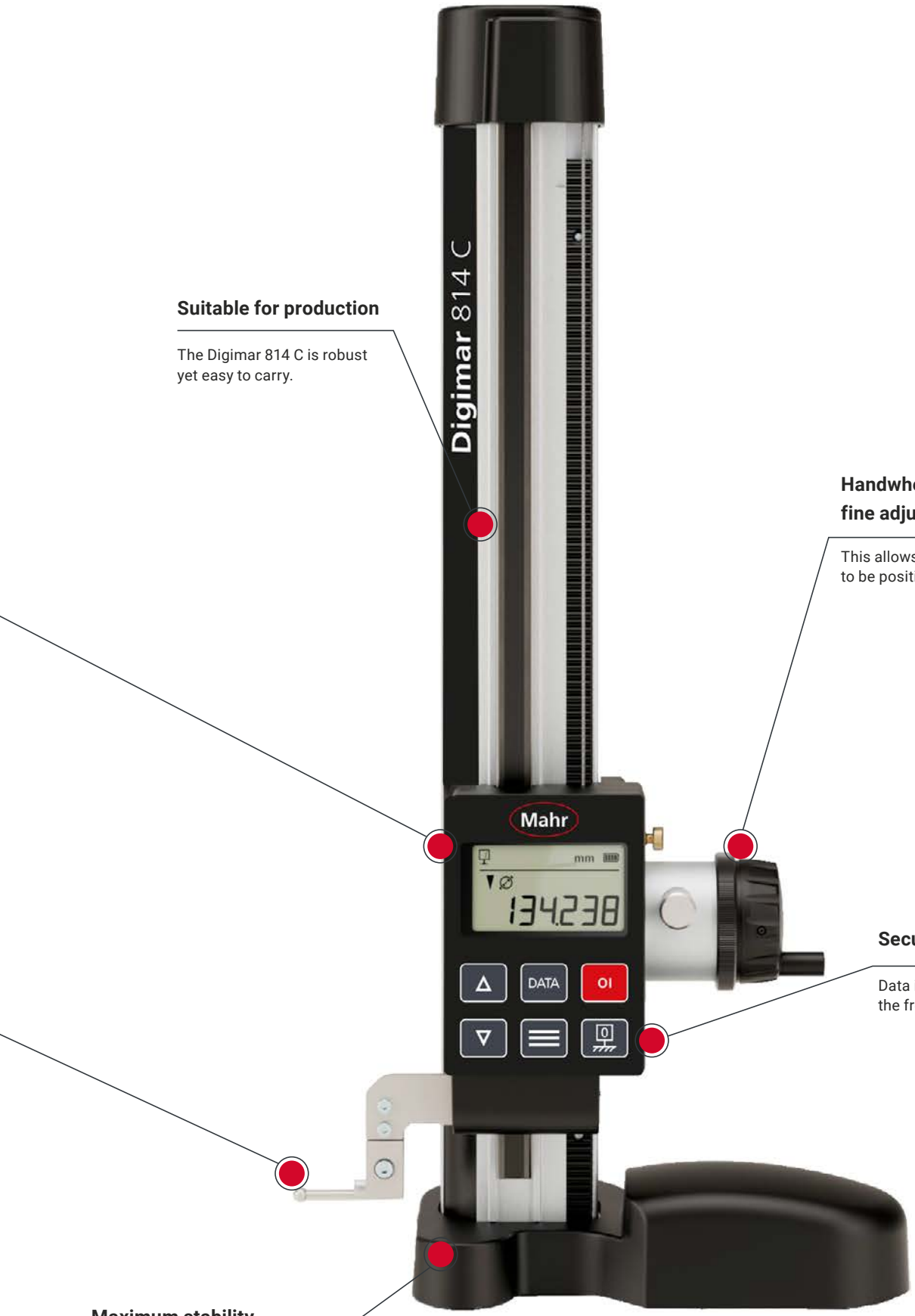
- Clear, simple operation
- Robust yet mobile
- Bidirectional measurement (diameter, distances)
- Constant measuring force for reproducible measuring results

Versatile

The device can be adapted to the respective measuring task with various anvils.

For more detailed information,
please visit our website:

metrology.mahr.com/digimar-height-measuring-instruments



Suitable for production

The Digimar 814 C is robust yet easy to carry.

Handwheel with fine adjustment

This allows the measuring slide to be positioned reliably.

Secure connection

Data is transferred by USB to the free MarCom software.

Maximum stability

The instrument is available with a steel base or granite table.

Testing measuring equipment has never been easier

The tried-and-tested Precimar ICM 100 IP has an even more powerful camera and impressive optimized accuracy.

Fully automatic, cost-effective, efficient: This is the new Precimar ICM 100 IP dial indicator test bench with improved mechanics and new, more powerful camera technology. This now also allows you to measure test-pieces with very large dial plates. Easy handling of the dial indicator test bench with just one hand and the smart software ensure the test instrument is the perfect solution for measuring rooms, calibration labs and production testing. Testing measuring equipment has never been as efficient as with the new Precimar ICM 100 IP. The fast image processing, user-friendly software and easy handling ensure time savings of more than 60%.

One-handed operation

With just one hand and without any tools. Quickly adjust the camera and light source to the optimum height and position for your measurement: Squeeze the lever, adjust the height – done!

Advantages

- Over 60% time saving
- Easy handling and toolless operation
- Versatile for a multitude of measuring devices
- Intuitive, software-assisted operation
- Supports a wide range of standards
- Work effortlessly without losing concentration

For more detailed information, please visit our website:

metrology.mahr.com/precimar-calibration-machines

New camera

The significantly higher resolution of the new camera now also makes it possible to test large testpieces such as the Millimess 1000A/1000B.

Manual mode

Do you want to check your test-pieces manually in individual cases? You can still do so with easy handwheel operation.
In manual mode, the camera serves as a magnifying glass.

Optimized accuracy

MPE: 0.1 µm+L/250

Setup made easy

Good to go in a matter of minutes – thanks to software support with live visualization. You can see at a glance whether the camera is focused and the lighting is sufficient. Visual feedback in real time ensures that every movement is spot on.

Convenient adjustment
of measuring equipment

The Precimar SM setting instrument boasts motorized positioning, high accuracy and outstanding ease of use.

Quality assurance experts know that comparative measuring instruments such as indicating snap gages, universal measuring instruments or 2-point inside measuring devices must be regularly adjusted to the dimension to be determined. Mahr has developed the new Precimar SM to avoid complicated and time-consuming calibration with gage block combinations and the need for lots of expensive setting rings: The motorized, horizontal measuring instrument automatically positions itself as a setting standard – thus eliminating the need for manual, time-consuming adjustment.
The new Precimar SM is conveniently operated via a touch display with a wide range of functions. Creating favorites makes adjustments even easier. And if you want even more convenience, print a barcode label and stick it on the measuring instrument. Simply scan the label the next time you need to make an adjustment – and the setting instrument will automatically move to the desired dimension!
And the best bit: The accuracy of the new Precimar SM is 0.7 µm + L / 1000 – setting it apart in the league of setting instruments!
The robust instrument has been specially designed for use in production and is available in measuring ranges of 350 mm, 650 mm and 1150 mm.

2-point inside measuring devices

Indicating snap gages

Universal measuring instruments

Flexible applications

Extensive range of accessories for mounting 2-point inside measuring devices, universal measuring devices (Multimar) and indicating snap gages.

