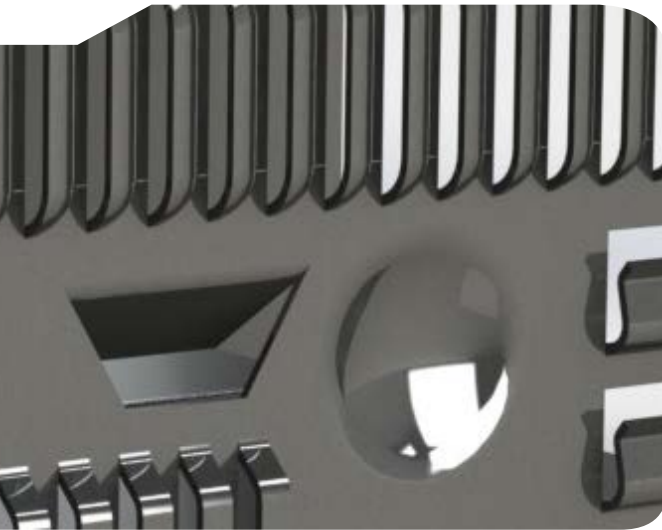


## Simple, 3D option to enhance InspecVision's Planar 2D Measurement System

### 2 ½D Sheet Metal Production

While 2D sheet metal production has become more reliable, 3D or 2½D sheet metal production is still susceptible to errors such as bending spring-back, press-brake programming errors, missing forms, louvres and inserts.



The demand for these 2½D parts is increasing and it is now common to see punching machines create parts with louvres, forms, inserts and even small folds. Even when the part is nominally flat it is quite common for the features punched in the part to deform the metal creating a relatively unflat component.

The InspecVision Opti-Scan 3D is a highly capable 3D scanner, however adoption of a full 3D scanning system on the shop floor can be a daunting.

A low cost and easy to use alternative is needed

The system should;

- Be aimed at shop floor operators
- Perform basic 3D inspection tasks such as checking form and insert heights and fold heights, lengths and angles with ease and against the 2D CAD files available on the shop floor
- Be capable of full 3D scanning and comparison to 3D CAD models if required

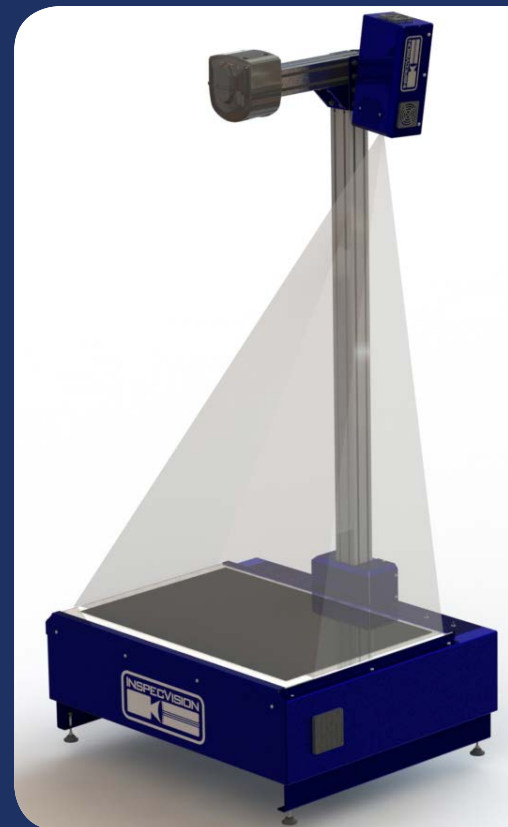
### InspecVision SurfScan2D

The SurfScan is a high resolution projector which mounts onto the existing Planar vertical column. The projector shines structured lights onto the part which are then imaged by the Planar's camera to create a 3D scan of the upper surface of the part.

However rather than focusing on purely 3D inspection the SurfScan is primarily designed to augment the existing 2D scanner and provide a powerful yet easy to use 3D or 2 ½D inspection capability.

