

Tue, 24 October 2023
Weekly Newsletter



NEWSLETTER #826

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



Editorial

A Busy Time Of Year At DVN!

Mid-autumn vacation time is coming (at least in Europe) and our team is preparing November and December events.

We're finalizing our event in Shanghai with the organization of our three panel discussions on regulation, rating, and design. Each panel promises to be intriguing, with a lot of new updates for 2024.

We're also putting the finishing touches on our **2023 DVN Study** we will publish on 1 November, about ADB. Many apposite things have happened over the last 18 months—the FMVSS 108 release in Q1 2022, the first microLED headlamp on the market this year, the introduction of road projections as part of the ADB function in ECE Regulations from January 2023, and a new proposal to include ADB in the China NCAP rating in 2024 are among the topics that the Study will detail.

In the last four weeks we've had a great deal of feedback across multiple channels, about interviews we've run in the DVNewsletter—Renault, Osram, Lumileds, Luxit, and more—and we are pleased this week to bring you this week's in-depth report about the Magna R&D team, with an interview, after my visit in Torino. I surely hope you will like it. We will continue these interviews and visits in the coming weeks as we have done for so many years. We always appreciate your input and feedback to improve our (your!) Newsletter and keep you engaged and interested in it.

Don't miss the information in this Newsletter about the Car Design News awards in London in December for the design best Lighting team. It's a great initiative, and DVN will be there to inform the community about the result. We really like the idea to have lighting as part of a design event!

Sincerely yours,

Paul-Henri Matha

DVN Chief Operating Officer and Lighting General Editor

A handwritten signature in blue ink, appearing to read 'pamm', located below the printed name and title.

In Depth Lighting Technology

DVN's Visit with Magna Rivoli



Paul-Henri Matha, DVN COO & Lighting General Editor

After GTB week in Torino, I visited Magna's facility at Rivoli. Last time I was there was in 2006 for the development of the Renault Scenic rear foglamp; time flies!

Magna's lighting team at Rivoli is about 5,300 of Magna's worldwide 174,000 employees. Magna have seven R&D centres dedicated to lighting, 12 lighting manufacturing plants worldwide. Their global lighting R&D staff itself is around 320 strong, split among North America; Europe; Brazil; India, and China.

In Europe, 70 engineers are located in Rivoli/Torino and 65 in Ostrava (formerly a Wipac team; Magna bought the Ostrava Wipac facility some years ago).

The former Rivoli plant has been transformed into an engineering Centre of Excellence and aftermarket service hub. A new plant about 20 km away in Moncalieri produces lighting products.

It's been quite an amazing evolution in the last 20 years for Magna lighting; they make headlamps, rear lamps, and complete front and rear facias with film and UV coating capabilities.

I also took the opportunity during my visit to test their latest ADB module—it offers very good performance in the bad weather conditions we encountered during the night drive.



I was invited by Frank Hallitschke, Magna Mechatronics-Mirrors-Lighting's VP of Global Engineering. His team is a very skilled and young team, with a widely international background—Italy, Germany, USA, Spain, Czechia. After the visit, we had an open interview:



DVN: How do you see the future for lighting?

Frank Hallitschke: Let us focus on exterior lighting. We think that the trend of the automakers to invest in exterior lighting as a brand and styling differentiator remains strong, and we want to support them in this mission with our technologies and innovative ideas we have in the pipeline.

Exterior lighting remains a safety feature and a product to support driving comfort. With the advent of electric vehicles, the canvas for exterior lighting continues to grow with new areas on the vehicle being made available to showcase innovative lighting, primarily front panels/grilleboards.

Lighting is no longer just a source of illumination, now it is transforming into a communication tool. These communications can be personalized for brand distinction purposes or meant to inform consumers about the intent of the vehicle on road (V2X).

Another opportunity continues to be to use lighting for sensor integration, to provide lighting support to help the sensors to do their job. Overall, the future seems to be bright for lighting and innovation in the lighting area.

