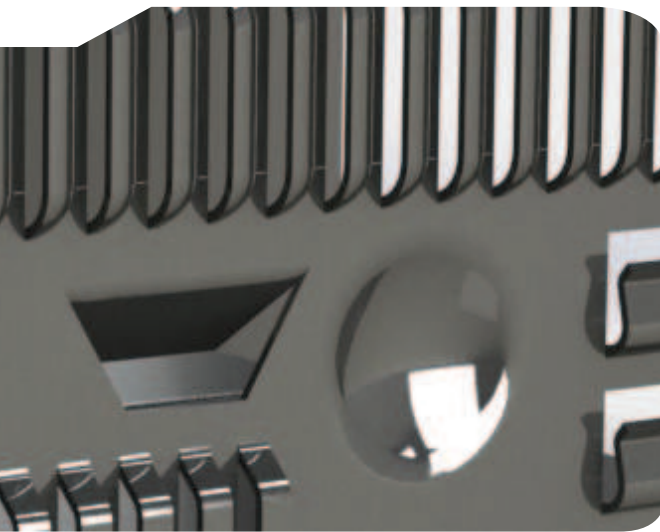


Simple, 3D option to enhance InspecVision's Planar 2D Measurement System

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 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

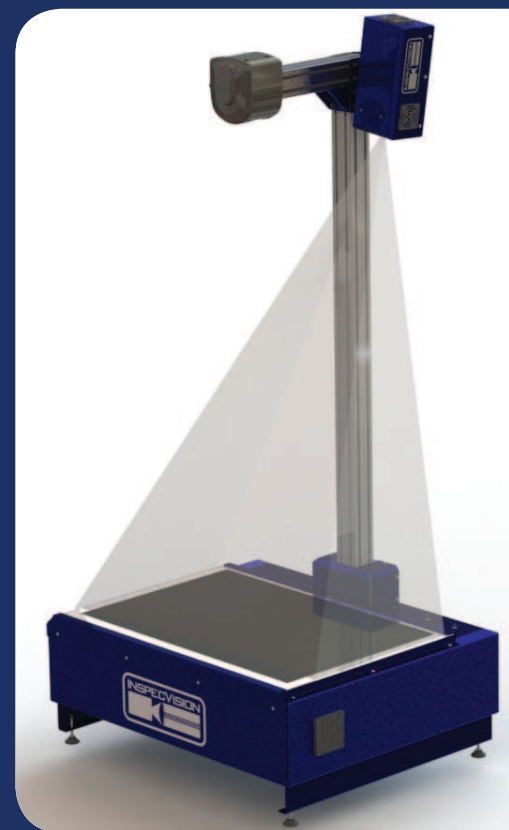
InspecVision SurfScan2D

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
- Fold heights
- Insert presence
- Insert height
- Fold lengths
- Part thickness
- Part flatness
- Form presence
- 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.

