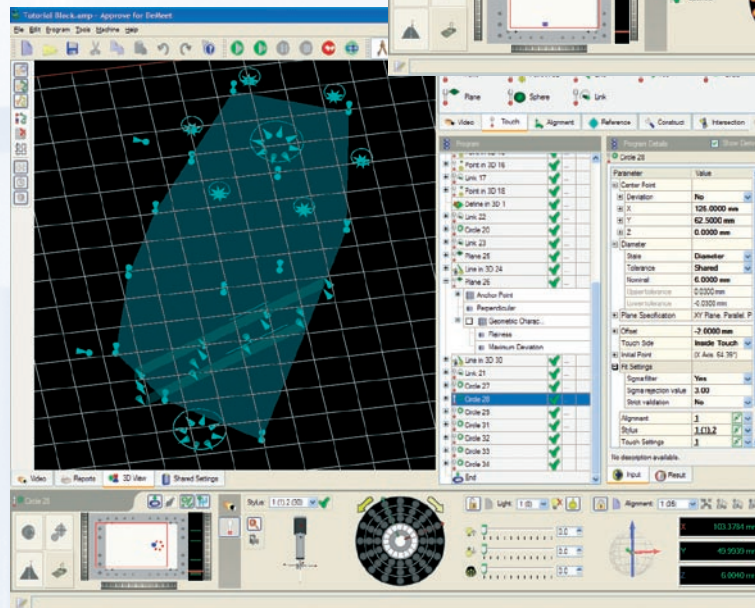
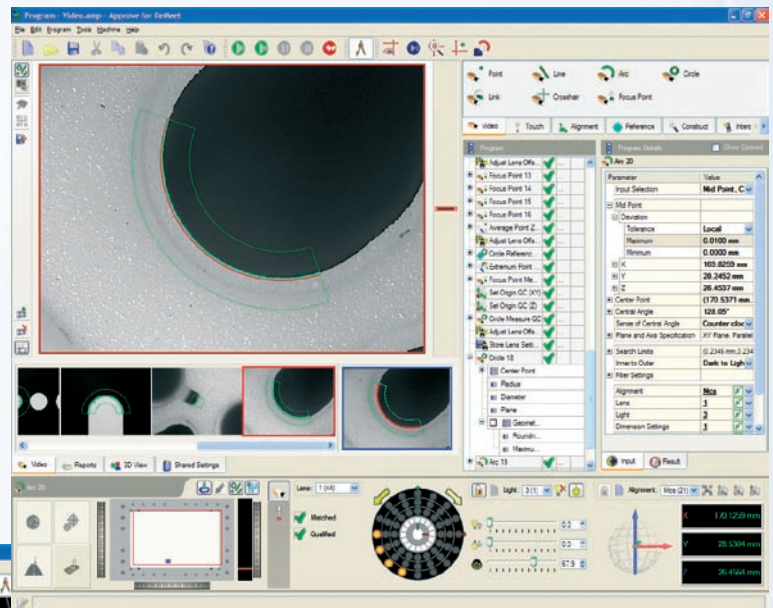


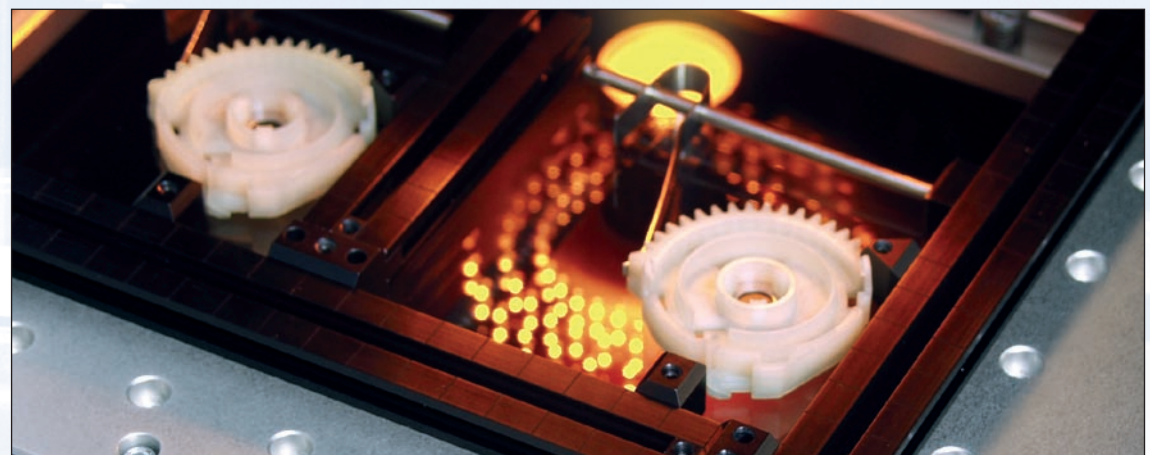
Approve for DeMeet is a true multi-sensor software package. It has been developed from the ground up, keeping the differences between the inputs of similar measurements, performed with different measuring devices, to just the necessary differences. The currently available measuring devices are video and touch probe. All the measuring results of video and touch probe can be displayed, reported, exported and used in constructs together, and are dynamically updated.

