DrivingVisionNews.com
Automotive lighting and driver assistance technologies

Tue, 30 March 2021 Weekly Newsletter NEWSLETTER #692

Editorial

Shanghai DVN Workshop; ADB DVN Report

We've worked hard to involve a global collection of lighting and ADAS luminaries in the Shanghai DVN Workshop, taking place on 19-20 April. The pandemic's constraints drove us to implement an interesting solution: a hybrid event, both face-to-live-face and online, including locals in the Shanghai area as well as global participants not able to physically attend.

The face-to-face workshop will be focussed on the lighting community in the Shanghai vicinity. The Marriott Hotel will welcome them with alarge area is dedicated to exhibitions; 12 companies have already taken out expo booths. The lectures will be a mix of those done live and those done online by speakers abroad. The Q&A and panel discussions will be done in real time, joining local and outside attendees, speakers, and session chairs. A Chinese DVN team will be in place to welcome the attendees and to organise the workshop. Maybe a miracle will allow me to attend…!

The online workshop will be focussed on the lighting community elsewhere in the world, who will be able to follow the workshop in real time as it happens, or at a time more suitable for their local time zones.

So this will be a new kind of DVN Workshop, never before done. The worldwide lighting community will be well catered for, with online access lasting a week after the actual event.

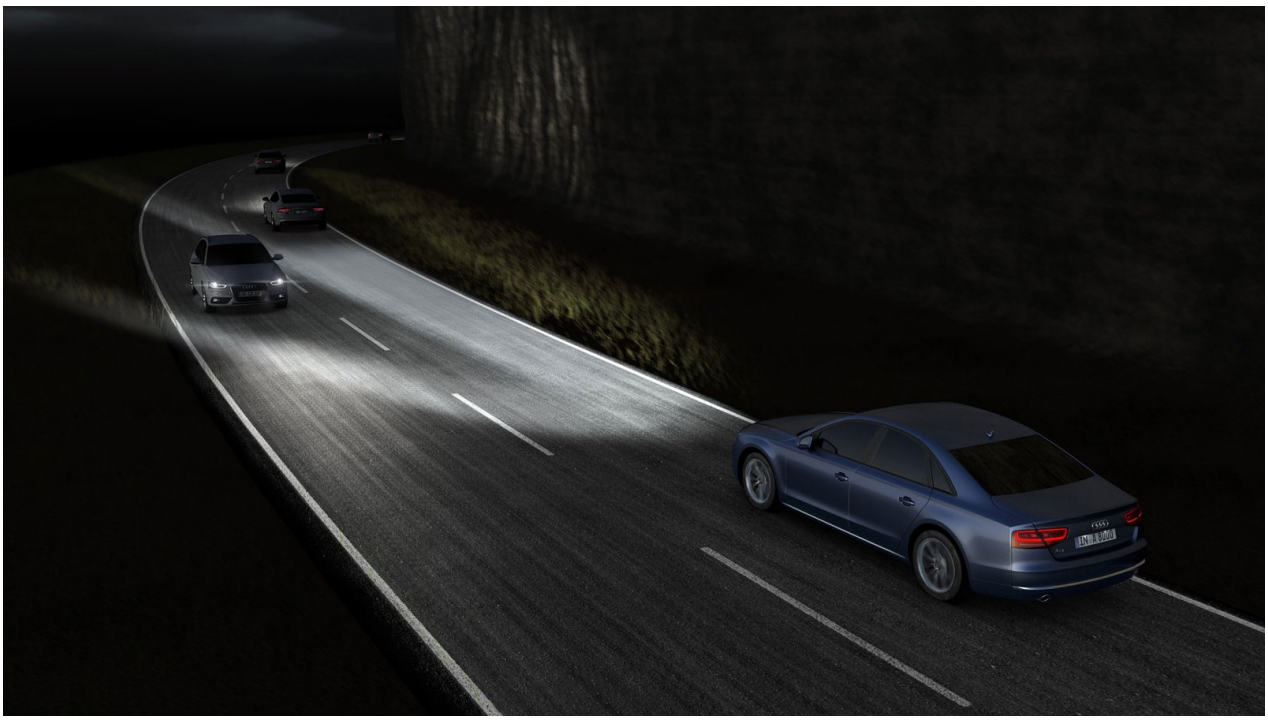
Information including the docket is available **here**. Register online following **this link**, or **contact Salomon Berner** for DVN members.

