

## TESA MICRO-HITE 3D DCC COORDINATE MEASURING MACHINE

ADVANCED MEASURING CAPABILITY SIZED FOR ANY BUDGET

The Brown & Sharpe TESA MICRO-HITE® 3D Direct Computer Control (DCC) coordinate measuring machine with PC-DMIS software is an affordable, entry level, high performance, high accuracy system designed to improve inspection throughput and accuracy in the lab or on the shop floor.

The TESA MICRO-HITE 3D DCC CMM can be used as a stand-alone, walk-up station for first piece inspection, layout inspection and tool set up, or as a flexible gage. Its large measuring envelope can handle workpiece sizes up to 440 mm (17.32 in.) X 490 mm (19.29 in.) X 390 mm (15.35 in.), representing some 80 percent of all manufactured parts. With a speed of 350 mm/second, the TESA MICRO-HITE 3D DCC CMM easily keeps pace with machine tools. Thermally compatible materials and components minimize the influence of ambient temperature changes on measurement results, making The TESA MICRO-HITE 3D DCC machine a good choice for shop floor applications.

The TESA MICRO-HITE 3D DCC CMM features an advanced dual reduction belt drive system that gives it an acceleration of 1730 mm/second<sup>2</sup>, five times faster than similar CMMs, significantly reducing inspection cycle time. Its lightweight, off-set triangular bridge is designed with a low center of gravity and an optimum stiffness-to-mass ratio for improved positioning accuracy. Wide bearing separation assures optimum control of bridge axis roll for precise volumetric measuring accuracy. Patented glass scales and opto-electric sensors provide high accuracy and repeatability to 2  $\mu$ m.



- Patented ultra-rigid Tricision bridge provides optimum stiffness-to-mass ratio
- All aluminum construction improves thermal, dimensional, torsional, and geometric stability
- 22 air bearings assure frictionless motion
- Advanced dual reduction belt drive system provides high acceleration
- Z-axis pneumatic counterbalance system
- Granite table with threaded clamping holes
- Air filter and regulator
- Vibration isolation pads
- Optical linear transducers
- TESASTAR-i Touch Trigger Indexable Probe
- Lock/unlock system on all axes
- Computer with keyboard and mouse, 17-inch TFT color monitor, color printer



## General



DCC  
CMM motorized

17.32" x 19.29" x  
16.32" measuring  
range (X/Y/Z)

Motorized  
probing  
movement.  
Optional fine adjust  
device.



Light alloy  
structure.  
Granite  
measuring table.



Opto-electronic  
measuring  
system based on  
incremental glass scales



13.62 in/s  
17.32 mm/s

Software: Software:  
PC-DMIS

## TESA MICRO-HITE 3D DCC COORDINATE MEASURING MACHINE

### Specifications

Order Number	03939140
EDP Number	23222
Measuring Range (X/Y/Z)	17.32" x 19.29" x 15.32" (440mm x 490mm x 390mm)
Measuring Speed	13.62 in/sec (1732 mm/sec)
Acceleration	68.19 in/sec <sup>2</sup> (1732 mm/sec <sup>2</sup> )
Max. Part Weight	501.10 lb (227 kg)
Working Temperature Range	68° ± 1° F (20° ± 1° C)
Operating Temperature Range	50° to 95° F (10° to 35° C)
Air Pressure	4.0 bar (57 psi)
Air Supply	21 NL/Min (0.7 scfm)
Accuracy	0.000276" (7.0 μm)
Repeatability	0.000078" (2.0 μm)
Uncertainties	3 + 4L/1000
Uncertainties	0.000137" (3.5 μm)
Electromagnetic Compatibility	✓
System Weight	867.55 lb (393 kg)
Overall Dimensions (LxHxD)	38.19" x 66.78" x 36.61" (970 mm x 1696 mm x 930 mm)



Machine Stand Included.



# TESA MICRO-HITE® 3D REFLEX

*Best price, performance ratio available in the industry*

The TESA MICRO-HITE 3D coordinate measuring system is an affordable, high accuracy measuring instrument designed to fill the operational gap between precision hand-held measuring instruments and high-end coordinate measuring machines. To assure its high production standards, this advanced measuring system is produced at the TESA factory in Renens, Switzerland in a dedicated manufacturing cell.

The TESA MICRO-HITE 3D measures to the micron. Interactive TESA REFLEX™ software allows operators of all skill levels to perform complex inspection routines quickly and efficiently with little training. The offset triangular bridge design provides a low center of gravity and optimum stiffness-to-mass ratio. Air bearings ensure frictionless motion in all three axes.

## KEY FEATURES

- Patented TESA optical reading system.
- X-axis Delta – guaranteeing excellent stability.
- TESA REFLEX application software – The standard for simplicity and reliability.
- Ergonomic design – The successful conclusion of an in-depth study.
- 22 air bearings to ensure a frictionless motion of the three axes.
- Choice of two probes – TESASTAR with adjustable triggering force or TESASTAR-i indexable probe.
- Flexibility – TESA MICRO-HITE 3D can be supplied with or without fine adjustment device. By adding a CCD camera, it can be converted into a true optical measuring system for non-contact measurement.


## Specifications


Measuring Range (X/Y/Z)	18.11" x 20.08" x 16.54" (460mm x 510mm x 420mm)
Measuring Speed	29.92 in/sec (760 mm/sec)
Acceleration	
Max. Part Weight	227 kg 500lb
Working Temperature Range	68° ± 1° F (20° ± 1° C)
Operating Temperature Range	55.4° to 95° F (13° to 35° C)
Air Pressure	4.0 bar (57 psi)
Air Supply	21 NL/Min (0.7 scfm)
Accuracy	
Repeatability	2 µm (B89)
Uncertainties	3 + 4L/1000
Uncertainties	3.5
Electromagnetic Compatibility	✓
System Weight	419.43 lb. (190 kg.)
Overall Dimensions (LxHxD)	38.19" x 63.78" x 36.61" (600mm x 750mm x 430mm)





## General




 CMM with moving bridge.  
Measuring system with air bearing guides in all three axes


 460 x 510 x 420 mm measuring range (X/Y/Z)


 0.001 mm 0.00001 in

 Manual probing movement.  
Optional fine adjust device.

 Light alloy structure.  
Granite measuring table.


 Opto-electronic measuring system based on incremental glass scales

 0.00001 mm (system)

 29.92 in/s 760 mm/s

## Control panel


 Display field 89 x 118 mm with illuminated background

 7-decade display (digits) plus sign for the measured values.  
icon-driven user's guide

 RS-232

## Accuracy

 Repeatability limit: 3 µm

 Uncertainties as per VDI/VDE:  
U1 = (0,003 + 3-L/1000) mm  
U3 = (0,003 + 4-L/1000) mm

Software:  
TESA Reflex



## Workpiece features

Max. workpiece dimensions:  
X = 600 mm,  
Y = 750 mm, Z = 430 mm

Max. workpiece weight:  
227 kg

## MH-3D technical data

Overall dimensions:  
970 x 1620 x 930 mm  
(W x H x D)

Net weight:  
198 kg (with granite table);  
granite measuring table alone: 99 kg.  
Gross weight: 250 kg.

Air supply pressure:  
4.8 to 8.3 bars  
(70 to 120 psi).  
Air absorption:  
21 l/min.

115 to 230 Vac  
± 10%,  
50 to 60 Hz.  
Power consumption:  
0,3 to 0,7 A

20 ± 1 °C

13 °C to 35 °C



Shipping packaging:  
115x220x110 cm  
(W x H x D)

Inspection report

## TESA Micro-Hite Coordinate Measuring Machine



03939040

28661

**Micro-Hite 3D basic version**

Consisting of:

03939020 TESASTAR probe

03969040 Kit of styli for M3 thread

03960170 Control panel with REFLEX application software

03969006 PCMCIA memory card

03969011 Reference sphere

82-703-1 Granite measuring table

049746 Air filter and regulator

03939041

28662

**Micro-Hite 3D\_i Basic version with indexable probe**

03939042

28663

**Micro-Hite 3D\_F Version with fine adjust**

03939043

28664

**Micro-Hite 3D\_Fi Version with fine adjust and indexable probe**



## Optional Accessories



03939020

29736

TESASTAR probe

03939030

29738

TESASTAR-i indexable probe

03969009

29743

ReflexScan program software

03969007

28520

RS-232 connection cable

03969031

28205

Matrix printer

03969005

28205

Connection cable for printer

03969001

29739

Cabinet with table top

03969003

29740

Dust cover

03969040

29744

Probe styli kit

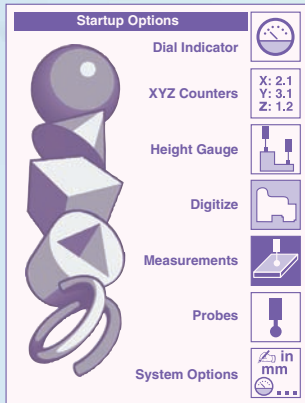
03960175

29766

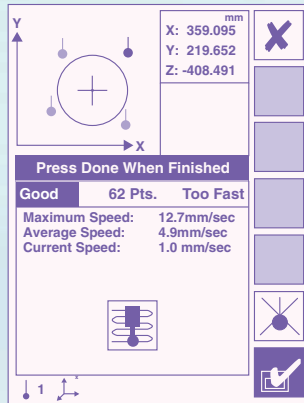
MH-3D air saver



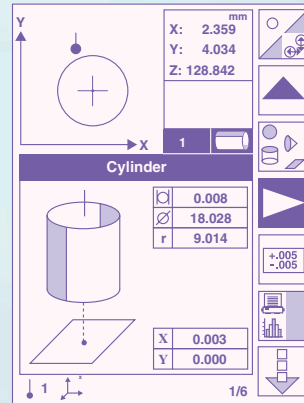
## Gaging as easy as...