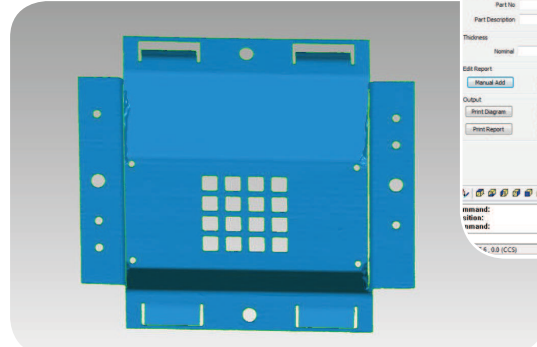


Figure 2: SurfScan 3D scan of folded sheet metal part

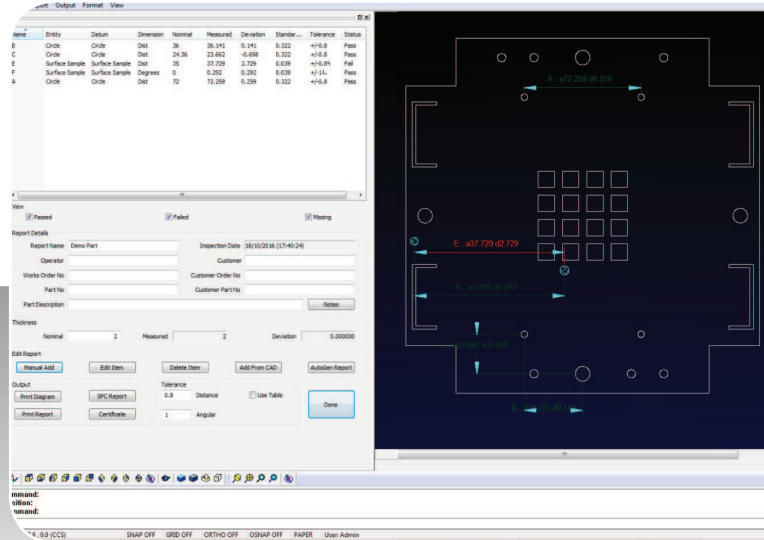


Figure 1: SurfScan 3D scan of folded sheet metal part

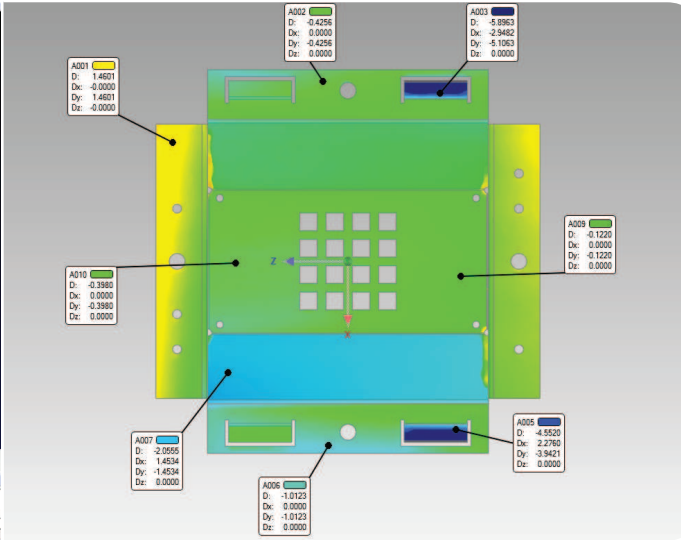


Figure 5: Comparison of scan to 3D CAD model

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 iges.

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.

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

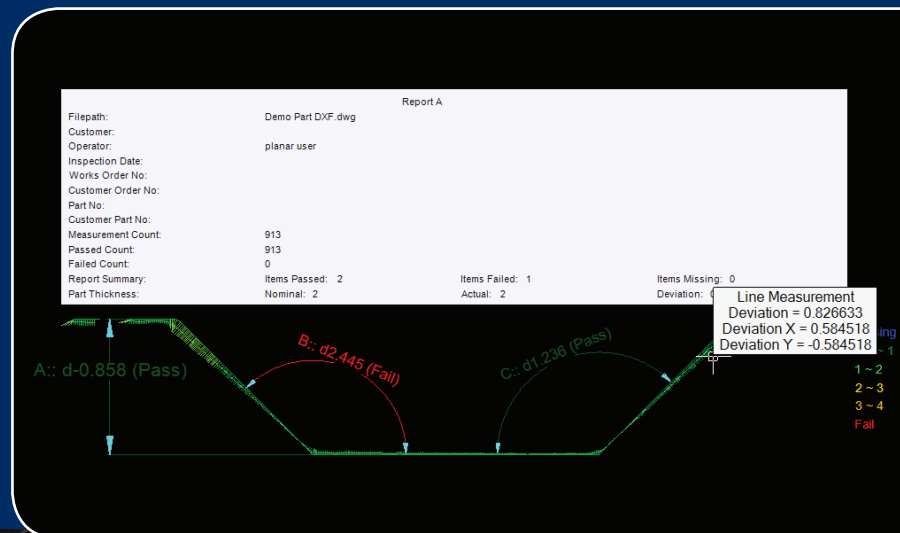


Figure 3: SurfScan Report

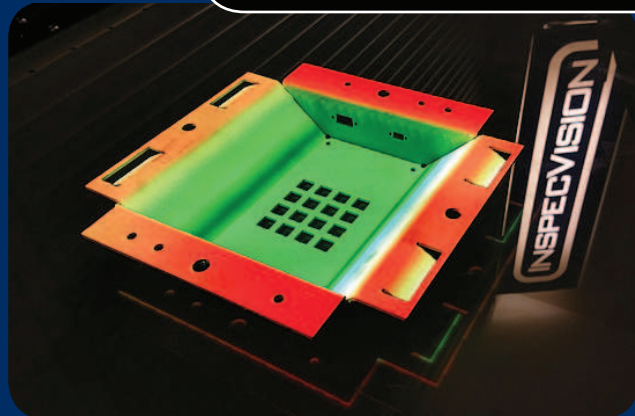


Figure 4: SurfScan projection of errors onto part

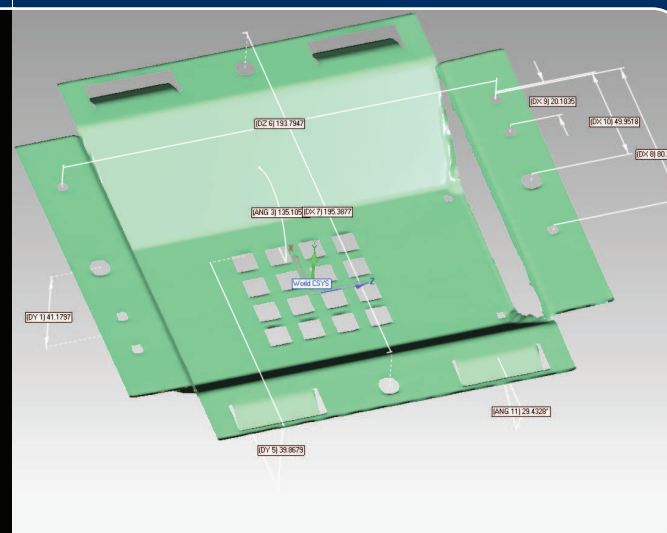


Figure 6: 3D Dimensioning

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

Speed, accuracy and reliability