But wait, there's more! Today we publish one of the most important reports we've ever put out. It presents the techological, technical, and regulatory history, status, and outlook for ADB since its beginnings in 2010, with data-driven forecasts for the next five years. Be sure and **download your copy!**

Sincerely yours

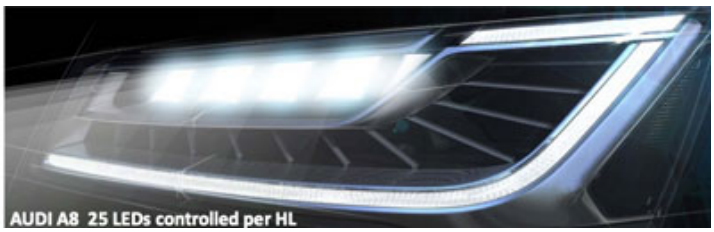
In Depth Lighting Technology

DVN Report: ADB Could Be Worth Mandating



Along with the advent of LEDs as primary light sources in vehicle lamps, ADB (adaptive driving beam, also called glare-free high beam) is the greatest innovation in decades. ADB gives high-beam seeing with low-beam glare, finally resolving the seeing-versus-glare dilemma which for nearly a century vexed industry, regulators, researchers, and drivers alike.

The latest DVN Report—released today—presents the origins of ADB, describes how we had to wait for electronics and onboard cameras to evolve in the 2000s to a level that would support practical ways to realise this longstanding dream, and the arrival in 2010 of the first mechanical ADB system with an HID light source.



An important chapter is dedicated to the presentation of four beam-shaping concepts: the **mechanical system** came first, in the VW Touareg, and is still used today with different methods. The **matrix beam** launched in the 2014 Audi A8 as a solid-state system (no moving parts!) allowing possibility of lighting between shadow zones. **Pixel lighting** came along first with a complex system in 2016 in the Mercedes E-class with 84 pixels, then with high-resolution using DMD, LCD, and µLED technologies. And **scanning systems** use MEMS or spinning mirrors.

A.Stella
Marelli AL

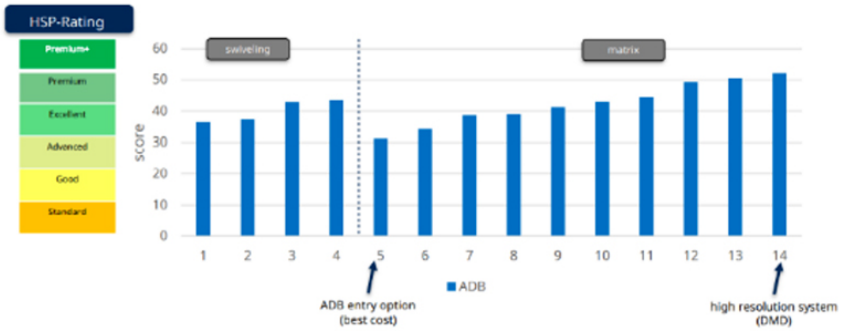
Michael Kleinkes
Hella

Kenji Arima
Koito

Benoit Reiss
Valeo

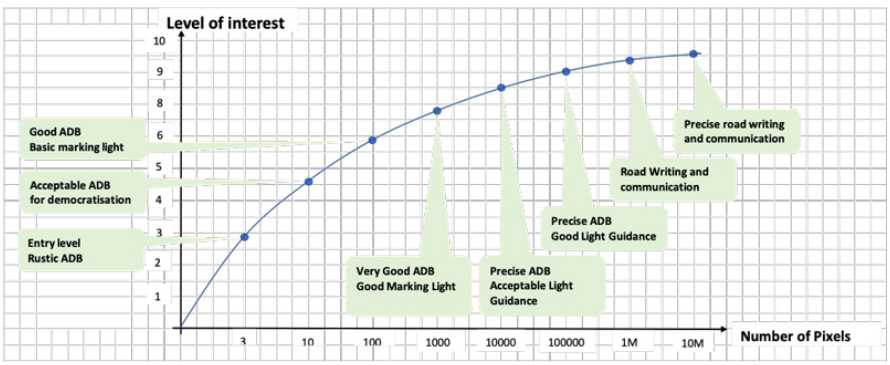
Jürgen Antonitsch
ZKW

The next chapter describes the achievements of tier-1 suppliers Marelli Automotive Lighting, Hella, Koito, Stanley, and ZKW with exclusive interviews of their R&D directors; and also of Tier-2 suppliers Lumileds, Nichia, Osram, Texas Instruments, and others arriving in the market.