**Approve
for DeMeet
multi-sensor
software**



The measuring results can also be viewed together in a 3D view.

Approve for DeMeet is designed to be a user-friendly software package, but still is flexible and very elaborate to measure many products. High accurate measurements in 2D and/or 3D can be done for all kinds of industries like precision mechanics, medical, plastics or electronics to improve quality control.

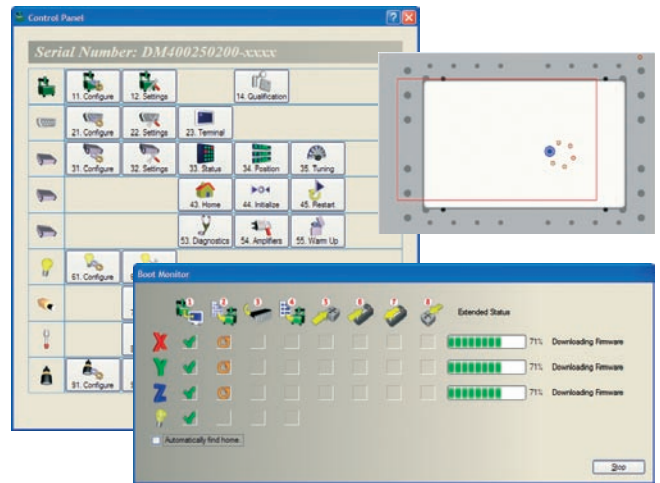


3D Movements

The 3D motor controller in *Approve for DeMeet* makes blended, curved, smooth moves for all measuring devices (including video). This will not only make the DeMeet run more fluently and faster, but also improves measuring accuracy. All movements and measuring results are corrected using an advanced 3D correction model.

The DeMeet will also move during video image processing and other calculations. This means the DeMeet will start with the next measurement, while calculations for the previous measurement are still running in the background. This parallel principle will shorten the measuring time considerably. The grabbed images are shown in an image history buffer underneath the main video image.

An approach direction and distance can be set for video measurements. Pretouch and average touch can be set for touch measurements. This is both to eliminate any possible remaining hysteresis and therefore improving accuracy.

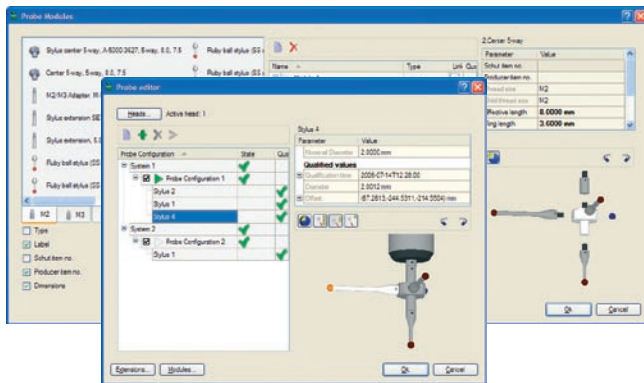


Important to know for current DeMeet users is that this does not require any DeMeet hardware upgrades.

Measurements

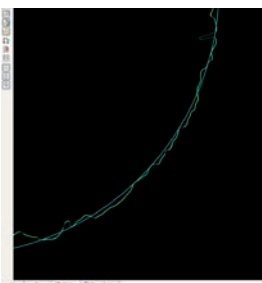
For touch probe measurements automatic start and clearance movements can be defined for a program step. This means for instance that a measuring program requires only one program step to measure a circle. This greatly reduces the complexity of a measuring program.

The graphical touch probe configuration editor allows for building a custom configuration for a specific measurement by using an extensive touch probe library.