1. Just push "Measurements"

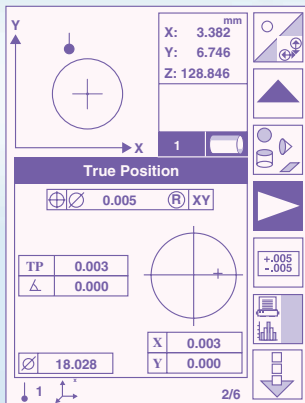


2. Scan a feature...  
MICRO-HITE 3D draws its picture and tells you if your probe technique is ok.

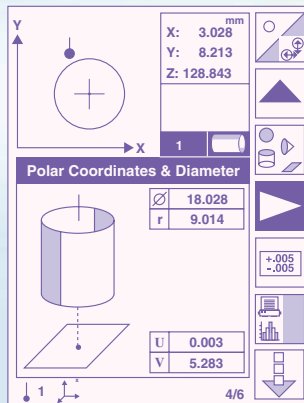


3. MICRO-HITE 3D automatically tells you what feature you touched... and displays its size and location.

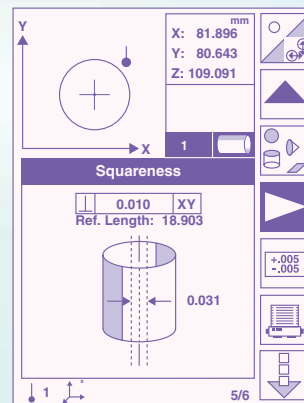
## Access all dimensional information about the feature quickly and easily.



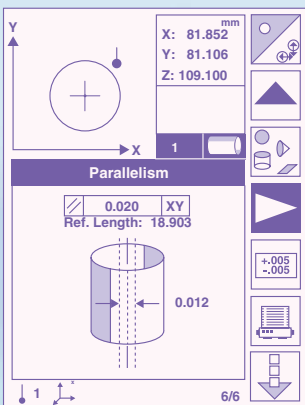
True Position



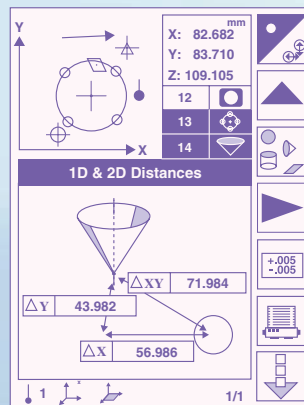
Polar Coordinates and Diameter



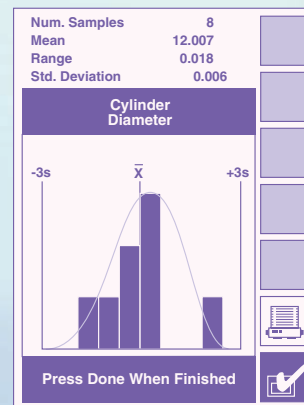
Squareness



Parallelism



Feature Relationship



Print a copy of the measurement results, or select the statistics package.



*Easy access to 3D measurement technology.  
With MICRO-HITE 3D you'll be ready to perform  
thousands of measurements in no time at all.*

## Simplicity and Efficiency

- Inspection is helped through software prompts.
- Immediate access to results.
- Graphic representation of measured features.
- Installation and training in just a few hours.



## Power and Technology

- Automatic recognition of measured forms.
- Reverse engineering through digitizing of workpiece shapes.
- Patented ZMOUSE system for Z-axis operations.
- PCMCIA card for storing inspection operations.



## Warranty

- Brown & Sharpe – A world renowned brand.

Technical Data	Dimensions	Weight	Measuring Travel
	X-Axis (18 in) 458 mm	Max. load even distribution	500 lbs / 227 kg
	Y-Axis (20 in) 510 mm	Machine weight	395 lbs / 180 kg
	Z-Axis (16 in) 406 mm	Total weight	870 lbs / 395 kg
<b>Measuring Capacity</b>	X-Axis (22 in) 559 mm	VDE/VDI U3 performance characteristic	
	Y-Axis (29.5 in) 750 mm	0.004 + 0.005 L/mm	at 68°F±1.8°F / 20±1°C
	Z-Axis (19 in) 483 mm	Resolution	.000010 in / 0.0001 mm



## TESA MICRO-HITE 3D MANUAL PC-DMIS

Running PC-DMIS – the industry-wide metrology software - this PC-DMIS version can operate all the functionalities of the machine.

Available as standard or with fine adjust device.

Equipped with TESASTAR-i probe.



### Specifications

Order Number	<b>03939124</b>
EDP Number	23221
Measuring Range (X/Y/Z)	18.11" x 20.08" x 16.54" (460mm x 510mm x 420mm)
Measuring Speed	29.92 in/sec (760 mm/sec)
Acceleration	
Max. Part Weight	227 kg 500lb
Working Temperature Range	68° ± 1° F (20° ± 1° C)
Operating Temperature Range	55.4° to 95° F (13° to 35° C)
Air Pressure	4.0 bar (57 psi)
Air Supply	21 NL/Min (0.7 scfm)
Accuracy	
Repeatability	2 µm (B89)
Uncertainties	3 + 4L/1000
Uncertainties	3.5
Electromagnetic Compatibility	✓
System Weight	419.43 lb. (190 kg.)
Overall Dimensions (LxHxD)	38.19" x 63.78" x 36.61" (600mm x 750mm x 430mm)

### General



Software: PC-DMIS

✓  
DCC  
CMM motorized

18.11" x 20.08" x  
16.54" measuring  
range (X/Y/Z)

Motorized  
probing  
movement.  
Optional fine adjust  
device.

Light alloy  
structure.  
Granite  
measuring table.

Opto-electronic  
measuring  
system based on  
incremental glass scales

20.92 in/s  
7.60 mm/s



## General



CMM with moving bridge.

Measuring system with air bearing guides in all three axes



460 x 510 x 420 mm measuring range (X/Y/Z)



0.001 mm  
0.00001 in



Manual probing movement.

Optional fine adjust device.



Light alloy structure. Granite measuring table.



Opto-electronic measuring system based on incremental glass scales



0.00001 mm (system)



29.92 in/s  
760 mm/s

## Control panel



Display field 89 x 118 mm with illuminated background



7-decade display (digits) plus sign for the measured values. icon-driven user's guide



RS-232

Software: TESA Reflex

## TESA MICRO-HITE 3D REMOTE CONTROL

Featuring 3 motors fully integrated and controlled with a joystick, this remote version allows fine positioning to the micron when checking small parts with complex geometry. On manual mode, the machine permits high-speed displacement in the three X, Y and Z coordinate directions.

Equipped with both TESASTAR-i and the REFLEX application software.

## Specifications

Order Number	<b>03939120</b>
EDP Number	23025
Measuring Range (X/Y/Z)	18.11" x 20.08" x 16.54" (460mm x 510mm x 420mm)
Measuring Speed	29.92 in/sec (760 mm/sec)
Acceleration	
Max. Part Weight	227 kg 500lb
Working Temperature Range	68° ± 1° F (20° ± 1° C)
Operating Temperature Range	55.4° to 95° F (13° to 35° C)
Air Pressure	4.0 bar (57 psi)
Air Supply	21 NL/Min (0.7 scfm)
Accuracy	
Repeatability	2 µm (B89)
Uncertainties	3 + 4L/1000
Uncertainties	3.5
Electromagnetic Compatibility	✓
System Weight	419.43 lb. (190 kg.)
Overall Dimensions (LxHxD)	38.19" x 63.78" x 36.61" (600mm x 750mm x 430mm)





## TESA MICRO-HITE 3D HIGH PRECISION

The High Precision version pushes back the limits of accuracy at a price that's just unbeatable. Besides a repeatability certified to 2.5  $\mu\text{m}$ , the machine comes with a 3-Year warranty along with a maintenance agreement over two years.