There's a chapter on how to assess the ADB lighting performance—a very tricky thing to do accurately, precisely, and repeatably. There's a detailed description of the method devised by Marelli AL and further developed with Darmstadt University and GTB members until it was precisely reproducable and scientifically accurate, and then discussed in the GTB deliberations. The target is to qualify this ADB rating system as a GTB position paper, though no decision on the matter has yet been taken by GTB.
Then a chapter describes the status of ADB regulations worldwide, as well as the increasingly problematic and frustrating USA exception.

There will be room for each category as the range of car models is large and so the offer with ADB is adapted to the purse of everybody.



Then comes a synthesis, the evaluation of lighting performance in relation with the number of pixels or segments, and analyses the market prevalence of ADB in Europe, Asia, and provides forecasts for the USA.

The last chapter is about the future of ADB. After starting as an option in premium brands, we are now in the second step, with ADB becoming standard fitment in premium cars and an option on increasing numbers of increasingly lower-segment vehicles. This involves increasing volumes, further development, and decreasing prices. In the same chapter, a new projects prognosis to 2026 explains weaknesses and strengths of each of the 11 technologies currently used in ADB systems, Mechanical, 1 segment with dynamic size, swivelling, Matrix up to 10 Segments, Matrix (11 to 84 segments), 5-, 25-, and 100-kilopixel microLED, kilopixel and megapixel DMD, BladeScan, LCD, and MEMS.

To conclude, the report explains how as a very effective safety system which can save lives, ADB has the potential of becoming mandatory in some regions of the world. A lot of research and even more communication is necessary before this could be realised, but in any event it is certain that low/high-beam systems are outdated technology and ADB has a bright future.

The report illustrates how and why ADB is a very effective safety system that can save lives. The report is summarised by this sentence: **All described possibilities have one thing in common - ADB has a bright future.**
Download your copy today!

Lighting News

Gasgoo Work to Boost Auto Industry Info Exchange

LIGHTING NEWS

盖世汽车 Gasgoo 汽车产业信息服务平台

As a vertical service provider for global auto industry, Gasgoo offer a variety of information and data to upstream and downstream companiesy. Gasgoo—very well known in China, but not yet widely heard-of elsewhere—are also an industrial media platform providing news and analysis of developments and trends in the auto industry.

Gasgoo hold online and offline professional forums, courses, and other events where executives and experts from leading enterprises and research institutions are invited to share their knowledges and insights, so as to boost the exchange of the industry.

Herewith, an exclusive DVN interview of Gasgoo CEO Tina Zhou:

DVN: Could you please share your opinions about current global and Chinese auto industries?

Gasgoo : The requirements on environmental protection and the technology advancements have greatly promoted the transition and upgrades of auto industry, and made intelligent electrification the mainstream of the industry. The boundary of auto industry is being broken down following the growing diversity of travelling methods and increasing number of new players. The change is in particular drastic in Chinese auto industry. In China, a country with a population of over 1.4 billion, consumers are pretty positive about emerging technologies and are keen to try new brands and new products. The localisation of Tesla's vehicles demonstrates the favourable advantages of China's local supply chain in the era of intelligent electrification. It also prompts more new players to join the smart EV domain, such as the leading consumer electronics firm Xiaomi, the renowned contract manufacturer Foxconn, and the technology giant Baidu. Undoubtedly, the phenomenon will result in fiercer market competition and higher requirements on products, while bring more and better choices for consumers. The automobile has become an extremely imaginative mobile carrier that integrates various technologies.

DVN: ADAS and lighting are our wheelhouse. What do you think of the competition landscape and future technology development trends of these two areas?

Gasgoo: The ADAS industry has seen a rapid growth in recent years. Both the Euro NCAP and the 2021 C-NCAP pose stricter requirements to automotive active safety. Automakers are increasing the installation of ADAS as a factory-installed device of vehicles, so as to efficiently satisfy consumer demands over auto safety performance and enhance the level of auto intelligence. We are upbeat about this industry and believe ADAS will be a standard facility for all vehicles in the future.

Due to the technology progress and the development of auto intelligence, the lighting industry has created many new values, developing from a domain that only underscored functional performance in old days. Apart from functionality, many automakers use lighting to create changeable ambiences and scenarios for their new vehicle models, in order to match users' different emotions and demands. Meanwhile, the lighting has served as an important port and interface of social communication by releasing diversified signals. Some companies like Audi work on allowing users to play games and watch videos through lighting, which are good applications as well.

DVN: News and trends about Lighting and ADAS in China are what our worldwide DVN community of readers would look for when visiting Gasgoo website. Can you give an example of information concerning lighting or ADAS you recently published ?