DVN: What are Magna strategies for headlamp in Europe?

F.H.: We are proceeding with our strategy to grow headlamps for Magna in Europe since Magna acquired the Ostrava development centre from Wipac in November 2019. We are launching our 1st headlamp which includes the complete front illumination with a new EV entrant, and we are in development with a traditional automaker with the launch in 2024. And we have additional plans for growth underway.

Accordingly, we have invested in forward lighting capability in engineering in our engineering centre in the heart of Ostrava by growing the team and investing in needed infrastructure. Our engineers and support staff recently moved into a new office, also here with the option to grow.

I think we were quite successful how the engineering teams cooperated between North America and Europe in advanced developments to grow fast our forward lighting module portfolio. We have several night drive cars in Europe and North America to showcase our technologies, and have made several presentations to target automakers, collected feedback and updated our modules accordingly. Magna's lighting portfolio and our roadmap shows all important solutions.

Beside our growth in Europe, I would like to underline that we have also good progress on headlamps in Brazil. We have already multiple headlamp developments locally ongoing for this market.

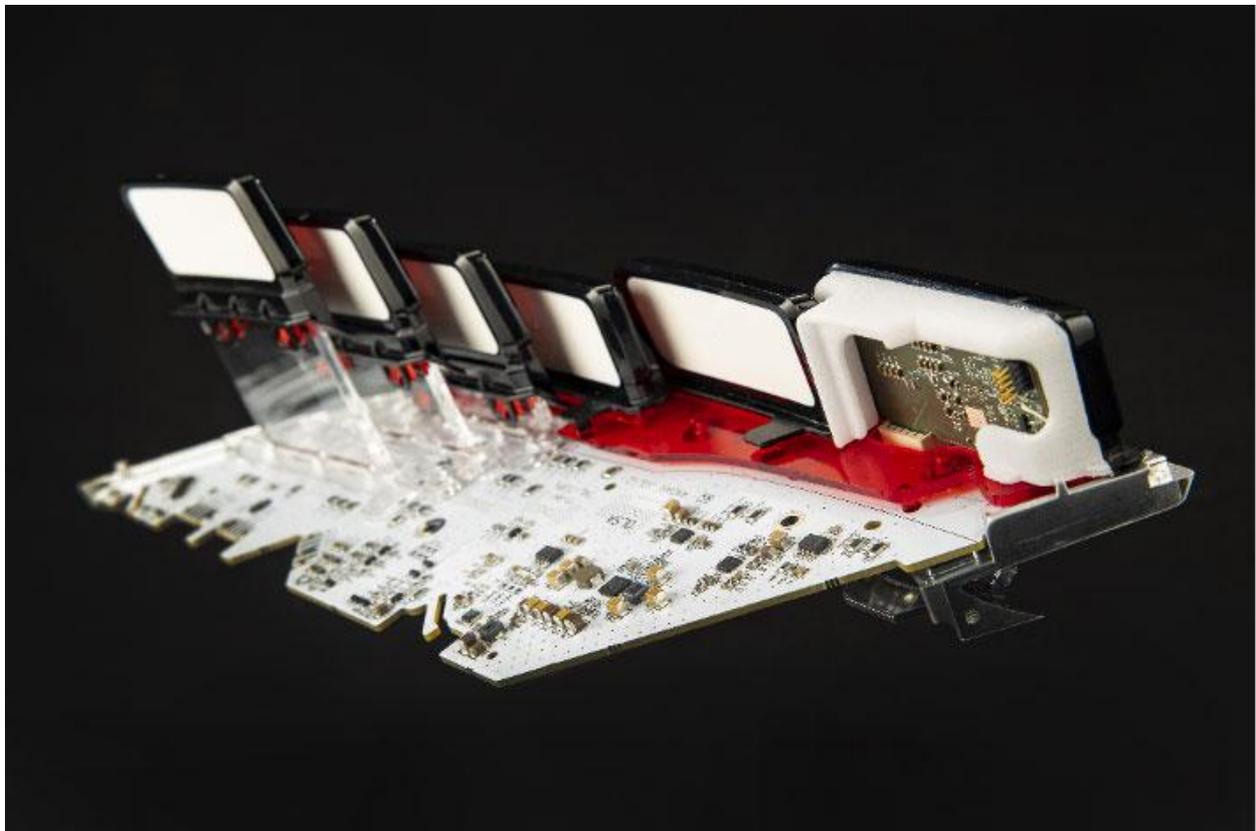
In parallel to grow on headlamps is always linked to footprint, which leads to high investment and here in Magna, we executed improvement over the last 3 years to prepare the plants for world-class manufacturing of headlamps and other forward lighting products.