Calibration certificate to ISO 10360-2.

Equipped with both TESASTAR-i and the REFLEX application software.



### Specifications

Order Number	<b>03939039</b>	
EDP Number	22798	
Measuring Range (X/Y/Z)	18.11" x 20.08" x 16.54" (460mm x 510mm x 420mm)	
Measuring Speed	29.92 in/sec (760 mm/sec)	
Acceleration		
Max. Part Weight	227 kg 500lb	
Working Temperature Range	68° ± 1° F (20° ± 1° C)	
Operating Temperature Range	55.4° to 95° F (13° to 35° C)	
Air Pressure	4.0 bar (57 psi)	
Air Supply	21 NL/Min (0.7 scfm)	
Accuracy		
Repeatability	2 $\mu\text{m}$ (B89)	
Uncertainties	3 + 4L/1000	
Uncertainties	3.5	
Electromagnetic Compatibility	✓	System Weight
419.43 lb. (190 kg.)		
Overall Dimensions (LxHxD)	38.19" x 63.78" x 36.61" (600mm x 750mm x 430mm)	

### General



CMM with moving bridge.

Measuring system with air bearing guides in all three axes



18.11" x 20.08" x 16.54" measuring range (X/Y/Z)



0.001 mm  
0.00001 in



Manual probing movement.

Optional fine adjust device.



Light alloy structure.

Granite measuring table.



Opto-electronic measuring system based on incremental glass scales



0.00001 mm (system)



29.92 in/s  
760 mm/s

### Control panel



Display field 89 x 118 mm with illuminated background



7-decade display (digits) plus sign for the measured values.

icon-driven user's guide



RS-232

Software: TESA Reflex

## General



DCC  
CMM motorized



18.11" x 20.08" x  
16.54" measuring  
range (X/Y/Z)



Motorized  
probing  
movement.  
Optional fine adjust  
device.



Light alloy  
structure.  
Granite  
measuring table.



Opto-electronic  
measuring  
system based on  
incremental glass scales



29.92 in/s  
7.60 mm/s

Software: PC-DMIS

## TESA MICRO-HITE 3D VOCATIONAL TECHNICAL

This version has been specially configured for educational applications in technical schools and universities. The MH3D DCC NS is designed for easy learning of the machine's operation allowing students to find out the many possibilities the machine provides for 3D inspection.

### Specifications

Order Number	<b>03939130</b>
EDP Number	24682
Measuring Range (X/Y/Z)	17.32" x 19.29" x 15.32" (440mm x 490mm x 390mm)
Measuring Speed	13.62 in/sec (1732 mm/sec)
Acceleration	68.19 in/sec <sup>2</sup> (1732 mm/sec <sup>2</sup> )
Max. Part Weight	501.10 lb (227 kg)
Working Temperature Range	68° ± 1° F (20° ± 1° C)
Operating Temperature Range	50° to 95° F (10° to 35° C)
Air Pressure	4.0 bar (57 psi)
Air Supply	21 NL/Min (0.7 scfm)
Accuracy	0.000276" (7.0 µm)
Repeatability	0.000078" (2.0 µm)
Uncertainties	3 + 4L/1000
Uncertainties	0.000137" (3.5 µm)
Electromagnetic Compatibility	✓
System Weight	867.55 lb (393 kg)
Overall Dimensions (LxHxD)	381" x 963.8" x 36.6" (970 mm x 1620 mm x 930 mm)



# TESA MICRO-HITE DCC WITH TESASTAR-M MOTORIZED PROBE HEAD

## ACCURACY AND SPEED THROUGH AUTOMATION

The TESA MICRO-HITE 3D DCC coordinate measuring machine comes equipped with PC-DMIS PRO™ measurement and inspection software. Powerful automated routines combined with the intuitive graphical user interface enable users of all skill levels to perform complex measurements quickly and efficiently. Equipped with the new motorized TESASTAR-m Probe Head for automatic inspection of sophisticated workpieces without the need for operator intervention.

## Specifications

MH3D DCC Motorized	
Machine type	MH3D DCC Motorized
Order number	<b>03939142</b>
EDP number	24683
Displacement	Motorized
Application software	PC-DMIS
Remote control	3
Accuracy	3 µm
Acceleration	1730 mm/s <sup>2</sup>
Velocity	up to 350 mm/s
Display resolution	0.00001 mm
Weight	350 kg / 772 lbs
Overall dimensions (L x H x D)	1160 x 1030 x 2320 mm / 457 x 406 x 914 in
Max. workpiece dimension (X x Y x Z)	580 x 730 x 400 mm / 229 x 288 x 158 in
Warranty	1 year
Maintenance agreement	upon request



## General



DCC  
CMM motorized



17.32" x 19.29" x  
16.32" measuring  
range (X/Y/Z)



Motorized  
probing  
movement.  
Optional fine adjust  
device.



Light alloy  
structure.  
Granite  
measuring table.



Opto-electronic  
measuring  
system based on  
incremental glass scales



13.62 in/s  
17.32 mm/s

Software: Software:  
PC-DMIS



# THE POWER OF TECHNOLOGY

FULL COMPATIBILITY WITH ALL COORDINATE MEASURING MACHINES AND SYSTEMS CURRENTLY AVAILABLE



Each TESASTAR probe head is Swiss made, featuring high-precision mechanics and state-of-the-art electronics. Developed using a high-level of metrology expertise, the TESASTAR-m motorized probe is the newest addition to the full range of advanced TESA probe heads. TESASTAR probes include a wide selection of optional touch probe and styli accessories, as well as a rack configuration for automatic probe exchange

### TESASTAR-m

Motorised probe head controlled by PC-DMIS and TESASTAR-e an electronic controller which serves an interface. The head can be pivoted through  $\pm 180^\circ$  while reaching angles ranging from  $+90^\circ$  to  $-115^\circ$  by increments of  $5^\circ$  at a speed of  $90^\circ$  in 2 seconds. Compatible with extension rods up to 300 mm long.

### TESASTAR-i

High-precision probe head that can be tilted through 168 positions without the need for recalibration. A specially designed indexing capability allows the probe to be repositioned in  $15^\circ$  increments in two coordinate directions. Single-handed release for easy operation.

### TESASTAR

Swivelling probe head fitted with a touch trigger probe.





### TESASTAR-m 03939051

Angular rotation:  
 A +90° to -115° by increments of 5° B 0 to ±180° by increments of 5°  
 Total number of positions: 2952  
 Rotation speed: 90° in 2 seconds  
 Positioning repeatability: 0.5 μm  
 Rotation torque: 0.6 Nm  
 Weight: < 900 g  
 Extension rods: L = >300 mm  
 TESASTAR-p coupling: TESA KINEMATIC JOINT  
 TESASTAR-e interface

**Order No. 03939051**  
**EDP No. 24691**

### TESASTAR-i 03939030

Indexing capability through to 168 positions by increments of 15°  
 Incrementation clearly stated  
 Adjustable trigger force: 0.10N to 0.30N  
 Positioning repeatability: 1.5 μm  
 Unidirectional repeatability: 0.35 μm  
 Probe orientation: A 0 to 90° by increments of 15° (swivelling) B ±180° by increments of 15° (rotation)  
 Locking device fitted with 2 thumb buttons in each coordinate direction  
 Styli with M3 thread, measuring length 21 to 100 mm  
 Coordinate directions: ±X, ±Y, +Z

**Order No. 03939030**  
**EDP No. 29738**

### TESASTAR 03939020

Unidirectional repeatability (2 sigma): 0.75 μm max.  
 Adjustable trigger force: 0.1N to 0.3N  
 Storage temperature range: -30°C to 60°C  
 Operating temperature range: 10°C to 40°C (relative humidity 80 %)  
 Coordinate directions: ±X, ±Y, +Z  
 Probe stylus overtravel: X/Y ± 20°, Z = +6 mm

**Order No. 03939020**  
**EDP No. 29736**

No	EDP		Uni-directional	Positioning		Positions
03939020	29736	TESASTAR (w/o styli)	≤0.75 μm	–	0.1 to 0.3 N	–
03939021	29737	TESASTAR (with styli)	≤0.75 μm	–	0.1 to 0.3 N	–
03939030	29738	TESASTAR-i	≤0.35 μm	≤1.5 μm	0.1 to 0.3 N	168



## TESASTAR-P FOR PROBE HEADS



TESASTAR-p includes a small module integrating a touch probe with force triggered by contact in 5 directions. Fitted with a common M8 threaded connection, this small-sized probe can be fitted to the majority of existing probe heads, whether manually operated or motor driven. There are four variants available, each providing a varying trigger force from 0.05 N to 0.10 N.

