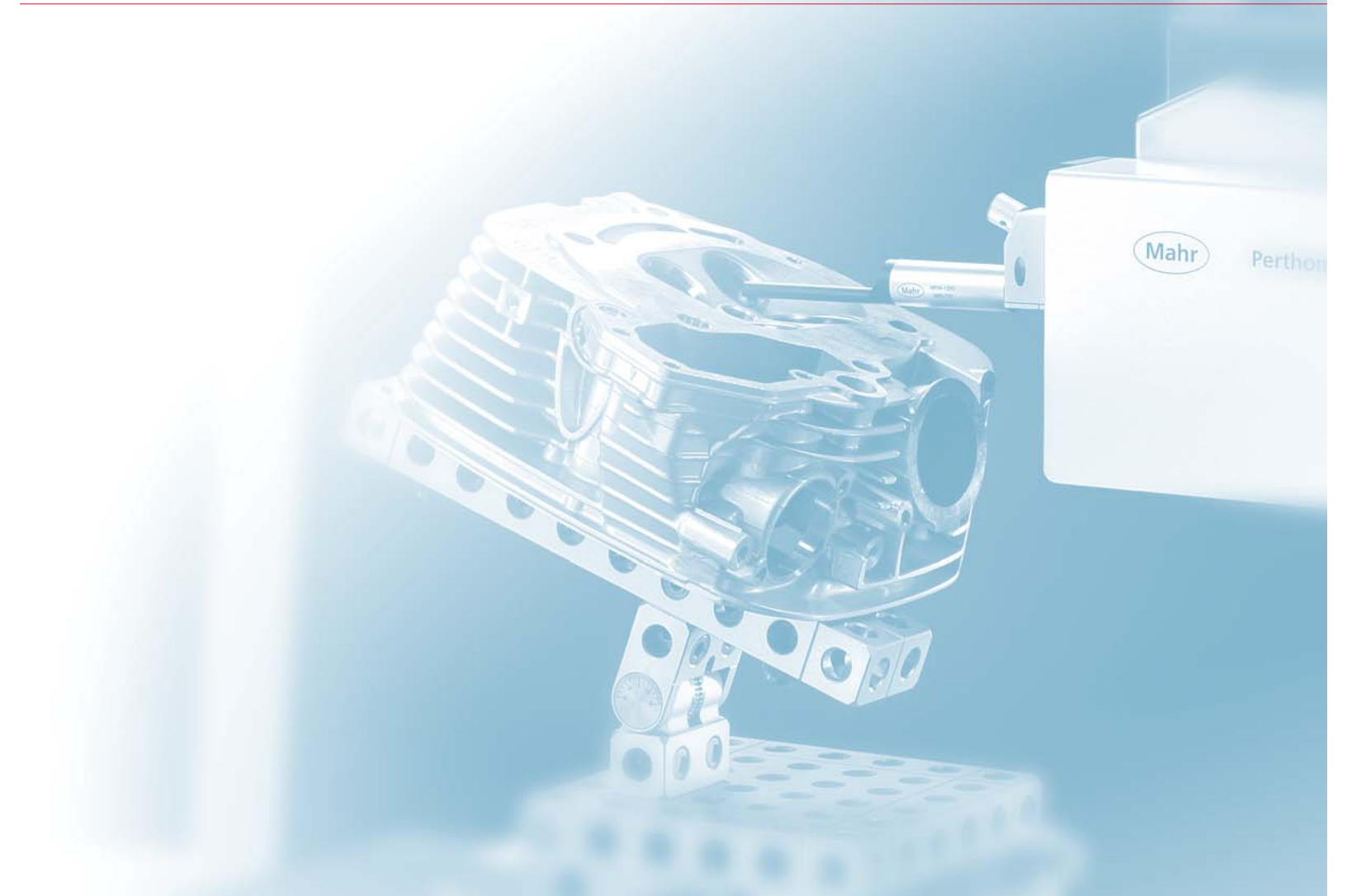
FROM THE THUMBNAIL TEST...

... TO MARSURF.



► | Wherever surface structures influence the function, processing or appearance of components or products, careful testing is essential. But how can surfaces be tested? At the beginning of the 20th Century, experts still had to test by eye and touch. A practiced eye can detect features in the µm range, and even the much maligned thumbnail test delivered perfectly acceptable results. Now however, we live in an age of exchangeable parts, fits and internationalization, where subjective tests like this are no longer adequate. Today, computer-aided measuring instruments provide objective data. Measurement and evaluation have become considerably easier. For decades, Mahr has been a worldwide pioneer in this area, as demonstrated by the company's numerous innovations and patented solutions in the field of surface roughness metrology. The interplay between the stylus, drive and measuring setup plays a key role in influencing the quality of surface measurement tasks. This is where Mahr's core expertise comes in, as demonstrated by the company's numerous innovations and patented solutions. Over this time, we have succeeded in perfecting the stylus method, which is now in widespread use throughout the world. We can meet even the most demanding requirements for non-contact measurement, e.g. where extremely soft materials or ultra-short measuring times are involved, thanks to the range of optical sensors offered in the MarSurf product family. Developed with Mahr quality, expertise and know-how, MarSurf is the solution for all your surface metrology needs. | ◄

► | MarSurf. Surface Metrology

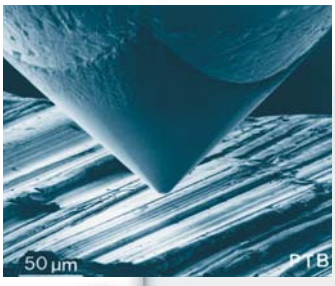
MarSurf. The Surface Metrology System for all Your Industry's Needs

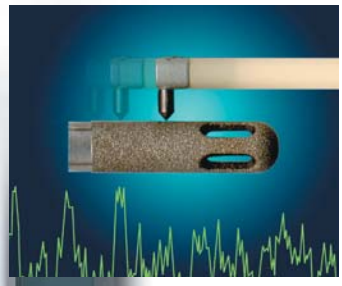
THE RIGHT SOLUTION FOR EVERY TASK

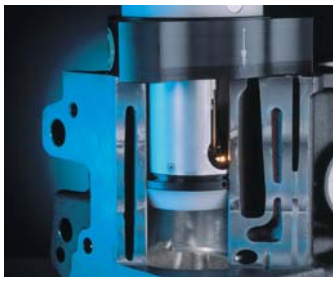
► | MarSurf has a universal range of applications. Key industries include:

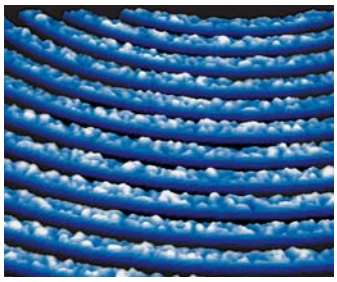
- Automotive industry
- Electronics industry
- Mechanical engineering industry
- Medical industry

