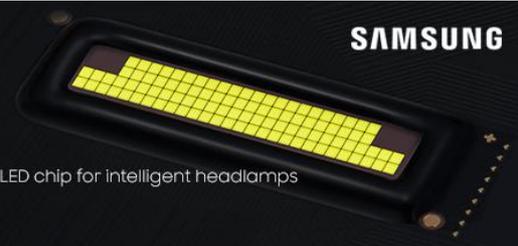


PixCell LED

Ultimate precision in perfect alignment

100+ individual cells with just 25 µm spacing, perfectly matrixed onto a single LED chip for intelligent headlamps

SAMSUNG



Editorial

Jaguar Land Rover's Lighting Squad

DVN was invited to visit Jaguar Land Rover (JLR) at their development centre in Gaydon, not far from Birmingham, England. It's a brand-new facility, huge like an airport with really impressive architecture.

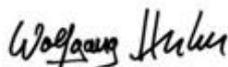
I have seen a surprisingly fresh culture and the most modern development processes in the industry. Everything runs to a new agile process across the whole development process so people can focus on value-added increments and short milestones. Everyone is working to the same drumbeat. A new mindset—or, let's say, a total cultural change—was necessary to accelerate the end-to-end progress, compared with the classic development process. A guiding principle is *fail fast and don't be scared to try*.

The whole lighting team consists today of 120 people and has been growing very fast. In the last six years it has doubled in size every two years. The new lighting organisation has been divided into different squads like the electronics squad, software squad, mechanical, and interior lighting squad. It is a truly global team and essential that a lot of daily interaction takes place amongst these squads and the lighting core team and program delivery teams, including several validation teams in India as well as those such as legacy teams located in Romania and newly in China.

The working process with the suppliers is also different to the normal industry procedure because all are working to the same "North Star". Joint 15-minutes meetings are the normal start to the working day. All squads manage themselves. The JLR people say the result is more collaboration and more fun.

All in all, I saw a company on the move. I met an enthusiastic, big lighting team of (mainly young) women and men from all over the world, who asked nearly more questions than I was asking. What a spirit!

I remind you the exceptional event boasts probably the best program ever in the 15-strong history of DVN Workshops. It's sure to be a don't-miss event, so **register to attend [here](#)**, and **book your room [here](#)**. **Don't wait; the event and hotel are filling up quickly!**



Wolfgang Huhn
DVN Senior Advisor

In Depth Lighting Technology

JLR Interview and Night Drives: Oh, What A Light!



DVN interviewed Gary Knight, the brand-new head of JLR's lighting development, successor to George Penrice.

Gary Knight is an engineer who studied aerospace engineering, and also earned a master's in both engineering and business management. He joined Rover Group in 1993 before moving to JLR 25 years ago and has worked with many great teams around the world including at Ford and BMW.

DVN: Which jobs inside JLR did you manage before the lighting?

GK: I have been lucky to spend time across engineering and business functions. Initially joining the crash team, then developing from Body CAE to full virtual vehicle test coordination. Whilst studying for my MBA, I joined Product and Business Strategy including a period of cross-carline planning as JLR were expanding their product range. In 2010 I moved to the Range Rover team and worked from concept and virtual phases to physical build and verification properties. My next big move came when I joined the PLM team and spent 5 years with a major business transformation programme before re-joining the engineering team as senior manager for exterior commodities in 2016. Since November 2022, I am responsible for the lighting engineering teams across all models in our portfolio.

DVN: A very rich experience, indeed. What are your expectations and targets in lighting?

GK: There are several key workstreams we need to deliver. We have a fantastic and ambitious plan to create a premium luxury experience with the highest levels of quality for our customers whilst aligning to the business-critical goals of reducing our carbon footprint, weight, and energy consumption. One key enabler will be to ensure we allow the team to fulfill their potential through our business transformation to a new agile mindset and framework with enhanced teamwork and purpose.

DVN: And which technologies and innovations do you want to push?

GK: It is too early for me to say. Let's talk about that in future months. In this context the team demonstrated the new manoeuvring light, a USP offered in the Range Rover in a dark room. The manoeuvring light is integrated in the mirrors and offers a perfectly lit scene for the top-view cameras—resulting in a perfect scene overview in the main display in totally dark areas where you see nearly nothing without this feature.