Gasgoo: Gasgoo is not only a mainstream professional auto industry media in China, (auto.gasgoo.com), but also an international media, serving as a window for the world to know the Chinese auto market (autonews.gasgoo.com). Our services cover the whole auto industry ecosystem, including timely following and deep reporting on industry news, leading enterprises and celebrities, technology trend, supply chain information, cross-border integration, etc. with focus on advanced fields like new energy, intelligent connectivity, new material, intelligent manufacturing and SDV. You can find the relevant information you need on autonews.gasgoo.com.

DVN: What suggestions will you provide for automotive companies and what is your expectation on their development?

Gasgoo: In the new era, the business logic and product demands for auto industry have been greatly changed. Companies used to merely focus on the design, the R&D and the manufacture of their own products, but now, even the firms mainly serving business users have to attach great importance to users' demands. Relying on each other, OEMs and auto parts suppliers should make joint efforts to offer users good services. In addition, the cycle of industrial chain is being shortened. Previously, a product could be sold in the market for three to five years without any upgrades, while the iteration and upgrade are being increasingly frequent as user demands are changing rather fast. The rapid change also requires companies to become stronger in technical capabilities, innovation and flexible production.

Where Is the Regulation on Lit Logos?

LIGHTING NEWS

by Geoff Draper, DVN Regulatory Advisor and former GTB President

Exterior lighting is evolving towards new functionalities, improved eco-efficiency, better performance, and new designs where lighting plays a central role in the style of the brands and models.Light is a perfect symbol for the mobility of the future. Exterior lit logos are one of the trends to enhance the exterior of the cars that more and more users are demanding.

China was the first region where passenger vehicles with lit emblems and logos appeared on the roads, although they are not included in the Chinese GB Standards. It is not clear, therefore, what basis they're approved on, but it is likely they are being certified as part of another lighting function. The Chinese SAC/TC114/SC-21 committee, responsible for drafting the GB standards, have started work to develop provisions for these lit logos and it is expected they will follow the outcome of the UN Regulation discussions in GRE.

Unlike the UN regulatory philosophy that anything not specifically allowed is prohibited, the self-certification system in the U.S. and Canada takes the opposite philosophy: anything not specifically prohibited is allowed, so there are no specific requirements for lit logos beyond the general provision that non-mandatory equipment may not "impair the effectiveness" of required equipment.

In countries around the world applying UN Regulations, there is a situation wherein a friendly type-approval authority grants an approval based upon its interpretation of the UN Regulations, but other type-approval authorities do not agree. This situation was introduced to the GRE agenda in April 2019 with **a proposal** from France and Germany to introduce conditions for the use of logos inside the illuminating surface of a signalling lamp in the UN Regulations 148 and 48. At its April 2019 session, GRE considered this proposal.

Subsequently, France and Germany submitted a modified proposal to the October 2019 GRE session. Several experts expressed their preference to completely prohibit the use of logos inside the lamps on safety concerns, while some others thought road safety would not be compromised, as the lamps should meet all requirements in the respective UN Regulations. Some experts wondered whether the use of letters inside the logos was allowed. Pending the outcome of this discussion, **GRE "invited" type approval authorities to refrain from granting type approvals to signalling lamps with logos inside the illuminating surface.**

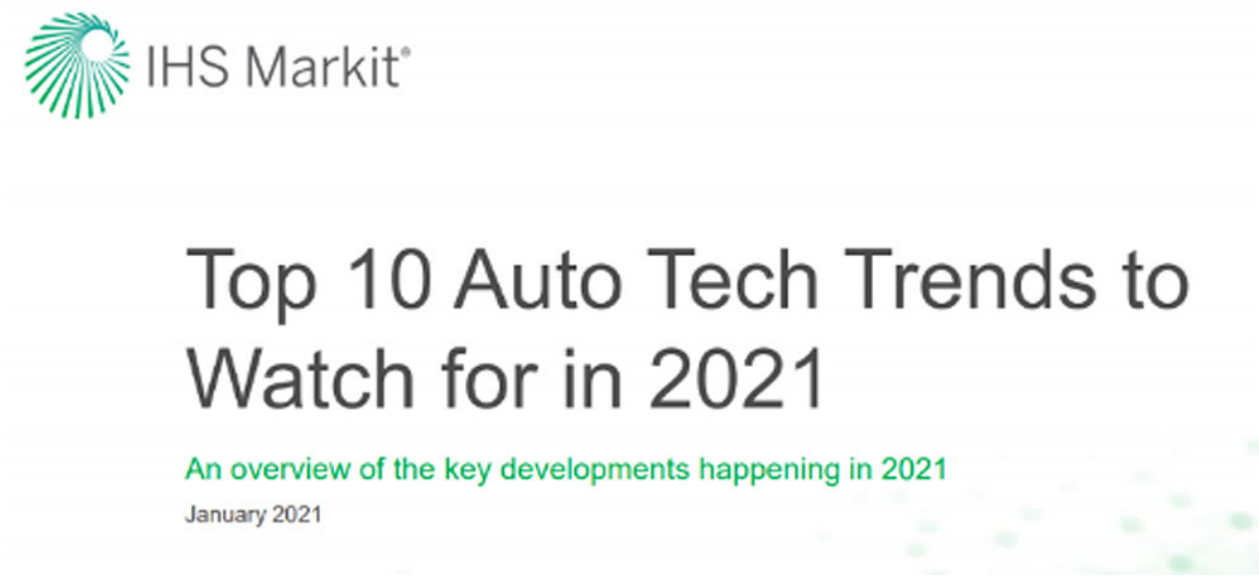
France and Germany submitted a further updated proposal and an **updated version** will be discussed at the next GRE session, this coming 26-30 April. If GRE adopts the latest proposal from

