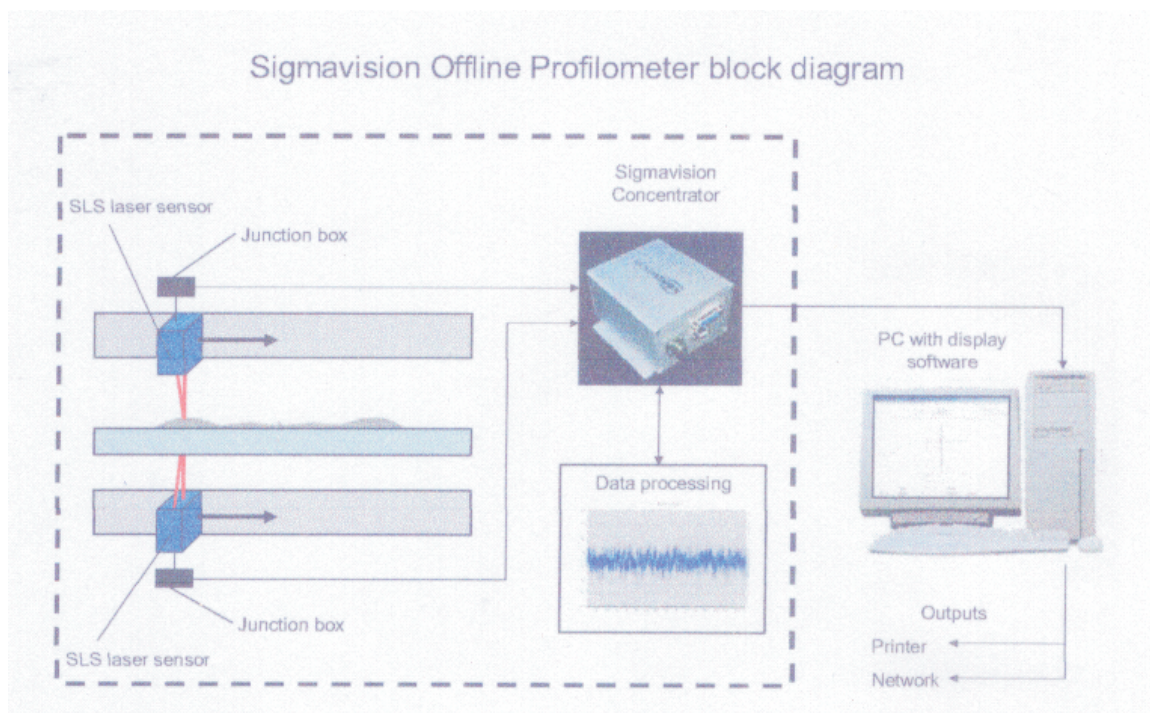


SigmaVision/Orbital Online Profile Scanner

The Online Profile Scanner, manufactured by SigmaVision / Orbital, is a measurement system based on 1D laser sensor technology for online profiling of product and materials produced by continuous processes. The system comprises 2 x SLS laser point sensors that is mounted on a frame that spans the production line with a high accuracy linear axis and servo controlled motor and drive. The component, such as a tyre tread extrusion, passes through the O frame on a conveyer. By traversing the SLS sensors across the width a complete cross sectional profile of the extrusion may be generated by computing the displacement measurements from each sensor and positional feedback from an optical linear scale.

The complete cross sectional profile and key dimensions are then reported using a TFT display mounted on the industrial enclosure. Visible alarms and I/Os for entering warning and error limits are provided for a library of >500 products. Optional statistical reports may be generated for product tracibility and continuous improvement purposes. A block diagram of the Online Scanning Profiler is shown below:



The benefits of the Online Profile Scanner are to:

- Eliminate manual measurements and improve measurement accuracy
- Reduce raw material consumption
- Faster profile and material volume verification
- Statistical reporting for trend analysis and continuous improvement

The extrusion process is characterised as follows:

- Extrusion type Symmetric and asymmetric treads and sidewalls
- Maximum extrusion width 675mm
- Typical line speed 30m/min
- Manufacturing tolerance (gauge) +/- 0.2mm
- Manufacturing tolerance (width) +/- 2.0mm

For tread extrusions the default template dimensions correspond to:

- Overall width
- Shoulder to shoulder (hump) width
- Left shoulder gauge
- Right shoulder gauge
- Crown gauge
- Total area
- Symmetry analysis (Conicity)

Product specific templates may also be created, such as incorporating material cutouts and die marks and creating specific reference points that are of interest when die changes are made.

TEPS software analyses processed measurement data that are coupled with position data from the optical linear scale to construct the cross sectional profile, calculate key dimensions and compare each value to the template value. The measurement controller outputs the tread profile and key dimensions continuously using a graphical interface on a TFT display as shown below for a tread profile. Key dimensions are colour coded to indicate if within specification, if warning limits are exceeded or error limits are exceeded.