Advantages

- Touch display with intuitive operation
- High level of convenience thanks to the ability to save favorites and read measuring equipment by barcode scanner
- Saves time and money as setting rings and gage blocks are no longer required
- No loss of accuracy compared to setting rings or gage block combinations

For more detailed information, please visit our website:

metrology.mahr.com/ precimar-sm-setting-gages

Time and cost savings

Simply enter the desired reference value and the setting instrument moves to the relevant dimension. No more time-consuming searches for the correct setting ring diameter or compiling gage block combinations.

Adjust dimensions simply by touch

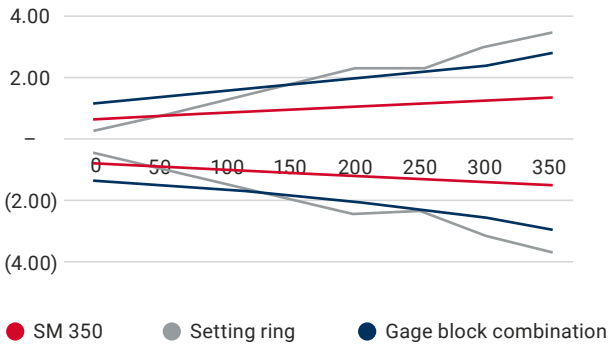
Intuitive operation via large, clear keys for quick and straightforward adjustment.

Highly convenient

Creating favorites makes regular adjustments even easier. The corresponding dimension is set directly by scanning the barcode on the measuring instrument.

Highly accurate

With an accuracy of 0.7 µm + L / 1000, gage block combinations and setting rings can be easily replaced.



Accuracy comparison
setting instrument / gage blocks / setting rings

OptoSurf | Scattered light technology

Making functions **visible through scattered light**

Functional properties such as friction, sheen, adhesive strength and seal play an important role in the manufacture of finished surfaces. Scattered light measurement technology quickly and reliably records these properties. Your benefit: The surface parameters are not obtained from individual height values, but from the reflected distribution of the microprofile angle within the illuminated measuring surface. The parameters are calculated directly from this. The rougher the surface, the greater the angular distribution, the variance of which is described as an Aq value according to VDA 2009 and is directly proportional to the hybrid parameter Rdq of ISO21920. According to the same principle it is also possible to measure shape and waviness using the macro angle. Up to 8000 roughness measurements per second can be carried out using this method, which makes the technology ideal for use in the manufacturing environment.

Vorteile

- High measuring speed (up to 8 kHz)
- Vibration-insensitive
- Very high measuring accuracy (up to 0.001 µm)
- Traceable to ISO 17025

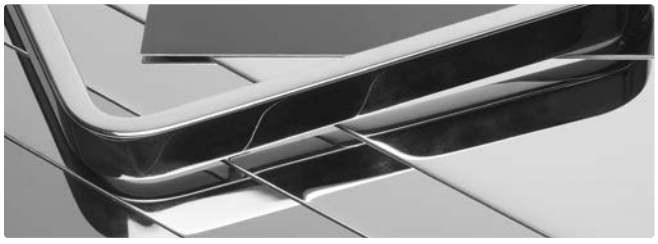
Application examples

Transmission shaft bearings
Waviness measurement

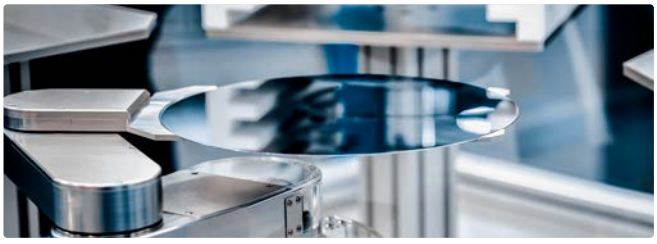
Roller bearing inner and outer rings
Waviness and roundness measurement

Rollers / films
Inline roughness measurement

Hip joint balls
Shape and roughness measurement with defect detection



Galvanized surfaces
Gloss measurement



Silicon wafers
Full surface roughness measurement

... as well as
racks, gear shafts, hydraulic shafts and rotor shafts, gear worms, ball studs, linear guides and much more.

High-performance measuring stations for your applications

Ball screws with perfect properties

Ball screws are used to convert rotational movements to longitudinal movements – for example in machine tools or steering systems. Particularly in the latter, efficiency, wear and possible noise development depend heavily on the surface characteristics of the ball tracks and friction surfaces. This is where the **OptoRack measuring machine** really comes into its own: It was specially developed for process monitoring during the grinding and finishing of racks and ball screws. Thanks to a swivel axis, the sensor can evaluate both flanks of the raceways separately, measure the micro-profile angles and waviness in any number of turns of the spindle and extensively evaluate contact areas.

MarSurf3D OptoRack

MarSurf3D OptoWorm

Monitor fine machining of worm gears

The worm shaft is of central importance in electric power steering systems such as the EPS dual or single pinion. This is because the demands placed on the surface of the worm flanks are extremely high due to the force transmitted by the worm wheel. An unfavorable microgeometry generates friction losses that directly affect the efficiency of the assembly. The **MarSurf3D OptoWorm** has been specially developed for process monitoring in the fine machining of worm gears. The machine makes it possible to measure the entire function surface of the left and right flank. Thanks to the extremely robust and, at the same time, precise scattered light sensor, the measuring instrument can be used directly next to the manufacturing machine.

Grinding and finishing of bearing seats at a glance

Ground bearing seats that are used in the gearbox or motor as running surfaces of needle bearings have high surface quality requirements: Even the smallest ripples with amplitudes < 0.05 µm can lead to intolerable noise. The waviness is caused by the unavoidable irregularities in the geometry during grinding processes, which sporadically lead to periodic shape deviations. These cannot be completely eliminated, even in downstream finishing processes, and sometimes result in complaints.
The **MarSurf3D OptoShaft** can monitor the grinding and finishing processes of the bearing seats in real time. Just like MarSurf3D, OptoWorm can be used directly next to the manufacturing machine

MarSurf3D OptoShaft

MarSurf3D Sensor OS 500

One sensor, countless measurement applications

Whether grinding and finishing machines, rollers, steel sheets or roller bearings: The **MarSurf3D OS 500** scattered light sensor can be integrated into machine control systems and measures exactly where it matters: directly in the line. The instrument is extremely fast, low-maintenance, robust and precise. It is controlled remotely and can evaluate roughness and waviness sing the software provided. The 8 kHz version of the OS 500 scattered light sensor is ideal for large surfaces such as rollers.

Compact all-rounder for **surface metrology**

Our portfolio of manual surface measuring instruments now includes the new MarSurf SD 140 AG 11, which can check both roughness and contour features – in just one measuring run. The measuring station offers easy handling and reliable quality assurance thanks to its high functionality. It is therefore also suitable as an entry-level model for stationary surface metrology.

The heart of the MarSurf SD 140 AG 11 is the newly developed tactile probe system. This can record the measured values for roughness and contour at the same time, which the software then evaluates separately. The probe arm measuring range covers 10 mm (100 mm probe arm) and 25 mm (200 mm probe arm); the measuring force from 0.7 mN to 30 mN can be set in the software.

