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**TIER 1 - SYSTEM DEVELOPERS &
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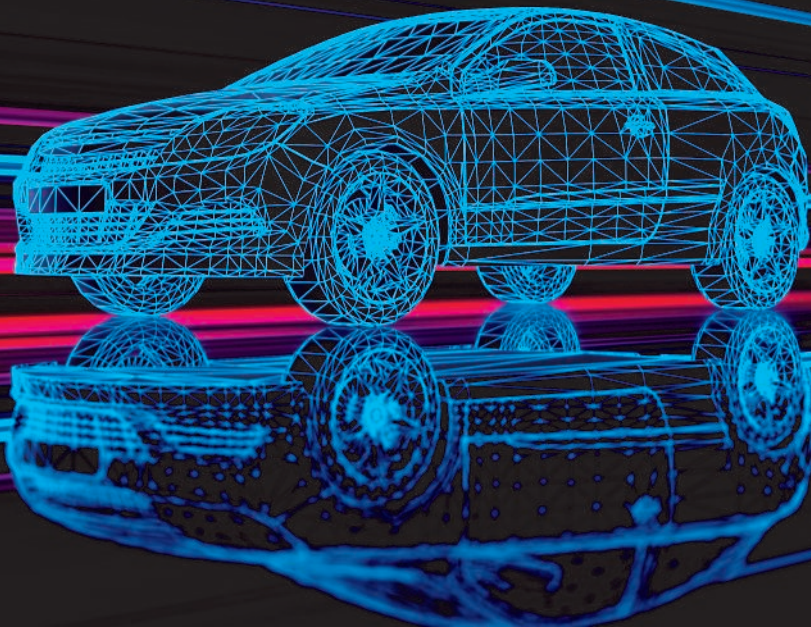
**TIER 2 - COMPONENT DEVELOPERS &
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VEHICLE COMPONENT SUPPLIERS


AESIN
AUTOMOTIVE ELECTRONICS INNOVATION

**CAPABILITY
DIRECTORY**

2019/20



TECHWORKS GALA DINNER AND AWARDS CEREMONY

WEDNESDAY 6TH NOVEMBER 2019

Join us for the TechWorks event of the year incorporating industry summit, gala dinner, awards ceremony, guest speaker, live music and dancing.

Industry Summit

Join hundreds of UK tech leaders, ministers, universities and funders & help shape the UK position in the Deep Tech Industry.

Gala Dinner

The prestigious TechWorks Gala Dinner will bring together over 300 executives and professionals from across the industry. Enjoy a meal, listen to our guest speaker and end the evening with music and dancing from our live act, Belissimo*

Awards

The TechWorks awards showcase excellence within the industry – rewarding the innovation, expertise and ambition of businesses.





I am proud to present, as Chairman of AESIN, the latest edition of this valuable Automotive Capability Directory which provides a rich resource of UK based Companies offering Automotive Electronics services and solutions. A core part of our work at AESIN is to help enable rapid innovation in Automotive Electronic Systems. It is therefore vital that we reach out to relevant companies and organisations across the UK and engage with our core Industry led Workstream activities (Connectivity (V2X), More Electric powertrain, ADAS & AV, Security, Software and Research) in support of that goal.

The AESIN Community is growing and seeking technology solutions. To assist in this, the Directory has both a searchable on-line and printed version to be distributed at AESIN 2019 Annual Conference 2nd October.

I would like to thank all those involved at AESIN and TECHWORKS for the work in preparing this new revision of the publication and also to those providing the engaging Editorial supplements.

I would encourage you make full use of the directory to help locate and connect with new potential suppliers and partners and I look forward to seeing this valuable resource continue to grow year on year as we expand the AESIN Community, include Research and Academic Institutions .

Dr. Stephen Lambert
AESIN Chairman



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Department for
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Innovate UK



ARTICLE



Driving the Electric Revolution

Matt Boyle

Interim Challenge Director for DER
Innovate UK, part of UKRI

The imperative to remove damaging carbon from the environment requires the electrification of many applications, many of these being in the automotive sector.



Driving the Electric Revolution seeks to make the UK a global leader in the manufacture of Power Electronics, Machines and Drives (PEMD) technologies which underpin electrification. Electrification is a supply chain disruptor. Seismic changes are occurring in many markets. We have a once in a lifetime opportunity to leverage our existing leadership in PEMD product development and IP to develop supply chains for manufacturing to support and exploit this disruption and protect industries which are vital to the UK economy. The world has set about trying to define global goals in activity. The Government has supported this with some very challenging stretch targets.

So, carbon neutral by 2050? Enacted policies like Zero Carbon Road Transport by 2040; No Diesel rolling stock on the railways by 2040; More electric and hybrid aircraft by 2040; all act to support the net-zero objective by 2050.

How are we going to achieve this goal?

Driving the Electric Revolution, the £80 million Industrial Strategy Challenge Fund Programme announced in the Autumn Statement 2018, is now up and running! We are focused on the PEMD supply chains in the seven sectors of Aerospace, Automotive, Energy, Industrial, Marine, Off Highway and Rail.



Electrification is the major weapon in the battle to reduce carbon in these sectors. Today, in these sectors, the UK generates approximately £7Bn worth of PEMD. Addressing the ever-growing demand for more capacity in PEMD manufacture will enable the UK to grow this market size significantly: The opportunity is huge! It is estimated that the UK could generate £80Bn of PEMD products by 2050, with a global market demand by then of over £2000Bn.

UK Industry needs help to exploit the opportunity and that help needs to come from several sources including - but not only - the Government, whose role is to establish the collaboration environment: Driving the Electric Revolution is the catalyst.

This challenge is industry-led, in close partnership with the research community. It is supported by businesses large and small, all of which are either involved, or aspire to be involved, with PEMD. Academia across the country is gearing up to support the challenge.

Our mission?

‘Driving the Electric Revolution will be the catalyst to building £5bn more Power Electronics, Motors and Drives (PEMD) products in the UK by 2025, encouraging industry across 7 sectors to invest and collaborate with academia to establish a PEMD supply Chain.’

Our Objectives?

To leverage the UK’s world leading research capability in PEMD to help industry create the supply chains necessary to manufacture the PEMD products the world needs

To identify gaps in the supply chains and help industry fill them.

To ensure cooperation and collaboration so we don’t duplicate effort, waste time and can reuse solutions across the 7 sectors.

We help fill the skills gap by retraining, upskilling and repurposing engineers from traditional internal combustion businesses into PEMD supply chains.

Using world leading Intellectual Property from the UK we are seeking to make the UK a global leader in the manufacture of core technologies of PEMD which underpin electrification. By supporting the growth of the UK’s supply chain and eco system for PEMD the Challenge will accelerate the UK’s ability to deliver; next generation electric vehicles, hybrid aircraft, energy generation, smart grids, industrial drives, consumer products, low-carbon off-highway for construction and agriculture, low-carbon maritime and rail.



There used to be the view that the earliest adoption is likely to be from the Automotive sector, but recently other major sectors have accelerated, spurred on by enacted legislation, market/societal demand and advances in battery performance. We now see existing electrification projects in all sectors covered by the Challenge.

Of course, one of the significant areas of work required is that of Skills development. It's been evident talking to business and traveling the country that in almost all areas, and at most levels, the issue of access to skilled people is one of the main concerns expressed by business. This issue is not limited to PEMD but is especially acute in these highly technical sectors. The Challenge is working hard to identify how to optimise the impact of the money dedicated to skills development.

The challenge will be delivered in four main elements:

Accelerated supply chain development R&D

£19m of funding to support projects starting from April 2020. Projects will be focused on filling gaps in the existing UK supply chain, via innovation to overcome challenges in manufacturing. This competition is now open.

Regional Industrialisation Centres

£30m funding to create a network of flagship Centres in PEMD research and scale up, building on existing assets. This is a major capital investment to provide a world class open access facility that will then operate with industry to develop new technologies and scale them.

Supply chain development for low volume and high volume manufacture R&D

£20.5m of funding to support projects that address innovation challenges and barriers in both high volume (i.e. automotive) and low volume (i.e. aerospace) manufacture.

The detailed focus of these competitions will be developed in early 2020, in consultation with industry. Round 1 is expected in April 2020.

Skills and training

Skills is a major barrier, with an acute shortage of the right skills in PEMD. We have £6m to support skills and training provision. This will focus on activity below PhD level. We are currently consulting widely on how to target our investment. Delivery

of this funding is not expected to take place until 2020.

To date, we have engaged with over 400 businesses in briefings, individual engagements and at various conferences.

The Challenge has begun successfully, the team are now eagerly awaiting the close of the first competition for the Accelerated Supply Chain projects. The next competition for the Regional Centres will open shortly.

The absolute imperative to remove damaging carbon from the environment is here now: To address it we need electrification.

The UK is world leading at developing electrification technologies: We need to get better at commercialising the technologies to ensure we are a supplier to the world.

Driving the Electric Revolution is a start.

So, get involved, we need your help!

Contact : DER@innovateuk.ukri.org

About the Author

Until November 30, 2017 Matt Boyle was President and CEO of Sevcon, a NASDAQ listed company, with operations in 9 countries.

In leading Sevcon Matt led a company which was at the forefront of electrification. Sevcon's global research and development helped customers replace ICE and Hydraulics in applications spanning Off Highway, Automotive, Marine, Energy Storage, Aerospace and Rail sectors.

Sevcon's research and development was headquartered in the North East of England but distributed across three continents, based where there was superior capability. It worked with some of the best Universities in Power Electronics, Machines and Drives (PEMD) around the world. It developed variable speed drives, Chargers and Capacitors building integrated solutions with motor partnerships in all meaningful technologies.

Matt was one of the bid writers for the Stephenson Challenge getting involved because of the vision of creating, developing and growing the UK's supply chain capability in PEMD. He's continued to assist the UKRI team develop the next steps in realising the vision for DER. Matt is now the interim Challenge Director for DER.



MEMBER SPOTLIGHT



How to build a virtual driving test for Autonomous Vehicles (AVs)

Mike Dempsey
CEO, Claytex



Before we let autonomous vehicles run without safety drivers, we need to be able to prove that the AI is safe enough.

This simple statement raises a lot of questions and, as a result, poses many challenges that need to be addressed. As a developer of simulation tools that are used for the development and testing of autonomous vehicles, we concern ourselves with these challenges, primarily, how do we prove they are safe and, what is safe enough?

In 2016 the Rand Corporation published a report where they calculated how far a vehicle would have to be driven to demonstrate it was reliable and safe. Their report concluded that to demonstrate with a 95% confidence and 80% power that the failure rate of an autonomous vehicle would be 20% better than a human driver, would require it to be driven 11 billion miles. This is simply not feasible.