#### Check:

- |                   |                  |                 |
|-------------------|------------------|-----------------|
| • Bend angles     | • Insert height  | • Part flatness |
| • Fold heights    | • Fold lengths   | • Form presence |
| • Insert presence | • Part thickness | • Form shape    |



## Shop floor friendly 2½D Inspection

Many punching machines do not produce completely 2D parts. The parts have forms, louvres, small bends, pins etc.

The SurfScan integrates seamlessly with the Planar 2D automatic inspection software to allow accurate inspection of both the parts 2D shape and its 2 ½D features with a single click.

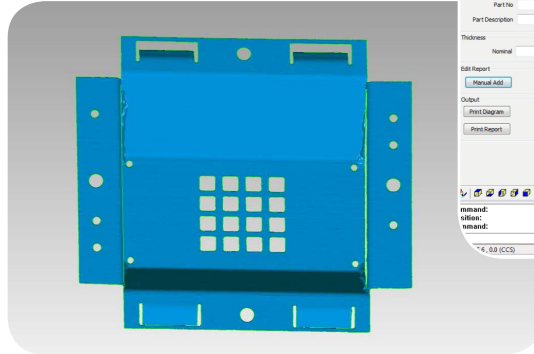


Figure 2: SurfScan 3D scan of folded sheet metal part

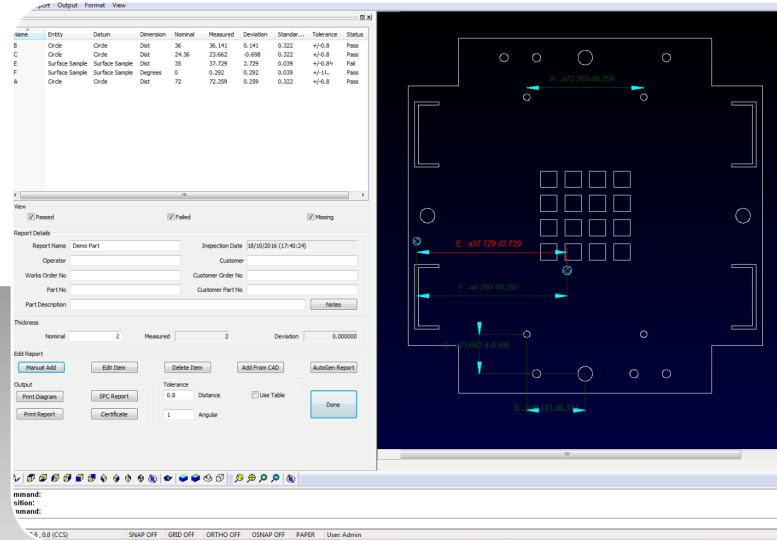


Figure 1: SurfScan 3D scan of folded sheet metal part

## Planar Software

The features included in the Planar software include;

- Easily retro-fitted to any Planar machine
- Creates a 3D point cloud
- Can be used to compensate for unflat or formed or folded parts to create an accurate plan view
- Creates 3D edges
- Can compare 3D edges to 2D CAD files
- Can create cross-sections of point clouds and compare them to a DXF file
- Can project deviations back onto the part
- Can take comparative spot height measurements within the Planar software
- Can take comparative spot angular measurements within the Planar software