| ◄

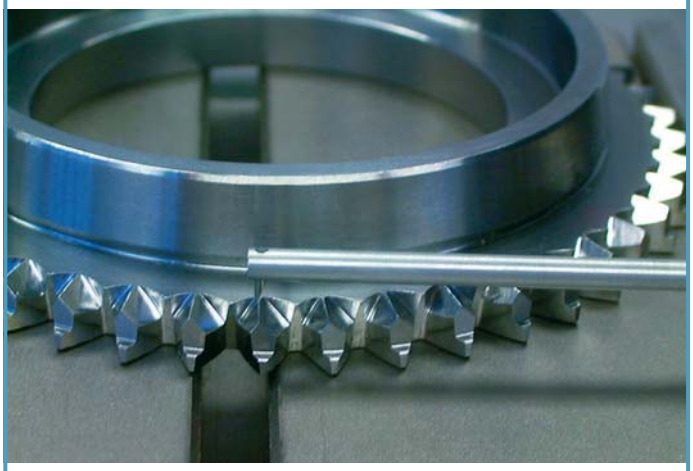








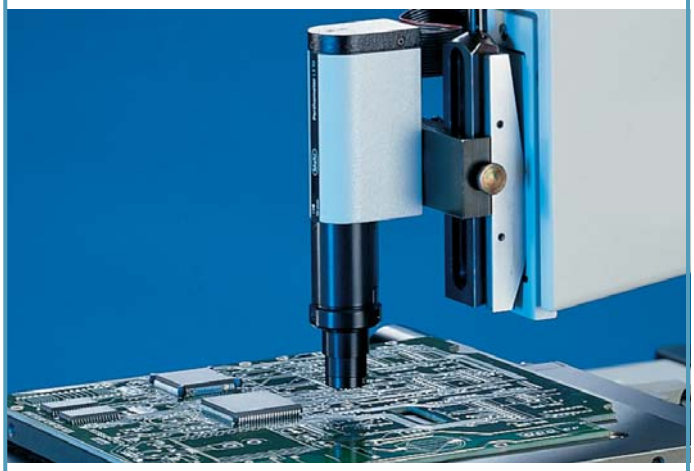
Automotive Industry



Measurements on synchronous rings

The automotive industry is often at the forefront of surface and contour measurement. Typical applications include measurements on crankshafts, camshafts, transmission components and engine parts. The measurement of the root geometry including roughness measurement for synchronous rings ensures both easy and smooth gear changing and a long service life.

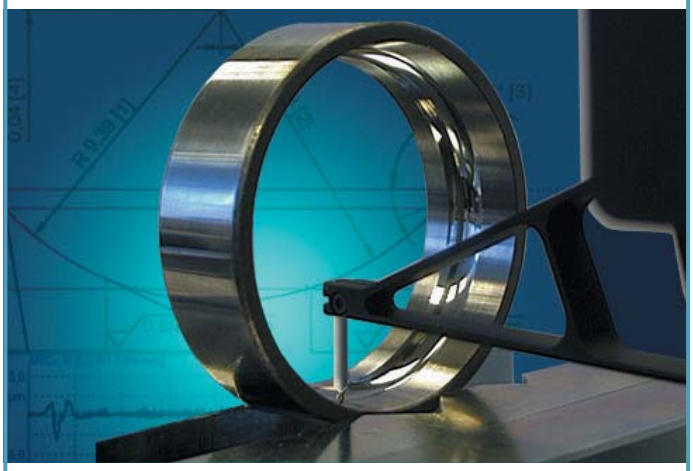
Electronics Industry



Measurement of conductive pathways on electronic boards

Precise, non-contact, topographic measurement is performed using strip-light projection or laser sensors with dynamic focusing. In strip-light projection in particular, over 1 million measuring points are calculated extremely quickly (< 10 seconds) for subsequent evaluation of e.g. the conductive pathway heights.

Mechanical engineering Industry



Measurements on ball rings

Ball races today need high-precision radii and minimum form deviation. The roughness measurement ensures smooth running and long service life with as little running noise as possible. MarSurf meets these requirements through user-friendly evaluation software and very low noise drive units.

Medical Technology

Measurements on hip joints

Hip joint measurements need to be extremely accurate. Both the contour and roughness of the ball and/or socket affect the durability and performance of the joint.

MarSurf. Handy and Precise for On-site Roughness Measurements

MOBILE ROUGHNESS MEASUREMENT DEVICES

► | Mahr has played a key role in ensuring the success of mobile roughness measurement devices. As early as the 1980s, Mahr was setting new standards with the M4P. The products have developed in line with changing production monitoring requirements. Today's devices meet the highest international standards. Mobile roughness measurement devices from Mahr are lightweight, ergonomically shaped for flexible handling. They offer high-precision measurements in different positions and easy positioning using V-blocks. | ◄

Perthometer M1

Entry-level roughness measurement

Description

The **Perthometer M1** is an investment that soon pays for itself, offering outstanding performance, straightforward operation, a minimum number of keys, convenience and value for money.

Features

- Patented automatic function for profile detection and standardized setting of filters and associated traversing lengths
- Parameters as per DIN / ISO / ASME/ SEP: Ra, Rz, Rmax, RPc, JIS: Ra, Rz
- Convenient shape and lightweight design of evaluation and drive unit ensure high flexibility

Accessories

- Scope of delivery includes a handy carrying case with pick-up, drive unit and other accessories
- Other application aids are optionally available to ensure easy handling in line with manufacturing requirements

Perthometer M2

Highly mobile, high-performance unit

Description

In addition to all the features of the M1, the **Perthometer M2** also supports the most common parameters, characteristic curves and parameter lists (e.g. material ratio) and evaluation in accordance with JIS or ISO (including CNOMO).

Features

- The **Perthometer M2** features integrated storage for approx. 200 measurements
- Further functions include tolerance monitoring, vertical scale selection and setting of asymmetric intersection lines for peak count calculations
- Support as per DIN EN ISO 12085 (Motif)
- Date and time of measurement specified

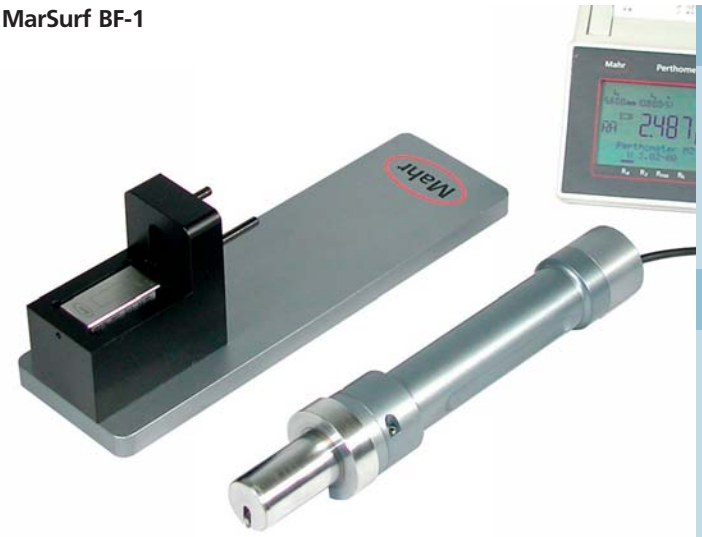
Accessories

- Scope of delivery includes a serial cable and an M-trans software that converts the data in the internal memory into a txt file

Perthometer M. Mobile Roughness Measurement

Efficient application aids for manufacturing

MarSurf BF-1



Description

Tough manufacturing environments require quick and easy roughness measurement. The shop floor is particularly demanding on measuring instruments. **Application aids from Mahr** are the perfect solution.

Features

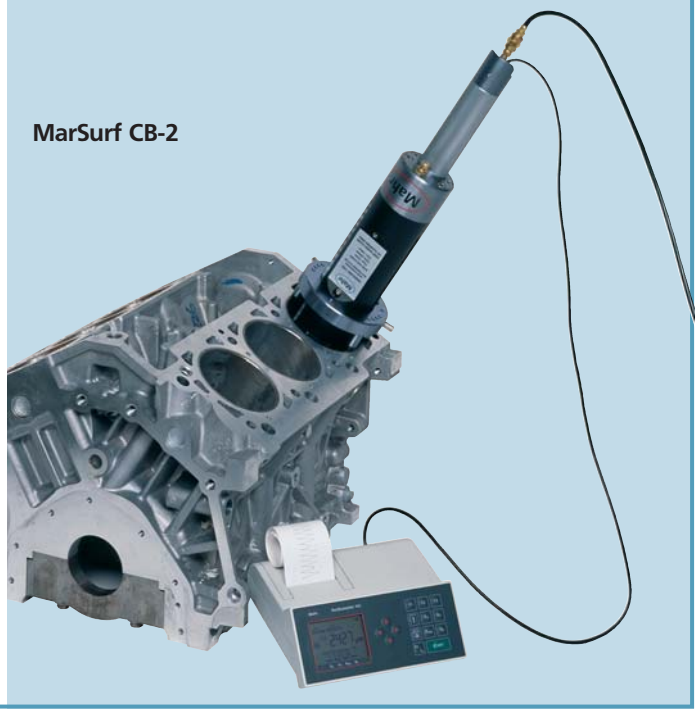
Our application aids work with evaluation instruments in the **M1** or **M2** series. A calibration or storage station is included in the scope of delivery. Calibration standards are available, with a Calibration Certificate if required.