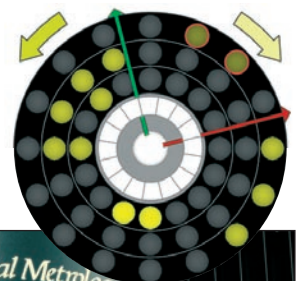
For video measurements our proprietary image processing algorithms were developed, which are completely different from algorithms used by other competing products and our previous software. The edge find algorithm finds complete curves instead of separate points. The interpolation of the pixels is virtually infinite and very accurate. Of course this is limited by the information in the image (number of pixels and pixel size) and the floating-point calculation limitations of the computer, but this is well within the resolution of a DeMeet.

A higher lens magnification will result in a more detailed curve, but with the new algorithms an even lower magnification will give sufficient accuracy. The advantage of a lower magnification for measurements is that it usually needs fewer images and therefore has a shorter measuring time.



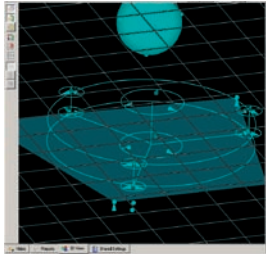
Video targets larger than one field of view can be measured in one program step, and will be automatically split into more images and combined together for the fitted result. The camera angle correction makes the combination of results of the separate images very accurate. The lights for video measurements can be set and changed using a graphical control for backlight, coaxial light and ring light.

For touch measurement it is normal that the targets are defined in 3D, but now this is also the case for video measurements. This is unique for *Approve for DeMeet*. Features (like a circle) can be measured properly even if they are not parallel to the camera. The actual 3D target for circle will appear as an ellipse, but is actually a circle on a slope.



Measuring Program

A measuring program in *Approve for DeMeet* is a real graphical program consisting of simple program steps. Program steps can be changed, added, copied, moved and removed very easily.



The inputs of a program step can be easily changed or linked to other results by using drag-and-drop. Certain settings in the input have detailed editors in the bottom bar (lights, alignments and measuring devices). These settings and others (movement settings, tolerances, etc.) can be shared between program steps. This allows the use of as many or as little of these settings as the user requires. The input target of a measuring program step can also be set by teach-in functionality.

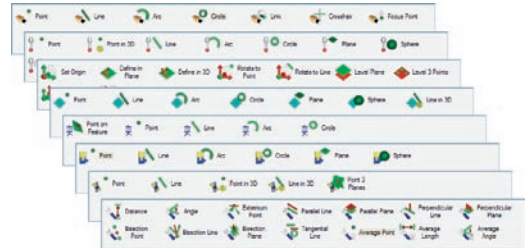
Besides normally running a whole program it is also possible to run it step by step to verify the measuring program. Just running one program step is also an easy feature while making the measuring program. After running a program step an icon will appear behind it to indicate its status.

The number of types of program steps in *Approve for DeMeet* will be expanded continuously. Program steps will be added when (new) requirements become apparent for our customers or on request of customers. The following program steps are currently available:

- Video: Point, Line, Arc, Circle, Link, Crosshair (manual), Focus Point
- Touch: Point, Line, Arc, Circle, Point in 3D, Plane, Cylinder, Cone, Sphere, Link
- Alignment: Set Origin, Define in Plane, Define in 3D, Rotate to Point, Rotate to Line, Level Plane, Level 3 Points, Set, Reset
- Reference: Point, Line, Arc, Circle, Line in 3D, Plane, Cylinder, Cone, Sphere
- Construct: Distance, Angle, Parallel Line, Parallel Plane,

Perpendicular Line, Perpendicular Plane, Bisection Point, Bisection Line, Bisection Plane, Tangential Line, Extremum Point,

- Average Point, Average Length, Average Angle
- Intersection: Point, Line, Point in 3D, Line in 3D, Point 3 Planes
- Projection: Point, Line, Arc, Circle, Point on Feature
- Fit: Point, Line, Arc, Circle, Plane, Sphere
- Others: Block, User Dialog
- Batch: Program Call



The following geometrical properties are currently available in *Approve for DeMeet*:

- Line: Begin Point, Mid Point, End Point, Length, Plane, Straightness, Maximum Deviation
- Arc: Begin Point, Mid Point, End Point, Center Point, Radius, Diameter, Central Angle, Plane
- Circle: Center Point, Radius, Diameter, Plane, Roundness, Maximum Deviation, Least Squares, Maximum Inscribed, Minimum Circumscribed
- Plane: Anchor Point, Perpendicular, Flatness, Maximum Deviation
- Cylinder: Bottom Center Point, Top Center Point, Radius, Diameter, Length, Direction, Cylindricity, Maximum Deviation
- Cone: Bottom Center Point, Top Center Point, Bottom Radius, Bottom Diameter, Top Radius, Top Diameter, Length, Apex Angle, Direction
- Sphere: Center Point, Radius, Diameter
- Angle: Angles in Planes
- Distance: Distances along Axes, Minimum Distances along Axes, Maximum Distances along Axes