Test Rides

DVN was invited for some test rides, always on the passenger seat.



L-R: GARY KNIGHT, LYDIA HEWITT, JAMES ESDERS, WAQAS AHMAD, PETER HALL, MARK ASHWORTH, RICHARD ADIYA, IRENE SANCHEZ, MONISHA RAJU, ALEX COSIC

First was a test on the proving ground inside the area of the technical center. The ride, handling, and performance of the new Range Rover and Range Rover Sport on-road are fantastic, no doubt.

Then we changed to the off-road part of the test area and here the normal scale starts to fail. It is really unbelievable what a Range Rover is able to climb, the tilt angle achievable without rolling, the water level the car can cross and which deep, muddy, or wet sand section it can pass through. I was also impressed how the displays are showing the actual extreme car situation and position. A very advanced off-road user interface. Great job! Of course, everything was totally safe because the lady behind the steering wheel was a professional off-road driver.



LEFT TO RIGHT: JAMES ESDERS, GARY KNIGHT, LYDIA HEWITT, WAQAS AHMAD, WOLFGANG HUHN, PETER HALL, MARK ASHWORTH, RICHARD ADIYIA, IRENE SANCHEZ, MONISHA RAJU, ALEX COSIC

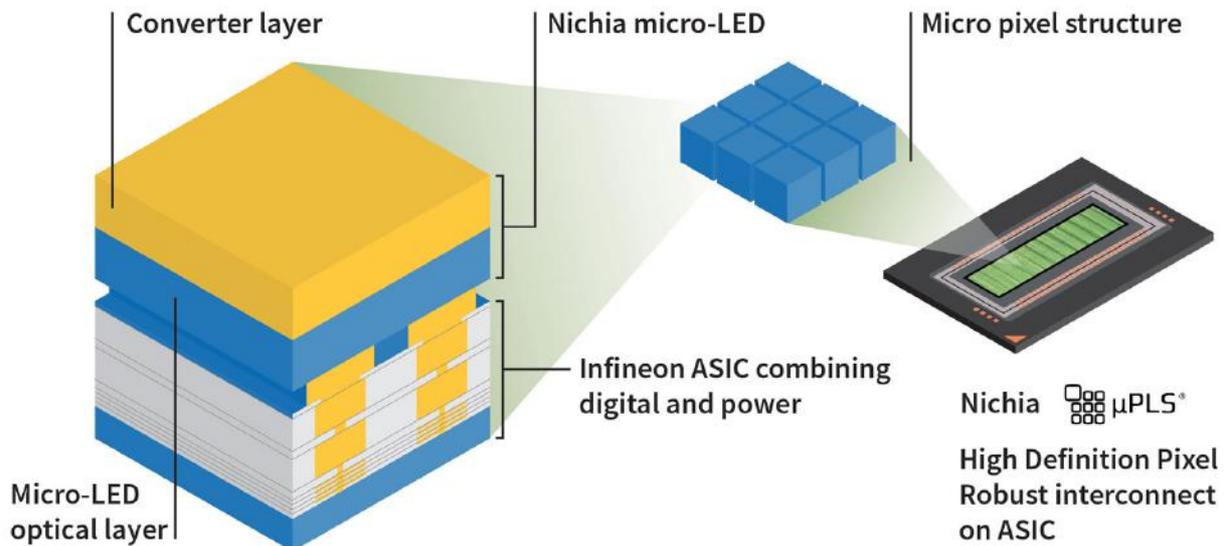
The second part of the test rides were a night drive in the Gaydon area with a Range Rover and a Jaguar F-Pace. The F-Pace was equipped with an ADB using the Varroc 81-pixel module which is on the market quite a while with good results. More advanced was the ZKW ADB with Matrix and DLP Technology. A really good high-end lighting system with a good software solution too. No glare to oncoming or proceeding cars although we were quite fast driving on small and winding roads with crests and hills. The system is ready for road projection.

At the end of this perfect day, we talked long about future lighting, roadmaps, innovations and technologies while enjoying a dinner in a very traditional English pub.

Lighting News

Nichia, Infineon in World-First HD μ LED Matrix Solution

LIGHTING NEWS



Three years ago, Nichia and Infineon announced the joint development of a high-definition (HD) light engine with more than 16,000 microLEDs for headlamp applications. Now, both companies are launching the industry's first fully integrated microLED light engine for HD ADB applications. It will be used in a German premium vehicle this year.