France and Germany at its April 2021 session it will be sent for adoption by WP.29 at its November 2021 session, and the amended regulations will enter force in May 2022. if GRE adopts the proposal in April 2021, the actual working time from April 2019 to May 2022 will have been 25 months!

As a general observation, manufacturers may wish to question the wisdom of seeking approvals based upon a creatively friendly interpretation by a type-approval authority. Of course, such an approval can provide a marketing lead, but the short-term gain of a jump-the-gun approval comes at a cost to everyone of long-term pain; history shows that governments react dyspeptically to such rule-bending, which prolongs and delays the necessary updates of the regulations to allow access to a majority of global markets.

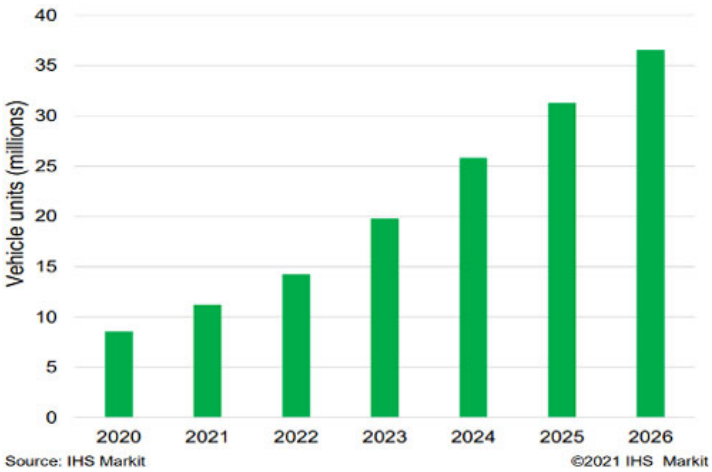
Auto Tech Trends: Matrix lighting in the Top 10

LIGHTING NEWS



IHS published an overview of the key developments happening in 2021.
Matrix lighting proliferates beyond premium
1. EV charging speeds keep increasing
2. 5G automotive deployment continues
57 million vehicles on the road supporting 5G by 2026
3. Automated driving launches continue to differentiate in L2, L2+, and L3
4. Software becomes critical to ACES
5. Europe to boost battery manufacturing
30% of battery capacity to be produced in Europe by 2026
6. Over the air software update (OTA) proliferates
7. Automotive chip shortage
8. Production 3D printing enters light production vehicles

9 – Matrix lighting proliferates beyond premium



ADB FUNCTION

• 46 automakers will offer adaptive ADB headlamps for their vehicles in 2021
• ADB has moved to lower sales segments for European and Japanese OEMs, boosting adoption further > Premium segments have shifted to higher pixels per headlamp, with some reaching >1m pixels per vehicle
• Despite growth in Europe, China, and Japan, regulatory hurdles remain in the US, but this is expected to change in the coming years

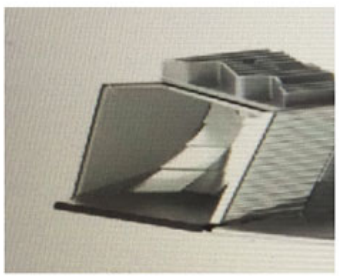
10. Lidar sensors enabling automation – especially in L3 and L4 launches

OsCon XLE Goes Live

LIGHTING NEWS

Osram-Continental officially launched their XLE (eXchangeable Light Engine) last week at an online seminar.