DVN: Do you work on ADAS—sensor integration, and otherwise like that?

F.H.: The direct answer is yes. In the past we have started activities in radar integration into lighting. We have also a series product with radars integrated into rear lamps.

We also have developed a midrange radar with a very small package size and integrated it into a rear lamp. This advanced project was done together with the Politecnico of Torino, including integration and vehicle testing. We cooperated with our colleagues from Magna Electronics during this project.

With Magna's recent acquisition of Veoneer, we have built a very good position in active safety with an increased sensor portfolio. And we are actively working together on several aspects and how integration between lighting and sensors can create added value. Like the complete lighting community, we also believe that sensor integration into lighting products can and will play an important part in the future of ADAS.



DVN: What is the benefit of being part of Magna?

F.H.: Magna is one of the most diversified suppliers in the automotive Industry. The power of Magna lies in our deep product expertise; our diversified portfolio allows us to take an integrated systems approach to bringing new innovations and products to market. For this reason, also for Magna we can count on several synergies within our groups:

- **Electronics** on sensor integration, radar, lidar, etc
 - **Exteriors** on front grilleboard modules
 - **Mirrors** on side turn signals and logo lamps
 - **Mechatronics** on gesture and capacitive opening, object detection, etc
- This approach allows to have the synergies already at very early stages like concept discussions or concept developments. It allows us to operate in front of the customer as one company.

DVN: How can Magna be more active in the lighting community—maybe through engagement with SAE, GTB, ISAL, SIA VISION...?

F.H.: What DVN is doing is something we consider really unique in the automotive industry and obviously we want to contribute to this community. Magna has bolstered lighting capability significantly in the past few years with the acquisitions of Olsa and Wipac's engineering team in Ostrava.

These acquisitions, along with organic growth, have allowed us to have tremendous progress with our technology roadmaps and growth plans. In 2024 we will have a comprehensive portfolio of ADB projectors developed ranging from 11-segment to HD pixel projectors. We have made progress on radar development and integration and have commercialized first-to-market Flecsform™ miniLED technology. The teams did globally a great job here.

Magna have been making purposeful efforts to focus on our promotion of our lighting capabilities. Over the course of the last year, we were present at two DVN Workshops in North America, including the latest one in San Francisco, presenting a lecture about our

Flecsform™ technology. We will be also present at the next DVN workshop in Shanghai in November.

We were present with a good group this week during GTB in Turin, and we were present during ISAL from September 25 to September 27. I'm especially proud about the investments we have made in showcasing how we can provide complete front and rear exterior lighting systems which we showcased at CES and just recently IAA.

We have strengthened our product management structure, and I can confirm there will come more during the next two years.

DVN: What do you see in terms of advanced technologies and trends?

F.H.: An important trend is to supply complete systems or highly integrated systems. One example is lit grilles. We see here that the trend and request is stable, and customers are looking for solutions coming from the tier-1s.

Our very close cooperation between Exteriors and Lighting allows to support customers at very early stages, like in car concept phases. We are working together on IPs to provide best solutions to our customers. Not only on product engineering. It starts already at product management when it comes to define the technology roadmaps and the investment plans and from these synergies between the groups, our customers benefit.