Live Video Image

Video Target

Video Measurement History

Video, Reports, 3D View, Shared Settings

CMM Control

Measuring Devices

Light Controls

Alignment

Program Step Gallery

Measuring Program

Program Step Parameters

Input & Result

CMM Position

Results, Report and Export

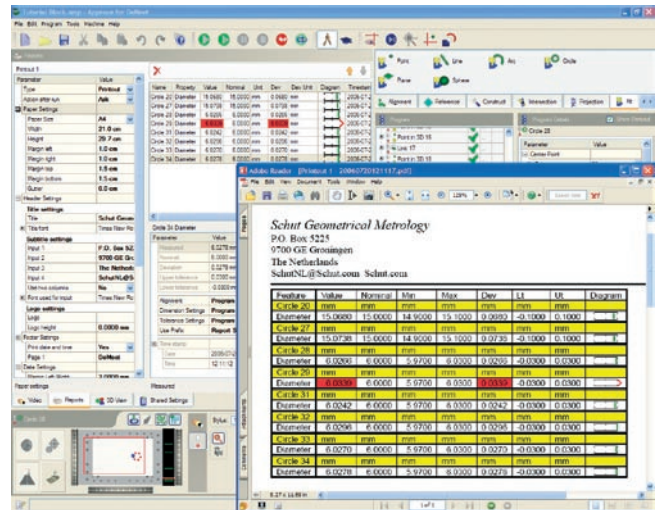
All results, from measurements and calculations (constructs, fits, etc.) as well as from other program steps, can be added to an export or a report by drag-and-drop, or by copy and paste. There is hardly any difference between an export and a report except for layout properties and file settings, therefore the term report is used for all data output in general. It is also possible to convert an export to a report and vice versa. An export can be either to a PDF file or a CSV file. A report will also use the PDF printing capabilities. The CSV file can also be used to export the data to *Approve DataManager* for statistical analysis. The necessary preparations have been made to build in traceability functionality.

Per report a clear list shows which results are added to the report. For every result a graphical bar indicator is shown when tolerances are being used. For every result in the report the parameters can be changed to customize the report if necessary. For instance the units and the tolerances can be changed. A result can also be in the report more than once, for example to show the same result in different units.

The number of reports in one measuring program is not limited. This allows reports to use the same result

with different tolerances, units or even alignments. The tolerances can be set per result or shared with other results.

Reports can be automatically printed and/or exported at the end of measuring program run. It is also possible to require a user to confirm the action or it can also be done manually at later time.



Software Modules

Approve for DeMeet consists of several modules. The following modules are currently available:

- Base module (constructs, reporting, export, tolerances, dimension units, etc.)
- Video measurement module
- Touch probe measurement module
- Batch measurement module

Later on other modules will be available, for example: advanced reporting module, advanced tolerance



module and statistics module, export modules for different file formats, laser measurement module, zoom lens module, 3D video focus module, CAD import and export modules, import modules for other file formats and inline script module for custom calculations.

High Standard of Development

Approve for DeMeet is developed completely in C++ conforming to the C++ ANSI/ISO standard as closely as possible, and using OpenGL and an object oriented design with event driven technology. This results in

a dynamically updated user interface, where everything works together. Preparations were made and are ongoing to run natively on 64 bit Windows and on Linux (32 bit and 64 bit).

Technical Specifications

General configuration remarks	No on-board shared VGA, no PCI-e on AMD systems
Recommended configuration	>3 GHz, P4+Intel chipset, or AMD+VIA KTx00 chipset, 1 GB RAM, VGA 128 MB, monitor 19" flat screen
Operating system	Windows 2000/XP-pro

Specifications are subject to change without prior notice. For more specifications refer to our website Schut.com.



ISO 9001

Schut Geometrische Meettechniek bv
Schut Geometrical Metrology
 Duinkerkenstraat 21, 9723 BN Groningen
 P.O. Box 5225, 9700 GE Groningen
 The Netherlands
 Tel: +31 (0)50 5 877 877
 Fax: +31 (0)50 5 877 899
 E-mail: SchutNL@Schut.com