Used in automatic exchange mode, TESASTAR-p will be fitted with the TESASTAR M8 kinematic joint prior to be mounted on the TESASTAR-r AUTOCHANGE rack. While substantially reducing the time needed to change the probe stylus within a measurement cycle, this also results in a flexible configuration that eliminates the need for recalibration.

TESA's engineers have carefully designed all components being part of this dedicated programme for 3D measurement – including styli, extensions and accessories. Truly SWISS MADE, each product gives evidence of a consistent family to our customers.



## TOUCH PROBES

### 1. TESASTAR-p Touch Probes

TESASTAR-p LF low force – 0.055N, L = 10 mm  
 TESASTAR-p SF standard force – 0.08N, L = 10 mm  
 TESASTAR-p MF medium force – 0.10N, L = 25 mm  
 TESASTAR-p EF extended force – 0.10N, L = 50 mm  
 Set 4 probes  
 13 mm probe diameter, 26 mm in length  
 M8 coupling thread  
 Repeatability limit (SF version): 0.35 µm  
 Measuring directions: 5

03939070  
 03939071  
 03939072  
 03939073  
 03939074

### 2. TESA Kinematic Joint

TESASTAR M8, 31 mm  
 TESASTAR M8, 140 mm  
 TESASTAR M8, 300 mm

03969365  
 03969366  
 03969367

### 3. Extension Rods with Kinematic Joint (all wiring)

TESASTAR-KJ 50, 50 mm  
 TESASTAR-KJ 100, 100 mm  
 TESASTAR-KJ 200, 200 mm  
 TESASTAR-KJ 300, 300 mm

03969360  
 03969361  
 03969362  
 03969363

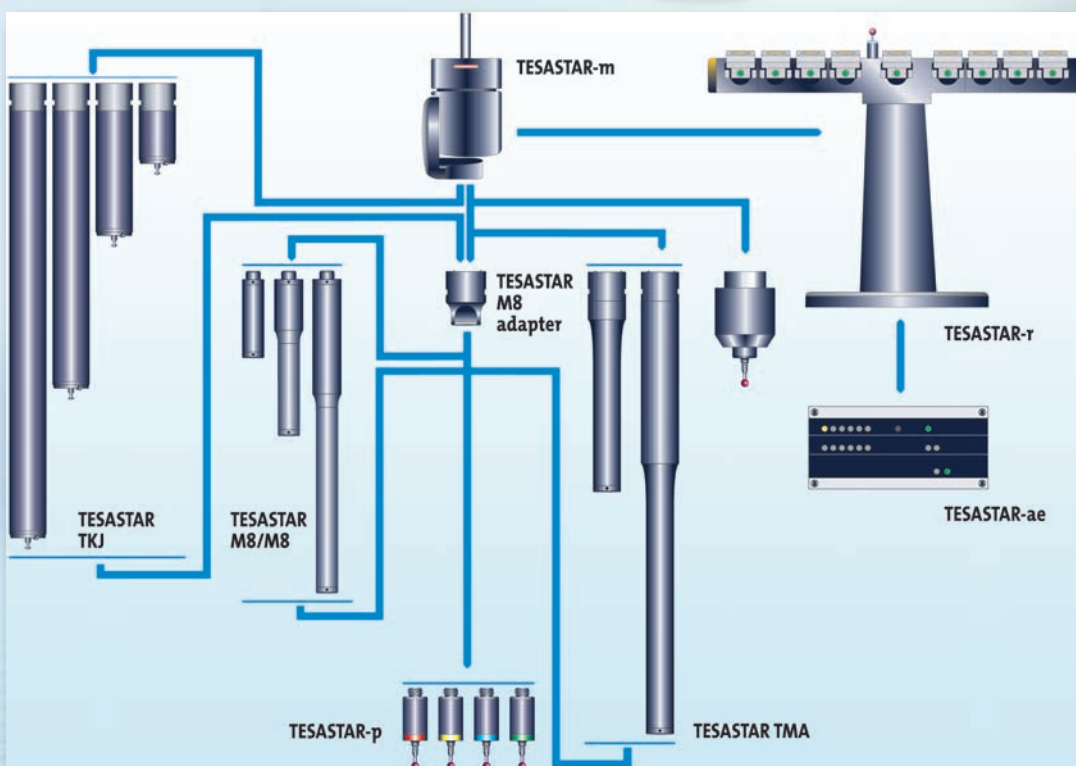
### 4. TESASTAR M8/M8

TESASTAR M8/M8, 50 mm  
 TESASTAR M8/M8, 100 mm  
 TESASTAR M8/M8, 200 mm  
 Kit 3 extensions

03969065  
 03969066  
 03969067  
 03969077

### Probe Styli

- Single item or in Kit
- Ball tip sphericity to ISO 3290, Grade 5
- Ball tip diameter from 0.5 up to 8 mm
- M2 and M3 threads
- Stainless steel and tungsten carbide probe shafts
- Fully compatible
- Swiss Made with certificate of conformity



# THE POWER OF TECHNOLOGY

## ESSENTIAL FOR AUTOMATED MEASUREMENT



### TESASTAR-r automated rack with accessories for coordinate measurement

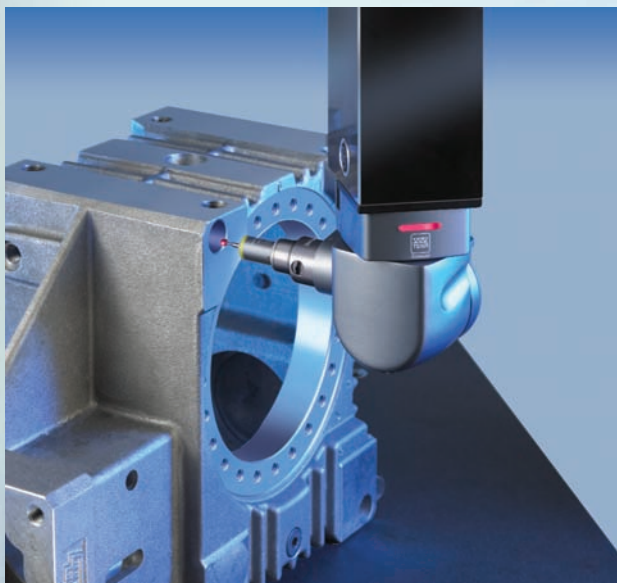
TESASTAR-r is the fruit of the latest advances in technology. This device permits probe styli and other accessories to be quickly changed without the need for the operator to take any action.

Dimensional inspection often requires to change the stylus used for the measurements frequently. As it can be conveniently adapted, this rack with modular design is perfect for any CNC controlled coordinate system.

Interfacing between the machine, TESASTAR-r and the computer is ensured through the electronic controller – i.e. TESASTAR-ae. The enterprise-wide PC-DMIS generates all the functions.

TESASTAR-r is offered in 3 versions, each consisting of 3, 5 or 9 modules. They can be supplied in either of both widths available (40 mm or 65 mm). These three variants allow users to change all existing standard stylus probes. Complementary modules can constantly be added to suit different stylus configurations. TESASTAR-p comes with the rack for system's calibration. This probe can further be used later for the measurement tasks.

Besides its exclusive design, TESASTAR-r is the synthesis of a sum of skills in terms of engineering, the common denominator of a system made up of an infinite number of components that offer quite a lot of possibilities.



### TESASTAR-e or TESASTAR-ae electronic controller

Each unit serves for interfacing all commands – i.e. changing probe and stylus, locking various features, choosing voltage, securing probe head and rack. These electronic controllers have a direct action on the way the movements of the rack and/or the probe head are generated.

The choice of either unit depends on the machines configuration, which may include a motorized probe head alone or coupled with the rack. In the first case, TESASTAR-e will be suited or TESASTAR-ae in the second one.

