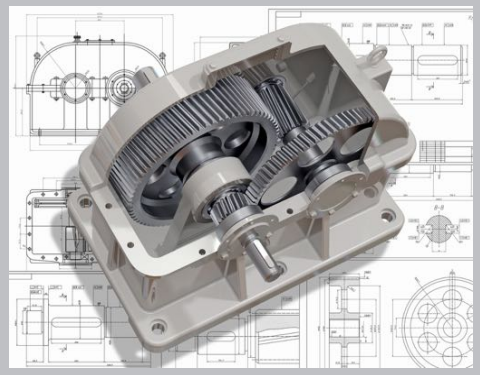
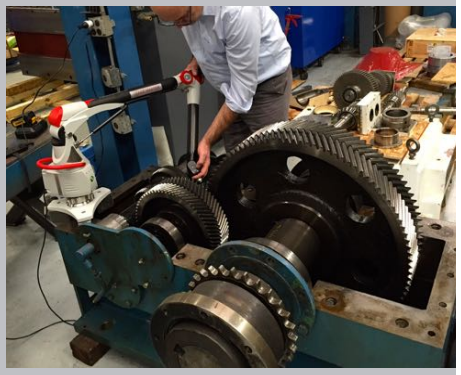
Inspection of Gearbox Housings

Gears and Gearbox Housings go hand in hand - and so do we…







The GageMaster allows not only to check gears. You can even inspect and evaluate all 3 dimensional forms and shapes, e.g. a gearbox housing.

To better explain how to check gearboxes we prepared a tiny aluminium model handy enough to carry it for demos and for training purpose.

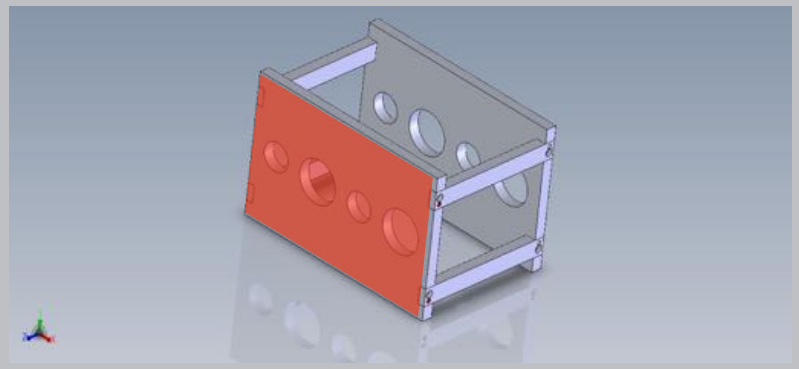
It has four bores on each side plane and one on the front side.

With these it is possible to simulate all measurements and evaluations typically requested on a gearbox.

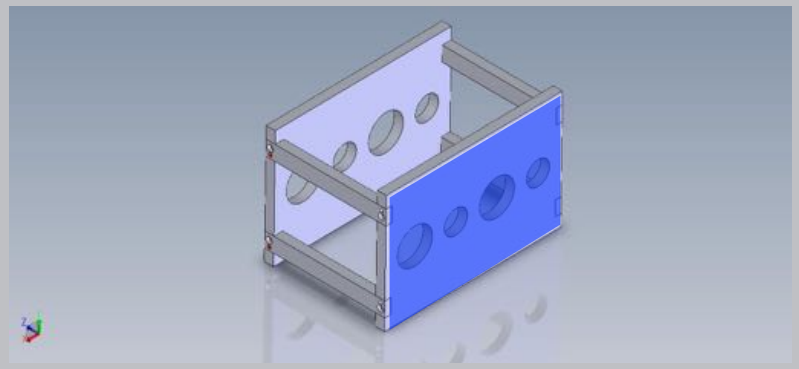
To start the measurement we need to create a workpiece coordinate system first.

To do this both side planes of the housing are measured.