For the past few years, autonomous vehicle developers have proudly announced their achievements in terms of miles driven. Waymo for example had driven 10 million miles autonomously on public roads by October 2018 and the rate at which it is adding to that mileage total is accelerating. But this is still several orders of magnitude short of the 11 billion miles cited in the mentioned report. Waymo themselves make extensive use of simulation to support the development of their autonomous vehicles and were expecting to have simulated more than 7 billion miles in the virtual world.

When you consider that these miles have been driven with vastly different versions of the AI software and hardware, it quickly becomes apparent that the miles driven is not a good metric for measuring their progress. What we really want to know is, can the AI handle all the situations it might encounter, especially the high-risk situations where a human life might be at risk?

Rather than miles driven, what we really want to understand is how the autonomous vehicle responds in different situations. For example, can it handle roundabouts, left and right turns with and without traffic, pedestrians and all the other situations and interactions that it's likely to encounter in the real world. However, we need to make this problem manageable and we can do this by defining an Operational Design Domain (ODD) for the vehicle.

At a high level, defining the ODD for the system we are developing should be relatively straight forward. For instance, we might be developing a passenger shuttle for use at an airport in which case we know the traffic rules, the layout of the roads and the missions that the vehicle would be expected to complete. But then we need to define all the scenarios that the system might encounter within this ODD.

There is, relatively speaking, very little risk associated with the routine driving tasks of following a lane, making a turn at this junction, etc. The risk all lies in the “edge cases”. These are the infrequent events, maybe even one-off events, that happen, and there are usually a huge number of these types of events covering everything from a pedestrian stepping out in front of the vehicle to objects making their way into the road, faded or confusing road markings and many more. Here is where the real challenges begin: how can we be sure we’ve captured all the edge cases and how do we test that the system can handle these cases?



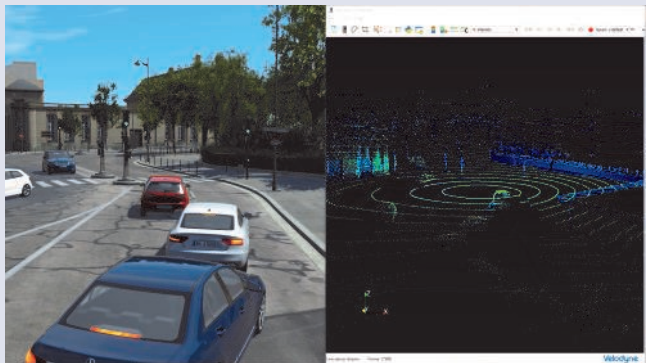
Pedestrian stepping out in front of a vehicle



Motorway scenario with vehicle cut-in

The data to define these edge cases can come from many different sources such as CCTV, our own experiences and data from vehicle fleets operating in the ODD. We then need tools and techniques to allow us to analyse this information to help us categorise the events and understand some of the tasks that the AV has to be developed to cope with. This then leads us to the second problem; we cannot test the performance of the system against all these edge cases in the real world. There will simply be too many of them to recreate in the real world and it would be too dangerous. This is where simulation can help by allowing us to recreate all these scenarios and evaluate the system performance in complete safety using a virtual world. We can start to define our virtual driving test.

What we need to ensure though is that the simulations are representative of the system behaviour in the real world so it's essential that we can recreate some of the scenarios in both the real and the virtual worlds. If we do this and the system behaves the same in both, then we can have confidence in our simulation tools and analyse the behaviour across a much wider range of scenarios.



rFpro simulation with LiDAR sensor model

Building a simulator for Virtual Testing of Autonomous Vehicles

Here at Claytex, we develop autonomous vehicle simulators with this goal in mind. We need to be able to run a simulation of our complete system and recreate the scenarios that we encounter within our ODD. In developing our simulators, we take a physics-based approach to every aspect of the system including the rendering for camera simulation, sensor models like LiDAR and radar, vehicle behaviour and the definition of the virtual world itself.

We use [rFpro](#) as the platform to build these simulators because it uses a physics based approach throughout and provides a number of APIs that allow us to connect in our customers own vehicle model (i.e. vehicle physics and control systems), plug in our own physics based sensor models and integrate different solutions for the simulation of traffic, pedestrians and other objects.

rFpro has its origins in Formula 1 and other high-end motorsport series where it is used in the Driver-in-the-Loop simulators and integrates each team's own vehicle model and provides the racing driver with a fully immersive environment. As a result, the rendering of scenes in rFpro is outstanding and the detailed Digital-Twins of real-world locations that can be supplied by rFpro are accurate down to the millimetre scale. This level of fidelity allows us to recreate the ODD in the virtual world and make sure that all the odd, random things that occur in the built environment are present inside the virtual world.

We are using a physics-based approach for the development of the sensor models, including camera, radar, LiDAR, ultrasound, GPS and the IMU. However, the models can't be based purely on first principle physics as we also need the sensor models to run in real-time to support full-stack testing of the system which is essential if a simulation tool is to be used for validation of a system. To support the development of the sensor models we are also carrying out physical tests of the



Reflections on a wet road in rFpro

sensors so that we can develop the calibration and validation processes that will be essential to prove that the sensor models are behaving correctly. The physical testing is being carried out in all weather conditions because most of the sensors



Sunlight reflecting off the street and driving at night in rFpro

are affected by the environmental conditions. By building up a database of how the sensor performance changes and linking this to the weather conditions we can

implement more accurate correlations, for example, between the amount of rainfall and the change in performance of a LiDAR sensor. There are lots of different effects that need to be considered – amount of rainfall, droplet size, ambient light, etc. - and each has a different effect on the sensors.

Let us consider how this works for camera simulation. rFpro renders the scenes according to the laws of physics, abandoning the computationally efficient special effects that are adequate for games and cinematography, because we haven't just got to convince humans, we've also got to convince machine vision systems. Objects in rFpro's Digital-Twins are made from materials that obey the laws of physics. When light strikes the paint on cars, the white lines on the road and the road surface, it must behave in the same way as the real world. Building on this approach for the LiDAR sensors, we can implement different material properties for different wavelengths that these sensors operate at and correctly determine the reflections off the objects in the scene.

The atmosphere is also physically modelled, allowing experiments to run at different times of day, in different weather conditions. Again, because rFpro's digital twins are physically modelled, when the rain is persistent, puddles will accumulate, in the correct places, and you may start to see reflections in the road surface (the material properties change as the road gets wet).

By creating a physically modelled world, it means your simulation can correlate with the real world. If you want to be able to recreate the edge cases you observe in the real world and validate your simulation against these, then you need to be physically modelling the real world and using physics to determine your interaction with this world. This will become essential as simulation starts to form part of the regulatory frameworks affecting AVs.

Underneath rFpro's graphics is a physically modelled road surface. A 1cm grid spanning the drivable surface, accurate to 1mm, which means, for example, that AI can learn to drive the path humans would, avoiding the bumps and potholes that human drivers instinctively miss; Essential if OEMs want AV customers in locations such as Detroit, the UK and other places where road quality is poor.



DYMOLA – Multi domain physics based vehicle model

Coupled to this is the vehicle model. rFpro provides an open API and interfaces to all the major vehicle dynamics tools. At Claytex, we use DYMOLA because it provides us with a multi-domain vehicle modelling tool that not only covers vehicle dynamics but also allows us to integrate the electrical system, cooling systems and every other aspect of the vehicle into the simulation. We have developed the VeSyMA suite of application libraries for DYMOLA to make this as easy as possible to build a comprehensive vehicle model and then interface it to rFpro.

DYMOLA uses physics to define the behaviour of each component within the model so we can integrate a representative vehicle model right from the start of the project. As soon as we have the basic targets for the vehicle project, we can build a model that uses these in DYMOLA. The first use of this is to carry out analysis of the targets to make sure that they are compatible and achievable by building a physics-based model to test them out. We then couple this vehicle model to rFpro to start to work on the overall system control and as the project advances and the definition of the vehicle improves, we can put more detail into the model and include this into the rFpro simulations. This approach also enables us to start looking at how the complete system performance is affected by changes in every component such as suspension geometry or the size of a heat exchanger.

Proving that our autonomous vehicles are safe to operate, it is a big challenge and one that we can only address through the use of simulation. Physical testing is essential, but it alone will not be sufficient to prove the safety of these systems. For the simulation approach to be successful, though, we need our Digital-Twin, i.e. the virtual world and all the models being used, to be truly representative of reality. This means accurate models, based on physics, that are validated against real world tests.

By using a physics-based approach we can evaluate how the system performs in all scenarios, including what happens when the material properties of an object change; for example, how do our sensors “see” a carbon-fibre body panel compared to a steel body panel. The same applies to the vehicle behaviour; this needs to be representative of the real vehicle and provide correct physics-based responses to the environment and demands of the control system. This then allows the exploration of the emergency and limit handling scenarios to make sure that the control systems can correctly respond to the way this specific vehicle behaves.

Simulation is an essential tool for the development of autonomous vehicles, one that we can use during their development, testing and validation. We can consider more scenarios in the virtual world than the real world and use them to create a virtual driving test to prove that they are safe and ready for deployment in the real world.

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Website	www.3m.co.uk



There's so much we could say when we are asked about our company - but let's keep things simple.

We are a science-based technology company that is committed to improving lives and doing business in the right way - which is why we have been listed as a World's Most Ethical Company for three years in succession. And we love applying our science to creating products that, in big ways and small, make things better in some way. Helping people to be safe. Making them more productive. Protecting their health. Safeguarding the environment. And we have an insatiable appetite for meeting the world's ever-changing challenges.

We are relentless in our pursuit of solutions to our customers' problems - one third of our revenues come from products that didn't exist five years ago.

At 3M, honesty, integrity and the ability to work as part of a team contribute to a culture that is founded on curiosity, problem-solving and collaboration.

We work tirelessly to deliver our vision: 3M technology advancing every company. 3M products enhancing every home. 3M innovation improving every life.





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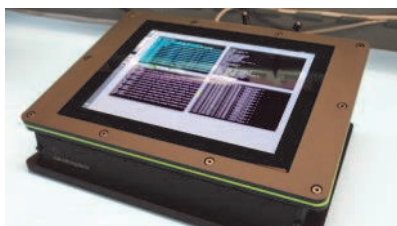
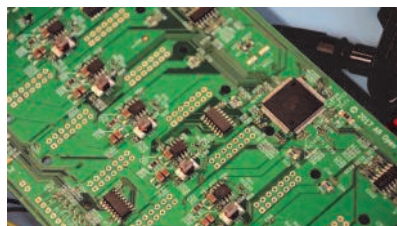
AB Open is an open source and technical communities consultancy that specialises in embedded and wireless systems.