The XLE can be used for all vehicle classes thanks to an architecture that is modular, scalable architecture in terms of luminous flux, size and performance; its highly efficient thermal design allows for optimal system integration with reduced mass, bulk, and parts count.



Traditional: PCB + LED, heatsink, reflector, headlamp housing

Now: XLE, reflector, headlamp housing

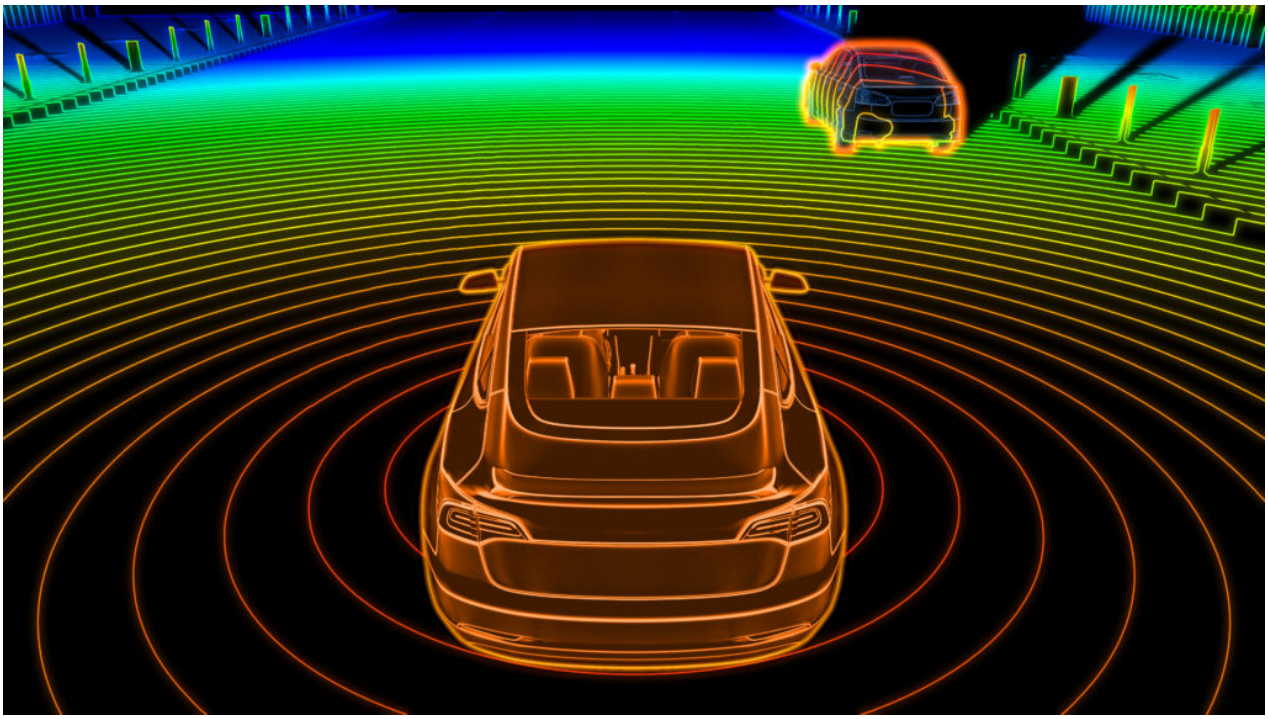
Model №	XLE 650	XLE 900	XLE 1100
Number of LEDs	1 × 2	1 × 3	1 × 3
Flux at 50°C	650 Lm	900 Lm	1,100 Lm

Osram-Continental say the intent of the new product is to extend the tremendous advantages of LED headlamps to entry-level cars. They aren't, however, saying much about the potential implications for the eLE range of the two companies' (Osram and Continental) dissolution-in-progress of their joint venture.

Driver Assistance News

Auto Tech Trends: Lidar Is In Top 10

DRIVER ASSISTANCE NEWS



A new IHS publication gives an overview of key automotive developments happening in 2021. Their top-ten list includes lidar sensors enabling automation, especially in L^3 and L^4 AVs. Here's that list:

1. EV charging speeds keep increasing; over 60 per cent of EVs produced in 2021 can charge at 100kW DC or faster.

2. 5G automotive deployment continues; 57 million vehicles on the road will support 5G by 2026.

3. Automated driving launches continue to differentiate in L^2, L^{2+}, and L^3. L^3 launches are (were?) expected in 2021, but challenges remain.