- Special design allows precise, easy positioning of measuring instrument
- Easy to use even without specialist metrology knowledge
- Device for protecting drive unit from environmental influences that might disrupt the measurement
- Pick-up protection, i.e. pick-up is only extended during measurement.
- Surface protection material ensures measurement leaves no marks on the workpiece

MarSurf TF-1

MarSurf DR-1

MarSurf CB-2



Pocket Surf® *

The portable surface roughness gage

**US-patent no. 4.776.212*

More information see part Precision Gages.

Technical Data

Dimensions		140 mm x 76 mm x 25mm/ 5.5 in x 3 in x 1 in
Weight		435 g/14oz.
Measuring Ranges	Ra	0.03 µm to 6.35 µm / 1 µin to 250 µin
	Ry	0.2 µm to 25.3 µm/8 µin to 999 µin
	Rmax	0.2 µm to 25.3 µm/8 µin to 999 µin
	Rz	0.2 µm to 25.3 µm/ 8 µin to 999 µin
Display Resolution		0.01 µm/1 µin
Measurement Accuracy		Meets ASME-B46.1, ISO, DIN standards and MIL specifications
Digital Readout		LCD; with; „Battery low" signal; „H" and „L" (measured values out-of-range)

Features

- Pocket-sized economically priced, completely portable instrument which performs traceable surface roughness measurements on a wide variety of surfaces; can be used confidently in production, on the shop floor and in the laboratory
- Solidly built, with a durable cast aluminum housing, to provide years of accurate, reliable surface finish gaging
- Can be used to measure any one of four, switch-selectable, parameters: Ra , Rmax/Ry , Rz
- Selectable traverse length 1, 3 or 5 cut-offs of 0.8 mm/.030 in
- Operates in any position – horizontal, vertical, and upside down
- Four switchable probe positions – axial (folded) or at 90°, 180° or 270°
- Even difficult-to-reach surfaces such as inside and outside diameters are accessible.
- Integrated data output for SPC-processing units that is compatible with the most common data processing systems
- Easy-to-read LCD readout presents the measured roughness value, in microinches or micrometers, within half a second after the surface is traversed
- Out-of-range (high or low) and "battery low" signals are also displayed

MarSurf. Surface Measuring Instruments for Production Area

SURFACE MEASURING STATION FOR PRODUCTION AREA AND INSPECTION ROOMS

► I Mahr stationary surface measuring instruments for manufacturing environments are high-performance and user-friendly. Their flexibility when performing evaluation and documentation makes them ideal for the increasingly demanding tasks on the shop floor. Standardized roughness, waviness and profile parameters are evaluated in accordance with international standards like ISO, JIS and ASME. Skidless pick-ups with easily exchangeable stylus tips support rapid adaptation to frequently changing measuring tasks. I ◄

Perthometer S2

Stationary and mobile surface measuring instrument

Description

The **Perthometer S2** meets all the surface evaluation requirements of today's manufacturing environments. It features simple operation and offers an excellent price-performance ratio.

Features

- More than 40 parameters can be selected
- Simple operation and extensive documentation options
- Easy creation of measuring programs
- Automatic or variable selection of filters and traversing lengths
- Various calibration functions
- Integrated statistical functions
- SPC and RS 232 interface
- Mobile measurements with skidless pick-ups

Accessories

- Connection and evaluation options for **Mahr** roughness drive units with datum plane **PZK**, **GD 25**, **PGK 120**
- Carrying and storage case
- Extensive range of accessories including measuring stands, V-blocks, X/Y tables etc.

Perthometer S2 for the Sheet Metal Industry

Roughness measurement on metal sheets and rollers

Description

The roughness depth structure on sheet metal surfaces considerably affects ductility and the coating process. The **Perthometer S2** with special accessories is ideally suited to the needs of the sheet metal industry.

Features

- Standardized measurement as per SEP 1940 (3) or prEN 10049
- Battery-operated, mobile measurement on coil / roller with high battery capacity
- Simple operation and extensive documentation options
- Automatic calibration function
- SPC and RS 232 interface
- Unit configuration allows immediate measurement without prior alignment

Accessories

- **PZK** drive unit with adapter and hand-held V-block
- **RT 250** pick-up as per SEP
- Carrying case

MarSurf. PC-based Stationary Surface Measuring Stations

VERSATILE, HIGH-PERFORMANCE UNITS FOR INSPECTION ROOM AND LABORATORY

► | In surface metrology, a distinction is made between mobile units, stationary shop-floor units and PC-based surface measuring instruments. The latter provide absolutely the best measurement and evaluation performance for surface measurement tasks. They fulfill all the requirements of a state-of-the-art PC-based measuring and evaluation system, including international standards, versatile evaluation methods, comprehensive documentation, large storage capacity, data export and import and networking with other systems. Extensive QA procedures guarantee the highest quality and stability of software and hardware. | ◄

MarSurf XR 20

Roughness and waviness measurement made easy

Description

MarSurf XR 20 is the perfect unit for moving into top class surface metrology. This PC-based unit supplies all the common parameters and profiles in accordance with ASME plus international standards, both in the inspection room and on the shop floor. The high-performance **MarSurf XR 20** is the fruit of decades of surface metrology experience combined with future-focused technology, clear symbols and straightforward operation help.

Features

- Over 65 parameters may be selected for R, P and W profiles as per ASME / ISO / JIS or MOTIF
- Tolerance monitoring and statistics for all parameters
- Fast creation of Quick & Easy measuring programs using Teach-In mode
- Comprehensive logging
- Automatic function for selecting standard-compliant filters and traversing lengths (patented)
- Support for different calibration methods (static / dynamic) with specification of parameter Ra or Rz
- Adjustable servicing and calibration intervals
- Simulation mode to help users familiarize themselves with the system quickly
- Numerous measuring station configurations for customized applications
- Different user levels can be set up
- Flexibility of the system thanks to various options and creation of customer-specific parameters
- Different user levels protect unit from operator error and ensure that no unauthorized users are able to use the device

Accessories

- Connection options for Mahr drive units **PZK**, **GD 25**, **PGK 20**, **PGK 120**, **PRK**
- Dominant waviness option available
- Software can also be used as evaluation software for **M** and **S** units
- Optional **QS-STAT**-based data transfer

MarSurf XC 2

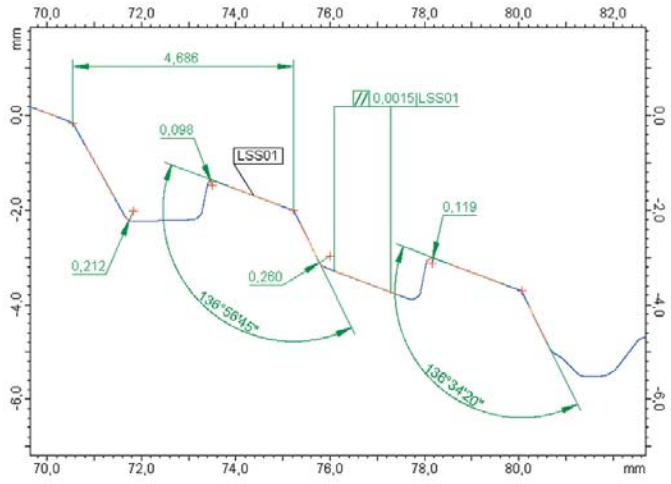
For entry-level, high-precision contour measurement