Measurement of the left hand plane



Measurement of the right hand plane

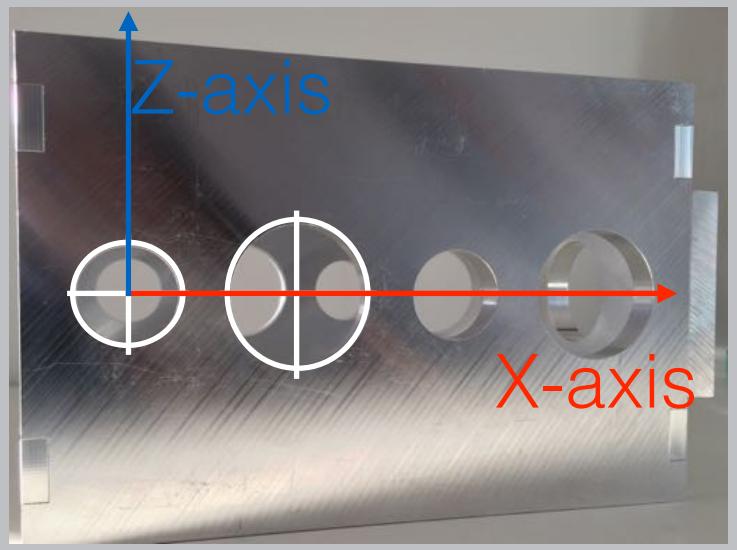


Next step is to look for the datum reference of the workpiece. It is usually given on the workpiece drawing.

In our case the datum is the left hand bore on which all other dimensions shall refer.

The X axis shall be the center line of our bores starting at the left hand bore.

The Z-axis also starts at the center of this bore.

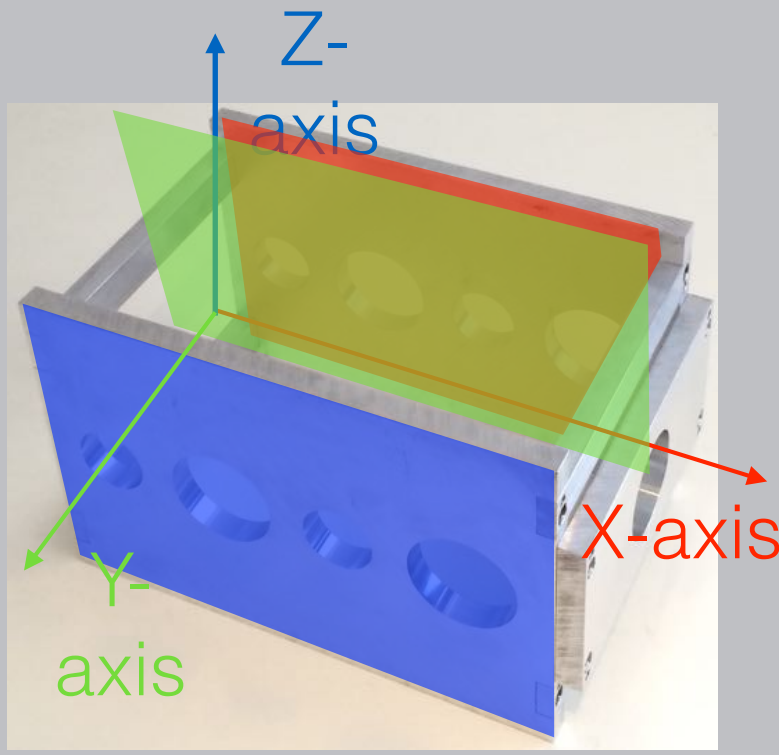


To create a very accurate coordinate system, the start of our Y coordinate should be the middle position of our side planes.

For this the software allows to create a symmetry plane fixing the zero of the Y-axis precisely where is should be.

The coordinate system is finished.

Finally the remaining side bores and the front plane and bore are measured. The complete measuring procedure takes hardly 10 minutes.