You also save time with the probe system's tool-free probe arm quick-change function, which allows you to quickly change over to another measuring task without having to recalibrate the newly fitted probe arm. Electronic probe arm detection and automatic measuring force selection provide even more reliability. This ensures that the correct contacting/measuring force is always guaranteed when switching between several stylus tips.

Support plate with hole grid

The special support plate allows you to use a wide variety of workpiece holders and clamps flexibly and quickly.

Manually adjustable Y-axis

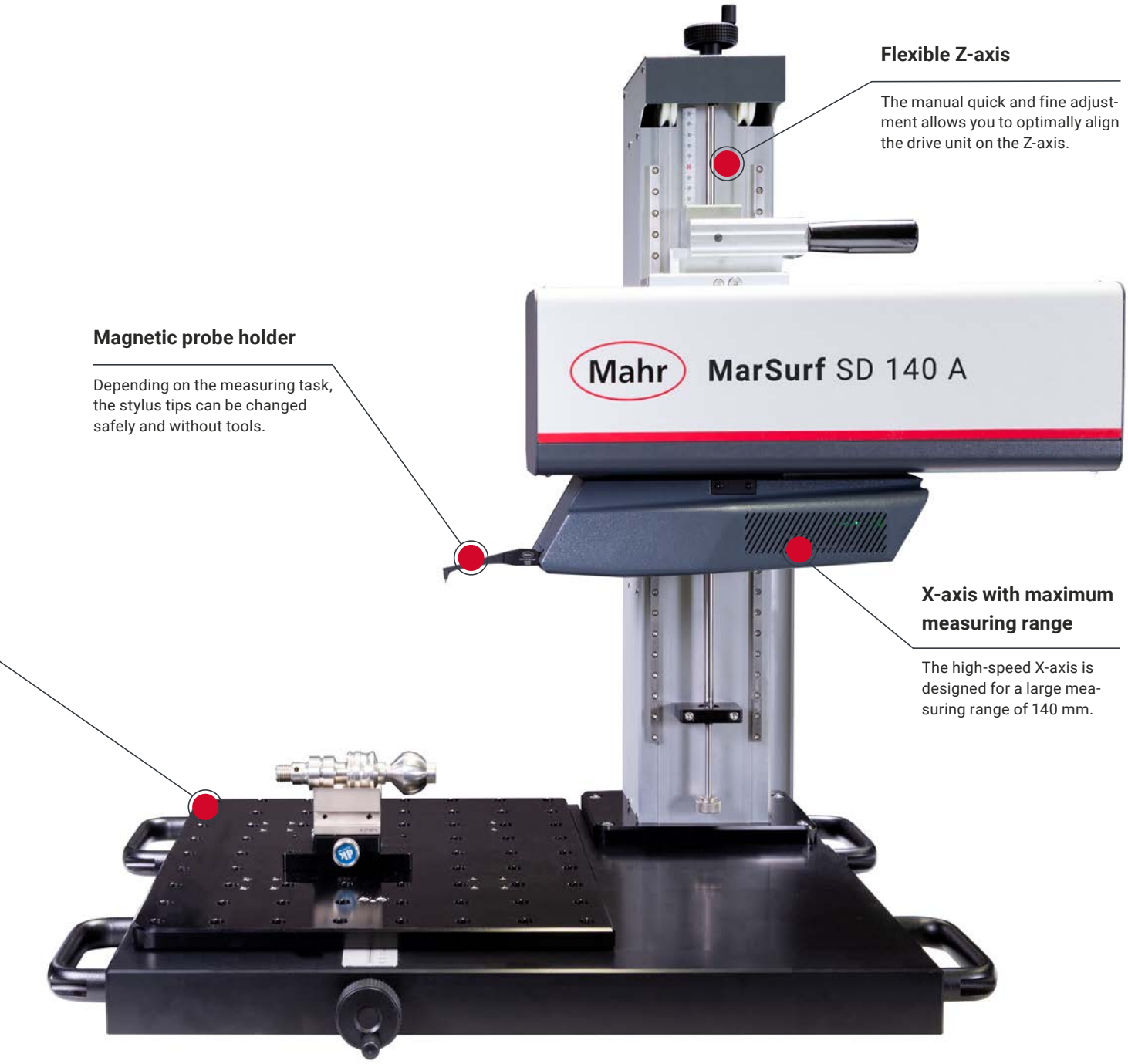
The user can manually adjust the Y-axis using the integrated 60 mm adjustment.

Advantages

- Measure roughness and contour in one measuring run
- Tool-free probe arm quick-change function
- Electronic probe arm detection
- Automatic measuring force selection
- Defined start position with aligned axis
- Flexible clamping system: Support plate (390 mm x 450 mm) with 50 mm hole grid

For more detailed information, please visit our website

metrology.mahr.com/marsurf-tactile-measuring-instruments



Flexible Z-axis

The manual quick and fine adjustment allows you to optimally align the drive unit on the Z-axis.

Magnetic probe holder

Depending on the measuring task, the stylus tips can be changed safely and without tools.

X-axis with maximum measuring range

The high-speed X-axis is designed for a large measuring range of 140 mm.

Features of MarSurf manual surface measuring stations

	MarSurf CD 140 AF	MarSurf CD 140 AG 11	MarSurf SD 140 AG 11
Contour	x	x	x
Roughness	–	–	x
Contour arm with roughness probe tip	x	x	–
Roughness and contour probe system	–	–	x
X-axis length	140 mm		
Z-axis length	–	350 mm	

Two high-performance devices for **optimum surface measurement**

In high-end surface metrology, you can now choose between two new motorized devices: the MarSurf LD 140/280 and the MarSurf SD 140 BG. Both are based on the same platform and allow roughness and contour to be measured at the same time with the utmost accuracy.

While the MarSurf LD 140/280 is currently Mahr's most powerful surface measuring station, the MarSurf SD 140 BG is the more economical solution of the two. Mahr has developed a new probe system for both devices. The probe arm units of the two new probe systems only record the measuring data once, which the software can then evaluate twice if desired for both roughness and contour features. Which means double savings for customers: on the one hand you save time by getting two measuring results in just one measuring run; and on the other, you save money as you only have to invest in one measuring station.

Both devices measure workpiece contours, straightness and surface deviations using the stylus method. The extensive portfolio of probe arms of varying sizes and designs means that they are also suitable for a wide range of measuring tasks at different measuring points. For geometry measurements, the probe arms guarantee maximum reliability and precision thanks to their high rigidity.

Toolless magnetic probe arm holder

Depending on the measuring task, the probe arms can be changed safely and without tools – the probe always sits perfectly.