We work with semiconductor companies, component distributors and equipment vendors, to help build mutually beneficial relationships with technical communities.

We have many years experience with both open source software and hardware, ranging from project development and ongoing governance, through to IP due diligence and defining comprehensive open source strategies.

We are able to assist with the establishment, evolution and day-to-day management of technical communities, along with delivering and supporting best-of-breed online community platforms which integrate tools such as blogs, wikis, version control and forums.

In combining this specialist expertise with content and event production, hands-on technical knowledge and workshop facilities, we are uniquely positioned to offer a joined-up service that would otherwise require engaging with numerous service providers. As a result of our integrated approach we are able to deliver better results — faster, at a lower cost and with reduced risk.



Altran is a global leader in engineering and R&D services. With over 47,000 employees across 30 global locations (13 offices in the UK) we design, develop, test and deploy highly advanced systems and technologies that improve the safety and enjoyment of the world around us.

altran

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We pride ourselves on developing high integrity systems and software, deployed across many different sectors all over the world. At our specialist Intelligent Systems Expertise Centre in the centre of Bath, our high integrity software development teams are involved in creating pioneering engineering projects that demand the very highest level of excellence. Our dedicated expertise within the transport sector ranges from safety and cyber security solutions for autonomous vehicles, to air traffic control systems that optimise flight safety and new innovative solutions for traffic management in rail. Our teams of data scientists are transforming the way companies extract value from data to enhance the safety, protection, comfort, convenience and enjoyment of drivers of the future.

We also created CoherenSE(r) - a dedicated software platform for next generation intelligent vehicles and machines. CoherenSE(r) enables and accelerates advanced automotive features such as autonomous driving, using a modular approach to deliver full control of the vehicle and manage the growing complexity of systems throughout the product lifetime.

Our culture of innovation even extends to the way we engage with our clients. We can either develop complete innovation projects from concept to completion - or offer niche expertise at every stage of the innovation lifecycle to either create, or enable our clients to create, cutting-edge products and services of tomorrow. We mainly work with automotive OEMs and tier1s in many aspects of product design and innovation. Get in touch to find out more.



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AHEAD OF WHAT'S POSSIBLE™

Analog Devices (NASDAQ: ADI) is a world leader in the design, manufacture, and marketing of a broad portfolio of high performance analog, mixed-signal, and digital signal processing (DSP) integrated circuits (ICs) used in virtually all types of electronic equipment.

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Website	www.analog.com

Since our inception in 1965, we have focused on solving the engineering challenges associated with signal processing in electronic equipment.

Used by over 100,000 customers worldwide, our signal processing products play a fundamental role in converting, conditioning, and processing real-world phenomena such as temperature, pressure, sound, light, speed, and motion into electrical signals to be used in a wide array of electronic devices. We focus on key strategic markets where our signal processing technology is often a critical differentiator in our customers' products, namely the industrial, automotive, communications, and consumer markets.

We currently produce a wide range of innovative products—including data converters, amplifiers and linear products, radio frequency (RF) ICs, power management products, sensors based on microelectromechanical systems (MEMS) technology and other sensors, and processing products, including DSP and other processors—that are designed to meet the needs of our broad base of customers.



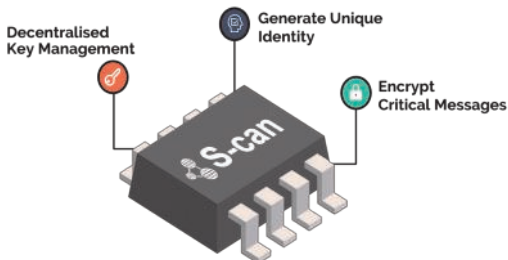
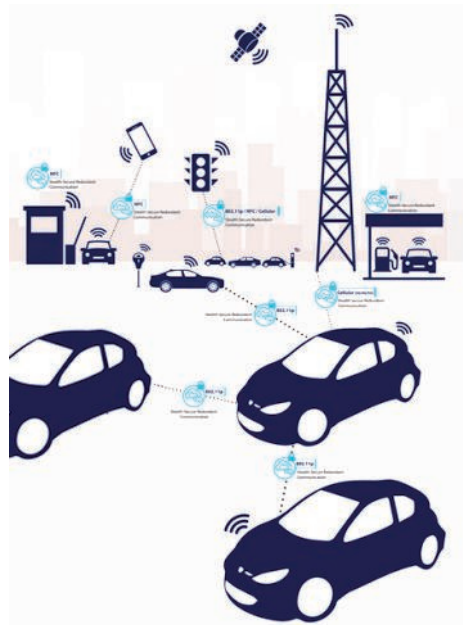
TIER 2 COMPONENT DEVELOPER & SUPPLIER

ANGOKA

ANGOKA Limited is a cyber security start-up, headquartered in Belfast, Northern Ireland. Angoka focuses on managing the cyber security risks inherent in connected and autonomous vehicles, industry 4.0, smart cities and IoT devices. It is developing S-CAN: a future-proof hardware solution for securing CAN-bus networks, a communication bus used widely in the automotive sector as well as embedded in industrial control.

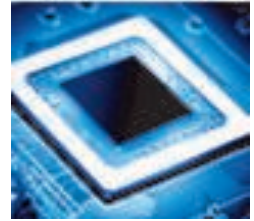
Angoka's S-CAN provides a quantum step forward for such networks, overlaying a highly secure authentication and communications protocol onto the established standard. It allows networks in their communications to send, receive and process information securely and efficiently, significantly lowering the risk of successful cyber-attacks to the systems and supporting infrastructures.

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APTCore

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AptCore – Efficient Processor Cores

AptCore provides optimised processor cores for silicon integrated circuits and FPGAs. AptCore's innovative designs and expertise greatly improve performance whilst lowering cost and power consumption for demanding Digital Signal Processing applications. Our IP cores are efficient and easy to integrate, whilst having full programmability, giving them the flexibility to serve as a common platform.

Silicon IP Cores

AptCore uses low power, parallel processing techniques to provide highly configurable, software programmable cores that achieve the ultimate performance and power efficiency. Utilising extensive experience of many DSP applications and deep knowledge of parallel processing architectures and techniques, AptCore's IP cores and software libraries bring benefits to many applications. By providing libraries, reference designs and validation data to accompany our cores, we provide a complete solution that is straightforward to use, enabling rapid design.

Technology and Applications

Our designs benefit from extensive experience in a number of fields including automotive collision avoidance, security and traffic monitoring. AptCore's technology spans many application areas, and our IP Cores and software can be used effectively in many fields.

Design Services

AptCore provides design services and consultancy for Integrated Circuit and FPGA design projects, enabling us to tailor solutions to your requirements. From specification and design work through to verification, testing and project management, we provide a range of services targeted across a number of application areas.



Telephone	+44 (0)1223 400 400
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Website	www.arm.com

Driving into the Future with Automotive Technology

The car is the most complex electronic device many of us will buy. The Arm architecture is a key enabler of automotive technology,

with more than 85 percent of infotainment systems and many under-the-hood applications powered by Arm-based chips. Autonomous driving is the next frontier for car manufacturers; it will be a revolution that changes the concept of mobility as we know it. Arm is playing a role in this transformation by providing high-performance compute platforms, meeting the power-efficient energy requirements that allow manufacturers to deploy autonomous vehicles at scale, and turn concept into reality.

New Era of Automotive Innovation

The automotive industry is currently looking at the technology innovation needed to move from today's prototype autonomous vehicles to deployable safe, self-driving solutions. Arm is working with key OEMs, Tier 1s and the broader ecosystem to help simplify and accelerate the path to real deployment of safe autonomous vehicles which will redefine our concept of mobility and enable a new era of automotive innovation for the entire vehicle



Scalability
From parking sensor to cockpit



Energy Efficiency
Minimum heat, maximum range



Trust
Electronic counter measures thwart attacks



Safety
Safe, reliable electronics



AVL is the world's largest independent company for the development, simulation and testing of powertrain systems (hybrid, combustion engine, transmission, electric drive, batteries, fuel cell and control technology) for passenger cars, commercial vehicles, construction, large engines and their integration into the vehicle.

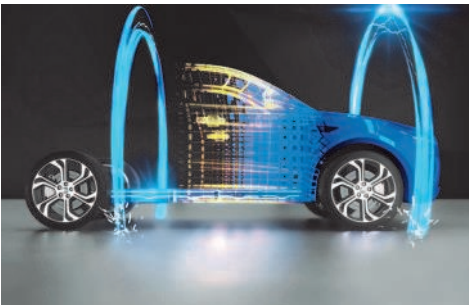
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Email	info.uk@avl.com
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Website	www.avl.com
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The company has decades of experience in the development and optimization of powertrain systems for all industries. As a global technology leader, AVL provides complete and integrated development environments, measurement and test systems as well as state-of-the-art simulation methods.

As a pioneer in the field of innovative solutions, such as diverse electrification strategies for powertrains, AVL is increasingly taking on new tasks in the field of autonomous driving, especially on the basis of subjective human sensations (driveability, connectivity, ADAS, etc.). In the competition of technologies – ICE-based engine, battery and fuel cell electric drive – and their combinations, AVL is working intensively and with the same priorities.



AVL has digitized the vehicle development process with state-of-the-art and highly scalable IT, software and technology platforms, and creates new customer solutions in the areas of big data, artificial intelligence, simulation and embedded systems in an agile and integrated development environment.

**AUTOMOTIVE CONSULTANCY - POWERTRAIN CONSULTANCY - TEST & CERTIFICATION
FACILITY - TIER 1 SYSTEMS DEVELOPER & INTEGRATOR**



ACCELERATING A SAFE AUTONOMOUS FUTURE

AVL AUTONOMOUS DRIVING AND ADAS

Safe, reliable and robust automated drive functions take the highest priority. AVL's competences cover all relevant aspects in developing, simulating and testing ADAS/AD solutions for levels 3 and beyond. Furthermore we offer comprehensive development and testing environments for ADAS/AD.

AVL SOLUTION PORTFOLIO:

- System design
- Tailored controls and software development
- Calibration, verification and validation



Bank Top Consulting provides collaborative advisory services and innovative connected mobility, transport technology, and highway infrastructure solutions to organisations in the Automotive and Traffic Management markets.