Features

- Creates regression straight lines and circles
- Creates points, intersection points, free points, center points, maximum and minimum points
- Determines radii, distances, angles, coordinates and line form deviations
- Performs nominal/actual comparisons
- Tolerance monitoring
- Associative elements, i.e. immediate change to variables dependent on reference elements when changes occur
- User access rights using password protection prevents incorrect operation
- Excellent straightforward calibration procedure thanks to many years' experience, i.e. including geometry calibration, measuring force calibration, compensation of the deflection, etc.
- Stability and rigidity of the pick-ups
- The drive unit runs very smoothly, and is highly stable and extremely accurate

Description

Measuring and evaluating geometries of workpieces and tools that are relevant for correct functioning is one of the primary requirements of research, technology and industry. Fast, straightforward, cost-effective 2D contour measuring systems are increasingly winning out over other systems. The tried-and-tested, user-friendly **MarSurf XC 2** is the best example of this. Not only does it meet all requirements in terms of accuracy and different evaluation criteria, it also delivers reliable results time after time.



Drive unit CD 120

The **CD 120** drive unit has a patented tracing arm support for fast and flexible changeover of the tracing arm without the need for tools. The calibration data for each tracing arm is stored separately. It is also possible to calibrate several identical tracing arms easily.

Features

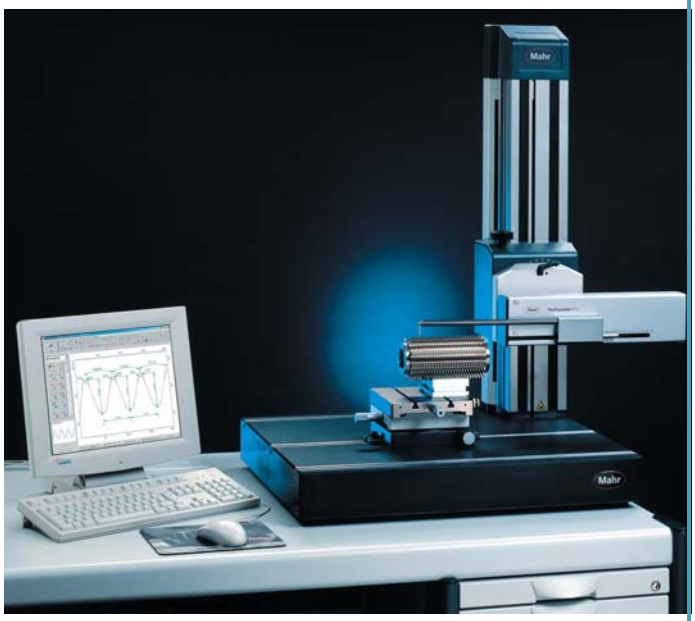
- Max. measuring range of 120 mm measuring length and 50 mm measuring stroke
- Automatic lowering and raising of the tracing arm with adjustable speed
- Variable setting of measuring force from 1 mN to 120 mN
- High positioning speed
- Collision protection thanks to patented tracing arm support

MarSurf XC 20

The new generation of contour measurement systems

Description

When it comes to contour evaluation, **MarSurf XC 20** is simply the best. What started over 30 years ago with the Conturograph - consisting of a drive unit and x-y plotter - has today developed into a state-of-the-art contour measurement system with the very latest technology. This perfectly coordinated configuration of instruments meets the highest performance standards. Both the drive unit and the measuring stand are controlled and positioned using the reliable measurement and evaluation software.



Features

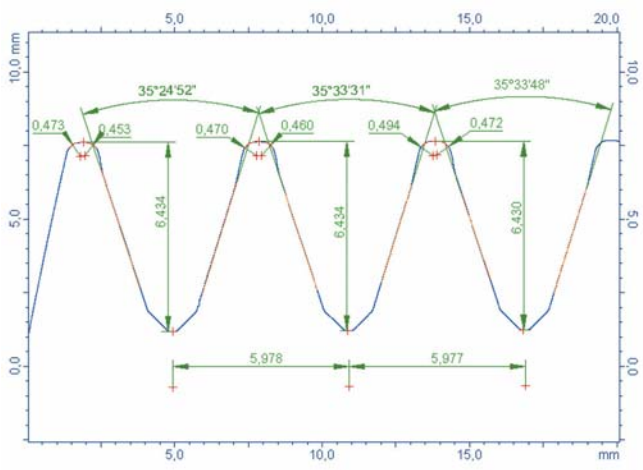
In addition to the functions of the **MarSurf XC 2** entry-level unit, the **MarSurf XC 20** also provides additional features:

- Operating-sequence notes can be displayed
- Interactive operating elements support evaluations and automatic operating sequences
- Measurement of upper and lower contours with "twin stylus". These contours can also be evaluated in relation to each other.
- Creates profile sections with evaluations of different parameters for each section
- Segmented measurement across obstacles such as bores or steep sides possible
- Import and export of DXF files for nominal/actual comparison
- **PCV** drive unit with patented tracing arm support allows tool-free, reproducible change of tracing arm, without the need for recalibration
- Flexibility of measuring station thanks to patented tracing system
- Manual, freely variable tracing forces also support flexibility
- Synthetic creation of nominal profiles from straight lines and arcs
- Straightforward comparison of nominal and actual profiles. Several ranges can be defined within a measured profile and each of these ranges can be assigned a different tolerance and different evaluations

Versions

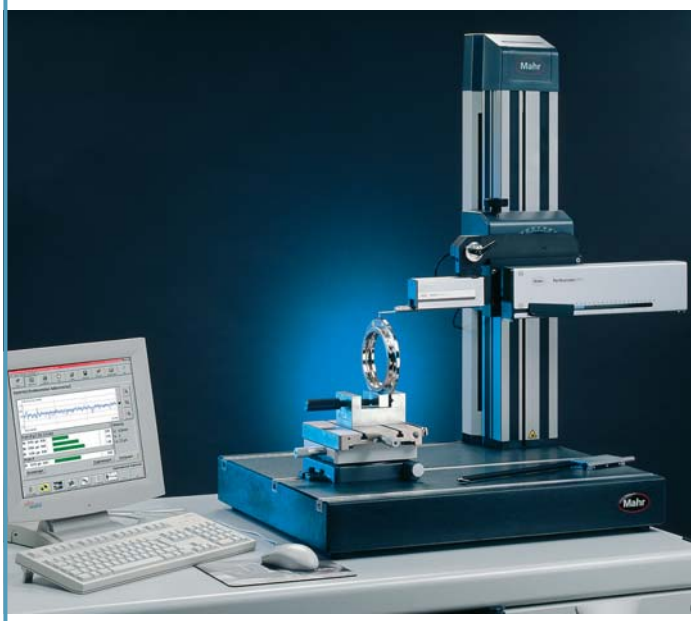
By combining the **MarSurf XC 20** software with the high-precision **LD 120** drive and tracing system and the **ST 500** or **ST 750** measuring stand, resolutions in the nm range can be achieved, thereby allowing contour and roughness depth to be determined in a single measuring run.

Additional functions such as **QS-STAT**-based data export or evaluation according to dominant waviness can also be optionally supplied.



MarSurf XCR 20

The new generation of combined roughness and contour measurement systems



Description

The **MarSurf XCR 20** is ideal for combining contour and roughness depth evaluation.
Marsurf XC 20 + **MarSurf XR 20** = **MarSurf XCR 20** - the **MarSurf XCR 20** combines the functions of the **XC 20** and the **XR 20** in a single unit. This saves both space and time. The roughness software and contour software each have their own user interface. **MarSurf XCR 20** is **Mahr's** top surface measurement system and enables even semi-automated operating sequences such as measuring stand positioning (**ST 750 CNC**) to be performed with ease.