New tactile probe systems

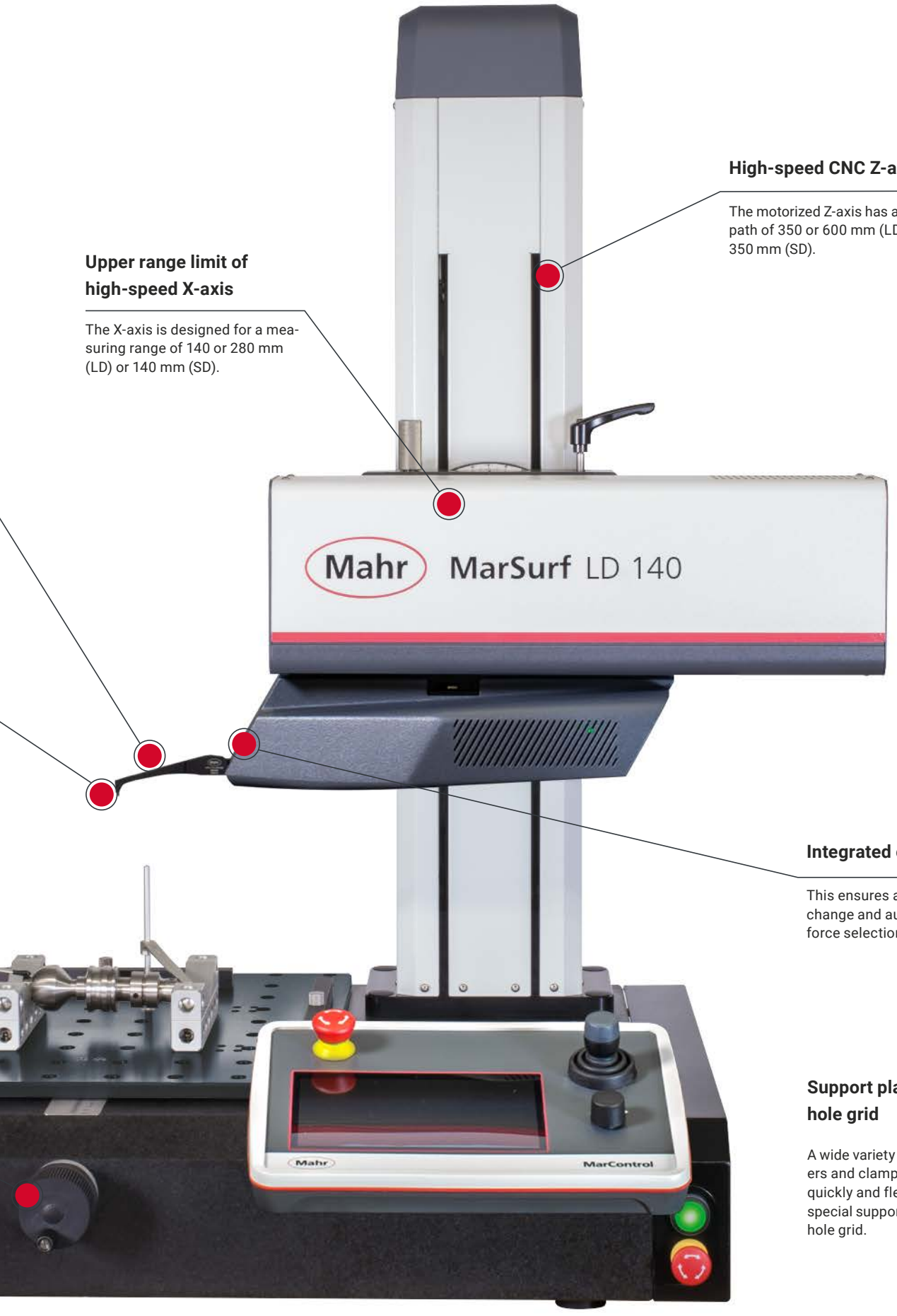
The two new probe systems record the values for roughness and contour in just one measuring run.

Integrated 60 mm TY-adjustment

The 60 mm TY-axis optionally features manual or motorized adjustment.

Detailed information about the MarSurf LD 140/280 can be found on our website:

metrology.mahr.com/ marsurf-tactile-measuring-instrument



High-speed CNC Z-axis

The motorized Z-axis has a travel path of 350 or 600 mm (LD) or 350 mm (SD).

Upper range limit of high-speed X-axis

The X-axis is designed for a measuring range of 140 or 280 mm (LD) or 140 mm (SD).

Integrated chip

This ensures a quick probe arm change and automatic measuring force selection or detection.

Support plate with hole grid

A wide variety of workpiece holders and clamps can be used quickly and flexibly thanks to the special support plate with 50 mm hole grid.

Advantages

- Measuring data for roughness and contour can be recorded simultaneously
- Fast and precise motorized positioning axes
- Flexible clamping system for shorter set-up times: Support plate (390 mm x 450 mm) with 50 mm hole grid
- Probe arm unit magnetically attached to probe system and can therefore be changed without tools
- Operation using the tried and tested MarWin software or the optimized MarControl manual control panel connected to the control unit
- Software with wizard for calibrating the probe arms
- Future-proof and investment security thanks to new MarSurf platform technology

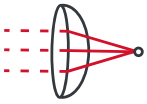
Sectors and **application examples**

The two motorized MarSurf devices are the instrument of choice wherever users want to evaluate small tolerances in the micrometer range or larger tolerances in a very small range.

Automotive industry
for example on crankshafts or camshafts, on connecting rods, motor or gear components

Mechanical engineering
for example on bearing races or hydraulic components with very small and precise chamfers

Aerospace industry
for example on turbine components



Optical industry
especially on lenses and aspheres

As the tolerances in the measurements performed are usually very small, it is recommended to install the instruments in an air-conditioned measuring room.

Features of MarSurf motorized surface measuring stations

	MarSurf CD BG	MarSurf GD BG	MarSurf VD BG	MarSurf SD BG	MarSurf LD
Contour	x	–	x	x	x
Roughness	> Rz 2 µm	x	x	x	x
Roughness and contour probe system	–	–	x	x	x
X-axis length	140 / 280 mm	140 / 280 mm	140 / 280 mm	140 mm	140 / 280 mm
Probe system measuring range	70 mm	0,5 mm	70 / 0.5 mm	25 mm	37.5 mm
Z-axis length	350 / 600 mm	350 / 600 mm	350 / 600 mm	350 mm	350 / 600 mm
TY-axis	manual or motorized				

Two platforms for
multiple measurement options

Mahr has restructured its optical 3D metrology and offers you a wide range of combination options from which you can easily put together the right system.

Do you want only the best from the world of 3D measurement for testing your workpieces? No worries! Simply combine the desired measuring platform – **MarSurf3D GS** for large workpieces from 200 mm or **MarSurf3D SX** for workpieces up to 200 mm – with a powerful measuring head of your choice. The areal measuring head technologies range from focus variation and white light interferometry to confocal measurement. Confocal profilometry and line sensors are also available. Or why not opt for the new multisensor measuring head, which combines the areal measuring technologies. For you this means: All surface measurements down to the lower nanometer range can be carried out with a single instrument, and of course in real time. There is no need to change the measuring instrument, as this powerful multifunctional tool combines three powerful technologies in one. Either for the laboratory, quality assurance or directly on the production machine, and therefore exactly where you manufacture your workpieces.

0.13 µm
Maximum sampling rate

4 sec.
Typical measuring time for 3D roughness measurements

0.1 – 100 %
Reflectivity of all the sample surfaces

50,000 MTBF
LED light source

126,000,000
Measuring points/second

Image: SX platform

Clever combination:
How it works!

