



APDIS

# APDIS GF-Series Gap & Flush System

Fully Automated Vehicle  
on Wheels Inspection

# Introducing the APDIS Gap & Flush System

The fully automatic, moving line Gap and Flush solution for vehicle on wheels with easy programming, high productivity and inherent part and operator safety.

 Learn more at [www.industry.nikon.com](http://www.industry.nikon.com)



## APDIS LASER RADAR TECHNOLOGY

As a long range, non-contact and accurate CMM, the Laser Radar is already used by major automotive OEMs around the world to measure 1000s of cars each day.

The APDIS Laser Radar is the latest generation to use this unique technology, offering high accuracy, high productivity, and completely automated measurements without the need for targets, probes or coatings.

Through its innovative use of a frequency modulated, steerable laser beam, measurements can be performed safely and quickly on the shop floor or in measurement rooms to high precision. The APDIS Gap & Flush System exploits these abilities to create a truly unique "Vehicle on Wheels" (VoW) moving line application with numerous benefits over existing automated options.



## QUALITY PERCEPTION

The panel and closure gap and flush on a finished vehicle can directly impact customers' perceived quality of the car and brand. Variations can also contribute to squeaks, rattle, wind noise and water ingress with even small issues impacting a customer's buying choice.



## QUALITY CONTROL

Reliable measurement of the gap and flush allow process feedback and overall quality control on the finished product but up until now, this has not necessarily been easy to achieve.

Manual measurements rely on operator skill and ability to reach the right locations repeatedly; automated measurements are typically robot based with complicated setup and programming making them prone to errors and require safety isolation from the rest of the line.

All of this needs to be done as the vehicles are constantly moving down the line in their final state within the cycle time



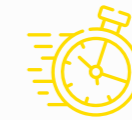
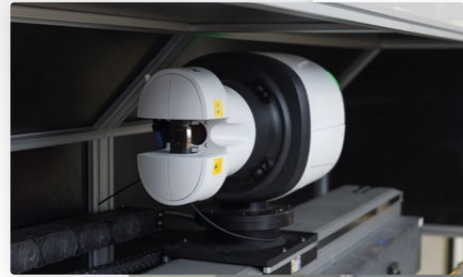
# Your APDIS Gap & Flush System Integration



## REDUCED COMPLEXITY, SIMPLER INSTALLATION, EASIER MODIFICATION

Using a simple linear axis to synchronize movement, and automatic alignment, programming can be performed off-line without needing complex synchronized robot programming. Installation is therefore simpler and safer with minimal production downtime.

Modifications to the measurements can also be done offline, with model additions, feature changes and adjustments all possible without stopping the line.



## INCREASED PRODUCTIVITY, INCREASED REPEATABILITY, INCREASED ACCESSIBILITY

Using three Laser Radars, multiple rail movements, and long-range measurement capability allows great visibility around the vehicle as well as a high number of measurement locations. With more than 95% coverage, up to 170 inspection locations per vehicle at less than 0.3mm dynamic repeatability, there simply is no comparison



## INTEGRATED, AUTOMATED, FLEXIBLE

Fully integrated into the production line, the Gap & Flush system provides fully automated measurements with instant feedback on vehicle quality.

The large measurement volume allows multiple variants and vehicle types to be measured up to conveyor speeds of 140mm/s



## LARGE STANDOFF, SAFE OPERATION

The large standoff provided by the APDIS Laser Radar means no possibility of the system damaging the vehicle and provides an inherent safety zone around the vehicle. With no robots to worry about, the Laser Radars are independently protected by polycarbonate surrounds and light guards maintaining the open production line and all certified to international safety standards.



## INDEPENDENT TRACKING AND ALIGNMENT

Vehicle tracking is performed by linear sensors for conveyor speed and optical systems for alignment all independently of the conveyor. The Laser Radar movement is synchronized, and alignment happens automatically accounting for positional variation on the conveyor.



# Join the revolution



Many automotive manufacturers around the world are already experiencing the benefits of Laser Radar measurements to monitor and improve their process control.

The innovative use of the APDIS Laser Radar for end of line gap and flush measurements is simply the next step in changing how the industry measures.

With multiple Gap and Flush systems already installed, customers are already seeing the advantages of the safer, simpler and highly productive inspection revolution.



## Benefits Summary



### SIMPLIFIED SETUP

Offline programming, no robot, low safety requirements, external tracking and synchronization.



### EXTERNAL VEHICLE TRACKING

Direct wheel/vehicle tracking measurement. No conveyor interlock



### EASY PROGRAMMING AND MODIFICATION

Offline metrology programming. Modify without disrupting production.



### HIGH MEASUREMENT RATE

Up to 170 measurement locations per vehicle



### GOOD MEASUREMENT COVERAGE

> 95% of vehicle.



### REPEATABLE MEASUREMENTS

< 0.15mm (flush) <0.30mm (gap) average dynamic range.



### VERY LOW COLOR/SURFACE SENSITIVITY

No issues with surface color or high reflectivity.



### LARGE SENSOR STANDOFF

>500mm for zero risk of collision in normal use.

## Product Specifications

Name	Install size (mm)			Measurement volume (mm)			Rail travel (mm)
	L	W	H	L	W	H	
GF320	7000 <sup>1</sup>	7000 <sup>1</sup>	3610	6000 <sup>3</sup>	3600	2200	1940
	10000 <sup>2</sup>	9200 <sup>2</sup>					

<sup>1</sup> Frame and tracking sensors

<sup>2</sup> Including cabinets and safety spacing

<sup>3</sup> Total measurable length dependent on wheelbase

## Measurement Specifications<sup>1</sup>

	GF320
Measurement Rate	Up to 120 scan lines/vehicle (HR) Up to 170 scan lines/vehicle (LR)
Static repeatability <sup>2</sup>	Flush: Average range < 0.050mm (HR) Average range < 0.050mm (LR)
	Gap: Average range < 0.150mm (HR) Average range < 0.300mm (LR)
Dynamic repeatability <sup>2</sup>	Flush: Average range < 0.150mm (HR) Average range < 0.150mm (LR)
	Gap: Average range < 0.300mm (HR) Average range < 0.600mm (LR)
Tracking speed	140mm/s
Conveyor stability	+/- 2% velocity variation

<sup>1</sup> High resolution (HR) = 0.1mm pt spacing; Low resolution (LR) = 0.25mm pt spacing

<sup>2</sup> Open gap, metal to metal, painted surface

[View more specifications at www.industry.nikon.com](http://www.industry.nikon.com)



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