4. Software becomes even more crucial to the CASE transport revolution.

5. Europe to boost battery manufacturing; 30% of battery capacity to be produced in Europe by 2026.

6. OTA (over the air) software updates proliferate; 350+ million vehicles will offer some OTA by 2025.

7. Automotive chip shortage—lead time for automotive semiconductors, once 12-16 weeks, now 26+.

8. Production 3D printing enters light production vehicles.

9. Matrix lighting proliferates beyond premium cars.

10. Lidar sensors enabling automation, especially in L^3 and L^4 launches.
New automated driving features provide primary use cases for new and diverse sensors, especially

lidar.
Technology, performance, and cost obstacles exist; there are high early costs but with relatively predictable declines.
FMCW (frequency-modulated continuous-wave) lidar is generating interest by providing velocity information not available from other kinds of lidar.

Object Detection in the Rain With Lidar

DRIVER ASSISTANCE NEWS

Researchers from the University of Warwick (WMG) are testing how lidar sensors on vehicles perform in the rain. Using a WMG 3xD simulator (explanatory video **here**) the team tested an autonomous vehicle's lidar sensors in different intensities of rain, driving around a simulation of real roads in and around Coventry, England.

One of the issues with lidar sensors is performance degradation in rain. Lidar works by emitting numerous narrow beams of near-infrared light with circular/elliptical cross sections that reflect off objects in their trajectories and return to the detector of the lidar sensor. If a lidar beam intersects with a raindrop close to the transmitter, the raindrop can reflect the beam back to the receiver, which will falsely detect the raindrop as an object. The droplets also can also absorb and refract some of the emitted light, degrading the sensors' effective range.

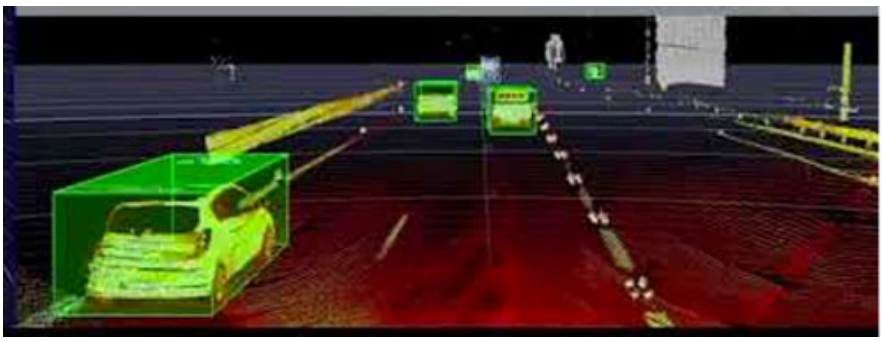
Researchers, using different rain models, made it rain in the simulator and measured the lidar sensor's responses, making a record of false positive and false negative detections. As the rain intensity increased, it became more difficult for the sensors to detect objects. At ranges up to 50 m, several rain drops were erroneously detected. At 50 to 100 metres' range, this decreased, but as rainfall increased up to 5 cm per hour, the sensors' detection of objects decreased and effective range was shortened.

"The developed real-time sensor and noise models will help to further investigate these aspects, and may also inform autonomous vehicles manufacturers' design choices, as more than one type of sensor will be needed to ensure the vehicle can detect objects in heavy rain." said Valentina Donzella from the University of Warwick. The team's research has been published in the journal **IEEE Sensors**.

Innoviz: Perception Platform to Accelerate AV Production

DRIVER ASSISTANCE NEWS

Innoviz have released their InovizAPP automotive perception platform. It includes automotive-grade hardware and software to enable AVs to identify and classify objects. Innoviz are shipping InnovizAPP to some automakers already, helping them accelerate timelines for consumer AV programs globally.



Based on Innoviz's advanced Perception Software, InnovizAPP enables safe autonomous driving as it identifies, detects, and classifies objects. InnovizAPP is based on Innoviz's advanced perception software, which uses proprietary AI algorithms to analyse rich data derived from Innoviz lidar sensors, so as to estimate an object's speed with high precision. The software can accurately detect and classify objects in any 3D driving scene up to 250 metres away, including cars, trucks, motorcycles, pedestrians, and more. It also executes perception algorithms in real time, detecting and classifying pixels as collision relevant or not. The InnovizAPP hardware is based on low-cost automotive-grade components. It connects to existing vehicle systems and enables real-time perception in a simple plug-and-chug manner, allowing automakers to test and learn how to build their own autonomous driving systems.

Innoviz CEO and cofounder Omer Keilaf says "InnovizAPP is a true technology breakthrough, offering an adaptable automotive-grade chip and platform that can be incorporated into existing vehicles. We developed it in response to requests from major automakers, and our customers in Asia, Europe, and North America are already optimising their AV programs with this platform".