SX and GS platforms

from 100 x 100 mm
up to 500 x 400 mm

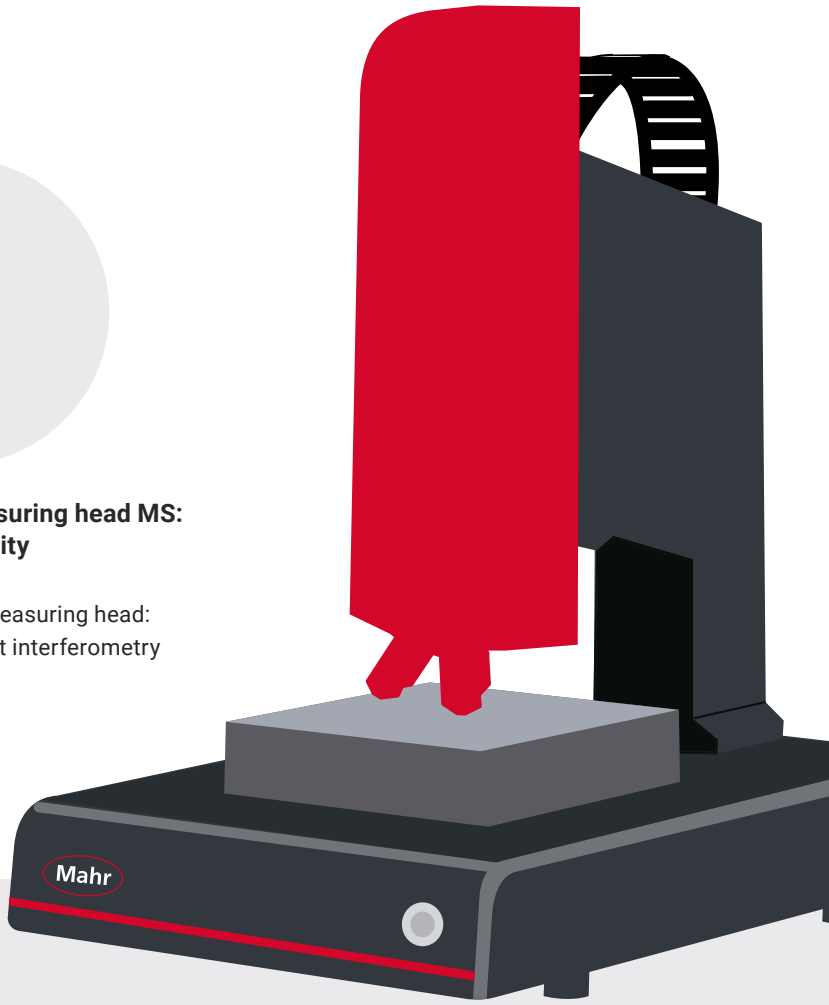
5 measuring heads to choose from:

White light interferometer WI: Highest vertical resolution

Record topographies in the subnanometer range

Multisensor measuring head MS: Maximum flexibility

Combined in one measuring head: confocal, white light interferometry and focus variation



Application	Confocal	Interferometry	Focus variation
Structured surfaces	++	+	+
Rough surfaces	++	o	+
Smooth surfaces	+	++	–
Steep flanks	+	o	++
Height measuring range	+	+	++
Layer thickness	+	+	–

Confocal measuring head CM:
The all-rounder

Robust surface metrology
for everyday use

3D profilometer CP:
Flexibility for quality control

Maximum flexibility even
for large components

3D profilometer CL:
Ultra-fast large-area measurement

High measuring point density
with high measuring speed

Image: SX platform

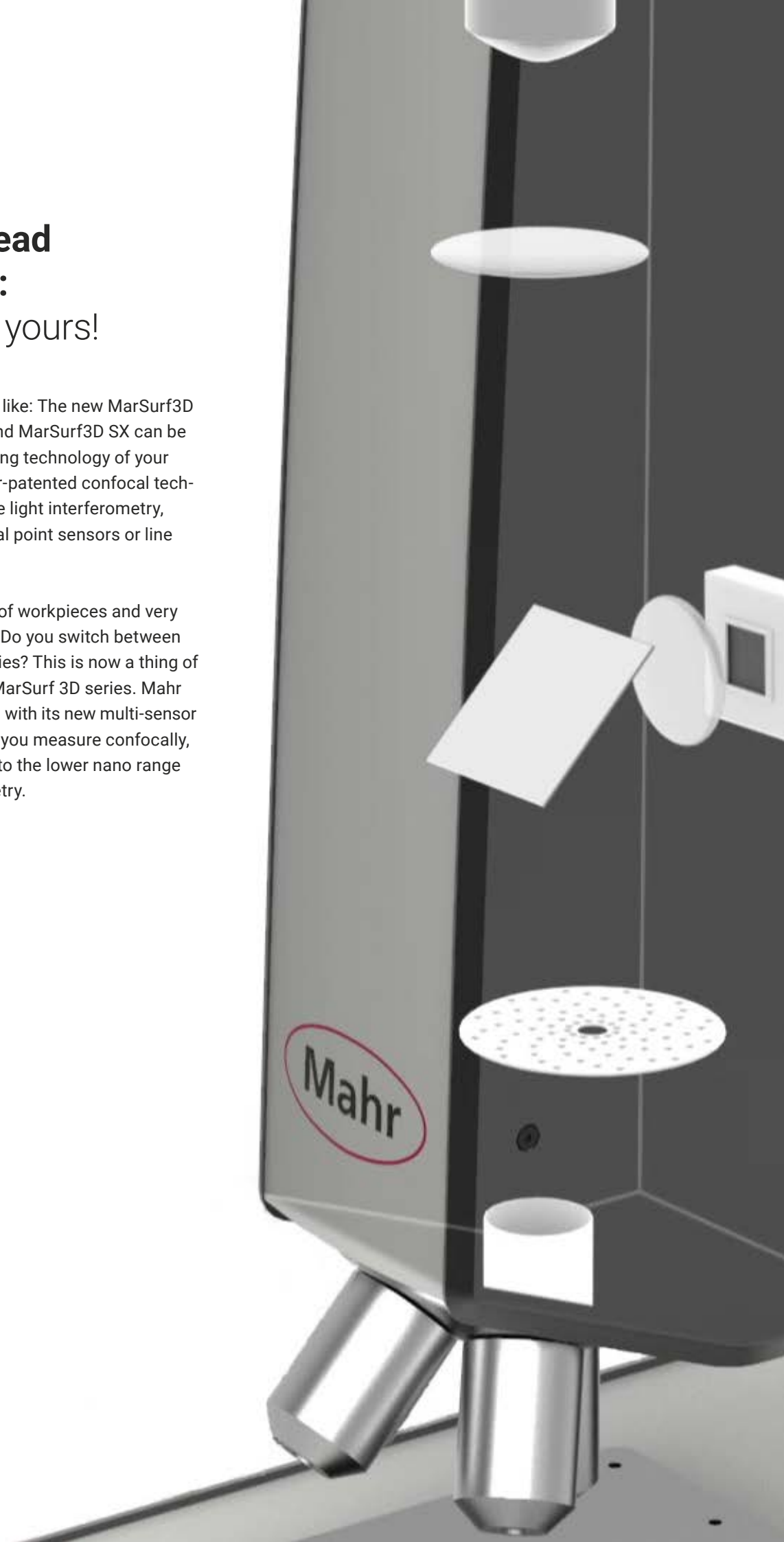
Platform		Measuring heads						
		CM	CM *plus*	WI *plus*	MS	MS *plus*	CP	CL
MarSurf3D **SX**	**3050**	x	x	x	–	–	–	–
	3100	x	x	x	x	x	–	–
	3200	x	x	x	x	x	–	–
	3201	x	x	x	x	x	–	–
MarSurf3D **GS**	**3201**	x	x	x	x	x	x	x
	3300	x	x	x	x	x	x	x
	3301	x	x	x	x	x	x	x
	3501	x	x	x	x	x	x	x

plus: with piezo drive

Measuring head technologies: The choice is yours!