Features

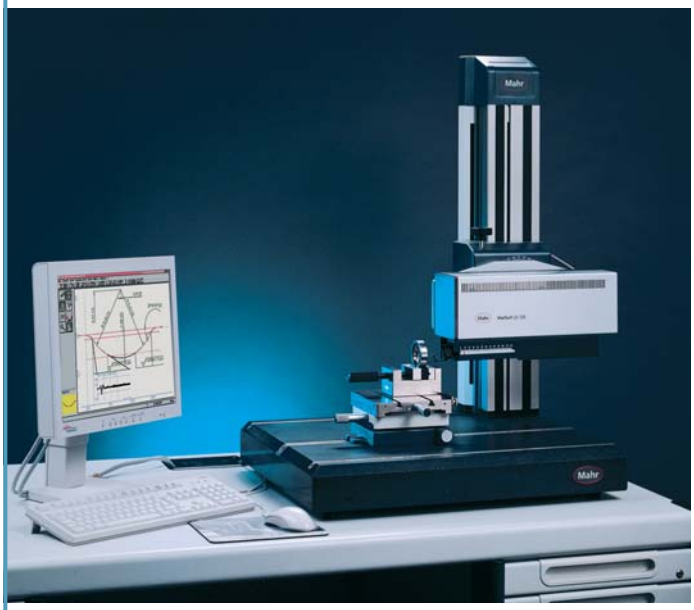
- Saves space because both drive units (**MarSurf PCV 200** contour drive unit and **GD 25** roughness drive unit) can be adapted using the corresponding combi-support on measuring stand **ST 500** or **ST 750**
- Roughness and contour evaluations possible from a single measurement using **MarSurf LD 120**
- High-precision contour and roughness evaluation with **MarSurf LD 120** measuring system on components requiring a large stroke and very high resolution
- Option of rapidly changing between roughness and contour measurements, realized through straightforward changeover within the software platform and changing of the mechanical components such as the drive unit and pick-up

Versions

- Combi-measuring station with one measuring stand and two drive units (**PCV 200** and **MarSurf GD 25**)
- Combi-measuring station with quick-change mounts (**PGK 120**, **PCV 200**)
- **MarSurf LD 120** enables high-precision contour and roughness evaluation on components from a single trace

MarSurf LD 120

Two in one. Contour and roughness measurement depth in a single run



- Increased precision due to morphological filtering of the **MarSurf X range**
- Tracing arms changed without re-calibration. Storage of calibration data for each arm and the magnetic pick-up mount guarantee high reproducibility

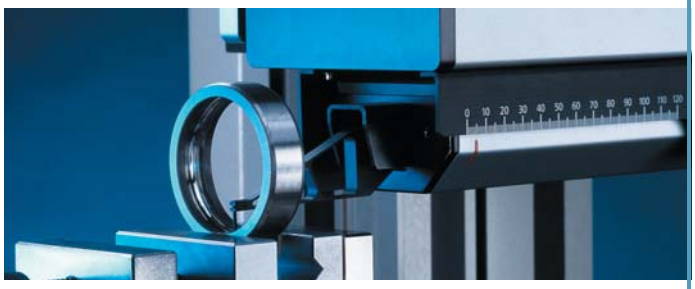
Versions

MarSurf LD 120 with measuring stand
This combination including measuring stand makes for a highly flexible measuring station.

MarSurf LD 120 compact measuring station
The **compact version** is designed for smaller workpieces and high accuracy, as oscillation is reliably suppressed by the rigid compact stand with **small** measuring circle.

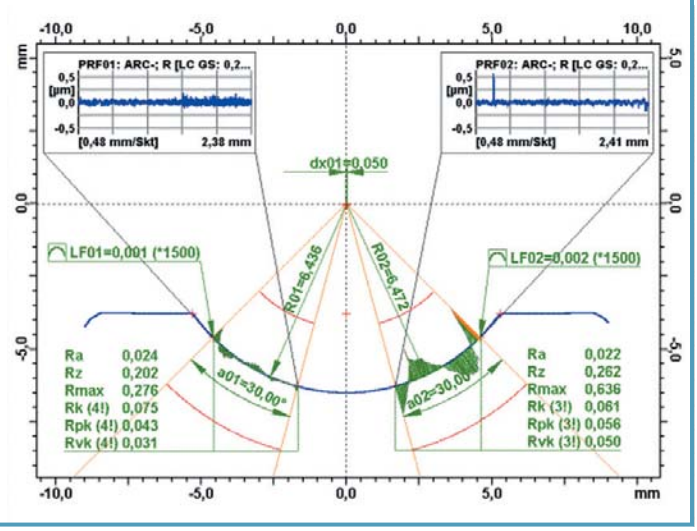
Description

MarSurf LD 120 is the new high-quality, high-precision contour and roughness measuring station with integrated laser measuring system. It calculates roughness and contour evaluations from a single parallel traverse. To perform both these measuring tasks with a single measurement, you need a high-precision measuring system that supports both the relatively large measuring stroke for the contour in radii, on slopes or in freeform areas and the resolution in the nm range for the roughness depth measurement.



Features

- The magnetic pick-up mount guarantees flexibility by supporting a diverse range of pick-ups that can be easily exchanged, while maintaining a high level of reliability
- Guaranteed positioning accuracy when exchanging pick-ups in the µm range and collision protection, rigidity and stability of the pick-ups for resolutions in the nm range
- Reliability of results thanks to calibration procedure specially geared to high accuracy
- Measuring forces from 0.5 to 30 mN whose settings can be varied via software and which remain constant over the entire measuring stroke deliver flexibility and reliability. You can select the optimum measuring force to match the material characteristics of the workpiece and the pick-up of your choice



MarSurf XP 20

A measuring station for all occasions

- Depending on the measuring task, the measuring station can be set up using modules with automatic linear/rotation axes
- Modular system affords flexibility
- One software language for all systems

Versions

Manual measuring stations:
- Roughness measuring station
- Contour measuring station
- Combined roughness and contour measuring station

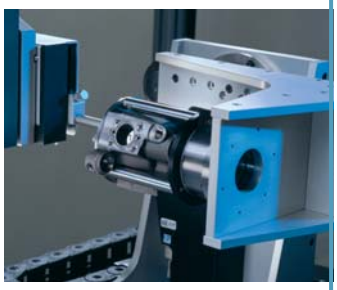
Automatic measuring stations:
- Roughness measuring station
- Contour measuring station
- Combined roughness and contour measuring station

Description

The new Mahr software platform **MarWin** is a modular control and evaluation system with considerable advantages. This multi-product software platform provides users with a standardized basis, thereby ensuring the reliability of operation and function particularly required in automated processes. Fast and simple configuration is achieved through the use of standardized mechanical and electronic measuring station components.

Features

- **MarTalk** coordinates the interface between the software and the machine
- **MarScript** handles the measuring language and control systems
- Components and software in tried-and-tested **Mahr quality** with a straightforward user interface provide reliable measuring results
- Safety for your system and operators through compliance with all relevant guidelines
- Modularity, i.e. depending on the measuring task, additional axes and workpiece supports can be used in addition to the standard components
- Time saved through widespread elimination of setup times for the automatic measuring station



MarSurf TS 50

The high-precision optical 3D measuring instrument

Versions

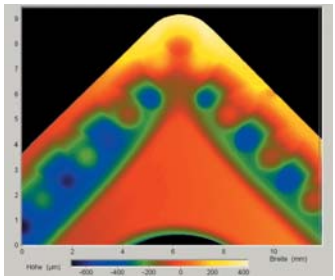
- **Version** with granite plate and simple measuring column
- **Version** with **MarSurf ST 500** measuring stand and granite plate with T-groove for supporting x/y tables etc.
- Various precision optics enable measuring fields ranging from 1 mm x 0.8 mm to 45 mm x 33 mm

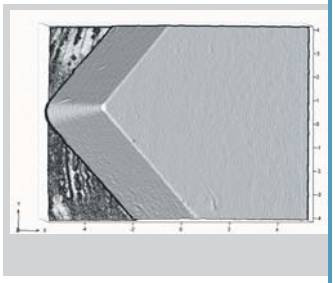
Applications

Measuring tasks in the following sectors:
- Microelectronics
- Microsystem technology
- Tool manufacturing and mechanical engineering
- Automotive manufacturers and suppliers
- Paper and plastics industry
- Cosmetics
- Medicine
- etc.

