MCG

General

The diagnostics machine checking gauge (MCG) screen is designed such to permit a machine performance check using the Renishaw MCG product to take place.

The MCG should normally be used only after acquisition, calculation and application of the error map. Its first use is usually to find the CMM axis squareness errors. After these have been added to the error map corrections, a second MCG check can confirm the accuracy of the CMM system with the map and squareness corrections active.

The screen shown below has two areas; these are the MCG set-up options and results areas.

MCG set up options

The machine set up options screen permits all necessary configuration aspects to be entered allowing the MCG test to be performed.

Perform MCG

This button commences the MCG performance test routine, all necessary set-up parameters must be completed prior to clicking on this button.

Import MCG data

This button permits previously stored MCG data files to be accessed and displayed within the MCG results screen.

Arm length

The six standard MCG arms lengths that are available in the MCG product range are listed in this option box. The appropriate arm length for the test to take place must be selected.

Number of runs
In this option box it is possible to select the number of runs for the MCG to complete and then be used for data analysis by the software.

Elevation angles
The value entered in this box is positive and negative elevation angle about the arm horizontal used by the MCG routine.

Speeds
Under some conditions it may be necessary to reduce machine speeds to allow the MCG test to be performed without inducing an illegal trigger when the machine is moving between points.
When the diagnostic MCG screen is started the current default machine operating speeds will be placed into these fields.
These input boxes will permit the speeds for the machine to be changed but the speeds cannot exceed the configuration maximum speeds set in the machine configuration file.

Save data
The default for this field is asserted, this ensures that a data file will be generated each time the MCG is run. At the end of each test the user will be prompted to enter a file name to store the results within.
It is possible to run the MCG without a file being created by deselecting this box. If this is the case then it is not possible to save the MCG run data after the MCG run.

Inhibit between points
The default for this field is unasserted, which leaves the probe active during the whole process of the MCG data capture.
During some tests, if illegal triggers are experienced during the machine positioning moves then it is possible to inhibit the probe during these moves by asserting this field.
NOTE: The inhibit between points button inhibits the trigger signal from the probe fitted to the quill of the CMM. During the period of time that this button is activated the probe will not register trigger events, except when it is performing a measure move.

Probe offsets
These probe offsets are the position of the stylus ball with respect to the tip 0.
These offsets permit the probe to be compensated correctly with the error map active.

Diagnostics
Results
Within the results screen area there are seven different results windows, these are listed below.
Sphere info

There are four fields listed in this results window these are:
☐ The X position of the calculated MCG sphere from the measured MCG pivot.
☐ The Y position of the calculated MCG sphere from the measured MCG pivot.
☐ The Z position of the calculated MCG sphere from the measured MCG pivot.
☐ The measured MCG arm radius.

Span
The form of the sphere calculated from the 24 points taken for each MCG run is displayed here.

Squareness
Using the MCG it is possible to calculate the remnant machine squareness errors, after map and skew compensation, using an embedded algorithm within the software.
For machine squareness figures to be calculated it is recommended that the MCG test should use settings of 45 degrees of elevation and 1 run.
The squareness figures can be displayed in radians / arc-seconds or mm/mm using the button located within the squareness box.
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Pivot drift
The pivot drift is the calculated 3D radial drift of the pivot sphere measured at the end of the run with respect to the measured pivot sphere at the start of the MCG run.

Maximum repeatability
This field will only be generated if more than 1 run is used for the MCG test.
The value specified in this field is the maximum span of measured arm lengths at each of the arm orientations measured by the MCG.

Volumetric measuring performance
This field contains the volumetric measuring performance figure for the MCG test, this figure is the form of the sphere calculated from all of the points taken (24 for 1 run, 48 for 2 runs or 72 for 3 runs) for the MCG routine.

Excel graph program
MSS will also provide you with an excel program that was produced by Renishaw to allow you to track the history of the volumetric checks that can be used to extend the calibration cycle of your CMM. For more details contact our calibration specialists at MSS.
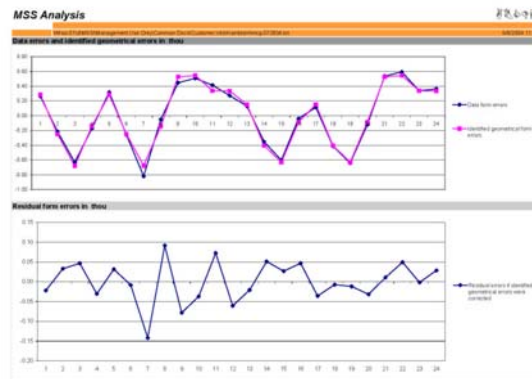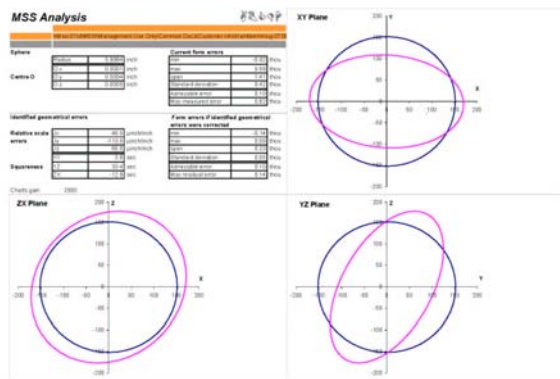
Video of MCG (Machine Checking Gage) http://www.youtube.com/watch?v=zt8MEQNLHyw

ALL MSS CMM's and retrofitted CMM's comes with the capabilities listed above, WITHOUT any additional charges or fees.

Make sure to ask your OEM for the above access when purchasing any CMM or retrofit.

Website: www.mss-i.com Phone: 317-485-6744

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