

Continental 
The Future in Motion



High-Performance, Agile LiDAR for Flexible Integration

DVN LiDAR Conference, 15.-16.11.2021

Continental BU ADAS Product Portfolio



Smart Camera

Satellite Camera

Long Range Radar

LiDAR

Surround Radar

Surround View

Assisted / Automated Driving Control Unit

November 16th, 2021
Heiko Leppin, © Continental AG

Business Unit ADAS LiDAR History

More than 20Mn LiDARs sold

FOUNDATION

A.D.C. GmbH is founded as Joint Venture of Temic GmbH, Nürnberg, Germany and Leica AG, Heerbrugg, Swiss.

1996



1st LiDAR behind Windshield

2008

2001

1st LiDAR for ACC



2016

1st LiDAR Camera fusion



2021

High Resolution Flash LiDAR



2024

High-resolution long-range scanning LiDAR



202x

Story develops

Continental continues to push the envelope of automotive LiDAR

LiDAR – Required for Safe Automated Driving

Full Range Portfolio

Short Range LiDAR



Solid State Flash LiDAR

Highlights

- › No gaps in image/data. No motion distortion
- › High accuracy object and free space detection
- › In production with premium Japanese OEM

Target application:

Urban areas, traffic jam, robocabs



in SOP: **now**

Long Range LiDAR

Strategic investment in LiDAR pioneer



MEMS¹ Mirror Scanning LiDAR



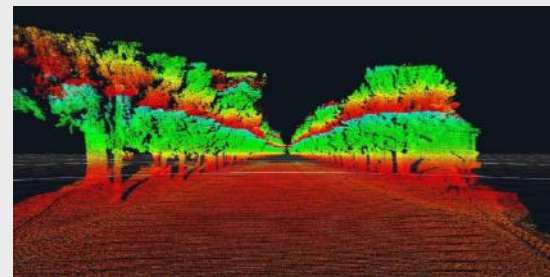
Highlights

1 MEMS: Micro electro-mechanical system

- › Patented novel advanced MEMS¹ technology
- › Dynamic spatial resolution enabling concurrent far range, high resolution and high sensitivity at minimized power consumption

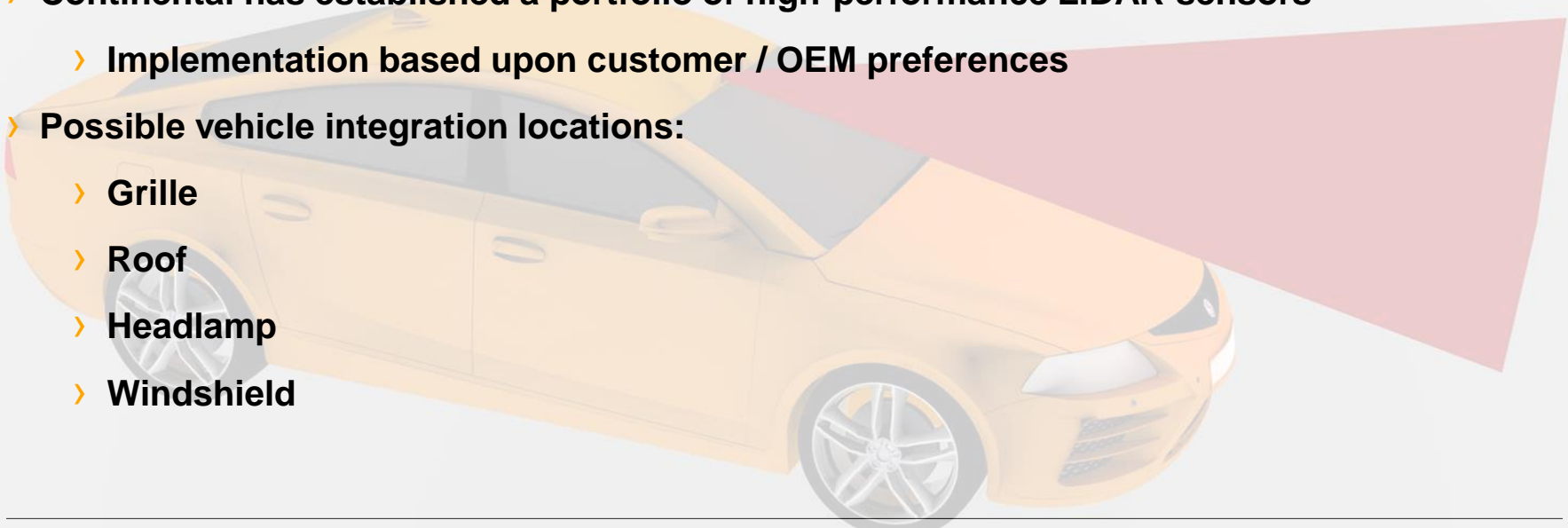
Target application:

Highway




Target SOP: **2024**

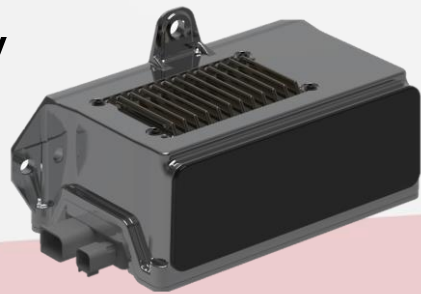
LiDAR – Focus on integration based on Use Case(s)

- › With high-performance / agility being fulfilled, the focus turns to integration
 - › Continental has established a portfolio of high-performance LiDAR sensors
 - › Implementation based upon customer / OEM preferences
 - › Possible vehicle integration locations:
 - › Grille
 - › Roof
 - › Headlamp
 - › Windshield
- 

HRL131 Base Design

Modular building blocks and SW configurability

- › Core sensor components based on  AEYE technology
- › Designed for maximum flexibility
 - › Opto-mechanical components can be re-arranged for optimized packaging or other constraints
 - › Single laser emitter (scan block) can be used with multiple receivers (FPAs)
 - › Programmable Fields of View (static or dynamic)
- › Continental offer wide performance in a variety of packaging form factors



HRL131 - Opto-mechanical Configurations

- › Standardized opto-mechanical components
- › Components can be re-arranged to fit mounting space
- › Re-arrangement does not affect performance

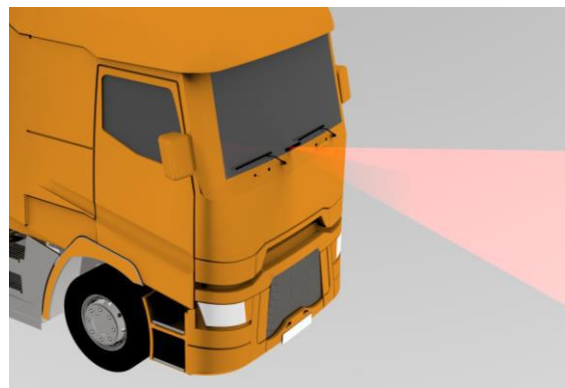
Example height constraint



Depth constraint



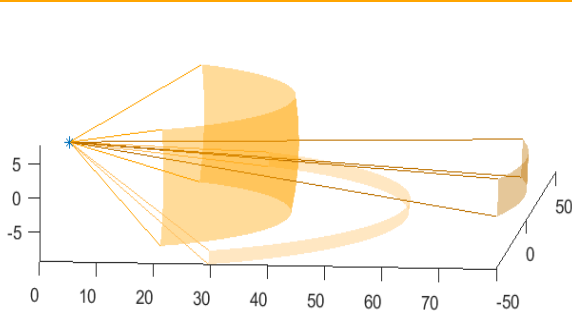
Depth & height constraint



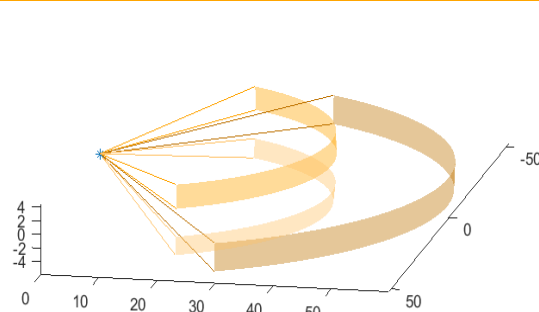
HRL131 – Programmable Sensing Area

- › Sensor receiver(s) establish Field(s) of View envelope
- › Transmit unit defines Field of View shape and pixel density
- › One transmit unit can support multiple receive units