Description

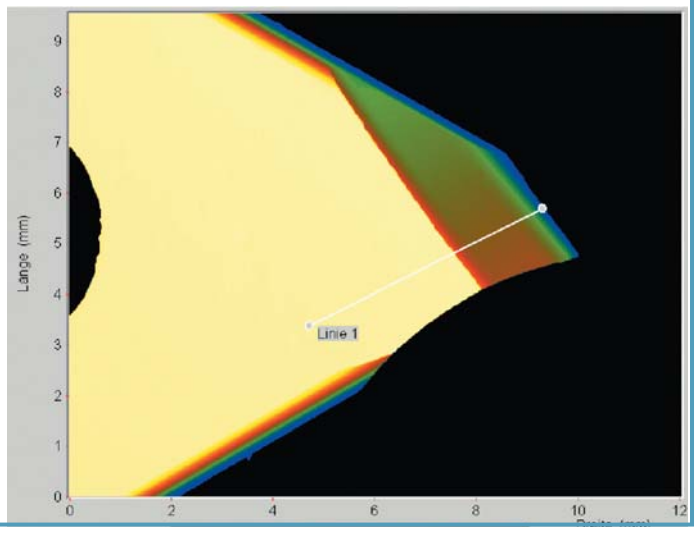
As well as the traditional stylus method, there is an increasing demand for rapid **3D acquisition** of **surface profiles** in the surface measurement and evaluation sector. The **MarSurf TS 50** non-contact optical 3D measuring instrument provides a high-quality solution that exactly meets these needs. It is based on digital light projection with microreflectors.





Features

- Optical recording and evaluation of 3D measuring data for analytical recording of surface structures in just a few seconds
- Closed-loop calibration concept with adequate adjustment standards provides proof of machine capability
- Applications range from inspection room in QA or R&D departments to checking and monitoring 3D quality features
- Option of integrating metrology into the production environment for automated 3D measurement and 3D inspection during the process cycle
- Various forms of representation: Color-coded 3D contour map, photo simulation, profile section



MarSurf. M and S Instruments Data Overview



	MarSurf M1	MarSurf M2	MarSurf S2
Parameters	Ra, Rz, Rmax, RPc; Jis: Ra, Rz	Over 25 roughness parameters	Over 40 roughness, waviness and P profile parameters
Pick-ups (skid tracing system)	NHT pick-up range (skid tracing system)	NHT pick-up range	MFW 250, R pick-ups, FRW 750*, Focodyn*, LS1/LS10* *Depends on drive unit
Drive unit	PFM (standard drive unit) Option: PFM 2 (transverse drive unit)	PFM (standard drive unit) Option: PFM 2 (transverse drive unit)	Applicable: PZK, GD 25, PGK 120, PGK 20, PRK via PAV 62
Traversing lengths (mm)	1.75 / 5.6 / 17.5 with PFM drive unit 1.75 / 5.6 with PFM 2 drive unit	1.75 / 5.6 / 17.5 with PFM drive unit 1.75 / 5.6 with PFM 2 drive unit	0.56 / 1.75 / 5.6 / 17.5 / 56 Lt var 0.56 to 120.0 Depends on drive unit
Profile resolution	12 nm	12 nm	Measuring range / 65,536 steps
Languages	13 languages 3 Asian languages	13 languages 3 Asian languages	13 languages 3 Asian languages
Dimensions (L x W x H (mm))	Approx. 190 x 170 x 75	Approx. 190 x 170 x 75	Approx. 150 x 320 x 250
Weight	< 1 kg	< 1 kg	< 3 kg
Power supply	Primary: 90 V to 264 V Secondary: 12 V	Primary: 90 V to 264 V Secondary: 12 V	Primary: 90 V to 264 V Secondary: 9 V

MarSurf. LD 120 Data Overview

	MarSurf LD 120
Parameters	Roughness parameters, waviness parameters, P-parameters see MarSurf XR 20
Contour elements:	Radii, distances, angles, see MarSurf XC 20
Pick-ups	LD A14-10-2 with diamond tip 2 µm 90°
Drive unit	MarSurf LD 120
Traversing lengths	0.1 mm to 120 mm
Measuring range	10 mm
Resolution (Z)	2 nm
Measuring force (in Z)	0.5 mN to 30 mN, adjustable
Dimensions (L x W x H) of the compl. ST 500 measuring stand	Approx. 700 x 550 x 720 mm
Weight incl. ST 500	Approx. 160 kg
Power supply	230 V (or 115 V possible)

MarSurf. TS 50 Data Overview

	MarSurf TS 50
Parameters	Analytical recording of surface structure, 3D and 2D evaluation options, wear-and-tear measurement, CAD export
Pick-ups	Digital strip projection with microreflector array
Measuring fields	1 x 0.8 mm, 2 x 1.5 mm, 4 x 3.0 mm, 12 x 10 mm, 26 x 20 mm, 45 x 33 mm
Profile resolution	≥ 1/10 000
No. of measuring points	Approx. 1.3 million (1280 x 1024)
Sensor dimensions (mm)	270 x 300 x 210
Sensor weight	Approx. 4 kg
Dimensions (L x W x H) of the compl. ST 500 measuring stand (mm)	Approx. 700 x 550 x 720
Weight incl. ST 500	Approx. 160 kg
Power supply	230 V (or 115 V possible)

MarSurf. XC Data Overview

	MarSurf XC 2	**MarSurf XC 20**
Parameters	Radii, angles, distances, coordinates, fitting in of regression straight lines, best-fit circles, circle sections. Defining points, circles and circle sections and much more	Radii, angles, distances, coordinates, fitting in of regression straight lines, best-fit circles, circle sections. Defining points, circles and circle sections, multiple measurements, double contours, DXF import etc.
Pick-ups	350 mm tracing arms, 175 mm tracing arms complete with stylus tips	350 mm tracing arms, 175 mm tracing arms complete with stylus tips
Drive unit	MarSurf CD 120	MarSurf PCV 200
Traversing lengths	1 mm to 120 mm	1 mm to 200 mm
Measuring range	± 25 mm with 350 mm tracing arm	± 25 mm with 350 mm tracing arm
Resolution (Z) referred to measuring system	350 mm tracing arm = 0.5 µm 175 mm tracing arm = 0.25 µm	350 mm tracing arm = 0.5 µm 175 mm tracing arm = 0.25 µm
Measuring force (in Z)	1 mN to 120 mN, adjustable	1 mN to 120 mN, adjustable
Dimensions (L x W x H) of the compl. ST 500 measuring stand (mm)	Approx. 700 x 550 x 720	Approx. 700 x 550 x 720
Weight of measuring station with ST 500 measuring stand	Approx. 160 kg	Approx. 160 kg
Power supply	230 V (or 115 V possible)	230 V (or 115 V possible)