Measure whatever way you like: The new MarSurf3D platforms MarSurf3D GS and MarSurf3D SX can be combined with the measuring technology of your choice. These include Mahr-patented confocal technology, high-precision white light interferometry, focus variation and confocal point sensors or line sensors.

Do you have a wide variety of workpieces and very different measuring tasks? Do you switch between instruments and technologies? This is now a thing of the past with the modular MarSurf 3D series. Mahr offers one instrument for all with its new multi-sensor measuring head – whether you measure confocally, by focus variation or down to the lower nano range with white light interferometry.



Technologies

Confocal

The specially developed and patented multi-pinhole technology ensures ultra-fast image capture with the highest signal quality, resulting in maximum repeatability down to the subnanometer range. This technology is suitable for a wide range of applications in the field of surface metrology, from smooth to very rough surfaces.

Interferometry

Interferometry offers a vertical resolution in the subnanometer range, regardless of the magnification. This allows surface heights in the NM range to be recorded on large measuring fields. Interferometry comes into its own on very smooth and continuous surfaces and is also suitable for the ultra-precise determination of step heights.

Focus variation

Focus variation with active lighting is a technology developed for measuring the geometry of large rough surfaces. Steeply inclined surfaces (up to 86°) in particular and a large vertical measuring range can be recorded in one measurement.

Multisensor

Maximum flexibility is achieved by combining the individual technologies: Confocal, white light interferometry and focus variation. The different strengths of the technologies can be utilized in one measuring system.

Two platforms with **a variety of measuring heads**

Combine the appropriate measuring head with one of the new MarSurf3D GS or MarSurf3D SX platforms. The sample size and the degree of automation determine the direction.

Compact and robust

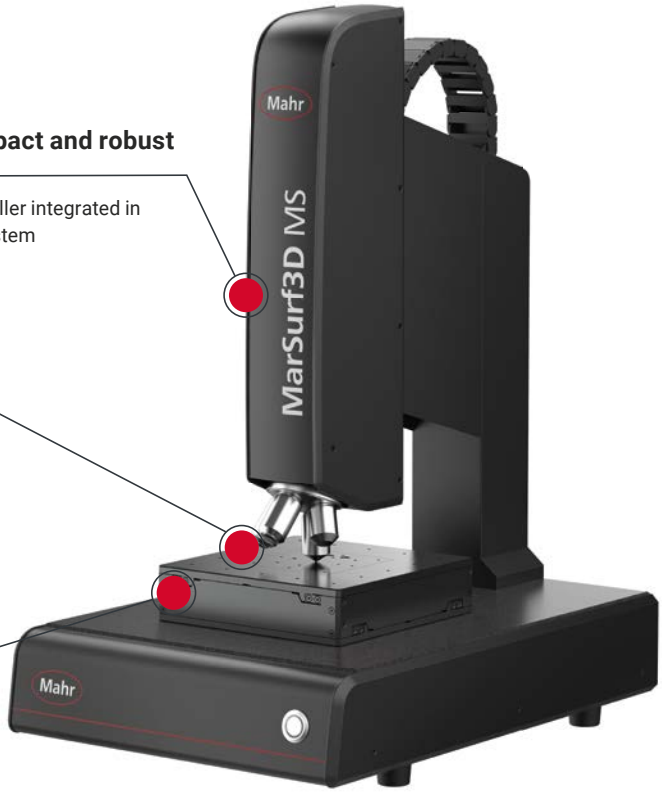
Controller integrated in the system

HD stitching

High resolution even with large measuring surfaces

Sample table

Travel path 100 x 100 mm or 200 x 200 mm



MarSurf3D SX

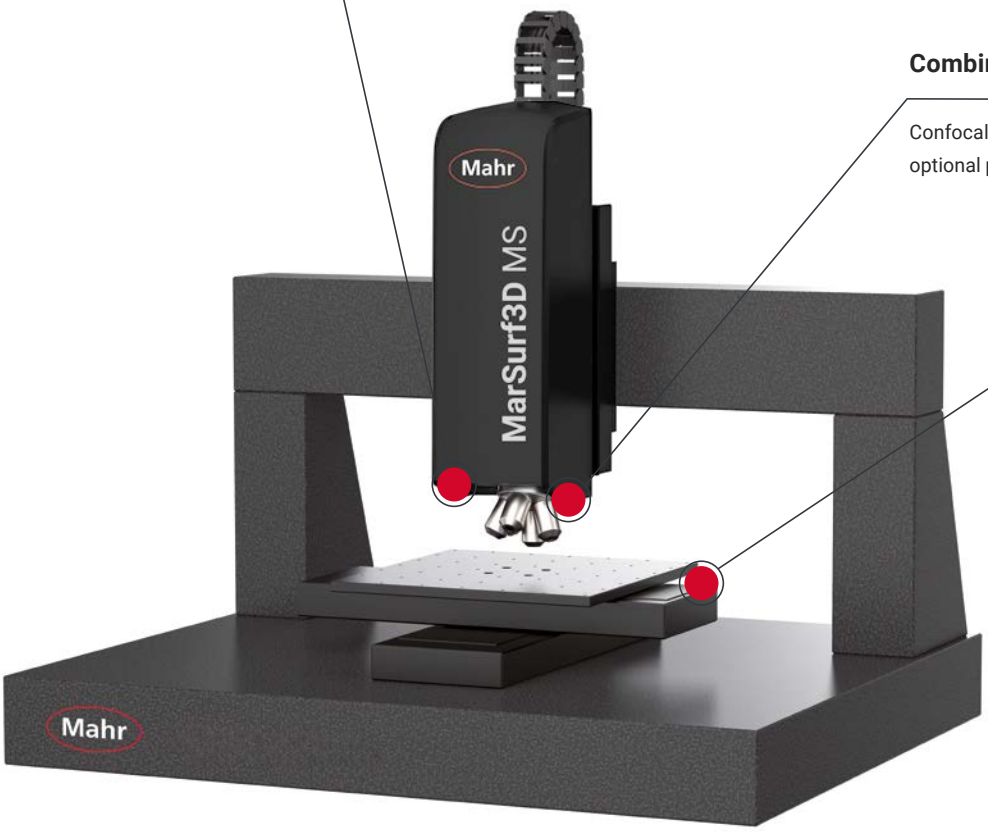
The MarSurf3D SX comes into its own for smaller workpieces with axis sizes up to a maximum of 200 mm. It has a compact design and integrated attenuation. Its shape is reminiscent of the tried-and-tested confocal series and it offers impressive value for money.

Advantages

- For laboratory and QA
- Flexible all-rounder
- Measurements can be automated

Offset camera

Optional for easy creation of measurements and registration mark detection



Combination options

Confocal area sensor, optional profilometer module

Sample table

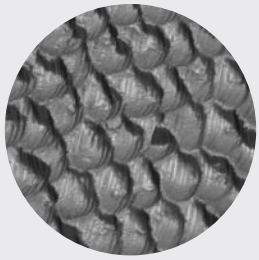
Travel path 200 x 200 mm to 450 x 450 mm

MarSurf3D GS

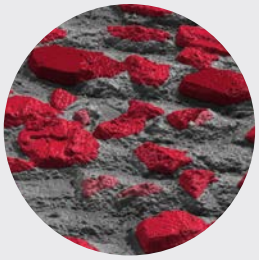
With its portal design, the MarSurf3D GS is suitable for large workpieces from 200 mm. Here you have a choice of different axes, which you can select depending on the dimensions of your workpieces. An integrated overview camera, a point sensor and an enclosure are available on request. And the best bit: The MarSurf Select offers 24/7 performance! It allows you to check the quality of your workpieces around the clock.