Andreas Doll, Infineon's SVP and general manager of Infineon Automotive's body power business unit calls the new tech "the industry's first fully-integrated matrix LED driver capable of driving 16,384 LEDs, combining all required microLED driver circuitry with extensive diagnostics and high-speed video and control interfaces".

The new HD light engine uses Nichia's microLED technology and an integrated LED driver IC from Infineon that can drive all 16,384 microLEDs individually using pulsewidth modulation. The driver IC monitors each microLED separately and provides on-chip temperature monitoring, allowing for optimal thermal control. Integrated video interfaces enable high-speed transmission of the video signal from the light pattern generator unit.

This allows for smaller and slimmer headlamp designs in the future. In addition, the new HD light engine enables adjustments that can be digitally programmed at the factory or activated by the vehicle manufacturer or driver on demand. With all these features, the new HD light significantly reduces design and production complexity for vehicle manufacturers.

Expected Rise of Micro-Optics

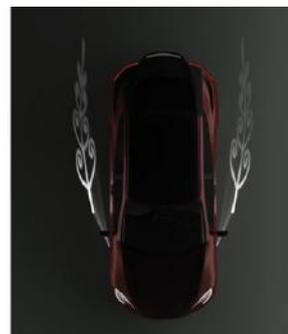
LIGHTING NEWS



Microoptics are a key enabler in the modern world, spurring advancements in vehicle lighting. The first two serial-production cars using microlens array (MLA) headlamps are on the road, and Suss MicroOptics CEO Reinhard Voelkel says they "achieve top ranking in saving space, energy, and material, and allow full design freedom for car designers".



MICROLENS ARRAY (MLA)-BASED HEADLIGHTS



EXTERNAL LIGHT PROJECTIONS

One class of microoptics is manufactured in much the same way as microchips. But instead of thousands of microchips on a wafer, thousands of lenses are manufactured on an industry-standard 8-inch substrate. Simultaneous processing of several thousand optics on a large wafer is essential to meet the demand of dynamic, growing markets. But unlike semiconductor production, microoptics fabrication remains at a much lower degree of industrialisation and automation and is encumbered by a large number of manual processing steps.

Demand for smaller, faster, lighter, and cheaper products continues to put pressure on the entire supply chain. The companies who work out how to do more in the same (or less) space will realise the most significant gains in the marketplace. Miniaturisation provides more functionality, more discrete capabilities, and efficient designs. But as the miniaturisation trend continues to push size and quality, pressure to keep up increases on the rest of the supply chain. This includes not only suppliers of high-precision injection molding for polymer optics, but also other supply chain partners, such as resin suppliers.

Suss MicroOptics' Voelkel believes that the micro-optics industry could actively reduce packaging challenges for its customers, for both passive and active alignment, by adding additional features such as alignment marks, prisms, monolithic integration of microlenses and prisms.

Macroblock's Drivers at CES

LIGHTING NEWS



Macroblock, who are actively developing in new fields, have recently begun work in the automotive market. Major makers have successively adopted Macroblock's automotive LED driver ICs.

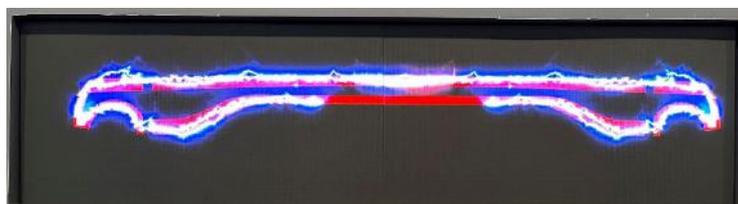
To enhance brand visibility, Macroblock participated in CES this year. The exhibits included LED headlamp and rear lights, and FALD (Full Array Local Dimming) LED backlight modules for in-vehicle displays.

Adaptive Driving Beam (ADB)

Macroblock demonstrated an ADB system by using 100 LEDs and their MBI6353Q driver ICs, which boasts flexible current design; 4,096 steps of brightness adjustment to fit ambient light change, and compliance with automotive safety integrity level ASIL B.