Telephone	+44 7775 662 842
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Website	www.banktop.tech

Our expertise and in-depth experience in the development, execution and operational deployment of technology programmes includes:

- **Smart Highway Solutions**
- **Electric Vehicle Infrastructure**
- **Connected & Cooperative ITS**
- **Autonomous Mobility**

The services we offer are transformational and include:

- **Technology Solutions & Business Development**
- **Project & Programme Management**
- **Interim Management & Collaborative Delivery**
- **Domain & Market Relationships**

Our customer relationships and domain network includes Government & Public Sector Organisations, Automotive Sector, Traffic Technology Integrators, Service Providers and Network Operators.



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The automotive industry is working toward autonomous driving vehicles.

As a result, future cars will be equipped with sensor

clusters, more computing power, car-to-car and in-vehicle communication technology, high-bandwidth Ethernet networks, and multiple high-definition displays. These changes create new design challenges for automotive suppliers, such as more complex electronic systems, functional safety, lack of space, reduction of power and weight (emissions), and cost constraints.

These additional challenges will push suppliers to integrate much more functionality on a chip, rather than on a PCB. As a result, suppliers will need:

- High-performance processors for advanced driver assistance system (ADAS) solutions
- Complete automotive Ethernet IP portfolio
- Extensive software ecosystem for infotainment, such as via Cadence® Tensilica® HiFi cores
- A new class of SoCs and SiPs enabled by Cadence Design IP and packaging technology
- Automated functional safety solution

Cadence's automotive design and verification solutions can help you deliver applications that can make cars safer and more reliable. We also provide an automated requirements management flow that helps you deliver silicon that

**AUTOMOTIVE CONSULTANCY - POWERTRAIN CONSULTANCY - TEST & CERTIFICATION
FACILITY - TIER 1 SYSTEMS DEVELOPER & INTEGRATOR**



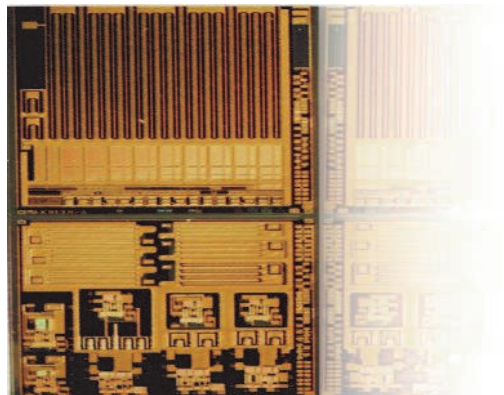
Telephone	+44 (0) 1223 598610
Email	info@camutronics.com
Website	www.camutronics.com

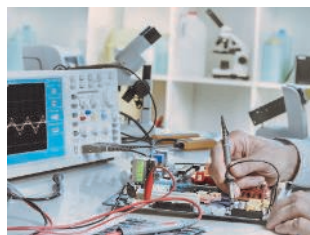
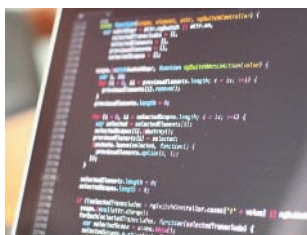
Cambridge Microelectronics Ltd (Camutronics) is a fabless semiconductor company offering a range of proprietary discrete and integrated lateral high voltage semiconductors for energy-saving power

electronics applications. Our aim is to deliver robust, optimised solutions for more efficient system performance. Our lateral integrated approach reduces number of components in the system leading to miniaturised and more cost-effective final products.

- Application-driven High Voltage Power Semiconductor development
- Technology transfer from R&D to production for high yield and low cost
- Product Reliability and Qualification
- Thermal analysis and optimisation at device, package and application levels
- High Voltage testing and product characterisation (wafer-level, packages)
- Modelling, 2D and 3D device and mixed-mode simulations
- Discrete and Power IC solutions
- Superjunction devices, IGBTs, MOSFETs, JFETs, Diodes
- Bulk Si, SOI, SiC, GaN, Diamond technologies

We have extensive experience in designing novel high voltage solutions up to 6.5kV, transferring research to industry and scaling R&D into very high volume production. We also offer a variety of consultancy services.





We are a specialist, expert team that is dedicated to improving the security of software, firmware, hardware and communications of embedded devices and IoT systems. Our goal is to help our clients achieve the right level of security to meet their increased risk when creating connected products.

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Website

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Security Consultancy : We provide security consultancy to semiconductor, automotive and "smart"/IoT product manufacturers. We provide a full-spectrum security consultancy to semiconductor companies and embedded systems product manufacturers. We can provide advice, analysis and vulnerability assessment of your end-to-end security architecture, design and implementation.

Security Software Development : Our specialist security software development services combine a wealth of experience in embedded firmware with in-depth knowledge of the latest software robustness and hardening techniques. We develop on platforms from small embedded devices based on microcontrollers and running "bare metal" code up to larger System-on-Chip based devices running complex Operating Systems such as Linux.

Embedded System Security Evaluation : We can evaluate the security of your product and help you to fix security vulnerabilities using the latest technologies and attack methods.

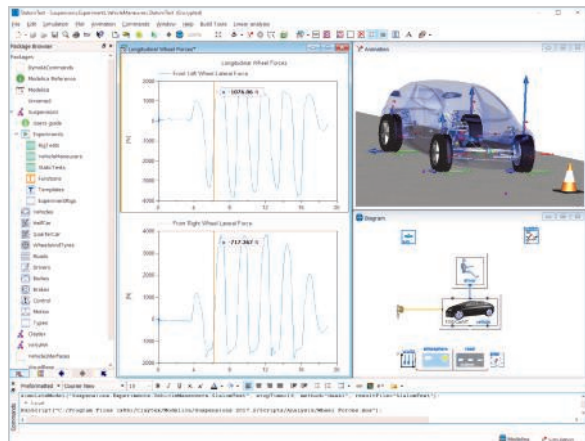
Modelling and simulation solutions for systems engineering



Everything we do at Claytex is about modelling and simulation, in particular the simulation of the dynamics and behaviour of the complete system. This covers multiple domains such as vehicle dynamics, powertrain, energy management, thermal management and extends into the virtual testing of ADAS and autonomous vehicles.

Claytex is a software distributor, solution developer, consultancy and training provider. We develop simulation solutions using the open standards of Modelica and FMI and distribute systems engineering solutions from Dassault Systemes, rFpro and specialist Modelica library developers.

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Website	www.claytex.com



Our portfolio of tools includes Dymola, Reqtify, ControlBuild, rFpro as well as our own software products.

Find out more about our products and services

<https://www.claytex.com/products/rfpro/>

<https://www.claytex.com/products/dymola/>

<https://www.claytex.com/products/reqtify/>

Vehicle Modelling and Virtual Testing

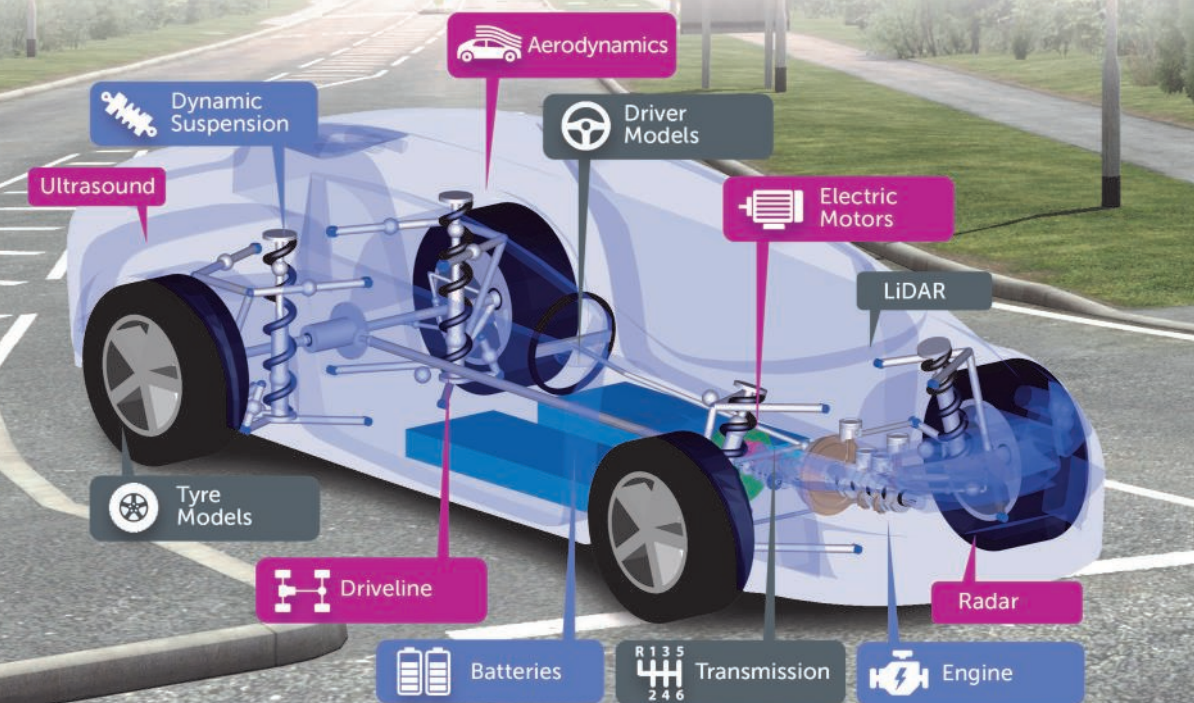


Dymola



VeSyMA

- Multi-domain modelling and simulation
- Immersive virtual test environment
- ADAS and autonomous vehicle development
- Integrated suite of Modelica libraries for Vehicle Systems Modelling and Analysis



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www.claytex.com

DELTA – a part of FORCE Technology is an independent hi-tech company

We make knowledge available for everyone and help the society and industry with the latest technological development. As our customers' strategic partner, we ensure optimal usage of advanced technology. We develop, test, certify and advise our customers in every phase of their product development, before the product is launched on the market.

DELTA - a part of FORCE Technology

Since 1941, DELTA's mission has been to ensure ideas succeed in the real world – for the benefit of the Danish industry and society.

Our profound competences are based on decades of technological development within electronics, microelectronics, light, optics, acoustics, vibration, software, and sensors.

DELTA is an Advanced Technology Group (GTS) institute, approved by the Danish Ministry of Higher Education and Science.