Advantages

- Suitable for large workpieces
- Designed for continuous operation
- Freely selectable degree of automation

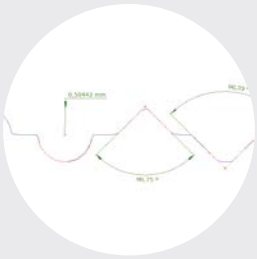


Roughness as per
ISO 25178, ISO 13565,
ISO 4287, ISO 21920

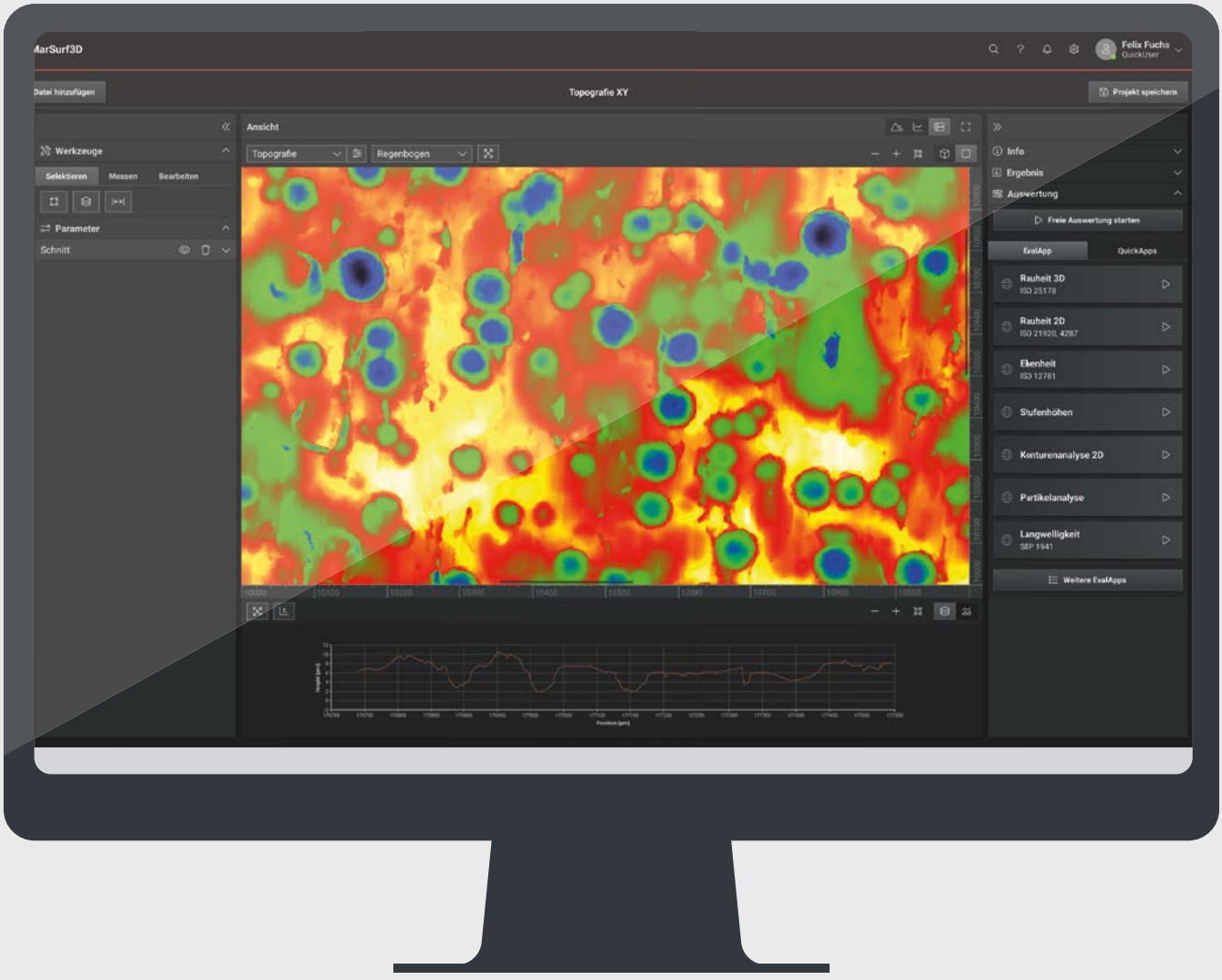


Particle/pore analysis including classification
Height/depth area,
volume, diameter

Flatness according to
ISO 12781



Geometry and contour evaluation in 2D

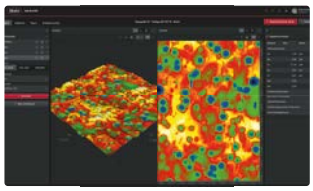


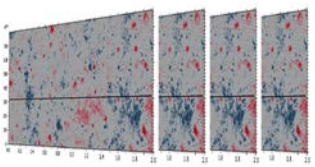
Surface characterstics **at the push of a button**

The surface analysis software MarSurf3D offers a comprehensive function package for displaying and evaluating structure, roughness, waviness, step height, contours, and other surface characteristics. The clearly structured user interface makes it possible to create simple analytical reports at the touch of a button. A variety of display options, such as profile view, 3D reconstruction, or a reflectance image provide informative measuring records. It is easy for users to create individual evaluation templates.

Effective display and evaluation

Display and document structures, roughness, waviness and more with the MarSurf3D software.





Edit →
Wide selection of tools to:

- remove formatting
- select
- filter

Evaluate →
Interactive analysis for:

- roughness
- geometry
- tribology

Document →
Creation of standardized reports:

- 2D and 3D images
- profiles
- tables

Automate
Use of the created evaluations for recurring measuring tasks:

- QuickApps
- batch processing

Fast and precise **measurement during production**

The cylinder coordinate measuring machines from the Mar4D PLQ product range measure complex rotationally symmetrical workpieces with more flexibility and more conveniently than ever before. They also operate at the highest speed and level of precision providing fast and reliable measuring results. As a new optional feature, we now offer a sensor for automated workpiece temperature compensation.

Thanks to their multisensor technology, the various Mar4D PLQ models cover a particularly broad range of dimensional measuring tasks. The devices also have an extremely robust design and are therefore suitable for measurements directly in production. This means shorter throughput times for you, which considerably increases your throughput and productivity. The instruments are also equipped with a motorized tailstock, which means they can even adjust workpieces between the centering tips. The equipment provided as standard includes a high-precision C-axis measuring machine. We offer various versions of the Mar4D PLQ, such as purely optical model or one without a tailstock. This allows you to select the exact version that best solves your measuring tasks.