The other trend to mention is to have the imaging capable solutions around the exterior of the car. We believe that the integration of large displays into exterior trim needs exterior lighting know-how. We are reaching in such applications very high luminance levels to guarantee readability under all lighting conditions. Managing high luminance with all consequence and an integration under styling conditions is the daily bread and butter job of a Lighting company.

We have developed our Flecsform™ technology in the direction of being imaging-capable, and today we have our 3rd generation ready which allows pitches of 1mm, frame rates of 120 fps, and luminance levels of 25,000 cd/m^2 . This enables fluid video animation, and we have an RGB-based proposition too, and further pitch reductions to 0.7 and 0.4mm in advanced development.



DVN: What else would you like to tell us about Magna Lighting?

F.H.: Currently we are approving our new innovation projects for the coming years, and we have many new ideas and projects in the pipeline, and we are more than happy to present them soon to our customers.

Lighting News

ASAP on Testing of Complex Lighting Systems

LIGHTING NEWS

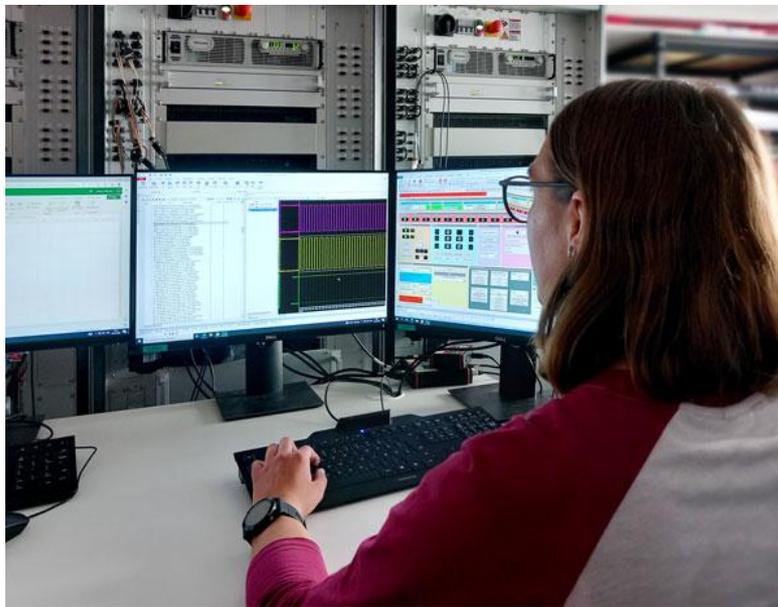


L-R: Alexej Giesbrecht, Dr. Wolfgang Huhn, Janina Brückel, Patrick Goerg

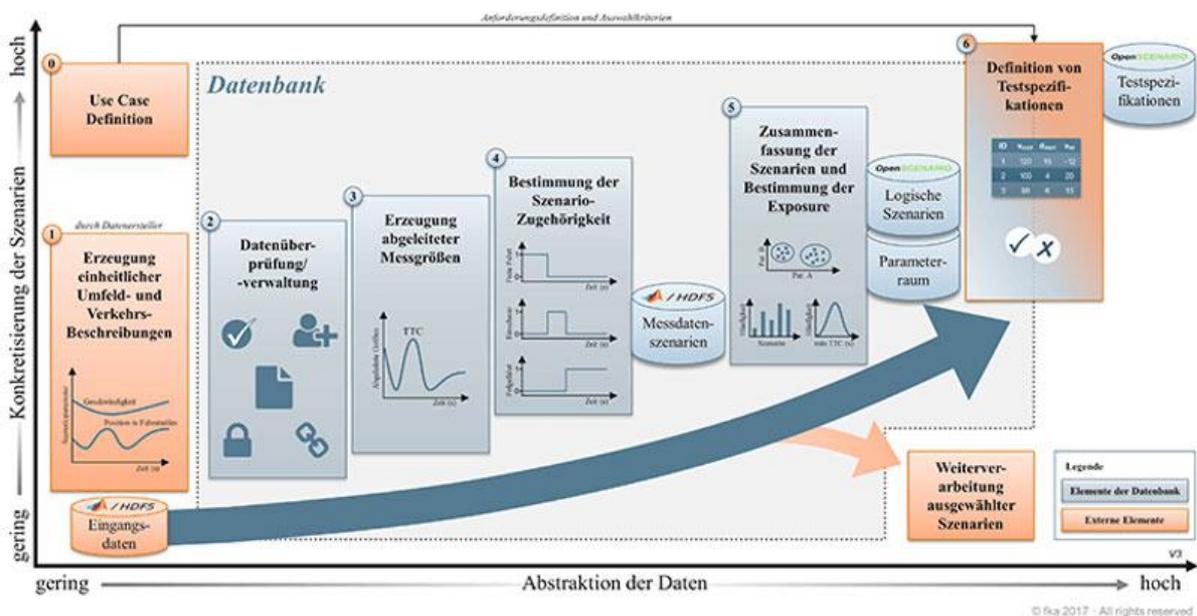
Wolfgang Huhn, DVN Senior advisor

ASAP are an international automotive engineering supplier. Their German site in Gaimersheim, on the outskirts of Ingolstadt, works for many different automakers as well as automotive suppliers and system providers. DVN visited the ASAP lighting test department, which has special expertise in hardware-in-the-loop (HIL) and software-in-the-loop (SIL) testing for lighting systems of the latest ADB generations and driver assistant projections. The team also conduct night-driving tests as a verification process, with professional documentation and data return.

One of the key factors of HIL and SIL testing is the rest-bus simulation. ASAP uses original lighting control units, including the high-performance body computer that contains the lighting software or parts of it. The rest of the car with all relevant signals—and of course the important camera—is simulated in the rest-bus simulation.



The new generation interface to the car is the Ethernet (ETH) bus. The lighting system communicates with CAN or CAN FD. This means an impressive number of CAN FD bus connections are used for the lighting system, especially for the animations of the front and rear lights. These animations are checked virtually, but a visual check is also very important because the 'flow' of the animations can only be judged by a human. Every single PWM value in the data sets is important. If there is any wobble, the data is optimized and sent back to the customer for review and approval.