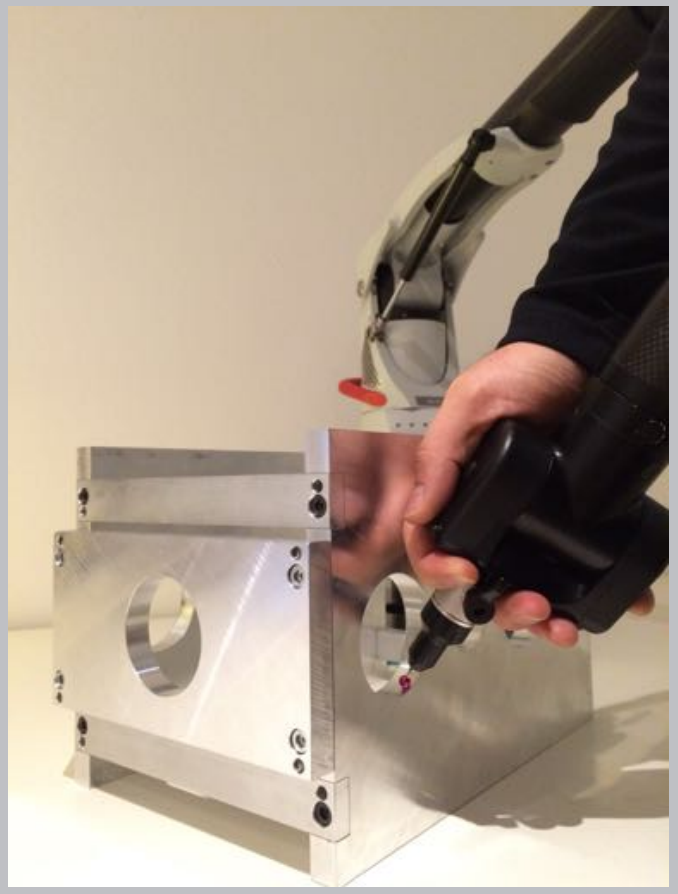


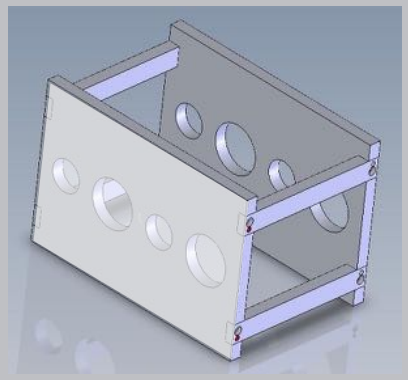
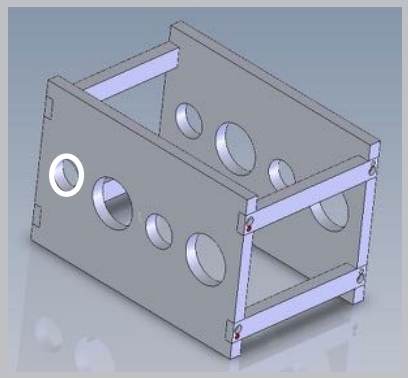
Now it is possible to evaluate the measurements taken.

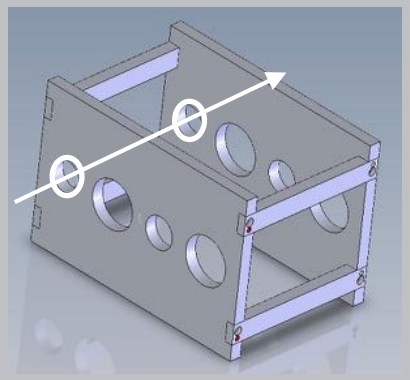
The software allows not only to specify the elements measured itself.

Different elements can be combined in multiple ways to create new elements and to link them with each other.