Hella Collaborate With Wejo for Sensor Data Wrangling

DRIVER ASSISTANCE NEWS

Hella have an extensive sensor portfolio including high-performance radar, battery, and rain-light-climate sensors. Many of these generate large amounts of data. In order to further improve the performance of the sensors based on data from millions of vehicles,
Hella have partnered with connected vehicle data provider Wejo. The relationship aims to potentially develop new data-driven business models. As part of the collaboration, Hella acquired a minority stake in Wejo.

Kay Talmi, Managing Director of Hella Aglaia and responsible for coördinating Hella's companywide software activities, says Hella are "already a strong supplier for a wide range of different sensors. Wejo is an important partner with whom we can also tap into the processing of sensor data in the cloud. More specifically, we want to gain a better understanding of how data is standardised, enriched, and turned into monetisable products on Wejo's data marketplace".

Wejo got started in 2014, and are headquartered in Manchester, U.K. The company's core product is a platform which processes data from 10.6 million connected vehicles made by a variety of makers. These vehicles transmit around 400,000 data points per second, which include movement data such as speed and position of the vehicle, as well as event-related data, for example from a deployed airbag or an activated brake assistant. The data is processed by Wejo and made available to other partners on the platform either directly or in the form of tailored products and services. Wejo's customers include, for example, transportation and municipal organisations, road authorities, and navigation service providers.

The first joint pilot projects between Hella and Wejo are currently being defined and will begin shortly. A strategic investment in Wejo also forms part of the collaboration between the two companies. The investment has been made by the Silicon Valley-based venture capital arm Hella Ventures, but the contracting parties have agreed not to disclose the exact amount of the investment.

General News

Start of production for Audi Q4 e-tron

GENERAL NEWS

The production of the Audi Q4 e-tron has started—the first electric SUV to be produced by Audi in Germany. The Q4 e-tron features a Volkswagen-made modular electric drive matrix (MEB), a highly versatile and variable platform that is suitable for numerous fully electric models and offers considerable scope for leveraging synergies.

The compact electric SUV will be unveiled next month and launched on the European markets this summer, adding thrust to Audi's electric-drive drive. By 2025, Audi plan to launch more than 20 fully electric models and expand their PHEV offering. The two main Audi plants, in Ingolstadt and Neckarsulm, also are set to manufacture fully electric vehicles; early next year the first model based on the Premium Platform Electric (PPE), developed jointly with Porsche, will start production at Ingolstadt.

The Q4 e-tron is described as electric premium mobility at an attractive price. It offers almost as much interior space as a full-size SUV, and the display concept, with an optional augmented-reality HUD, is also pioneering in its class.

Audi are working to further minimise CO_2 emissions in the value chain, and production of the Q4 e-tron will be carbon-neutral; the Zwickau plant covers its entire energy needs using renewables, and has a highly efficient combined heat and power plant. When the Q4 e-tron reaches the end of its service life, its battery will be used in second-life concepts or recycled as a source of raw materials.

Geely's New Premium EV Brand: Zeekr

GENERAL NEWS

Geely Auto have announced Zeekr Company Limited, a new Chinese electric mobility technology provider that will serve growing global demand for premium electric vehicles.
The first Zeekr vehicles are expected to be delivered later this year, with a target to deliver a new EV model to market in each of the coming five years.

Geely say the goal is for Zeekr to fully integrate the end user into a new super ecosystem focusing on the full service of end user requirements with an "innovation as standard" approach to sales and servicing. Under the plans, Zeekr will use Geely's SEA (Sustainable Experience Architecture) and will include Zeekr-specific battery and motor technologies, battery management systems, and electric vehicle supply chain support. SEA technology will allow Zeekr vehicles to offer OTA software upgrades throughout the lifetime of the vehicle.

Zeekr will become the latest electrification initiative within the wider Geely brand portfolio, in which other companies such as Volvo have recently announced ambitious zero-emission strategies. Other Geely EV brands include Lynk & Co, Polestar, LEVC, Geometry, and Lotus Cars—all expanding in different market segments, providing consumers with a wide range of electrified automobiles.

The initial market strategy for Zeekr will be focused on the Chinese market as part of Geely, but export opportunities are being considered to satisfy global market demand for premium EVs. Zeekr will be jointly owned by Geely Automobile Holdings and Zhejiang Geely Holding Group under a 51% and 49% share structure, both parties having pledged to inject RMB 2bn in capital into the company.