Pegasus database mechanics

A very important innovation in the testing process is the keyword-based test scenarios, based on the results of the PEGASUS ADAS and AD research project, funded by the German Government.

The goal of Pegasus is to create services for securing automated driving. ASAP has adapted and downscaled the Pegasus result, and also use the ISO 29119-5 test descriptions for the complex new lighting systems. Traditional test concepts are already struggling with today's amount of data. In the coming years, the data will increase rapidly, making new and automated test methods and processes inevitable. Clearly, here is a company working to future-proof for the testing of highly complex lighting systems that automakers will need for their upcoming OTA business as well as SUMS and cybersecurity regulations.

ADB Should Be Mandatory: German Safety Council

LIGHTING NEWS



The German Road Safety Council (DVR) have issued six recommendations to reduce headlight glare to road users and improve traffic safety:

- Automatic levelling devices should be mandatory for all headlamps. The DVR support the proposed amendment to UN Regulation № 48 on the mandatory installation of automatic headlight range control for all headlamp systems.
- The cleaning performance of conventional headlight cleaning systems is not comparable to manual cleaning. Vehicle manufacturers and suppliers should make efforts to improve the effectiveness of cleaning equipment.
- **ADB should be mandatory.** The legal requirements must be adapted in such a way that the detection and suppression of all oncoming glare is ensured by glare-free high beams.
- It is recommended to evaluate the potential of modern lighting technology in the Euro NCAP ranking, such as by using the HSPR (Headlamp Safety Performance Rating) protocol.
- Further accident research is needed on the question of the contribution of modern lighting technology to road safety and the influence of glare on vulnerable road users.
- As luminance increases with smaller headlights, the BMDV (German Federal Ministry of Transport and Digital Infrastructure) should advocate for the regulation of luminance at the international level. Same with the blue component in LED headlights which can cause unpleasant glare and potentially damage the photoreceptors of the human eye over a long period of time.