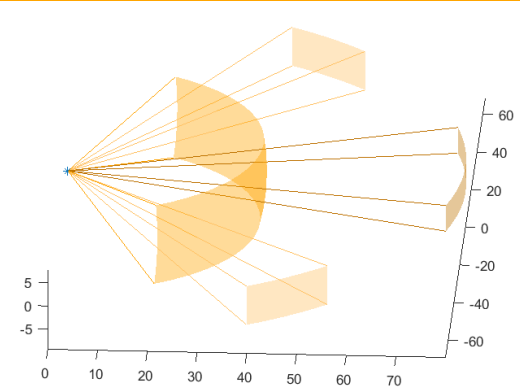
Center focus example



Horizon focus example

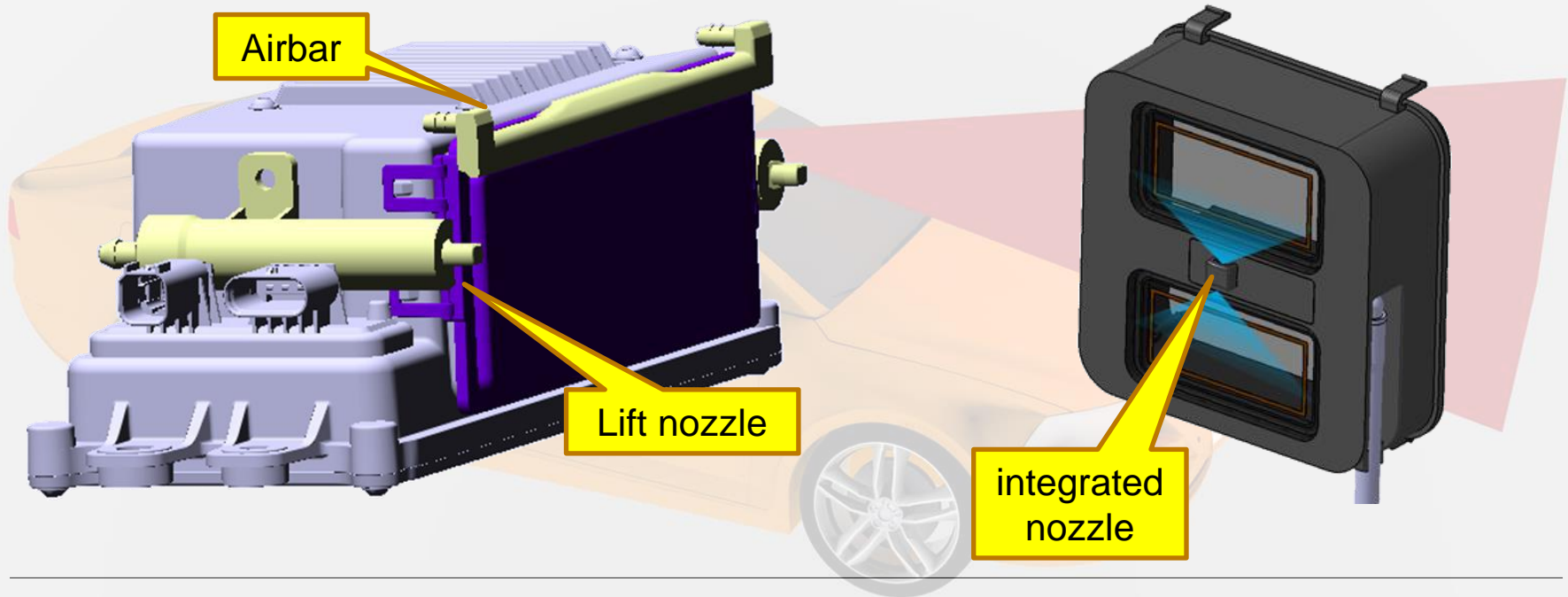


Intersection example



Cleaning:

Optical sensors require cleaning no matter where they are located



Continental Washer Systems

In-house expertise in cleaning



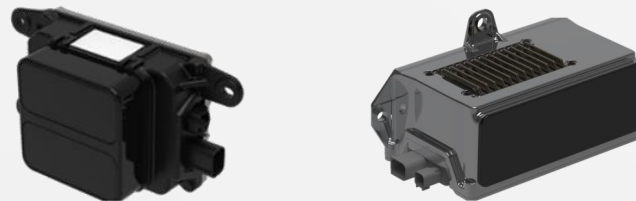
Example of LiDAR cleaning system

Windshield Location

Integration remains challenging

- › Continental has long experience with windshield integration
- › The presented modular design can enable in-cabin integration
- › Windshield losses make performance unattractive for certain passenger car integrations
 - › High Fresnel losses (typ. incident angles 65° - 80°)
 - › Coating endurance (no resistance to wiper and ice scraper)
 - › Platform dependency (angle depends on vehicle platform)
- › For steep windshields, this is a preferred integration option for OEMs

Summary



Continental offers a portfolio of high-performance LiDAR solutions to support OEMs



Continental LiDAR portfolio serves all relevant Use Cases and meets a wide variety of integration demands

High-Performance, Agile LiDAR for Flexible Integration
Thank you for your attention.