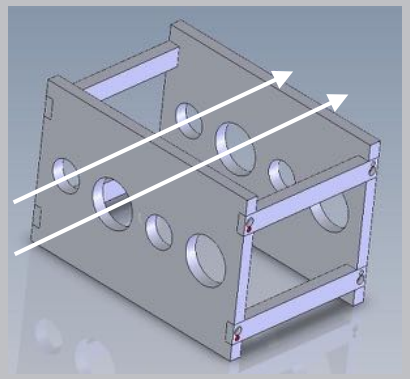
For better understanding here are a few examples.



Element	Result
 Plane	- Form Error
 Circle	- Form Error - Diameter



Element	Result
Circle left Circle right	Axis



Axis A Axis B	- Distance between axes - Parallelism

Protocol

Once all your measuring results are evaluated you want them to be displayed on a measuring protocol.

Such protocol should be significant and tolerances and errors should be easily identifiable.

You are able to select which parameters shall be displayed on the protocol and which ones are obsolete. Tolerances can freely be selected.

The protocol can be customized to suit your and your customers requirements.

Protocol Header

QUINDOS	Measuring Report		GAGE MASTER
			3D-Application Center
Description	Gearbox Model Test	Customer	WSGD
Drawing Number		Serial Number	
Remarks		Article Number	
Supplier		Delivery Date	
Delivery Note		Delivery Volume	
Lot Number		Lot Size	
Test Schedule		Sample Size	
Production Machine		Production Tool	
Production Date		Production Time	
Order		Department	
Inspector	chanke	Inspection Date	15-FEB-2015, 15:09:38
Measuring Device	GageMaster	Measuring Program	Quindos7 - V 7.10.GM
User Name		WKP Name	Model

Serves to tell you and your customer all about the who/what/where and why…

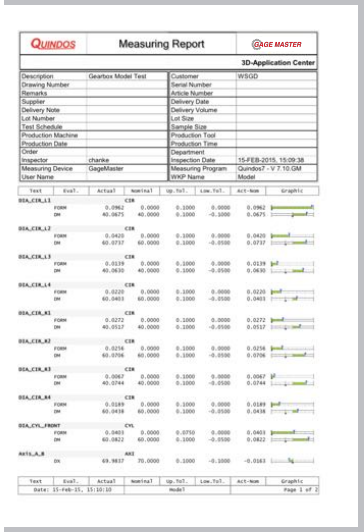
When it comes to quality people want to know if it is OK or NOT OK. So the protocol should give an answer which is crystal clear at first sight.

Text	Eval.	Actual	Nominal	Up.Tol.	Low.Tol.	Act-Nom	Graphic
DIA_CIR_L1			CIR				
	FORM	0.0962	0.0000	0.1000	0.0000	0.0962	
	DM	40.0675	40.0000	0.1000	-0.1000	0.0675	
PERP_PLA_L_TO_A			PLA				
	SQRNES	0.5702	0.0000	0.1000	0.0000	0.5702	


Green Colour means = GO


Red Colour means = NO GO

The GageMaster combines the ability to check gears and gearbox housings on the same device.
Flexible, portable and with an accuracy which is a class of its own.