Koito, Denso Collaborate for Night Driving Safety

LIGHTING NEWS



Koito and Denso have begun collaborating to develop a system to improve the object recognition rate of vehicle image sensors by coordinating lamps and image sensors, with the aim of improving driving safety at night.

Koito have been contributing to safety by improving nighttime visibility with high-function, high-performance lighting technologies, including numerous kinds of ADB systems. Denso have deep expertise in developing sensors that recognize a vehicle's surroundings. These are the eyes of an ADAS, and Denso are working to improve the object recognition rate of image sensors in various traffic situations, including at night.

In the collaboration, the companies will combine Koito's strength in driving-beam photometry control technology and Denso's strength in object recognition technology from image sensors to study the development of a system that can contribute to improving the safety of vehicles at night.

The two companies will explore and establish specific development themes, such as the feasibility of lighting that enables image sensors to recognize pedestrians more quickly.



TAKAYUKI KATSUDA WITH WOLFGANG HUHN, DVN
SENIOR ADVISOR

Takayuki Katsuda, Senior Managing Corporate Officer of Koito's engineering division, says, "We believe that the collaboration with Denso will make a significant contribution to the realization of next-generation mobility. Koito will continue to develop and supply products that contribute to safety and security in the next-generation mobility society toward the achievement of the 'Koito VISION: Lighting the Way' for our sustainable future".

Car Design News Awards 2023

LIGHTING NEWS



On 9 October, Car Design News announced that their People Awards will be returning for this, their second year. This event aims to recognize the individuals and teams who have made significant contributions to the design industry. With categories ranging from CMF and UX Design to Undiscovered Talent, they have received entries from talented professionals worldwide. The winners will be revealed during the annual CDN gala dinner, taking place at The Londoner Hotel on 7 December.

CDN presented the finalist entries for this year's CDN People Awards. Among the 15 awards, CDN will provide the best Lighting Design Team award, and DVN team is fully supporting this initiative.

Design is central to today's vehicle lighting world; a nice design and technology can be successfully commercialized only with harmonious work among designers; engineers, and lamp suppliers. Direct connection between designers and industry is the key to succeed.

A crucial DVN goal is to facilitate this kind of connection and continue building and supporting the community. That is why DVN is promoting the event and will participate actively.

The jury will have to select the best lighting team among these six finalist companies:

- Lynk & Co Exterior Lighting Design Team
- Changan Global Design Centre, Component Creative Design Department
- Hyundai Lighting Design Team Namyang
- Volvo Lighting Design Team
- Range Rover Lighting Design Team
- SEAT/Cupra Exterior Illumination Team

For more information visit the [CDN website](https://www.cardesignnews.com/cdn-people-awards).

Hella Sales Up in First Three Quarters

LIGHTING NEWS



Hella have published sales data for the first nine months of fiscal year 2023 (1 January to 30 September 2023). Compared to the same period last year, Group sales increased by 12.6 per cent to €5.9bn. Sales adjusted for exchange rate effects improved by 16.8 per cent, to €6.2bn.

Lighting sales improved by 16 per cent to €2.9bn, mainly due to higher production volumes in all regions and especially the increased demand for the latest lighting technologies from manufacturers of electric vehicles.

Electronics recorded sales growth of 10 per cent to €2.5bn, mainly due to the successful business with high-voltage battery management systems and radar sensors.