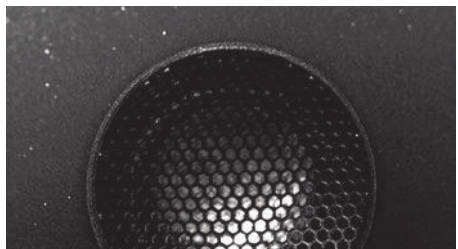
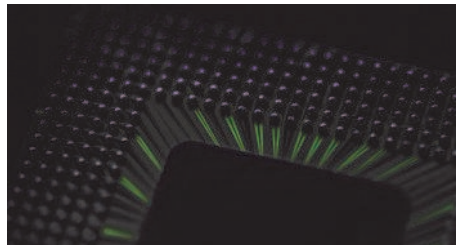
Core competencies

- Electronics
- Microelectronics
- Software technology
- Light
- Optics
- Acoustics
- Vibration
- Sensor systems

**TEST & CERTIFICATION FACILITY - TIER 1
SYSTEMS DEVELOPER AND INTEGRATOR -
TIER 2 COMPONENT DEVELOPER AND
SUPPLIER**



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Embedded Success



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Email	info@dSPACE.co.uk
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Accelerating Your Success

All over the world, wherever engineers are working on cars and planes, dSPACE is involved. Why? Because our hardware and software solutions accelerate the development and testing of mechatronic control systems. And because efficiency and productivity are more important than ever before.

dSPACE is the world's leading provider of technology for the development and test of electronic control systems. Used by every OEM and Tier One supplier worldwide, we have a significant range of products. They cover the areas of:

- Hardware in the Loop Testing
- System Architecture
- Controller Design
- Rapid Control Prototyping
- Automatic Production Code Generation
- Virtual Validation
- Data Management
- Engineering
- Test Benches





DYNEX

Dependable Power through Innovation

Dynex designs and manufactures high power semiconductors for customers around the world including the European, US and the rapidly growing Far Eastern markets.

Telephone

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Email

contactus@dynexsemi.com

Website

www.dynexsemi.com

The Power Semiconductor operation is located in Lincoln, England, manufacturing a range of high power Module and Bipolar discrete products that include insulated gate bipolar transistor (IGBT) and diode modules, IGBT/FRD die, fast diodes, fast thyristors, gate turn-off thyristors, rectifier diodes, phase control thyristors and transistors.

Semiconductors



Offering high power IGBT modules and bipolar products Dynex manufacture highly robust and reliable modules that are in service in over 60 different countries around the world.

Power Assemblies



Providing support for customers requiring more than the basic semiconductor by utilising the skills of our power electronics, mechanical and electronic engineers. The Dynex team have direct access to the company's application, test and product design personnel to produce the optimum solution for your requirements.

Electric Vehicle Systems



Efficient electric drive train solutions with the ability to provide standard and custom inverter and charging systems in 60 & 85kW configuration. Manufacturing optimised IGBT modules designed for efficient operation with a fully integrated cooling loop to enhance performance.

TIER 1 SYSTEMS DEVELOPER AND INTEGRATOR - TIER 2 COMPONENT DEVELOPER AND SUPPLIER

EDA Solutions is the exclusive European business partner for Mentor, a Siemens business.

We offer unrivalled access to cost-effective Custom IC EDA design tools and semiconductor test data analytic solutions.

Our customers design sophisticated analog/mixed signal custom ASIC, MEMS, Printed Electronic and Silicon Photonic IC devices.

EDA Solutions provide a range of software, tools, and services that fulfill many EDA applications.

- Digital/Mixed Signal IC Design
- Analog/RF IC Design
- Imaging/Display Design
- MEMS/Biochip Design
- Semiconductor Test Data Analytics

Services you can trust

We are dedicated to providing our customers with best in class design software and consultancy, foundry, assembly and test services, backed by unrivalled customer service and support.



from software to silicon

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Email

info@eda-solutions.com

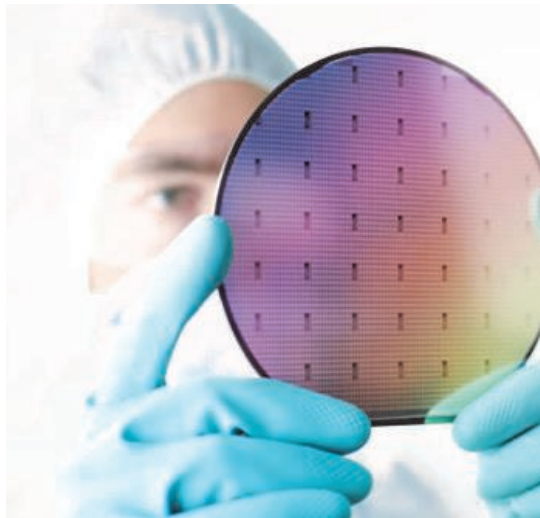
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www.eda-solutions.com

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Solution
Partner
PLM

SIEMENS



DEVELOPMENT TOOL SUPPLIER - TEST & CERTIFICATION FACILITY - TIER 1 SYSTEMS
DEVELOPER & INTEGRATOR



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Website	www.embecosm.com

Embecosm works with you to select the best tools to support your hardware's intended application. The architectures we currently develop for range from the smallest deeply embedded processors to the largest high-performance computing systems including RISC-V and Arm processors.

Compiler tool chain development and

porting. We develop open source tool chains (principally GCC and LLVM). This may be creation of a new tool chain

from scratch or upgrading and development of an existing tool chain. A particular speciality is development of tool chains for new processors pre-silicon using models of the processor. Embecosm develops tool chains for processors of all types, but has acquired a reputation for expertise with ■ smaller embedded processors and digital signal processors (DSP), where minimizing code size and energy consumption can be as important as maximizing code speed.

Hardware modeling. We focus on processor modeling, although where appropriate we develop models of peripheral IP. This includes development of instruction set simulators using tools such as CGEN and TableGen and creation of cycle accurate models using Verilator. These models are very often used as test targets when porting compiler tool chains.

Open source tool support. Beyond development of open source tool chains, we are able to provide support for other open source EDA tools. This involves keeping the tool up to date, fixing bugs and extending the tool. We have strong relationships with many tool development teams, and most of our maintenance work is contributed upstream to official distributions. This ensures any new functionality continues to be maintained long term.

Embedded operating systems. We develop open source embedded operating systems, including embedded Linux, FreeBSD, and Free RTOS, spanning from resource-limited 8-bit devices to fully featured 64-bit systems.



Automotive ASIC Design and Supply

EnSilica is focused on delivering high-quality automotive ASIC design and supply services that enable our OEM customers to deliver ASIC solutions across a wide range of automotive applications including those needing to address functional safety.

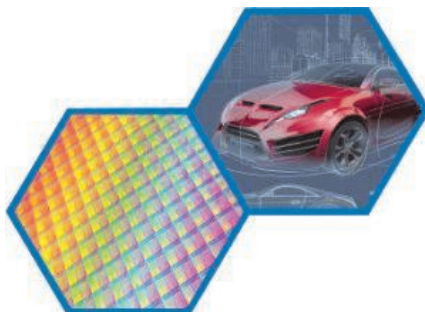
Telephone	0118 321 7310
Email	Email via the website
Website	www.ensilica.com

EnSilica is one of Europe's leading companies in the field of custom mixed signal and digital ASIC design and has a proven track record developing complex ASICs for tier1 automotive suppliers. Our wealth of experience, core skills and IP knowledge ensure that every project meets its requirements and is delivered on-time and on budget.

Simplifying the ASIC Development Process

Using EnSilica's end-to-end design and supply service means that the benefits of custom ICs are now within easy reach, including:

- Reduced BOM
- Lower power consumption
- Smaller size
- Greater functionality
- Supply chain protection and simplification
- IP security
- Increased safety and reliability



ASIC Design Consultation

There are significant advantages to the ASIC model but to be sure it's the right choice for your next project our ASIC consultants can review your requirements and provide a technical assessment and a budgetary estimate of the economic benefits, considering the NRE and licensing costs and the potential BOM savings.



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Founded in 1999 by several of the world's top reliability and safety experts, exida is the world's leading product certification and knowledge company specializing in automation system safety, alarm management, cybersecurity, and availability.

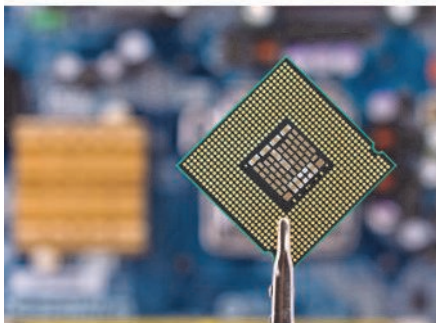
With over 20 locations worldwide, exida's global presence ensures there is always someone close by ready to help your team be successful.

Companies around the world turn to exida for help and guidance related to functional safety, alarm management, and control system cybersecurity standards implementation.

Our team of industry leading engineers have over 500 years of combined knowledge, with extensive experience in Chemical, Petro-Chemical, Oil & Gas, Subsea, Metals and Mining, Pharmaceutical, Pulp & Paper, Power Utilities, Automotive, Robotics, and Machinery applications. This unique combination of technical depth and hands on experience enables exida to provide practical solutions to address your most difficult challenges.

exida is the choice of leading companies when it comes to implementing and achieving compliance to the global standards relating to the IEC 61508 and IEC 61511 standards for functional safety for the process industry; IEC 62443 for industrial control system cybersecurity; ISA-18.2 for alarm management; ISO 26262 for functional safety of automotive, IEC 62061 and ISO 13849 for safety of machinery, and ANSI/RIA 1506 for robot safety.

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Feabhas provides world-class training and consultancy to improve embedded software development skills.

Feabhas already improves the embedded software development skills within the world's leading electronic companies, such as Samsung, Arm, HP and Intel. They rely on Feabhas competency assessments, face -to-face training, and consultancy, to help their embedded software developers and engineers to increase product quality and speed to market, reduce product failures caused by bugs and stay at the forefront of best practice for embedded systems development and testing.

Choosing Feabhas as your partner for embedded software development improvement gives you access to onsite team training, around the globe, public training for individual engineers in the UK, pre and post course assessments, graduate training programs, re-skilling from other software development and engineering disciplines.

Feabhas provides an onsite 1 day course for MISRA C (www.feabhas.com/content/guidelines-writing-high-integrity-software-c-misra-c2012-guidelines).

The full range of embedded software training includes courses for programming languages (C, C++, C++ 11/C++14, and Python), design techniques, Agile for Embedded, design techniques, operating systems, and quality. But it's not just about training teams or individuals. Feabhas also provides services to support organisations looking to develop or improve their own embedded software competence strategies, such as bespoke course curriculum creation, consultancy, mentoring and assistance with developing software standards such as DO178C, ISO 26262, IEC 62304, EN 50128 and more.