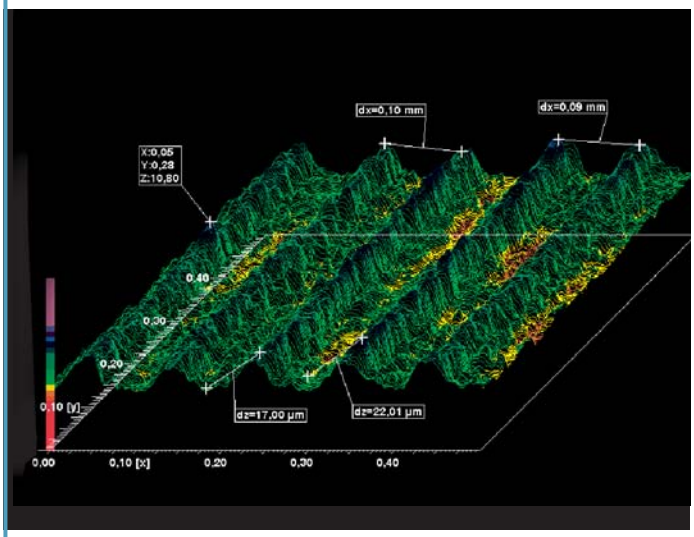
MarSurf. XR Data Overview

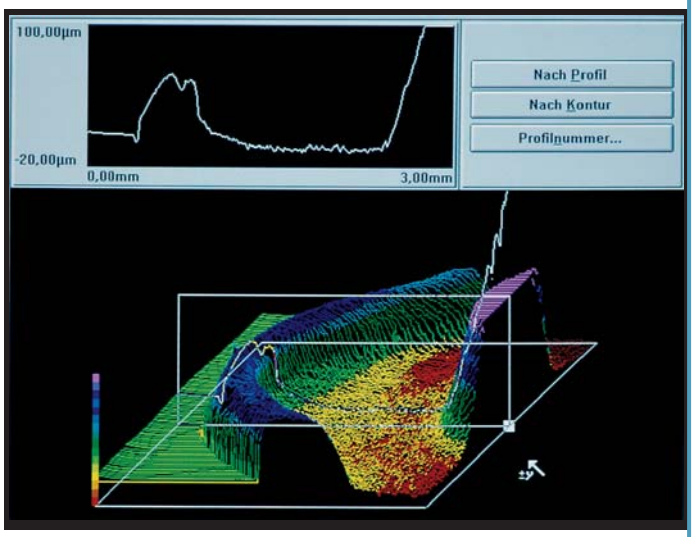
	MarSurf XR 20
Parameters	Over 75 roughness, waviness, P-profile and motif parameters
Pick-ups	MFW 250, R pick-ups, FRW 750*, Focodyn*, LS 1 / LS 10*
Drive unit	Applicable: PZK, GD 25, PGK 120, PGK 20, PRK via PAV 62
Traversing lengths (mm)	Depending on drive unit 0.56/1.75/5.6/17.5/56, Lt var 0.56 to 120.0
Profile resolution	± 25 µm = 0.5 nm, ± 250 µm = 5 nm
Dimensions (L x W x H (mm))	of the compl. ST 500 measuring stand, approx. 700 x 550 x 720
Weight of measuring station	With ST 500 measuring stand, approx. 160 kg
Power supply	230 V (115 V possible)

*Depending on drive unit

MarSurf Topography

The PC-based measurement and evaluation instrument for topography





Description

A powerful and cost-effective solution for analyses requiring 3D representation when the parallel traverse in the classic surface measurement alone will not suffice.

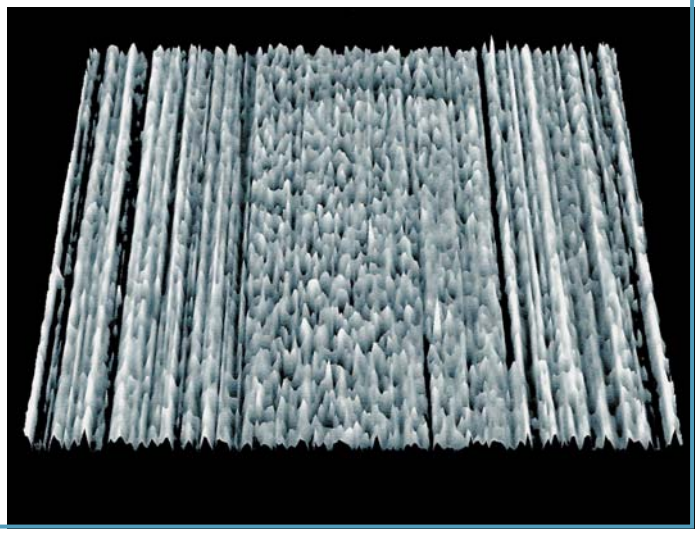
MarSurf Topography is a software package that works under Windows. It controls the components of the measuring station and enables a choice of individual profiles or segments for calculating 3D parameters, volumes and 3D material ratios.

Features

- Photo simulation
- Creation of measuring programs and automatic measuring runs for series measurements
- Simple operation using either mouse or function keys
- Continuous 3D display of roughness and contour profiles in photo simulation, black/white and color
- Display of false colors, contour lines, grid, view and profile
- Combination view of topography, profile, ADC, Z 3D representation
- Choice of zoom sections
- Defining of elements such as: Profile from polyline, highest and lowest points, center of gravity, plane
- Hiding of areas
- Defining new 3D parameters
- Calculating volumes and 3D material ratio
- All common characteristic curves and profile types
- Different measuring ranges depending on configuration
- Maximum traversing length up to 200 mm, depending on drive unit
- Transverse feed up to 100 mm, standard 17.5 mm
- Over 30 topography parameters can be evaluated

Options

- **GD 25**, **PGK 120**, **PCV 200**, **PZK** drive units connectable
- Use of various positioning and x/y tables depending on the measuring task
- Supports **MarSurf ST 500** and **MarSurf ST 750** measuring stands



MarSurf PCV 200

Contour drive unit

Description

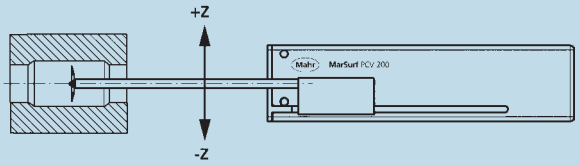
The **PCV 200** contour drive unit is based on the technology of the **CD 120** drive unit. It supports measuring paths up to 200 mm.

Many contour measuring tasks, e.g. calculating double contours using the twin stylus, can be performed in conjunction with the **MarSurf XC 20**.

Features

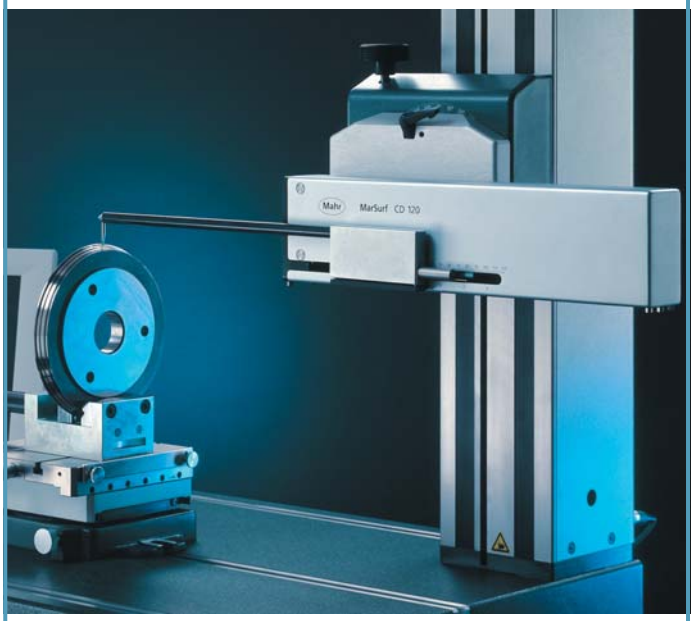
- Collision protection of the tracing arm thanks to patented tracing arm mount
- Programmed measuring run with lifting and lowering of the tracing arm and positioning
- Selection of different measuring speeds ranging from 0.2 mm/s to 4 mm/s
- Variable setting of measuring force from 1 mN to 120 mN
- Measuring force remains constant over the whole measuring range

The drive unit supports a large number of existing tracing arms of different shapes and sizes.