Lifecycle Solutions increased sales by 10 per cent as well, to €0.8bn. The main drivers were the strong spare parts business in Poland, Mexico, and Brazil; a further increase in demand for a newly launched particle counter; and solid business for agricultural and construction machinery, trucks and buses.

Driver Assistance News

Cruise, GM, Honda to Bring Driverless Ridehailing to Japan

DRIVER ASSISTANCE NEWS



Cruise, GM, and Honda have agreed a memorandum of understanding to establish a new joint venture to provide driverless ridehail service in Japan starting in early 2026.

Cruise CEO Kyle Vogt says, "There is an important and growing societal need for safe and accessible transportation in Japan that autonomous vehicles can provide a solution for. In addition to societal impact, the business opportunity is also exciting, as Japan represents one of the largest potential autonomous vehicle ridehail markets in the world, with many dense, highly populated cities that have high transportation needs".

Co-developed with GM and Honda, the Cruise Origin will offer customers in Japan an entirely new kind of mobility experience. The purpose-built autonomous vehicle can carry up to six passengers with comfortable 'campfire' seating. Approximately 500 Origins will be manufactured by GM for the launch of this new JV at Factory ZERO Detroit-Hamtramck Assembly plant in Michigan.

In offering this driverless ridehail service, the new venture will coordinate and collaborate with various stakeholders, including the national and local governments, and transportation service providers in Japan. The service aims to help address a driver shortage in Japan, and offer a safer, more accessible form of transportation.

Pending government approvals, initial testing will begin next year, and commercialization will begin in central Tokyo in early 2026. The three companies plan to subsequently expand and scale the service to areas outside of central Tokyo.

General News

Tesla Hit Snags in Cybertruck Launch

GENERAL NEWS



Tesla CEO Elon Musk admits his company will lose money on each Cybertruck they build over the next year and a half; it will take at least another 18 months to push production of the Cybertruck to an annual rate of 250,000 units, he says, and the ramp-up of the much-delayed vehicle will face significant challenges before the truck is profitable.

Additionally, the official introduction of Cybertruck will now take place after Thanksgiving. Earlier this year, Musk was promising the Cybertruck, which he first previewed in November 2019, would be ready by the end of September.

Nevertheless, Musk—who has been promising real self-driving 'next year' for at least a decade, but whose cars' L^2 driver-assist systems struggle to keep up with state-of-the-art performance and safety benchmarks—insists Tesla will build 1.8 million vehicles worldwide even as their profit margins tumble. Operating margin for the third quarter came in at 7.6 per cent of sales, a fall from 9.6 per cent in the second quarter and 17.2 per cent a year ago, as the company's net income dropped by 37 per cent.

Musk also suggested plans for Tesla's next round of new products, including a smaller, more affordable model, are on hold.

Volvo's New Integrated Software Testing Centre

GENERAL NEWS



Volvo Cars' new 22,000-m² facility is dedicated to software-defined vehicle development with over-the-air (OTA) software updates. The test facility will initially employ around 100 people, expected to grow to 300 once the testing centre is running at full capacity. Eventually, the site will house around 500 testing rigs and digital test environments, up from almost 200 today.

“This is a state-of-the-art facility that will be the hub for our global software testing and validation activities,” said Anders Bell, Global Head of R&D. “Developers from all our global engineering sites and Tech Hubs can run software tests here remotely, 24 hours a day, 365 days a year. I firmly believe that with this new testing centre, we’ve set a new benchmark for the automotive industry.”

The company also have smaller software test centres in Lund, Sweden; and Shanghai, China. Last month, they set up a tech hub in Singapore, and announced plans for another software-focused tech hub in Krakow, Poland.

“The aim is to boost our innovation speed by developing software for key areas for Volvo Cars—from core safety technology based on our deep understanding of what causes accidents, to our perception and driver-assistance algorithms and software for future autonomous driving.” said Alwin Bakkenes, Global Head of Software Engineering.