FEABHAS
EMBEDDING SOFTWARE COMPETENCE



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Website	www.firsteda.com

Established in 2002, FirstEDA is a highly responsive value-added distributor of EDA tools and training in Europe.

The company comprises a team of highly skilled engineers and is the trusted partner-of-choice for a number of EDA companies; each of which has a range of innovative and versatile products. As experienced engineers, FirstEDA ensures the solutions we promote and support are fit-for-purpose and

able to tackle today's most demanding challenges. Moreover, we work extremely closely with each of our suppliers and their product specialists so, on the rare occasion when additional support is required, we provide a fast turnaround.

FirstEDA ensures that the solutions it supplies and supports integrate seamlessly into the end-users' design flows, and that quantifiable benefits result.

As seasoned EDA engineers we have a wealth of expertise, making FirstEDA an extremely capable company.

We are engineers. We live and breathe EDA, and we understand what our customers are trying to achieve. Our considerable capabilities enable us to provide support and guidance throughout the entire development lifecycle. From top-level system design and verification down to software machine code and hardware description languages, we have hands-on experience. We support customers developing applications in a variety of sectors, including aerospace, automotive and medical. We have an impressive working knowledge of HDL languages, as well as systems languages. We are also familiar with the EDA industry's latest verification methodologies plus the methods contained therein. In addition, we are well-versed in design and verification for safety- and mission-critical applications and have a working knowledge of the industry standards. We also have considerable experience in the use of platforms for in-hardware, at-speed design verification – a requirement of DO-254.

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Website	www.gfmicro.com



A leading independent silicon design company for the past twenty-five years, GF Micro successfully delivers products and services that meet our customers' absolute need for quality, reliability and performance.

Focussing on digital and analogue design as well as fabless silicon supply, we have gained a reputation for innovation, technical excellence and total reliability. This is represented by the company's consistent growth and a track record of developing leading-edge solutions.

We service our clients from two UK design centres based in Stroud and Bristol. Underpinning our service is a team with over 500 years of combined digital and analogue design, verification and layout experience. This depth of knowledge, across a wide range of domains, means we are able to offer a 'right first time' service across all our client base.

As well as having significant in-house expertise we partner with top silicon foundries across the world to source and supply devices that can always satisfy customer demands for quality and reliability.

We also offer a range of bespoke design services and are constantly looking to future technologies and markets, bringing a level of leadership and innovation to everything we do. This has meant working with clients from a wide variety of industries including Avionics, Space, Precision Industrial and most recently Home Automation, RFID and Backplanes for Microdisplays.



TIER 1 SYSTEMS DEVELOPER AND INTEGRATOR - TIER 2 COMPONENT DEVELOPER AND SUPPLIER

Green Hills Software is the world's leading supplier of safety and security certified software products and services for the embedded and IoT marketplaces.

For over 35 years Green Hills Software has helped clients solve the most difficult design challenges by delivering unmatched knowledge, cross-industry expertise, a proven portfolio of ISO 26262 ASIL qualified products and unequalled cybersecurity solutions and expertise to the automotive market.

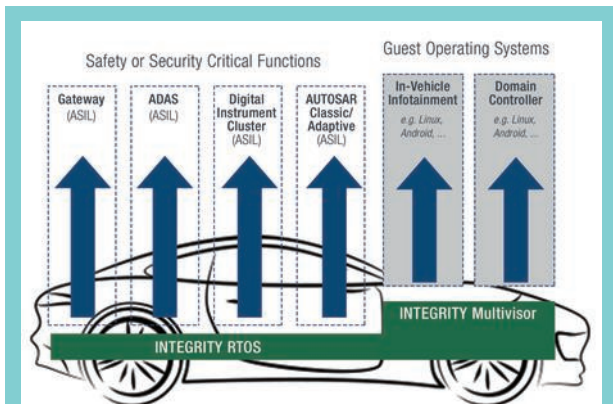


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Green Hills Software and its subsidiary INTEGRITY Security Services (ISS) provide secure software platforms to address the Connected Car (C2X), Instrument Clusters, ADAS/AD, Secure Gateways, Infotainment and Powertrain.

The INTEGRITY operating system and INTEGRITY Multivisor virtualization (running guest Linux, Android and other operating systems) enable the consolidation of applications at differing levels of safety and security (e.g. Cluster + AUTOSAR + Infotainment).

In combination with the MULTI Integrated Development Environment, these platforms are ISO 26262 ASIL D compliant. Also, with the ISS cryptographic toolkits, secure OTA updates and key management infrastructure these secure software platforms provide end-to-end security in the increasingly connected and threatened automotive market.



The combination of safety-certified INTEGRITY RTOS and its Multivisor secure virtualization provide the trusted foundation for a single scalable platform to consolidate multiple cockpit domains concurrently utilizing Linux, Android and RTOS applications, all on the same processors.

AUTOMOTIVE CONSULTANCY - DEVELOPMENT TOOL SUPPLIER - TIER 2 COMPONENT DEVELOPER & SUPPLIER



SAFE AND SECURE AUTOMOTIVE SOFTWARE

DIGITAL
INSTRUMENT
CLUSTERS

VIRTUALIZATION
FOR IN-VEHICLE
INFOTAINMENT

GATEWAY AND
CONNECTED
CAR

OVER THE
AIR UPDATE
INFRASTRUCTURE



CAR2X/V2X
COMMUNICATIONS

POWERTRAIN,
CHASSIS
AND BODY
ELECTRONICS

ADVANCED
DRIVER ASSIST
AND
AUTONOMOUS
DRIVING

Develop and deploy next generation electronics with confidence leveraging Green Hills Software's 35+ years of design and certification expertise in embedded software to the highest levels of safety and security.

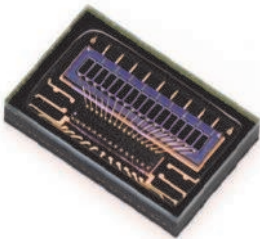
Visit ghs.com/automotive or call +44 (0)1844 267950 for further information.

HAMAMATSU

PHOTON IS OUR BUSINESS

Hamamatsu Photonics have been supplying the automotive industry since 1978; first introducing sun sensors for HVAC systems. We offer a wide range of opto-semiconductors including, all supporting automotive systems by providing information about brightness, or refraction of light. These can be offered as modular solutions or discrete components to compliment your existing system.

Hamamatsu also offer highly sensitive photodetectors and light sources specifically for LiDAR applications in ADAS and AV's. These include Silicon and InGaAs semiconductor detectors; ranging from photodiode arrays, SPAD's and Silicon photomultipliers. Which can be complimented with various component light sources; VCSEL's, PLD's etc, to offer a solution for any customer requirements.


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Website
www.hamamatsu.com


With fully integrated research, development and mass production capability from front to back end, we deliver high volume production with a bespoke level of service. By offering customers the security of full autonomy of the process, Hamamatsu provides a unique solution for automotive OEM's; covering MEMS level components to production line manufacturing support systems.

TIER 2 COMPONENT DEVELOPER & SUPPLIER



Helix Technologies is developing a range of compact, high-performance, dielectric-loaded ceramic antennas for use in a wide range of demanding telecommunications and navigation applications.

Telephone	+44 1235 887 444
Email	info@helixtechnologies.co.uk
Website	helixtechnologies.co.uk

The use of the ceramic core enables the fabrication of antennas that are physically smaller than conventional antennas, behave much

more effectively and predictably in a wide range of challenging user scenarios and have many compelling technical advantages which include:-

- Maintaining radiation efficiency near absorbing objects (e.g. such as the human body)
- Improving the accuracy of GNSS systems in multi-path environments (e.g. in cities)
- Operation in sub-optimal orientations towards the sky
- Are able to be placed into very tightly integrated systems
- Operation in slim-devices without a ground plane
- Unsurpassed gain/efficiency per unit of volume
- Simple and robust design and construction for durability and reliability
- Un-rivalled beam-width (omni-directionality)
- Multi-frequency, tailored frequency response
-

These characteristics make the dielectric-loaded, multi-filar helix antenna a compelling choice for a wide range of demanding telecommunications and navigation applications including Internet of Things (IoT), GNSS, autonomous vehicles/driverless cars (GNSS/V2X/DSRC), drone delivery platforms, LEO satellite communications, personal body-worn devices and Machine-to-Machine (M2M) and any other scenarios where there is downward pressure on device size, weight and power (SWAP).



Telephone	+44 (0)24 7635 5000
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HORIBA MIRA is a global provider of pioneering engineering, research and test services to the automotive, defence, aerospace and rail sectors. We work in close

collaboration with vehicle manufacturers and suppliers around the world, providing comprehensive support ranging from individual product tests to turnkey multi-vehicle design, development and build programmes.

With over 70 years' experience in developing some of the world's most iconic vehicles, our engineers utilise the latest test facilities and simulation tools to improve lives by making journeys safer, cleaner and smarter. Our suite of 40 major test facilities, 100km of specialised proving ground and wealth of engineering experience, combined with our expanding international presence, means we are confident that we can achieve our vision – that every journey in the world will be positively influenced by us.

Progress towards achieving our vision has been significantly accelerated through the creation of MIRA Technology Park, Europe's largest transport technology R&D cluster, where a purpose-designed campus with proximity to world-class facilities and engineers allows companies to develop competitive products quickly and cost-effectively.



AUTOMOTIVE CONSULTANCY - POWERTRAIN CONSULTANCY - TEST & CERTIFICATION FACILITY

IC INTELLECTUAL CAPITAL RESOURCES

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Website	www.ic-resources.com

IC Resources is Europe's leading deep tech recruitment company in the automotive sector across Electronics, Software, Semiconductors, Sales and Marketing, Supply Chain and IT.

At an individual level, everyone is seeking a successful and satisfying career. At a corporate level, every company seeks out the most talented people who will contribute to the organisation's long term success.

For 20 years, our role has been to ensure that these individual and communal aspirations are fulfilled through mutually beneficial introductions.

Our goal is simple: to deliver value to the individuals and companies we work with. Our candidates are given well-informed career advice and introduced to opportunities which help them progress their careers. Our clients are introduced to talented individuals with sought-after skills who can help them succeed in a globally competitive marketplace.

Since 1999, IC Resources has been delivering efficient, authoritative and cost-effective recruitment results. If you'd like to discuss the employment marketplace, salary levels, your recruitment strategy or indeed your career, please contact us.