MarSurf CD 120

Contour drive unit



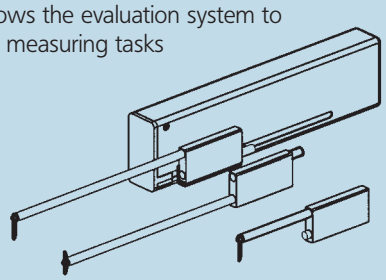
Description

The **CD 120** contour drive unit performs precise and straightforward measurement of contour elements such as radii, distances, angles etc.
In conjunction with **MarSurf XC 2**, it forms the basic contour measurement unit.

Features

- Automatic lowering and raising of the tracing arm with adjustable speed
- Tracing arm for bores > 2 mm available
- Selection of different positioning speeds ranging from 0.2 mm/s to 10 mm/s
- Variable setting of measuring force from 1 mN to 120 mN
- Patented tracing arm mount for reproducible tracing arm exchange without need for tools

The use of complete tracing arms, each with their own separately stored calibration data, allows the evaluation system to change between different measuring tasks quickly and flexibly.



MarSurf. PZK Drive Unit

Small and handy

Description

This set consists of the small, handy **PZK** drive unit and the integrated, inductive **MFW 250** pick-up. The tracing arms can be changed very quickly. The built-in datum plane allows both standard skidded and skidless measurements.
The **PZK** set also includes a hand-held mount. The prism on the underside of the hand-held mount enables measurement on flat and cylindrical workpieces. This makes the **PZK** universally applicable.

MarSurf. MarSurf GD 25 Drive Unit

Standard-Drive Unit for Surface Measurements

Description

This unit offers high straightness precision and smooth running over a measuring length of 25.4 mm (1"). Patented motorized height adjustment ensures the pick-up is positioned in the area of 4 mm and provides motorized pick-up zeroizing. The **MFW 250** skidless pick-up can be used, along with all skidded pick-ups of the **R series**.

MarSurf. PGK 120 Drive Unit

Straightforward roughness measurement for long traversing lengths

Description

In addition to high-precision roughness measurements, the **PGK 120** is primarily used for waviness measurements over long traversing lengths up to 120 mm. The patented motorized pick-up zeroizing over 22 mm saves both setup work and time. The drive unit optionally supports problematic measuring positions such as transverse or vertical tracing using simple, adaptable pick-up mounts.

MarSurf. GD 120 CNC Drive Unit

Specially designed for automated operation

Description

Precise positioning on the horizontal axis is very important for automatic operating sequences. The **GD 120 CNC** allows precise positioning on the X-axis. This drive unit also offers the same outstanding features as the **PGK 120**, which guarantees the precision and reliability required for automatic operation under **MarSurf XP**.

MarSurf. Surface Pick-ups

Pick-ups for almost all applications

Description

Skidless pick-ups

Today there is a clear trend towards skidless pick-ups whose strength lies in the fact that they are very versatile. The deflection of the diamond tip is performed relative to the geometric ideal profile of the datum plane in the drive unit.

Advantages:
- No skid-related filter effect
- Very short traversing lengths possible
- Calculation of W and P parameters
- Recording of profile angularity and increments

Single-skid pick-ups

The most widespread in practice, single-skid pick-ups are supported on just one skid on the workpiece and therefore need to be aligned to the surface.

Advantages:
- Not sensitive to oscillation because of very small measuring circle
- Suitable for curved testing surfaces
- Angularity of the drive unit is uncritical

Dual-skid pick-ups
Dual-skid pick-ups are linked via hinges with the drive unit and align themselves automatically to the surface. They are ideal for flat workpieces.

Advantages:
- Very insensitive to oscillation
- Minimum alignment necessary

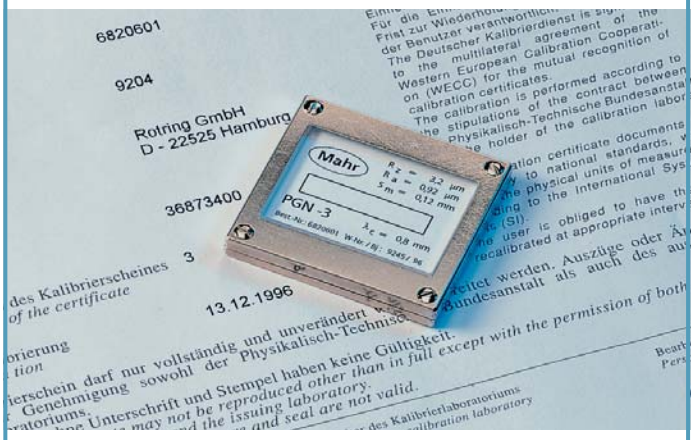
Optical pick-ups
(Focodyn, LS 1 and LS 10 laser sensors)

These optical pick-ups work in a similar way to the mechanical skidless pick-ups. Following the principle of dynamic focusing, the pick-up generates a sharp, delimited focal point on the surface.

Advantages:
- Non-contact profile recording
- Also suitable for soft and sensitive workpiece surfaces

PGN Geometric Standard

DIN EN ISO 5436 type C1 sinusoidal groove profile



Surface standard with sinusoidal groove profile for dynamic monitoring of the roughness measuring station. Ra, Rz, Sm
Optical flat. The following versions are available:
PGN 1. Profile depth approx. 1.5 µm, groove distance approx. 0.10 mm
PGN 3. Profile depth approx. 3 µm, groove distance approx. 0.12 mm
PGN 10. Profile depth approx. 10 µm, groove distance approx. 0.20 mm
DKD (German Calibration Service) and Mahr Calibration Certificate on request.

PEN 10-1 Setting Standard

DIN EN ISO 5436 type A1 depth setting standard

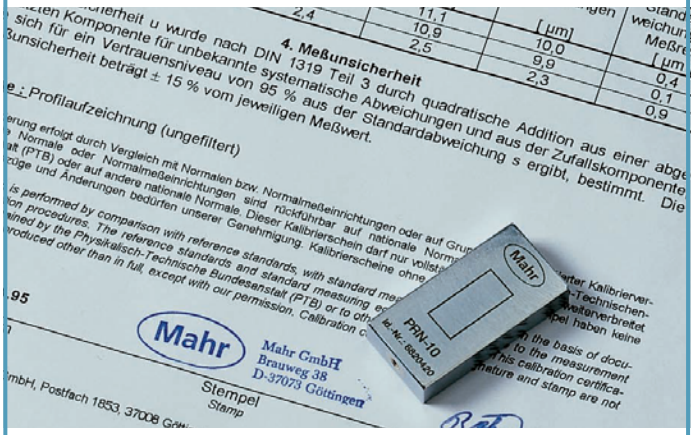
Depth setting standard for static calibration of the vertical stroke for all skidless pick-ups, single-skid pick-ups and dual-skid pick-ups. Measuring groove depth approx. 10 µm, diameter 44 mm.

- 2 calibration grooves
- Optical flat

DKD (German Calibration Service) and Mahr Calibration Certificate on request.

PRN 10 Geometric Standard

Turned roughness profile



Including Mahr Calibration Certificate. Surface standard with turned profile, chromium-plated, profile depth approx. 10 µm, for monitoring the roughness measuring station. Ra, Rz.

KN 100 Contour Standard

Standard for monitoring contour measurement systems

The **KN 100** contour standard was developed in cooperation with the PTB.
It is the first standard to allow confirmation and acceptance tests to be performed so that they can be traced to realistic geometries through concrete references.

It conforms to the requirements of VDI/VDE Guideline 2629.