#### Sales Program

##### TESASTAR-r AUTOCHANGE

TESASTAR-r 3 modules	03939080
TESASTAR-r 5 modules	03939081
TESASTAR-r 9 modules	03939082
Probe holder MH3D DCC	03939083

##### Additional Modules

TESASTAR Active module 40 mm	03939091
TESASTAR Active module 65 mm	03939092

#### Sales Program

Interface TESASTAR-e for motorized probe head	03939100
Set of connecting cables for TESA MH3D DCC	03969104
Set of connecting cables for B&S global	03969118

Interface TESASTAR-ae for motorised probe head and TESASTAR-r	03939102
Set of connecting cables for TESA MH3D DCC	03969100
Set of connecting cables for B&S global	03969117







mm  
A    Ø    L    B    g    Stem

## Styli

### Thread M2, L = 10 mm

Stylus with Ruby Ball Tip Ø 1 mm	03969201	29768	M2	1	10	4.5	0.3	Stainless
Stylus with Ruby Ball Tip Ø 2 mm	03969202	29769	M2	2	10	6.0	0.3	Stainless
Stylus with Ruby Ball Tip Ø 3 mm	03969203	29770	M2	3	10	7.5	0.4	Stainless
Stylus with Ruby Ball Tip Ø 4 mm	03969204	29771	M2	4	10	10	0.5	Stainless
Stylus with Ruby Ball Tip Ø 5 mm	03969205	29772	M2	5	10	10	0.7	Stainless
Stylus with Ruby Ball Tip Ø 6 mm	03969206	29773	M2	6	10	10	1.0	Stainless
Stylus with Ruby Ball Tip Ø 8 mm	03969208	29774	M2	8	10	11	1.5	Stainless

### Thread M2, L = 20 mm

Stylus with Ruby Ball Tip Ø 2 mm	03969212	29775	M2	2	20	14	0.5	Stainless
Stylus with Ruby Ball Tip Ø 3 mm	03969213	29776	M2	3	20	17	0.5	Stainless
Stylus with Ruby Ball Tip Ø 4 mm	03969214	29777	M2	4	20	20.2	0.8	Stainless

### Thread M2

Stylus with Ruby Ball Tip Ø 0.5 mm	03969220	29778	M2	0.5	10	3	0.3	Carbide
Stylus with Ruby Ball Tip Ø 1 mm	03969221	29779	M2	1	20	7	0.6	Carbide
Stylus with Ruby Ball Tip Ø 2 mm	03969222	29780	M2	2	20	15	0.45	Carbide

### Thread M3, L = 21 mm

Stylus with Ruby Ball Tip Ø 1 mm	03969301	29786	M3	1	21	4	1.1	Stainless
Stylus with Ruby Ball Tip Ø 2 mm	03969302	29787	M3	2	21	8	1.1	Stainless
Stylus with Ruby Ball Tip Ø 3 mm	03969303	29788	M3	3	21	12	1.1	Stainless
Stylus with Ruby Ball Tip Ø 4 mm	03969304	29789	M3	4	21	17	1.4	Stainless
Stylus with Ruby Ball Tip Ø 5 mm	03969305	29790	M3	5	21	21	1.55	Stainless

### Thread M3, L = 31 mm

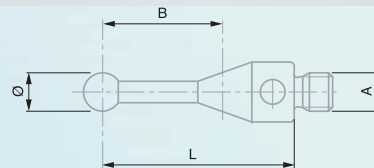
Stylus with Ruby Ball Tip Ø 3 mm	03969333	29795	M3	3	31	22	1.4	Stainless
Stylus with Ruby Ball Tip Ø 4 mm	03969334	29796	M3	4	31	27	2.0	Stainless
Stylus with Ruby Ball Tip Ø 5 mm	03969335	29797	M3	5	31	31	2.5	Stainless

### Thread M3,

Stylus with Ruby Ball Tip Ø 0.5 mm	03969310	29791	M3	0.5	21	3	1.1	Carbide
Stylus with Ruby Ball Tip Ø 2 mm	03969312	29792	M3	2	21	15	0.8	Carbide

### Thread M3,

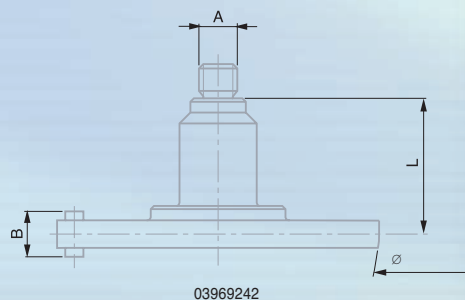
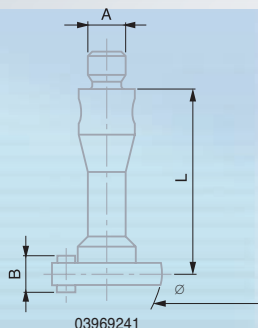
Stylus with Ruby Ball Tip Ø 2 mm	03969322	29793	M3	2	30	22.5	1.3	Carbide
Stylus with Ruby Ball Tip Ø 3 mm	03969323	29794	M3	3	30	22.5	1.4	Carbide

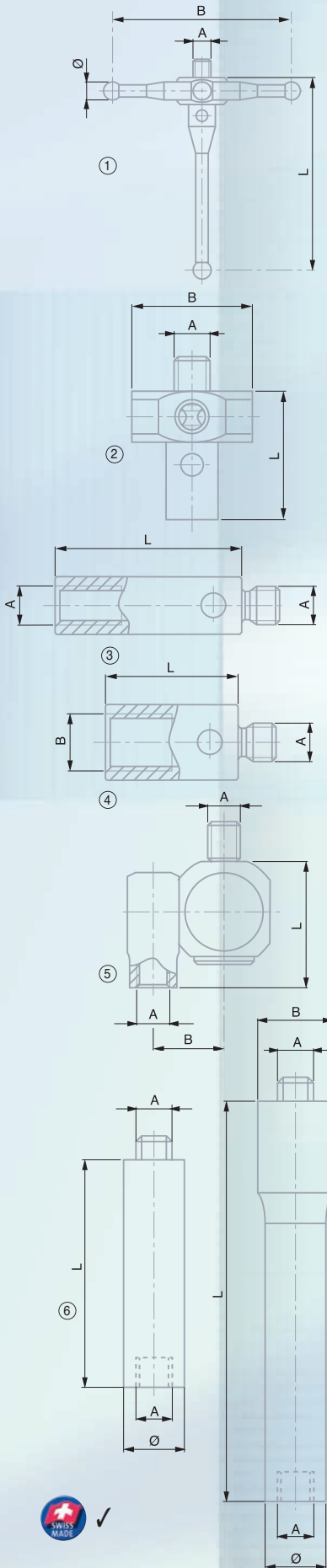


mm  
A    Ø    L    B    g    Stem

### Disc M2

Disc M2, L = 10.0 Ø 6 mm	03969241	29784	M2	6	10	2	0.6	Stainless/Ruby
Disc M2, L = 7.55, Ø 18 mm	03969242	29785	M2	18	7.5	2.5	3.1	Stainless





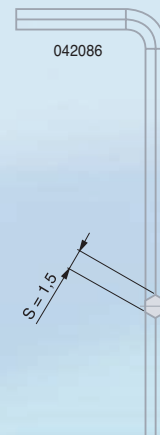
			mm				
			A	Ø	L	B	g Stem
<b>1</b>	<b>Star M2</b>						
	Stylus Star 5 directions M2, B = Ø 2 mm, D = Ø 20 mm	<b>03969055</b>	M2	2	20	20	1.5 Stainless
	Stylus Star 5 directions M2, B = Ø 2 mm, D = Ø 30 mm	<b>03969056</b>	M2	2	20	30	1.8 Stainless
<b>1</b>	<b>Star M3</b>						
	Stylus Star 5 directions M3, Ø 2 mm, B = Ø 20 mm	<b>03969057</b>	M3	2	20	20	2.2 Stainless
	Stylus Star 5 directions M3, Ø 2 mm, B = Ø 30 mm	<b>03969058</b>	M3	2	20	30	2.5 Stainless
<b>2</b>	<b>Brace</b>						
	Brace 5 directions – M2	<b>03969054</b>	M2		7.5	7	1.1 Stainless
	Brace 5 directions – M3	<b>03969046</b>	M3		13	10	3.7 Stainless
<b>3</b>	<b>Extension M2</b>						
	Extension M2, L = 10 mm	<b>03969231</b>	M2		10		0.5 Stainless
	Extension M2, L = 20 mm	<b>03969232</b>	M2		20		1 Stainless
	Extension M2, L = 30 mm	<b>03969233</b>	M2		30		1.6 Stainless
<b>3</b>	<b>Extension M3</b>						
	Extension M3, L = 10 mm	<b>03969044</b>	M3		10		0.8 Stainless
	Extension M3, L = 20 mm	<b>03969045</b>	M3		20		1.8 Stainless
<b>4</b>	<b>Adaptor</b>						
	Adaptor M2→M3	<b>03969061</b>	M2		7	M3	0.5 Stainless
	Adaptor M3→M2	<b>03969062</b>	M3		5	M2	0.5 Stainless
<b>5</b>	<b>Stylus Knuckles</b>						
	Stylus Knuckle M2	<b>03969059</b>	M2		8	4.5	1.7 Stainless
	Stylus Knuckle M3	<b>03969060</b>	M3		12	6	3.8 Stainless
<b>6</b>	<b>Extension MMT</b>						
	Extension M8, L = 50 mm	<b>03969065</b>	M8	13	50		23 Alum/*
	Extension M8, L = 100 mm	<b>03969066</b>	M8	13	100	18	55 Alum/*
	Extension M8, L = 200 mm	<b>03969067</b>	M8	13	200	18	85 Alum/*

