360° SIMS
AUTOMOTIVE SOLUTIONS MAP
SMART INLINE MEASUREMENT SOLUTIONS
APPLICATIONS AND CELL CONFIGURATIONS

OTHER POWERFUL HEXAGON MANUFACTURING INTELLIGENCE SYSTEMS FOR THE AUTOMOTIVE INDUSTRY

360° SIMS for Underbody/BiW

- Location: Body shop, die shop or in the measuring room
- Application support: Hexagon’s experts provide real-time setup and savings recommendations
- Key objectives:
  - Video of the day – hundreds of measurements in 60 second video clip
  - Go / No Go evaluation based on customer control limits per point
  - Holes, points and studs measurement
  - Control part variations and focus corrective welding operations
  - Check underbody assemblies after critical welding operations

360° SIMS for Doors / Z BASE Assemblies

- Location: Final fit and finish line
- Application support: Hexagon’s experts provide real-time setup and savings recommendations
- Key objectives:
  - 100% inline inspection
  - Virtual assembly matching with BiW
  - Short / Long inspection routines fitting into available cycle time or production breaks
  - Outer and inner part surface analysis measurements

360° SIMS for Sheet Metal Parts, Assemblies, BiW

- Location: Body shop, final fit and finish line
- Application support: Hexagon’s experts provide real-time setup and savings recommendations
- Key objectives:
  - Automatically generates easily understood inspection reports accessible to end users
  - Patented retro wall / floor for faster measurement
  - Sheet metal part holes, points and edge lines measurements
  - Virtual assembly matching with BiW
  - Measure machined elements to ensure dimensional stability during home line process tuning of new dies
  - Measure fl ush and gap points between body and closures along with other local characteristics for car inspection

360° SIMS for Car Body with Closures

- Location: Body shop, final fit and finish line
- Application support: Hexagon’s experts provide real-time setup and savings recommendations
- Key objectives:
  - Automatic “Flush Nominal” unit for repeatable measurement
  - Fixed station for sheet metal BiW or moving painted car inspection
  - Measure fl ush and gap points between body and closures along with other local characteristics for car inspection

360° SIMS for Closing / Subassemblies

- Location: Final fit and finish line
- Application support: Hexagon’s experts provide real-time setup and savings recommendations
- Key objectives:
  - Inspect seal area surfaces
  - Ensure high-quality hemming and welds
  - Virtual assembly matching with BiW
  - Short / Long inspection routines fitting into available cycle time or production breaks

360° SIMS for Casted / Machined Parts

- Location: Final fit and finish line
- Application support: Hexagon’s experts provide real-time setup and savings recommendations
- Key objectives:
  - Go / No-Go alerts
  - Comparing to both pre- and post-machining measurements
  - Feedback to CAM/CNC
  - Surface colour mapping (under/over stock)

360° SIMS for Sheet Metal Parts, Assemblies, BiW

- Location: Final fit and finish line
- Application support: Hexagon’s experts provide real-time setup and savings recommendations
- Key objectives:
  - Detailed studies and adaptive inspections during production cycle
  - Actionable information for faster problem solving
  - Serves as primary measurement system during innovative dimensional control strategies
  - Measurement within production cycle time
  - 24/7 operation
  - Up to 100% inspection of carbody assemblies, closures, cradles, sheet metal parts and finished products

360° SIMS ROI Considerations

- Systems can be reprogrammed and repurposed to support new vehicle programmes
- Simplified lower cost holding fixtures compared to CMM fixtures or checking fixtures
- More comprehensive measurement including surface maps, edge lines and cross sections
- Reduced logistical efforts and process delays
- Results measured directly in or near the line
- Higher fidelity visual data from imaging sensors compared to traditional coordinates
- Faster to support on changes and faults

AUTOMOTIVE OEM AND SUPPLIER BENEFITS AND ROI CONSIDERATIONS

- Excellent support from local Hexagon offices
- Flexible configurations can be implemented
- Results can be stored and managed in a central data server
- Detailed studies and adaptive inspections during production cycle
- Actionable information for faster problem solving
- Serves as primary measurement system during innovative dimensional control strategies
- Measurement within production cycle time
- 24/7 operation
- Up to 100% inspection of carbody assemblies, closures, cradles, sheet metal parts and finished products

- Innovative dimensional control strategies
- Measurement within production cycle time
- 24/7 operation
- Up to 100% inspection of carbody assemblies, closures, cradles, sheet metal parts and finished products
360° SIMS OVERVIEW

**Sensor Technologies**

- **White Light Sensors**
  - Industry-leading ultra-fast optical exposure
  - 3 integrated digital cameras for high-accuracy 3D measurements
  - Unique single pattern projection using static LED projector
  - Immunity to shop-floor vibrations and illumination conditions
  - 2D and 3D reconstruction technology for accurate feature measurement
  - Automatic incremental sensor calibration
  - Robot-mounted sensor controller and power and communication cables

- **Other Measurement Technologies**
  - RPS device integrated sensor
  - Fixed laser line triangulation / photogrammetry sensor
  - Robotic dual view F&G sensors and others

**Automation**

- **Industrial Integration**
  - Operates with leading industrial robot brands, controller types and communication standards
  - Interfaces with variety of line PLCs for fully-automated processes
  - Integrated operation with a variety of automation devices including turntables, fixtures, sliders and lifters, etc.
  - Robot and sensor integrated temperature compensation
  - Patented RPS device for accurate part alignment and measurement

**Software**

- **360° SIMS Software Suite**
  - Server-based architecture with historical data archiving
  - Dedicated functionalities for operators / analysts
  - Fast data computation in parallel to robotic data acquisition
  - Special analysis capabilities for problem identification and solving
  - Combination large data set colour map and points-based quality evaluation
  - Patented / Patent pending visual SPC (Statistical Process Control) tools and video of the day reporting
  - Digital flexibility of adding points post-measurement

**Factory IT**

- **Enhanced data usage and system integration**
  - Data interfaces to factory SPC systems for archiving and reporting
  - Automatic backup of measurement results to central server room network drive
  - Historical archiving of measurement results and inspection reports for long-term use
  - Authorised access of engineers and technician from various departments using 3D viewers and PDF readers
  - Integration to CAD/PDM and other systems via the MMS software platform
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