Full-width rear lights

Automakers design rear lights in a strip or narrow shape, forming a full-width rear light band. The visual extension is achieved by increasing the illuminated area, and cars are easier to identify when lit up at night. A higher-end design is capable of independent control of LEDs, and welcome light effect of rear light can be programmed variously.



A FULL-WIDTH REAR LIGHT USED BY LED DISPLAY MODULES CAN CREATE THOUSANDS OF LIGHT SHAPES.

Hella Sales, Earnings Up in H1-FY22

LIGHTING NEWS



Hella closed the first six months of the short fiscal year 2022 (1 June to 30 November 2022) with double-digit growth in sales and earnings. Sales increased by 25 per cent to €3.8bn. The adjusted earnings before interest and taxes (adjusted EBIT) increased by 30 per cent to €202m. Reported EBIT was €162m, corresponding to an EBIT margin of 4.3 per cent.

CEO Michel Favre says "After a strong start to the fiscal year, we accelerated our successful business development even further in the second quarter. Firstly, the Lighting and Electronics Business Groups both grew at double-digit rates and strongly outperformed global light vehicle production, which has only increased by around 18% in the same period. Secondly, we boosted the globalisation of the business with strong outperformance in China as well as in North America".

Lighting increased sales mainly due to higher production volumes after series launches in the previous year. In the first six months of the fiscal year 2022, the lighting business group increased sales by 27 per cent to €1.8bn.

The company outlook for 1 June 2022 to 31 May 2023 is confirmed as in line with the forecast published in the annual report 2021/2022. Accordingly, Hella expect to generate currency and portfolio-adjusted consolidated sales at the upper end of the range of €7.1bn to €7.6bn in this period. The EBIT margin, adjusted for structural measures and portfolio effects, is expected to be at the lower end of the forecast range of around 5.5 to 7 per cent.

Driver Assistance News

Webasto's New AV Roof Sensor Module

DRIVER ASSISTANCE NEWS



Reliably detecting surroundings, recognising obstacles and hazards in all weather conditions, and ensuring safety for all road users and pedestrians will create new challenges as AVs take to the roads. For Webasto, it's an opportunity to integrate sensor technology into the vehicle's roof, the highest point of the vehicle with the best all-round view.



To that end, Webasto developed what they call the Roof Sensor Module for AVs. It's an openable roof made of glass or polycarbonate and featuring integration of sensors—cameras, lidars, and radars—designed to ensure sensor availability during sensor cleaning; cooling, and deicing.

It can go directly into the production lines as a fully assembled roof. Different variants and options are available depending on desired performance, use cases and customer experience.

Zvision's New Short-Range Lidar

DRIVER ASSISTANCE NEWS



Zvision launched their new short-range ML-30s+ lidar at CES. It boasts an ultra-large FOV of $140^{\circ}\text{H} \times 70^{\circ}\text{V}$; enhanced imaging effects; new automotive-grade hardware and software architecture, and customised engineering solutions.

The new lidar provides better coverage of the area alongside the rear part of the vehicle side without heading angle adjustment, sensing any object entering the designated area faster and earlier. The 140° FOV means detection of a vehicle advancing from behind 1.4m earlier than conventional 120° -FOV lidars, which gives the vehicle's control system an extra 300 to 700 ms to respond. Furthermore, with the same case of 360° blind spot coverage, the blind spot splicing of 140° is twice as small as that of 120° .

As to vertical FOV, the ML-30s+ has an asymmetric design that directs the limited FOV to the closest blind area. The -50° (placed horizontally) of the ML-30s+ is the largest in the industry, which can effectively detect objects at ground level, such as low safety guardrails, bricks, boulders, stone abutments, safety cones and other road obstacles, as well as accurately identifying lane and parking markings. The actual coverage exceeds that of symmetrical vertical FOV of 90° .

The angular resolution of $0.44^{\circ} \times 0.44^{\circ}$ and the frequency of 512 kilopoints per second (in single echo mode) assure that ML-30s+ meets the requirements for constructing a detailed map of the object. This allows to obtain 20 point clouds from the black-clad pedestrian at a distance of 22 m, and 6 point clouds from the triangular cone barrel at a distance of 25 m.

ML-30s+ has been comprehensively optimized in terms of geometry, at $120\text{ (W)} \times 60\text{ (H)} \times 97\text{ (D)}$ mm, a weight of 750 g, and power consumption less than 14w. Compared with its predecessor, both volume and weight have been reduced by 40 per cent, while power consumption has been halved.