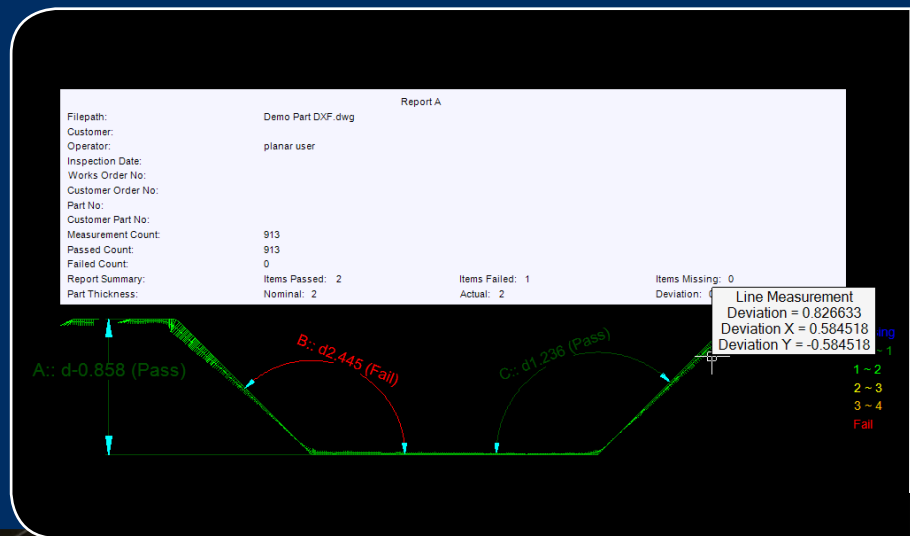


Figure 3: SurfScan projection of errors onto part

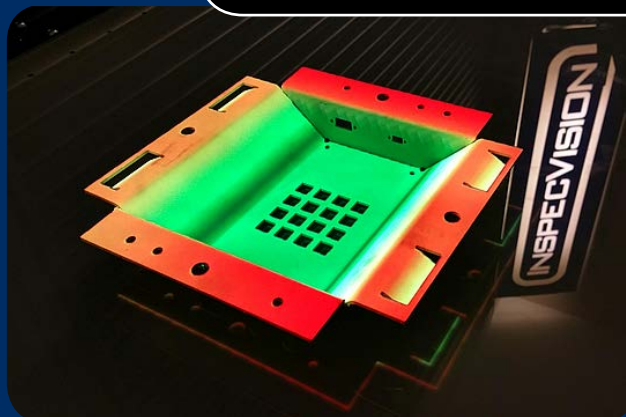


Figure 4: SurfScan projection of errors onto part

Speed, accuracy

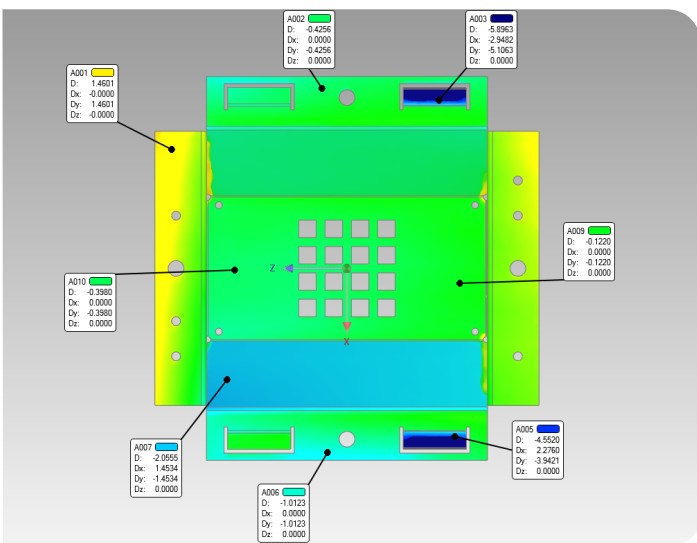


Figure 5: Comparison of scan to 3D CAD model

## Full 3D scanning

If 2 ½D is not enough for some jobs the system can be turned into a full 3D inspection system.

The point clouds or meshes created by the system can then be loaded into free and readily available 3D inspection software for comparison against a 3D solid CAD model, such as step or igs.

The point clouds are also compatible with packages like Geomagic Control, Control X, Polyworks etc.

Parts with complex geometry can be scanned from several angles to create a complete scan of all visible surfaces.