Recruitment partner to the global technology community

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AUTOMOTIVE CONSULTANCY

IDIADA UK provides engineering services for full turnkey or sub-system projects. Specific skills include systems, software, safety engineering (ISO-26262) and ECU design for powertrain, ADAS, connected & automated vehicles and infotainment systems.



Our IDAPT platform is designed to support CAV R&D projects such as MuCCA. IDAPT provides a compact, robust solution based around an NVIDIA GPU with V2X, cellular, ethernet, cameras, CAN and a variety of analogue and digital I/O.

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Website

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Applus IDIADA is a global partner to the automotive industry providing design, engineering, testing and homologation services. The company has over 2,700 professionals in 24 countries. Our headquarters includes a 360-hectare technical centre and proving ground located near Barcelona, Spain.



AUTOMOTIVE CONSULTANCY, TEST & CERTIFICATION FACILITIES

Imagination: your route to success

At Imagination, we create and license market-leading processor solutions for graphics, vision & AI processing, and multi-standard communications. They are PowerVR graphics, PowerVR vision & AI and Enigma connectivity. Imagination is chosen as a partner by many leading innovators in electronics. We achieved that position because we are passionate

about innovation and have the drive to deliver technologies that solve key problems in new, more efficient ways. Our technologies offer strong differentiation compared to competing solutions. Our technologies are instrumental in key segments such as: mobile; consumer; automotive; IoT; AR/VR; security; AI; and other markets. We are a strong, independent IP company, owned by Canyon Bridge, a Silicon Valley-based private equity firm. We pride ourselves on our consistent focus on creating win-win products in conjunction with our customers. Our powerful, cutting-edge designs are driving the digital revolution forward by enabling our partners to build world-changing electronics.

We offer features that enable success: whether the latest APIs for graphics and compute; support for a wide range of neural networks; or special features of our architectures such as our low-power and low-bandwidth TBDR graphics processing, or our secure and safe hardware virtualization. Our business model means we only succeed if our customers succeed. We receive a royalty payment when companies create products in volume using our technologies. If our customers do not ship in volume, we don't make a profit. This means we are motivated to work in partnership with our customers and to deliver the support and services they need to reach their target market, on time and in volume.

Our IP is extensively tested and verified. Our customer and solutions engineering teams have the latest in tools. And we give extensive support to our customers including design optimisation kits, reference software and education. Innovation and collaboration are in our DNA. Our goal is to help create a smarter, more connected world that enriches the lives of billions of people. Find out how you can get Imagination on your side to deliver your best products at your best time to market.

Imagination has three core offerings that can work individually, or together, to help you create the highly optimised SoCs to meet your customer's requirements - Superior Graphics, Vision & AI and Flexible Communications.



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Website	www.inexmicro.com

INEX is an innovative company offering leading-edge production of micro/nano technology and semiconductor based systems. Established in 2002 as a commercial unit of Newcastle University in North East England, it rapidly grew a strong reputation for specialist manufacturing services and close collaborative relationships with partners and customers.

INEX is now a valued commercial partner for delivering next generation sensors, advanced RF/power devices and miniaturized systems.

The significant investment INEX has enjoyed over more than 10 years puts the company at an unqualified technological advantage. With full-featured processing on a 150mm line, we are seen as unique in the UK for comprehensive processing of microsystems and compound semiconductor based electronics.

In order to deliver technical excellence, INEX incorporates systematic QA principles throughout all customer engagement, design, development and production processes. We are committed to the principles of customer focus and continuous improvement within the ISO9001:2008 standard, to which our quality systems are certified.

INEX conducts routine internal audits and is open to customer audits of our quality management system and procedures. Audits have been conducted by defence prime contractors, large multi-national companies and start-ups to satisfy both customers and investors of their choice of development and production foundry partner.

Our team understands the very different challenges faced by volume production compared with development phases.

Utilising tools such as SPC, FMEA, Gauge R&R, 8D and the principles of six sigma we can ensure that we deliver quality products reliably and on time.

Infineon Technologies AG is a world leader in semiconductor solutions that make life easier, safer and greener.

Microelectronics from Infineon is the key to a better future.

Automotive

Semiconductors are essential to realizing key trends like electro-mobility, automated driving and secure, connected cars.

We are the leading semiconductor partner in the fast-changing automotive world, based on our system knowledge coupled with our passion for innovation and quality.

We are a key driver in the ever-advancing pace of digitalization in the automotive industry.

We shape the future of mobility with micro-electronics enabling clean, safe and smart cars.



Telephone	+49 89 234 65555
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Inseto is a leading technical distributor of equipment and related materials to the semiconductor, microelectronic & advanced technology sectors, as well as adhesives for electronics, automotive & industrial manufacturing.

Our advanced equipment and materials are available from specialist technology divisions, which offer carefully selected, technically innovative, high performance products, comprising:



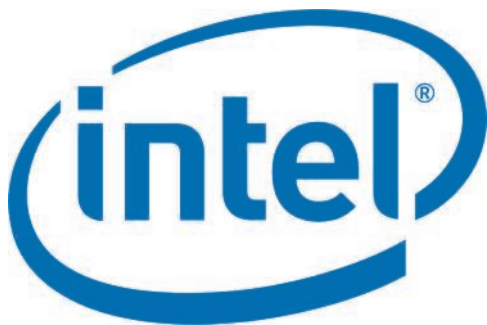
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EQUIPMENT DIVISION: Provides fabrication, assembly, test & inspection equipment, including: manual and automated lithography equipment for exposure, resist coating and development, plus semiconductor furnaces, wafer bonders, probing systems, dicing saws and diamond scribing machines, die bonders and sorters, inspection and metrology equipment, ultrasonic wire bonding machines, plasma cleaners and etching systems, vacuum solder reflow ovens, material testers for wire pull and shear testing etc.

With several hundred equipment installations throughout Europe, our dedicated team of specialist engineers provides each of our customers with a full technical and after sales support programme.

CONSUMABLE DIVISION: Provides fabrication and packaging materials and services, plus machine assembly consumables. Our products include: semiconductor & silica wafers, sub-contract wafer bumping grinding & dicing, wires & ribbons for bonding and soldering, precision stampings & preforms, hermetic metal & ceramic packages, thick film materials, thin film substrates, thermal dissipation materials, welding electrodes, plus bonding wedges, capillaries, die collets & dicing blades etc.

ADHESIVE DIVISION: Provides technically advanced adhesives for bonding, sealing & encapsulation throughout the UK & Ireland. Exclusively representing DELO Industrial Adhesives, our adhesive division has the technical expertise to advise on all your project requirements. Products include an extensive range of UV cured or light activated Epoxies, light cured Acrylates, light / heat cured Epoxies, dual curing materials, light / Anaerobic curing Adhesives, 2 part Polyurethanes, 1 & 2 part Epoxies, Cyanoacrylates and single part Silicones.



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You may know us for our processors. But we do so much more. Intel invents at the boundaries of technology to make amazing experiences possible for business and society, and for every person on Earth.

Harnessing the capability of the cloud, the ubiquity of the Internet of Things, the latest advances in memory and programmable solutions, and the promise of always-on 5G connectivity, Intel is disrupting industries and solving global challenges. Leading on policy, diversity, inclusion, education and sustainability, we create value for our stockholders, customers, and society.

Experience Intel® Innovation

We believe technology must constantly evolve to make more things possible and all things easier, smarter, and more connected than ever before.



TIER 1 SYSTEMS DEVELOPER AND INTEGRATOR - TIER 2 COMPONENT DEVELOPER AND SUPPLIER

ITDev delivers engineering excellence through fully managed software and electronic design services. We thrive on building relationships, developing insight and delivering value to our clients.

Specialists in embedded software, electronic engineering and systems engineering, our engineers have a wealth of experience in a wide range of commercial and open source technologies, including C, C++, Python, PHP, Java, VHDL and SystemVerilog for FPGAs.

From our UK based offices, we develop:

- embedded systems
- device drivers for Linux and Android operating systems
- mobile applications (e.g. for Android)
- PC and web-based applications
- FPGA solutions

We are defined by a set of shared values: Empathy, Trust, Considered, Passionate and Smart. These drive our decision making, the way we work and our relationships with our clients, suppliers and peers.

What does this mean for you? We will...

- work to find the best fit for you and your project
- be open, dependable and ethical at all times: you'll have access to our Client Portal so you can track progress, set priorities and monitor time spent
- architect our designs with care and make use of continuous integration and test automation to deliver high quality work as efficiently as possible
- impress at every opportunity, build our knowledge and experience so we can solve your problems as efficiently and quickly as possible
- take a smart approach to projects, reducing risk, delivering value sooner and providing more flexibility

Contact us for a no obligation discussion of your requirements.



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Website	www.itdev.co.uk

AUTOMOTIVE CONSULTANCY - TIER 2 COMPONENT DEVELOPER & SUPPLIER



Jaltek Systems

Jaltek is a leading electronics technology solutions provider, based in the UK, offering a comprehensive range of vertically integrated design and manufacturing services tailored to meet our customer's highly diversified business requirements.

Telephone	+44 (0)7551 272637
Email	claire.mackay@jaltek.com
Website	www.jaltek.com

We offer a tool box of solutions which can either be utilised as a fully integrated solution or a single service. From conceptual design, PCB Layout and NPI, through manufacturing and test of PCBA's, to final product realisation, Jaltek supports products through-out their complete lifecycle.

- 3 SMT lines with 1 dedicated to NPI & Prototyping
- PCB Layout
- Selective Solder and Manual Assembly workmanship standards up to IPC-A-610 C Class 3
- Conformal Coating
- Cable Assembly
- Pressfit
- Extensive test suite
- X-ray
- State-of-the-art 3D inspection
- Box-build & High Level Assembly
- System Integration



**TEST & CERTIFICATION FACILITY -
TIER 2 COMPONENT DEVELOPER & SUPPLIER - VEHICLE COMPONENT SUPPLIER**



Telephone	+44 (0) 189 532 0831
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KORE is a pioneer, leader, and trusted advisor in IoT deployment, delivering transformative business performance from IoT solutions.

We empower organizations of all sizes to improve IoT operational

and business results by simplifying the complexity of IoT. Our deep IoT knowledge and experience, global reach, purpose-built solutions, and deployment agility accelerate and materially impact our customers' business outcomes.

An independent, expert advisor, KORE eliminates the time-consuming need to identify, evaluate, contract, and manage multiple network connectivity providers, equipment manufacturers, and professional services organizations. We deliver all of the components required for a successful IoT implementation and deployment, as well as the proven expertise and guidance that organizations need to maximize IoT investments and transform IoT business performance.