Innoviz, Exwayz in Lidar Pact

DRIVER ASSISTANCE NEWS



Innoviz are collaborating with Exwayz, a Parisian deep-tech company developing real-time 3D processing software to demonstrate new lidar-based perception solutions for various non-automotive applications.

Exwayz provide plug-and-play perception software to enable lidar-based 3D mapping, localization and re-localisation, as well as object detection and classification for autonomous system manufacturers. Innoviz's collaboration with Exwayz is intended to add Exwayz's plug-and-play perception software to Innoviz's existing perception software capabilities, creating a turnkey solution for the development and demonstration of Innoviz's lidar technology across a wide range of applications, including: logistics, construction, security, and last-mile delivery services, such as LOXO's zero-emission vehicles where Innoviz is the lidar provider.

Innoviz's suite of lidar products enable safe autonomy by bringing unparalleled optics, seamless design and cutting-edge technology to market at a competitive price. Innoviz's collaboration with Exwayz is expected to further unlock the potential utilization of its lidar technology across a wide range of global customers for near-term revenue opportunities.

PreAct Acquires Gestoos

DRIVER ASSISTANCE NEWS



PreAct

TECHNOLOGIES

PreAct Technologies, specialists in near-field, software-definable flash lidar technology, have agreed to acquire Barcelona-based Gestoos, makers of a unique software platform that enables users with no special training to quickly generate AI algorithms. The idea behind the acquisition is to bolster PreAct's provision of high-performing sensor solutions for automotive, trucking, robotics and other industrial applications.

PreAct CEO Paul Drysch says "By marrying a powerful AI algorithm development platform with our best-in-class flash lidar, we have created a unique environment for our customers to quickly solve difficult use cases. The Gestoos AI development platform comes pre-integrated with our flash lidar solution and a development environment making AI training tractable by our customers' own engineers with minimal hand holding".

The Gestoos AI development platform is built to make AI development approachable; one can think of it as a CAD system for AI developers. The AI platform can be used to train algorithms for any purpose, with an especially large library classifying gestures, human motion, and multiple combinations of humans and objects interacting. When coupled with PreAct's flash lidar, algorithm development tasks that once took teams of experts weeks can now be accomplished in a few hours, revolutionising fields from in-cabin monitoring to automatic door actuation.

Gestoos technology is currently being used or evaluated in a variety of applications, including automotive child-driver-occupant detection and monitoring, and behavior-based insurance risk rating.

PreAct Technologies provide high-resolution, affordable lidar solutions to a wide range of industries including automotive. They're headquartered in Portland, Oregon, with offices in Ashburn, Virginia; Rochester, New York, and Barcelona, Spain.

General News

2023 NACTOY winners: Ford F-150, Kia EV6, Acura Integra

GENERAL NEWS



The electric Ford F-150 Lightning was named 2023 North American Truck of the Year while the Kia EV6 was named Utility Vehicle of the Year and the Acura Integra took Car of the Year honors.



ACURA INTEGRA



FORD F150 LIGHTNING



KIA EV6

The winners, announced, were selected by a jury of 50 automotive journalists from U.S. and Canadian media. The vehicles were picked from three finalists in each category revealed in November last year.

The Lightning's victory is the latest in a string of awards for Ford's electric pickup since its April 2022 launch. "It shows us the sentiment out there for electric trucks," said Darren Palmer, VP of EV programs at Ford. "It helps confirm the investments we're making, because we're all-in on leading in electric. The teams will be bolstered by this success because we're already working on our next generation of trucks and cars."

The Integra's victory was Acura's first NACTOY award since 2001, while Kia netted its first NACTOY win since 2020 and second overall as a brand. This year marked the first time all three utility category finalists were EVs. "It's a huge honor for Kia," said Steven Center, COO of Kia America. "In the 30 years we've been in business in the U.S., this is more or less a high point, given the technology this car has and the market reaction to this car."

China Car Production is continuing its slow recovery despite adverse conditions

GENERAL NEWS



In China in 2022, the cumulative production volumes of cars from January to December were 27,02 million units, up 3,4% y/y, and +7,1% compared to 2020, close now to the peak of 2017.