\* Carbide available upon request

<b>Accessories</b>		
Stylus Tool M2-M3	<b>047866</b>	
Hex Key, 1.5 mm	<b>042086</b>	



047866



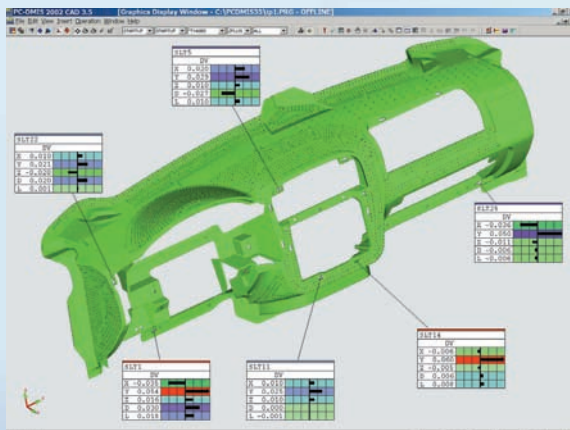
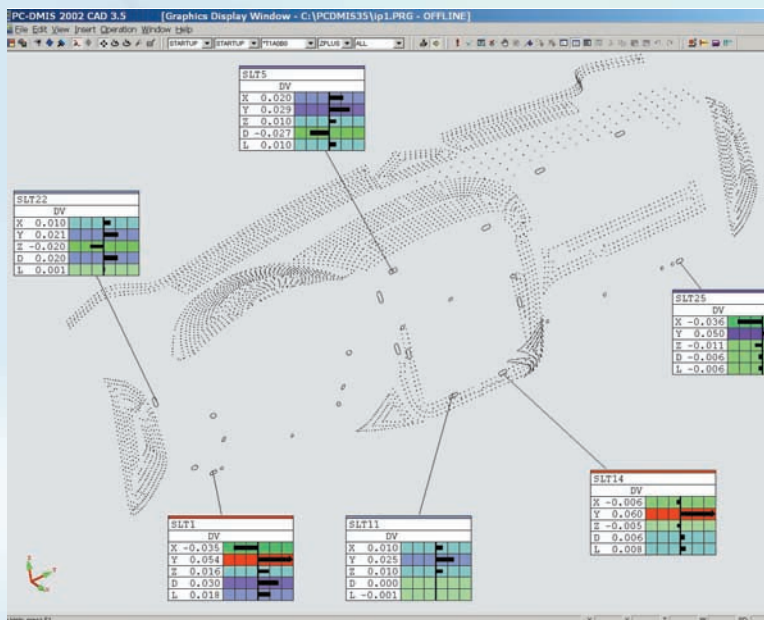
042086

			A
<b>KIT 03969063</b>			
Stylus with Ruby Ball Ø 1 mm	<b>03969201</b>	M2	
Stylus with Ruby Ball Ø 2 mm	<b>03969202</b>	M2	
Stylus with Ruby Ball Ø 3 mm	<b>03969203</b>	M2	
Stylus with Ruby Ball Ø 2 mm	<b>03969212</b>	M2	
Stylus with Ruby Ball Ø 3 mm	<b>03969213</b>	M2	
Disc M2, L = 10, Ø 6 mm	<b>03969241</b>	M2	
Disc M2, L = 7.5, Ø 18 mm	<b>03969242</b>	M2	
Stylus Star 5 directions M2, Ø 2 mm, B = Ø 30 mm	<b>03969056</b>	M2	
Extension M2, L = 10 mm	<b>03969231</b>	M2	
Knuckle M2	<b>03969059</b>	M2	
Stylus Tool M2-M3	<b>047866</b>		
Hex Key, 1,5 mm	<b>042086</b>		
Case	<b>03969064</b>		

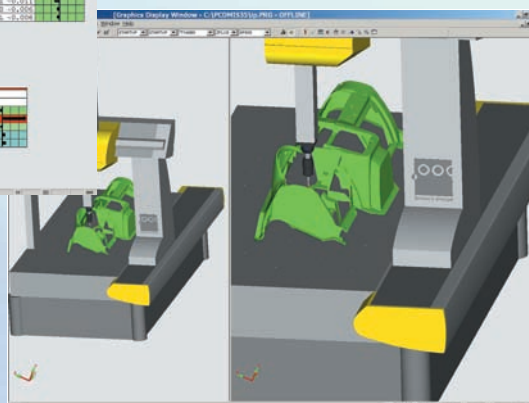


## Software

With Brown & Sharpe measurement and inspection software, you can measure everything from simple prismatic parts to complex, contoured surfaces with speed, efficiency and accuracy. PC-DMIS®, QUINDOS®, PRO-MEASURE™, and REFLEX® software suites each offer features to meet specific inspection application requirements.

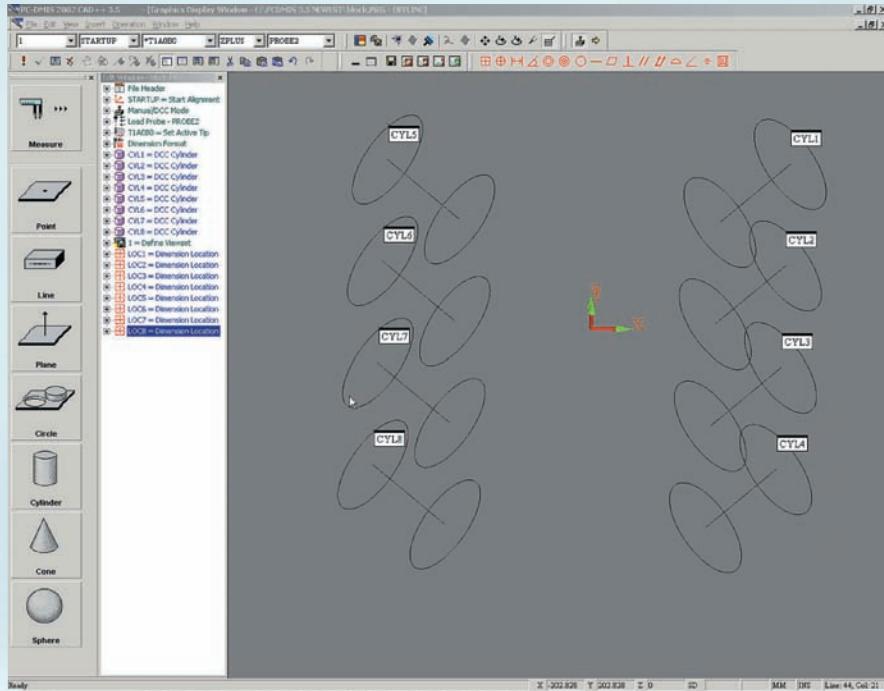


pc·dmis<sup>®</sup>  
**pro**



pc·dmis<sup>®</sup>  
**cad**

pc·dmis<sup>®</sup>  
**cad++**



## PC-DMIS™ Pro®

### Fast, Efficient Inspection

**Quick Start routines**—Fast access to probe qualifications, part alignments and hyper reporting functions

**Iconized tool bars**—Modify or delete to streamline and simplify commands

**Full programming environment**—Use advanced command selections to create a solution for any programming task

### Wizards make tough jobs easy

3-2-1 (Plane/Line/Point) alignment and two-circle (Plane/Circle/Circle) alignment