Advantages

- Future-proof: Optical and tactile metrology that can be combined as required
- Versatile: Fast interchangeable Mahr T7W probe systems with motorized rotational axis or 3D scanning probe SP25M by Renishaw
- Flexible: Additional Y-axis on tactile unit, e.g. for zenith search or for scanning entire hole geometries
- Universal: Inspection of several features including the length, diameter, form, position, contour, roundness, roughness, or 3D geometries, such as the symmetry, during a single measuring run
- Fast and precise: Unique speed and optimum axis accuracy even as the tolerances become smaller achieved thanks to specially developed control architecture
- Convenient and safe: Ergonomic operation and reliable safety concept

Mar4D | PLQ 3200 / 4200

Unique centering and tilting table: A guarantee of precision and speed

The outstanding feature of the -T3 and -T4 models is the newly developed automatic centering and tilting table. It aligns workpieces, that have not been manufactured between tips, in the shortest amount of time and with an accuracy of micrometers, for example from 4 mm to 1 µm in just 30 seconds. This completely computational method of correcting alignment errors is thus far superior.

Comparison of Mar4D PLQ variants

Version	Axes	Sensor technology	Motorized tailstock	Centering and tilting table	Workpiece size
Mar4D PLQ 3200-T2	C, X, Z	optical	x		Ø 200 mm | length 450/730/1,000 mm | 20/50 kg
Mar4D PLQ 3200-T2	C, X, Z	optical		x	Ø 200 mm | length 730 mm | 20/50 kg
Mar4D PLQ 3200-T4	C, X, Z	optical	x	x	Ø 200 mm | length 450 mm | 20/50 kg
Mar4D PLQ 4200-T2	C, X1, X2, Z	optical, tactile	x		Ø 200 mm | length 450/730/1,000 mm | 20/50 kg
Mar4D PLQ 4200-T3	C, X1, X2, Z	optical, tactile		x	Ø 200 mm | length 730 mm | 20/50 kg
Mar4D PLQ 4200-T4	C, X1, X2, Z	optical, tactile	x	x	Ø 200 mm | length 450 mm | 20/50 kg

Workpiece temperature compensation: Measuring certainty and repeatability

The latest optional feature is workpiece temperature compensation by means of a sensor mounted on the X1 axis. This can be moved automatically according to the dimensions of the workpiece and contacts it at a defined point. Through repeated measurements, the software can now create a compensation curve specific to the workpiece and its features. In addition, measurements can be taken directly after heat has been added, or generally at higher ambient temperatures without having to acclimatize the workpiece for a long time. Overall, this leads to maximum measuring certainty and repeatable measuring results, without any operator influence. With the already integrated device temperature compensation plus the new workpiece temperature compensation, Mahr offers complete monitoring of the measuring instrument and workpiece.

More secure

The motorized tailstock with clamping force monitor (models -T2 and -T4) secures the workpieces mounted between the centering tips perfectly in alignment without operator intervention.

Versatile

The multisensor technology of the Mar4D PLQ 4200 enables measurement of various rotationally symmetrical workpieces directly in production.

Maximum measuring certainty

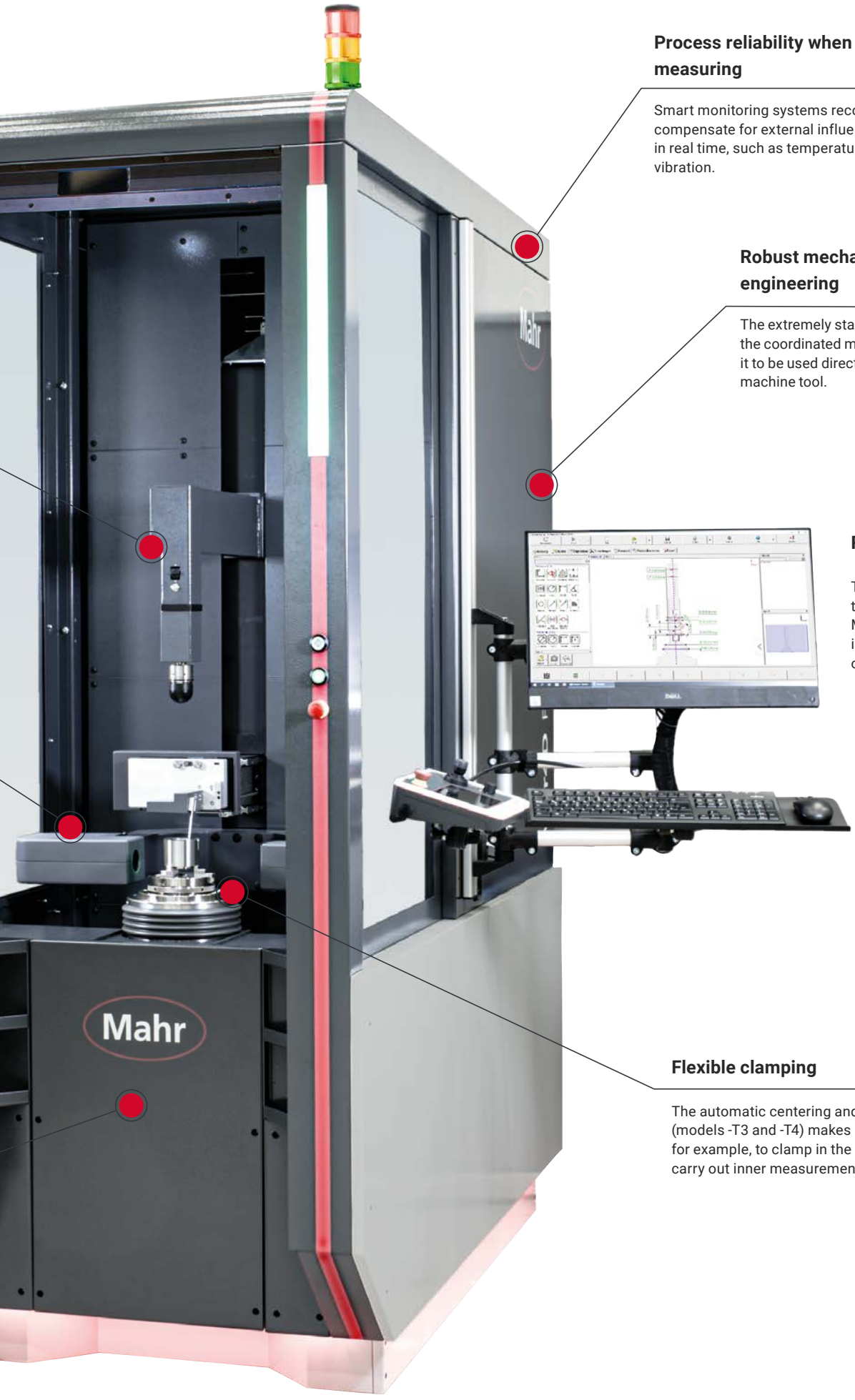
The optional sensor for workpiece temperature compensation ensures reliable and repeatable measuring results.

Ergonomic design

The sophisticated design ensures convenient and safe operation.

Detailed information can be found on our website:

metrology.mahr.com/mar4d-plq-overview



Process reliability when measuring

Smart monitoring systems record and compensate for external influences in real time, such as temperature and vibration.

Robust mechanical engineering

The extremely stable design and the coordinated materials allow it to be used directly next to a machine tool.

Reliable software

Thanks to its clearly structured user interface, the MarWin platform software is very user friendly: learn once, apply again and again.

Flexible clamping

The automatic centering and tilting table (models -T3 and -T4) makes it possible, for example, to clamp in the chuck and carry out inner measurements.

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