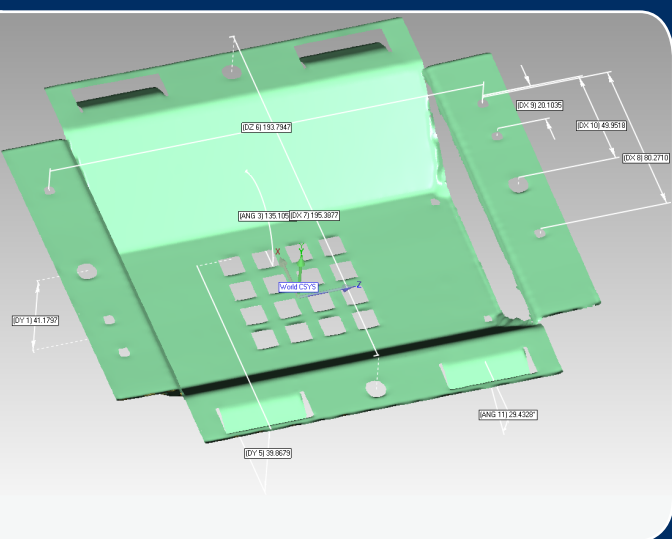


Figure 6: 3D Dimensioning

3D scanning features include;

- Point clouds are fully compatible with free off-the-shelf 3D inspection software.
- Can compare point cloud to 3D solid models
- 3D dimensioning
- 3D GD&T
- Cross-sections
- Full surface deviation inspection
- Merging of scans
- Automatic alignment of scan to CAD
- Point cloud meshing, processing and filtering
- Extraction of nominal data from CAD model
- Comparison of 2 scans



Figure 7: Comparison of scan to 3D CAD model

# Specification and scope of supply of SurfScan Option

Description	Specification/scope of supply
Max Single scan area* 1 & 2	> 90% of Planar measurement area
Max Single scan depth* 1 & 2	100mm (Z)
Volumetric accuracy* ** & 3	Better than 250 microns
Repeatability* ** & 3	Better than 150 microns
Scanning speed***	> 20,000 points per second
Scanning time***	< 1 to 3 minutes depending on system
Processing time****	< 15 seconds
Required Operating System	Windows 7 64bit
3D scanning software	3D scanning, texture map acquisition, 3D color rendering, creation of cross-sections, creation of 3D edges, creation of 3D point clouds in VRML, ASCII, PLY & STL formats, creation of texture mapped scans in VRML & PLY files, calibration software.
3D inspection software	Comparison of 3D edges to 3D DXF/DWG, comparison of cross-sections to DXF/DWG cross-sections, measurement of fold angles, fold heights, insert presence, insert height, form shape, form height, form presence, part thickness and part flatness. Projection of errors onto part. 3D point clouds can be exported to full 3D inspection software.
Free 3D Inspection Software:	Fully compatible with off the shelf free 3D inspection software. Functionality includes comparison to 3D solid models, dimensioning, GD&T, cross-sections, full surface deviation inspection, merging of scans, customizable reports, automatic alignment of scan to CAD, point cloud meshing, processing and filtering, extraction of nominal data from CAD model, comparison of 2 scans.
3D reverse engineering software	Reverse engineering of 3D edges to DXF/DWG. Reverse Engineering of cross-sections.
SurfScan construction	DLP projector mounted in metal clad frame
Power supply	110-240V 50/60Hz
Power consumption	1.5 Amp maximum at 230 Volt, 3 Amp max at 110 Volt.
EC directives	Compliant with Machinery, Low voltage and EMC Directives.
Paint colour (powder paint)	RAL5013, cobalt blue, other colors are available on request
Ambient operating conditions	5-35 degree C, light attenuation required please contact InspecVision for further details.
Approx Footprint width/ depth/ height/ weight	206mm (W) x 379mm (D) x 161mm (H) <10.0kgs
Mounting arrangement	Projector mounted onto Planar column
Standard packing	Export boxing suitable for air and road shipment, or supplied with Planar system

1 Larger parts can be measured with multiple scans

2 Other sizes are available on request, exact dimensions may vary by slightly depending on setup.

3 Other accuracies are available on request

\*Actual scanning range will be larger, however measurements outside of this range may have additional noise.

\*\*Accuracy achieved by measuring a reference object at various locations within the measuring volume, contact InspecVision for further details.

\*\*\*Time taken to measure a typical component. Results may vary depending on part measured or speed of computer

\*\*\*\*Time taken to process the measurements of a typical component. Results may vary depending on part measured or speed of computer.

Actual measuring accuracies achieved will depend on operating environment, user input, quality and condition of materials

Due to our policy of continuous improvement specifications are subject to change without notice, please contact factory or your InspecVision dealer



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