QUINDOS Measuring Report GAGE MASTER

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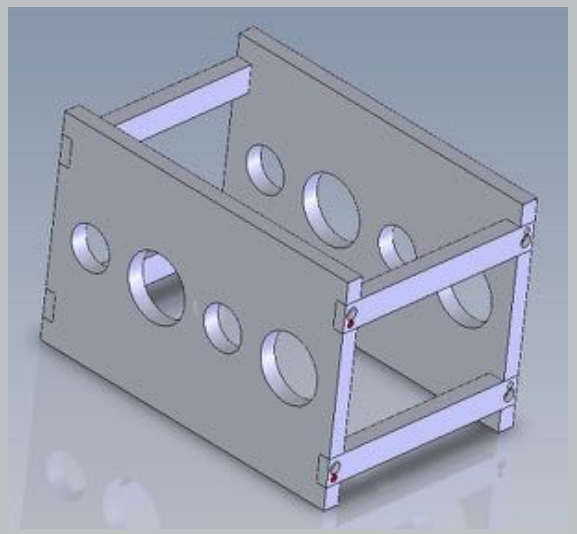
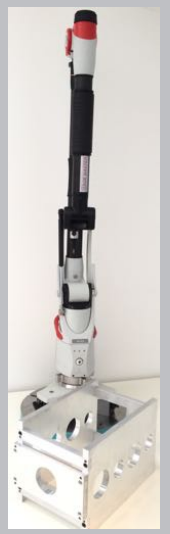
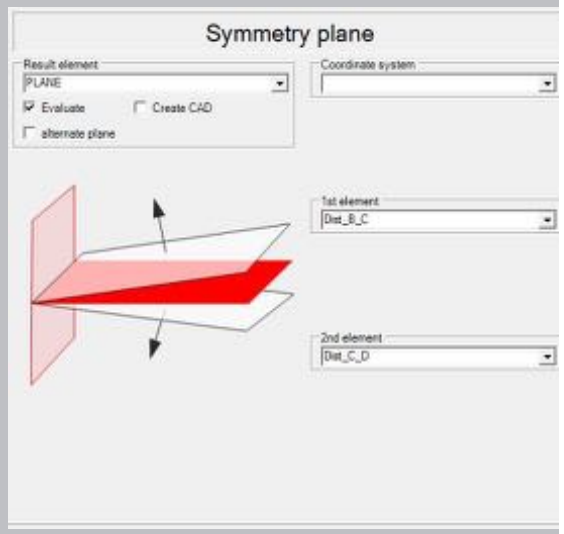
Text	Eval.	Actual	Nominal	Up.Tol.	Low.Tol.	Act-Nom	Graphic
BGA_CCR_L1			CCR				
	FORM	0.0962	0.0000	0.1000	0.0000	0.0962	
	DH	40.0675	40.0000	0.1000	-0.1000	0.0675	
BGA_CCR_L2			CCR				
	FORM	0.0420	0.0000	0.1000	0.0000	0.0420	
	DH	60.0737	60.0000	0.1000	-0.0500	0.0737	
BGA_CCR_L3			CCR				
	FORM	0.0139	0.0000	0.1000	0.0000	0.0139	
	DH	40.0630	40.0000	0.1000	-0.0500	0.0630	
BGA_CCR_L4			CCR				
	FORM	0.0220	0.0000	0.1000	0.0000	0.0220	
	DH	60.0403	60.0000	0.1000	-0.0500	0.0403	
BGA_CCR_R1			CCR				
	FORM	0.0272	0.0000	0.1000	0.0000	0.0272	
	DH	40.0517	40.0000	0.1000	-0.0500	0.0517	
BGA_CCR_R2			CCR				
	FORM	0.0256	0.0000	0.1000	0.0000	0.0256	
	DH	60.0706	60.0000	0.1000	-0.0500	0.0706	
BGA_CCR_R3			CCR				
	FORM	0.0067	0.0000	0.1000	0.0000	0.0067	
	DH	40.0744	40.0000	0.1000	-0.0500	0.0744	
BGA_CCR_R4			CCR				
	FORM	0.0189	0.0000	0.1000	0.0000	0.0189	
	DH	60.0438	60.0000	0.1000	-0.0500	0.0438	
BGA_CYL_FRONT			CYL				
	FORM	0.0401	0.0000	0.0750	0.0000	0.0401	
	DH	60.0822	60.0000	0.1000	-0.0500	0.0822	
Axis_A_B			AXS				
	DH	69.9837	70.0000	0.1000	-0.1000	-0.0163	

Text	Eval.	Actual	Nominal	Up.Tol.	Low.Tol.	Act-Nom	Graphic
Date: 15-Feb-15, 15:10:10			Model				Page 1 of 2







Next Newsletter coming up soon: APEX measurement on double helical gears