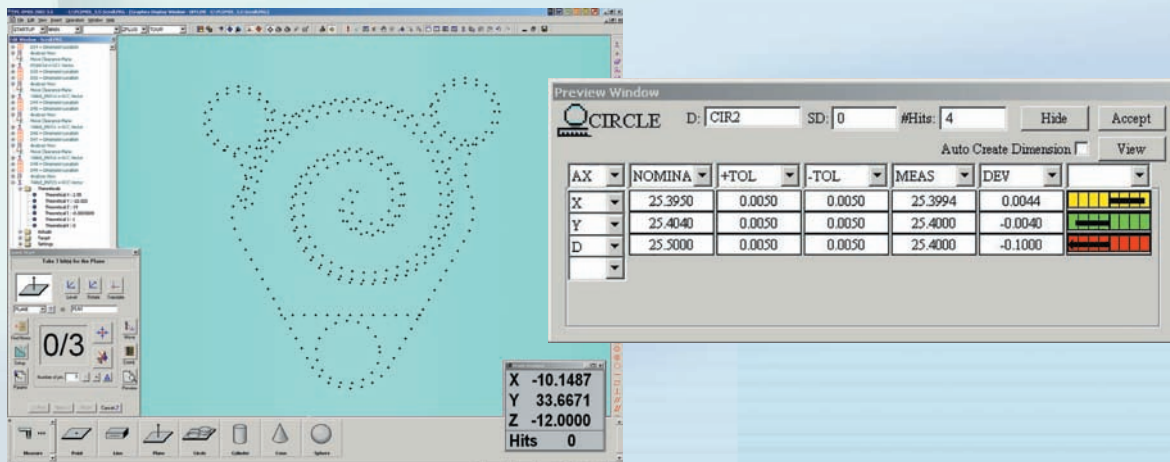
Export part program files as DMIS files

Define and calibrate a probe

Create an interactive alignment

Loop the part program indefinitely or a specified number of times

**Support for more than 10,000 inspection routines**

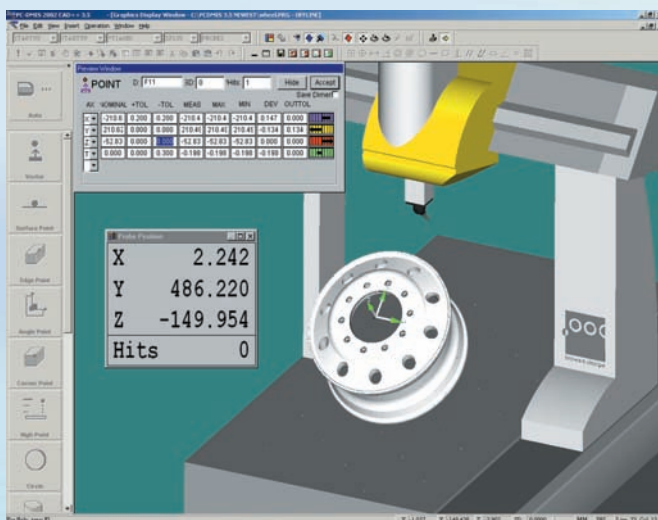
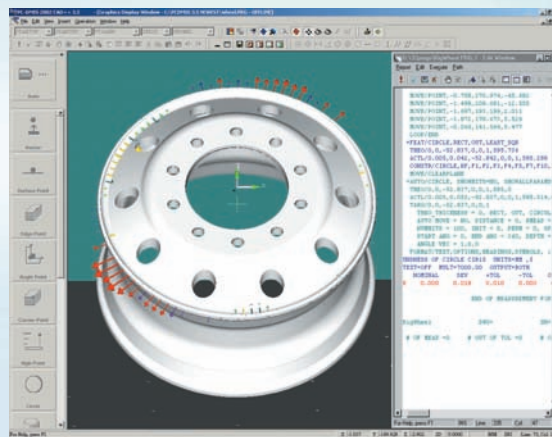
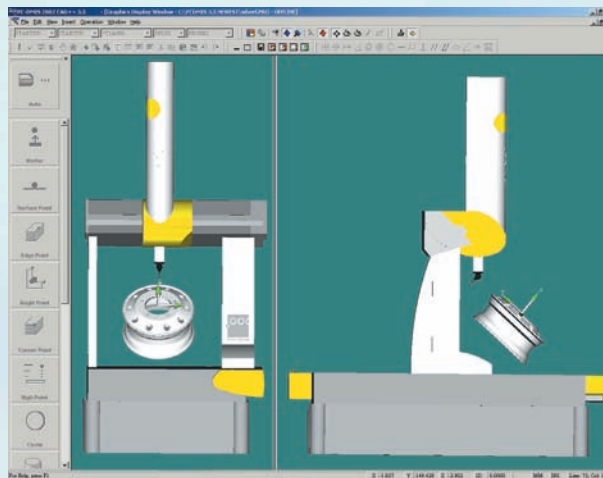


## PC-DMIS CAD

PC-DMIS CAD lets you use the power of 3D CAD data to create part programs, both on and off-line, complete with graphical part models and probe path simulations. Using the powerful PC-DMIS CAD graphical environment, you can create simulations to find and correct program errors before they are downloaded to the shop floor.

Full 3D animation capability lets you include elements such as digitized images of parts and fixtures on the machine so that you can visually verify the setup and program prior to actual part inspection. Plus, you can insert visual tutorials to help operators understand particularly complex jobs.

PC-DMIS CAD also lets you fully document unknown parts and generate computer models for reverse engineering applications.



### Specialized Graphics Functions

**Improved graphics engine** – Manipulates large CAD files (200MB+) with ease and efficiency

**Dynamic alignment guide** – Graphically guides you to a metrologically stable alignment system using its unique Floating Coordinate Trihedron™ (FCT)

**Mirror CAD™** – Dynamically reorients CAD axes to reflect the relationship between the model and the part

**Layer Create™** – Creates your own CAD layers within PC-DMIS from an imported model, allowing you to work only on the geometry of interest

**Edit CAD™** – Deletes extraneous CAD elements or changes their fundamental characteristics such as names or colors

**Make CAD 3D™** – Manipulates 2D CAD drawings three dimensionally

Full control over open GL graphics settings for maximizing performance

**Display/Animate probe path** – Lets you view the actual path the probe will follow during part measurement

**Full kinematic machine modeling** – Enhances part program animation

**Switchable body line axis grid** – Rapidly identifies inspection areas on the model



## Special Sheet Metal Tools

**Find Hole** – Controls the machine to search in one of several available patterns in an area around the theoretical center of a hole

**Auto PH10** – Calculates the most suitable PH10 angle for measurement based on the theoretical location and vector of a feature. Automatically rotates to this angle to achieve measurement

Special Sheet Metal Measurement

Routines include:

- Square Slot
- Round Slot
- Notch
- Edge Point
- High Point
- Angle Point
- Corner Point
- Surface Point
- Ellipse
- Circle
- Cylinder

## Extended Sheet Metal options

Allows custom vector direction definition and reporting using separate punch and pin vectors

Perform 2D and 3D best fits using Least Squares, Vector, or Min/Max techniques. Control the directional and translational degrees of freedom

Scan for reverse engineering or surface analysis using the following powerful scan types:

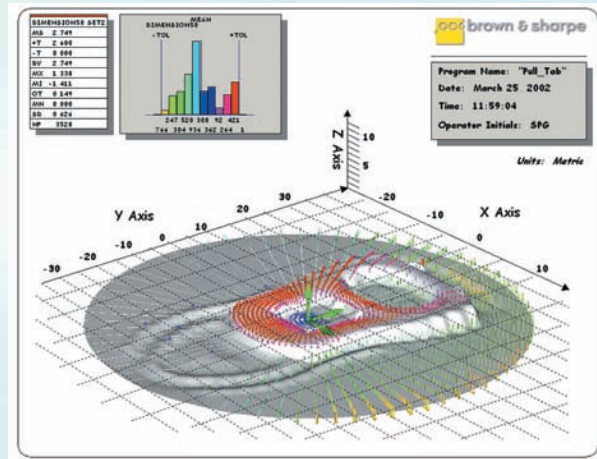
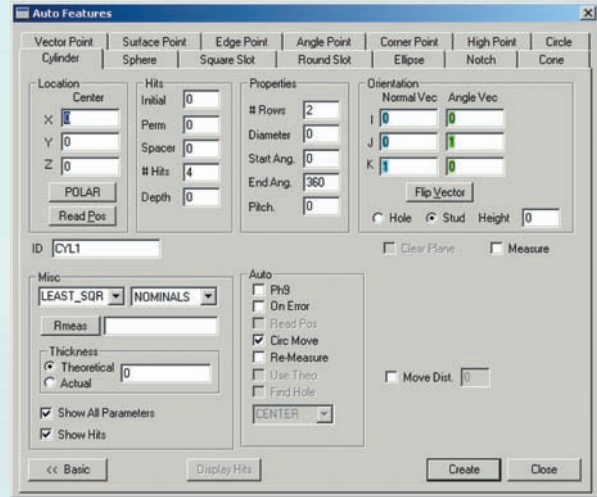
- Linear Open
- Linear Closed
- Patch
- Section
- Perimeter
- Rotary
- UV
- Edge Point Scan
- Surface Point Scan
- Vector Point Scan

## PC-DMIS CAD ++

*PC-DMIS CAD ++ is an ideal tool for model making, die adjustment, process troubleshooting, and failure analysis.*

