

BMW Z3 Car Door Measurement Using PRO-SPOT

Introduction:

The following report describes a sample automotive PRO-SPOT application. The report summarizes the results of the targetless 3-D measurement of a car door.

The door was measured in just 33 minutes with four projector setups. Over 9,500 points were measured on the top surface of the door to an accuracy of better than 0.020mm



Primary Measurement Requirements:

1. Measure surface of door with multiple projector set-ups
2. Perform complete measurement in less than 60 minutes
3. Collect additional data in the door handle and mirror areas of the door.



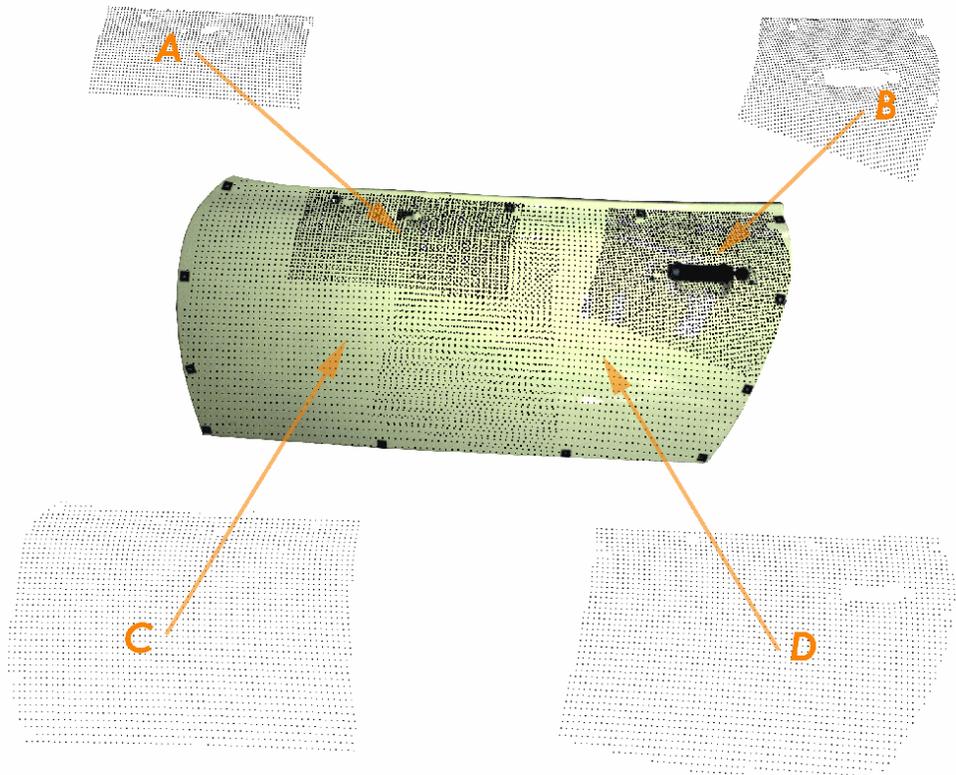
The measurement:

The car door was measured in small dense sections and then “stitched” together through the use of the global control on the door. The basic setup used to collect the data is shown in figure below.



The projector was set back approximately a meter and focused on the areas of interest. A total of four networks were collected. Each of these was made up of eight stations. The networks were named A-D respectively. These networks are shown

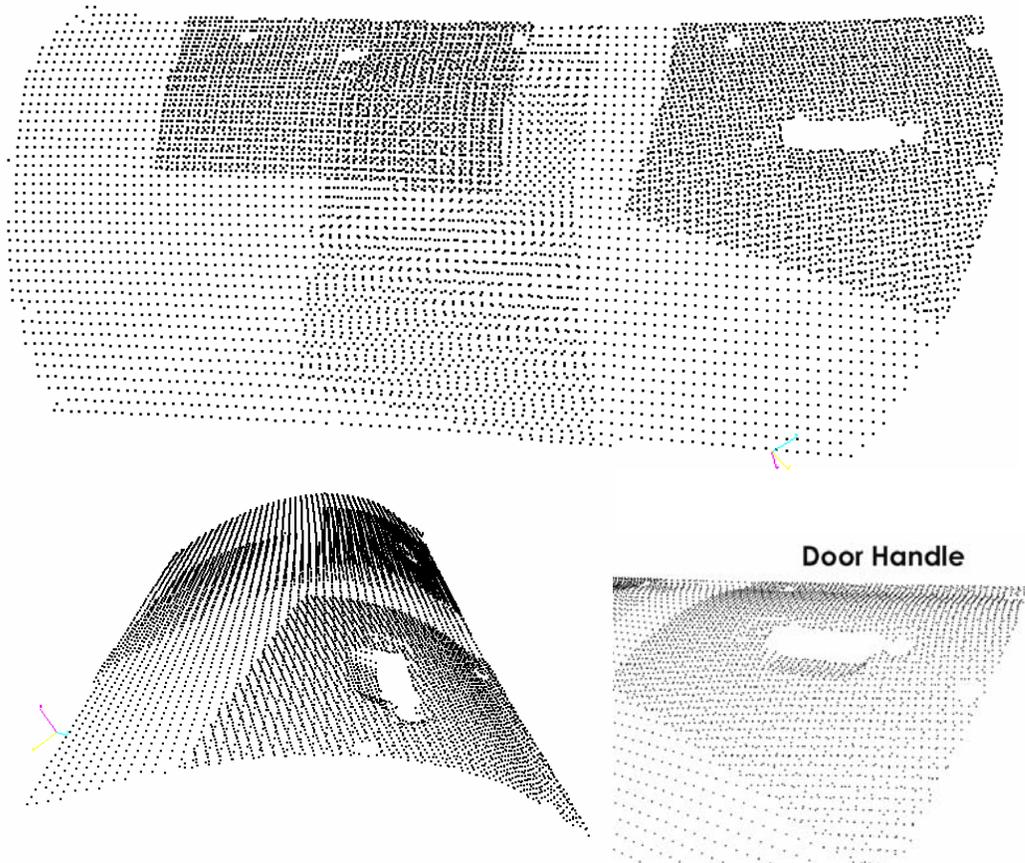
in adjacent figure. Networks A and B were used to collect dense data in the two areas of the door with the most detail, that is, the mirror and handle assembly points. Networks C and D were used to collect general surface data on the door.



Results:

The results of the measurement are summarized in table below.

Category	A	B	C	D	Total
Points	1959	2609	2558	2692	9818
Setup –positioning and focus	2 minutes	2 minutes	2 minutes	2 minutes	8 minutes
Photography	2 minutes	2 minutes	2 minutes	2 minutes	8 minutes
Processing	3 minutes	3 minutes	3 minutes	3 minutes	12 minutes
Stitching					5 minutes
Total					33 minutes
Accuracy estimate XYZ (μm)	13,8,8	18,13,10	13,8,8	10,8,8	



Concluding Remarks:

The door measurement has demonstrated how easily data sets can be combined to form large more complex data sets. This is useful when trying to map larger objects or objects with complex surface combinations.