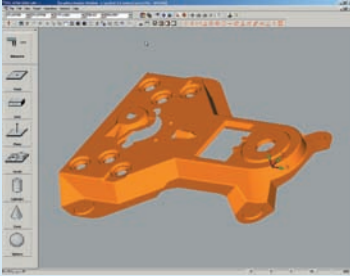
*It incorporates a scanning function that allows you to accurately measure complex shapes such as turbine blades, dies, models, sheet metal components and other curved shapes quickly and efficiently. A wide variety of scan features create scan patterns on the surface of a part, a valuable tool for checking dimensions of mating part surfaces. Just point and click on the graphical representation of the part to select the area you want to scan. The software automatically extracts nominal values and correct vectors from the mathematical definition of the surface of the part from the CAD model. With manual CMMs the program graphically directs the operator to the correct locations on the part. The software then calculates the difference between where measured points are located and where they should be along a vector of deviation.*

*PC-DMIS CAD ++ also includes a complete suite of measurement routines that make the inspection of thin-walled (sheet metal, plastics, glass, pipes, etc.) parts faster and easier. These routines include automatic feature search, real time 3D probe compensation and the ability to sample the location and orientation of the surface to automatically compensate for part variability.*

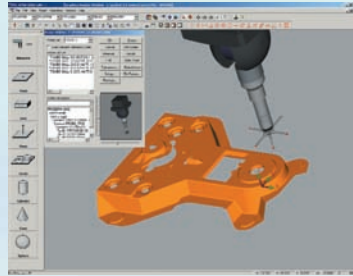


## Use CAD data to drive your CMM

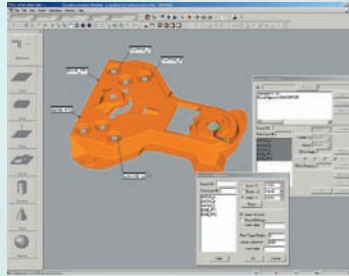
- 1** Download part model from any CAD system.



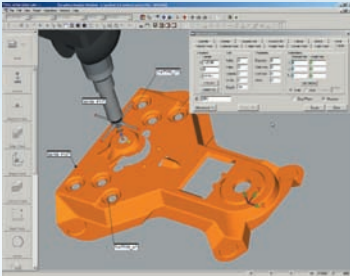
- 2** Select your probe/head configuration graphically.



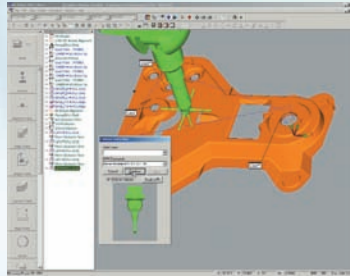
- 3** Align your part automatically using the CAD database.



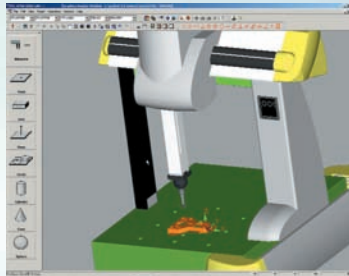
- 4** Click on any surface/feature of the model and automatically create a DCC part program.



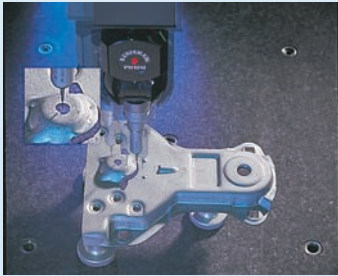
- 5** Use the animated probe simulation to verify and/or debug DCC inspection programs off-line.



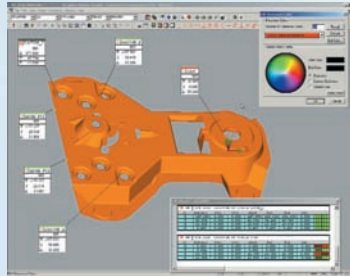
- 6** Use full CMM animation to detect collisions automatically.



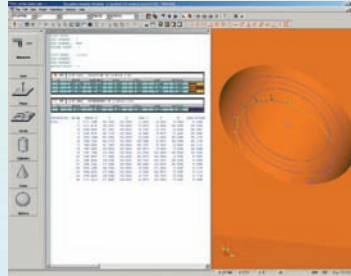
- 7** Display the inspection results on the graphical representation of the part.



- 8** Display the inspection results on the graphical representation of the part.

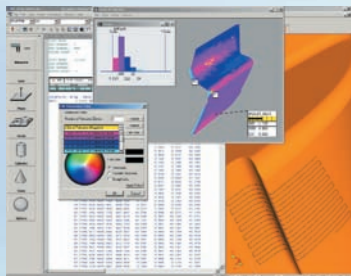


- 9** Diagnose dimensional deviations graphically.

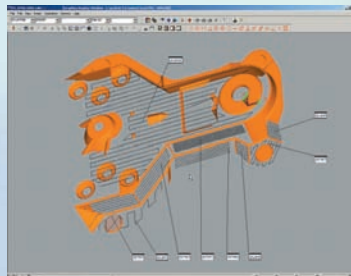


*To verify and/or update your CAD database, PC-DMIS uploads the inspection results directly to the CAD system via its unique bi-directional IGES link.*

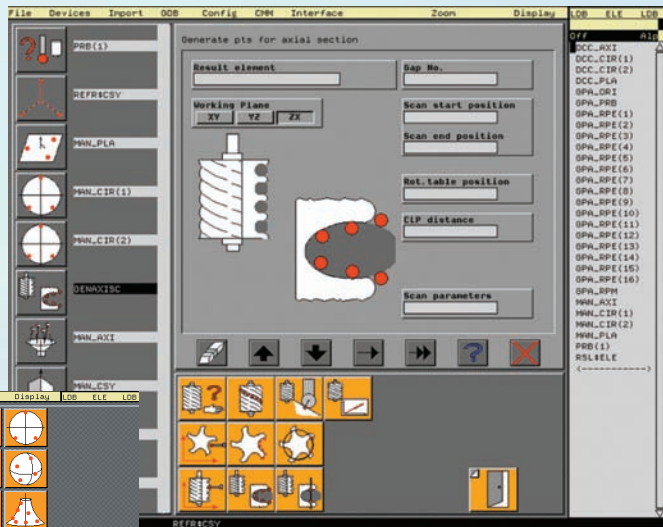
- 10** CAD equals part.



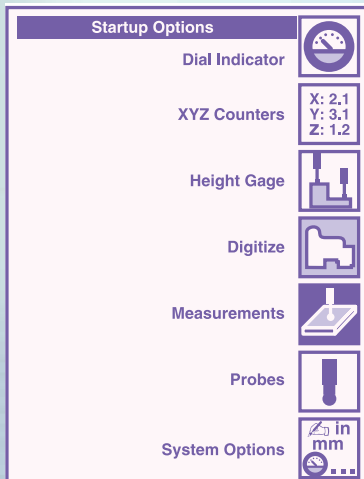
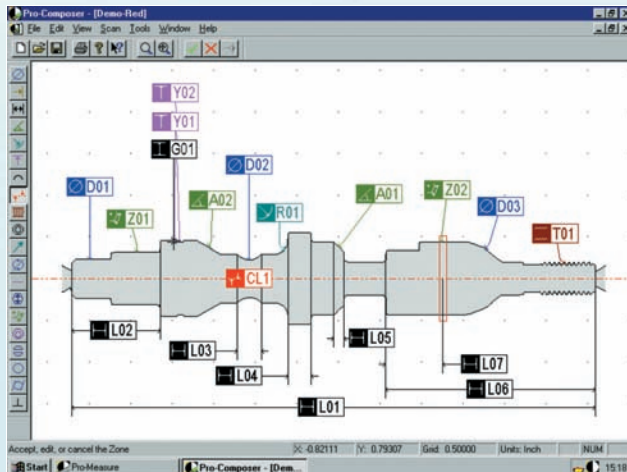
- 11** Reverse the design.



QUINDOS® features point-and-click feature-based measurement capability, intuitive program editing, and can be used effectively by operators of all skill levels. QUINDOS offers more than 60 optional applications modules for complex surfaces such as scroll compressors, threads, gears and airfoil shapes, making it one of the most flexible, yet customizable, software packages.



PRO-MEASURE™ is a powerful measurement and inspection software developed exclusively for the PROFILE line of round parts inspection machines. PRO-COMPOSER™, a module of PRO-MEASURE, uses a graphic representation of the part to aid part programming.



REFLEX® software allows the GAGE 2000 to operate as a caliper, dial indicator, height gage or coordinate measuring machine. During the measurement routine, REFLEX software recognizes and draws the part feature on a 1/4 VGA monitor, automatically compares its dimensions to nominal, and indicates its conformance to tolerance requirements.



All Brown & Sharpe CMM software is certified by Physikalisch-Technische Bundesanstalt (PTB) as having the highest algorithmic precision.