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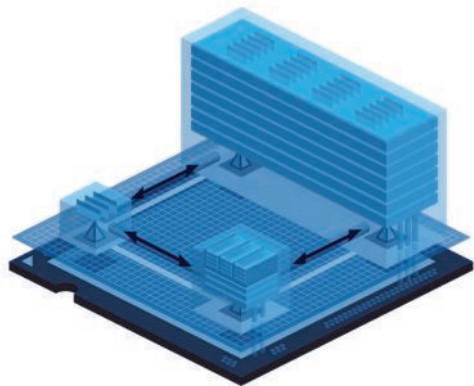
LYNX | SOFTWARE TECHNOLOGIES

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Website	www.lynx.com

Every day, millions of people worldwide benefit from products that rely on LYNX Software Technologies - from Internet and phone communications, to airline flight-control systems, office automation, and medical devices.

LYNX has crafted and adapted platform architectures across thirty years of processor evolution, beginning with the LynxOS® real-time operating system (RTOS), which was one of the first operating systems to leverage hardware memory protection capabilities. Featuring a state-of-the-art scalable real-time thread execution model, LynxOS® offered a UNIX®-like user model and standard POSIX® interfaces to embedded developers. LynxOS-178®—a 2nd Generation refinement of the LynxOS® RTOS—introduced kernel partitioning and ARINC API standards to the avionic development community. LynxOS-178® is developed and certified to the distinguished FAA DO-178C DAL A safety standard and received the first and only FAA Reusable Software Component certificate.

Lynx MOSAic™ extends this proud history of innovation by leveraging CPU virtualization to further simplify and decentralize platform abstraction layers, providing a modular development & integration framework for rapidly building comprehensible software systems out of independent application modules. An innovator in modern platform software technologies, LYNX provides the richest set of options for efficiently realizing robust, comprehensible software systems onto modern CPUs.



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Magna-Power Electronics designs, and manufactures robust programmable DC power supplies now spans 1.5 kW to 2000 kW+ with over 500 standard models ranging from 5 Vdc to 10,000 Vdc and from 0.2 Adc to 24,000 Adc.

All Magna-Power DC power supplies models come with monitoring and control from a

variety of sources, including: front panel, computer interface and an isolated DB37 analogue-digital user I/O connector. A Standard Commands for Programmable Instrumentation (SCPI) command set is supported, allowing easy ASCII text programming over a computer interface. In addition, an IVI driver is included for the Visual Studio programming environment along with a dedicated National Instruments LabVIEW™ and LabWindows™ driver. Additional computer interface options include LXI TCP/IP Ethernet (+LXI), IEEE-488 GPIB (+GPIB), USB and RS-485.

Alongside the MagnaDC units sits the MagnaLOAD product line of DC electronic loads spanning 1.25 kW to 120 kW+. The new product line includes 3 product series, ALx Series, ARx Series, and WRx Series spanning 39 air- and water-cooled models from 1.25 kW to 120 kW+ with voltage ranges up to 0-1,000 Vdc and current ranges up to 0-1,200 Adc.

The MagnaLOAD product line launches with Magna-Power's all new distributed DSP architecture, MagnaLINK™, featuring digital control loops and an internally developed high-speed product-to-product communication protocol. The MagnaLOAD product line is designed to dissipate DC power during development, manufacturing, and validation of DC sources, including: power supplies, DC-DC converters, batteries, solar panels, fuel cells, motors, and electromagnets.





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MASER Engineering, founded in 1993, is an independent engineering service company operating in the semiconductor and electronic systems industry and has its main facilities in Enschede, The Netherlands.

We offer Reliability Tests and Diagnostic services to a wide range of customers who are active as Fabless Semiconductor supplier or as Integrated Device Manufacturers or as a system supplier, from Automotive Electronics to Aerospace and Space applications.

Our customers are located throughout Europe, the UK and in Israel.

As an active member of standardization committees and throughout development activities with national and international partners MASER Engineering aims to offer her customers a best in class service concerning product quality and reliability.

- Physical Failure Analysis
- Construction Analysis
- First Silicon FIB Circuit Edit
- 2D/3D CT X-Ray Inspection
- Thermal Emission Analysis
- FIB/(S)TEM-EDX Microscopy
- Reliability & Robustness Test
- JEDEC/Q100 Qualification
- ESD & Latch-up Testing
- Mechanical/Environmental
- HALT Assessment
- (O)LED Test Service
- Power Electronics Test

MASER Engineering has ISO-9001:2015 certification and ISO-17025:2005 accreditation according to scope L388 www.rva.nl

McLaren

APPLIED TECHNOLOGIES

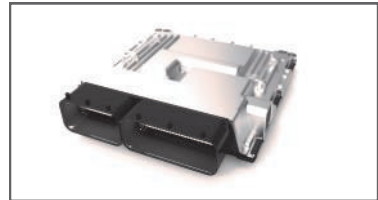
Telephone	+44 (0)1483 261400
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Website	www.mclaren.com/auto

McLaren Applied Technologies was originally established in 1988, as the company addressed the increasing importance of electronic control systems in motorsport to gain a competitive edge.

This quickly translated into McLaren Applied Technologies supporting automotive manufacturers, providing the latest technology with the freedom to innovate, to differentiate, to build a competitive advantage.

Our technology is the bedrock of all our automotive products. We understand that each market has specific needs, and our products have been created with this in mind; delivering unique, tailored solutions for specific applications since 1993. As the industry has become increasingly safety focused, so has McLaren Applied Technology, providing our in-house ISO26262 capabilities into every safety critical product.

We offer expertise in safety critical controllers, hybrid and electrification technologies as well as vehicle dynamic simulators and data analytics toolsets. To find out more about how we can meet your automotive needs and exceed your expectations, email sales@mclaren.com or telephone +44 (0) 1483 261400 for the UK and worldwide .



www.mclaren.com/appliedtechnologies

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System design and implementation for electrical/electronic systems

- Optimized electrical system implementation
- Electrical and electronic architecture with Capital
- Wire harness manufacture with Capital
- Design AUTOSAR-compliant software for popular ECUs
- Advanced thermal and radiometric characterization
- Industry-best design definition to manufacturing flow
- Service and maintenance with Capital

Electric vehicles and supporting technology

- System perspective on EV design
- Thermal analysis before physical prototyping
- Simulation software, thermal characterization hardware
- Battery & vehicle thermal management
- Manage hardware, software and network complexity

Autonomous driving and driver assist solutions

- System design, hardware and software integration, and design services
- DRS360™ Autonomous Drive Platform. Centralized raw data fusion, neural networks for machine learning
- Custom FPGA design and production plus integration services
- Overhead views to boost safety
- Hardware and algorithm development services

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Mentor Automotive provides the software, systems and services that unleash your freedom to innovate.

Connectivity : Connecting car, driver and the external world

- Secure, reliable data connections
- Advanced, high-performance audio and video for your automotive systems
- Full-featured, safety-certified instrument clusters
- Active noise control, A2B design, technical services and more
- Remote software life-cycle management tailored for automotive
- Internet access for navigation, entertainment and more



TIER 1 SYSTEMS DEVELOPER & INTEGRATOR - TIER 2 COMPONENT DEVELOPER AND SUPPLIER

The collective power usage of data centers around the world is rapidly growing.

Currently, data centers are the fourth largest consumer of power behind only China, the US and the EU. Growth is unsustainable using current hardware. We believe that re-programmable silicon is the heart of the low-power future of data centers.

We're in good company with this view: every server Microsoft deploys into Azure data centers contains the re-programmable silicon we program for exactly this reason.

Machine learning, our flagship expertise, is expected to fuel a significant proportion of data center growth. Our vision is to produce data center solutions that accelerate machine learning whilst reducing its power consumption: advancing the vast potential of machine learning to enhance our lives without costing the planet.

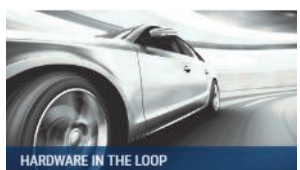
Machine learning models change so fast that hardware optimized for current models can quickly become inefficient. We view machine learning optimization as a three-piece problem. We believe machine learning models must be designed paying close attention to their numerics; their quantization, sparsity and compression; with a clear understanding of the hardware cost of implementing them on all the available platforms.

Only by understanding machine learning model behavior, efficiencies in model computation and optimal design of computation hardware, can we generate truly optimized solutions. We advocate algorithm-accelerator co-design to create world class solutions. Models have unique properties that can be capitalized upon. New data center boards from Xilinx and Intel allow optimized data structures to be continually redesigned and deployed, allowing new machine learning models to be optimized for performance and power consumption.

Find out more at <https://myrtle.ai/>

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Telephone 01635 523545

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Website www.ni.com/en-gb/

A new era of mobility is upon us. Overcome the pressure of rapidly changing test requirements by using an open and easily upgradable platform that is designed for test system flexibility.

POWERTRAIN TEST : Automotive engineers testing EV, ICE, and Hybrid powertrains can use NI solutions to test earlier in the design cycle, increasing test coverage and decreasing test cost.

ADAS TEST : Perform automotive testing that can natively integrate all the I/O types you need to properly test advanced driver assistance systems (ADAS) technology.

END-OF-LINE TEST : Test vehicle components to ensure a high-quality product while maximizing the speed of your production line.

INFOTAINMENT TEST & V2X SYSTEMS : NI offers a single, software-defined, platform-based approach to automotive testing that can natively integrate all the I/O types you need to test today's and tomorrow's technology.

HARDWARE IN THE LOOP : Test engine control units (ECUs) in a virtual environment to ensure maximum test coverage for minimum cost.

DATA MANAGEMENT & ANALYSIS : Intelligently standardize, analyze, and report on large amounts of data with NI data management software.



The North East is renowned for automotive manufacturing region accounting for 1/3rd of UK passenger vehicles, 20% of Europe's electric passenger vehicles, 10% of all UK non-highway vehicles and produce 325,000 engines.

It is home to a globally competitive supply chain has 28 Tier1 suppliers and a wealth of specialist SMEs and numerous R&D centres. These total over 240 companies and account for 26% of the regions manufacturing jobs; and generate over £11bn of sales.

The North East Automotive Alliance (NEAA) was established in March 2015 to support the sustainable economic growth and competitiveness of the North East automotive sector.

The NEAA is the largest automotive cluster in the UK and is widely recognised as the exemplar cluster. The NEAA provides a unparalleled collaborative network where companies find benefit from leadership and co-ordination of activities of mutual benefit. Today, over 160 industrialists provide over £500,000 of in-kind support to NEAA activities through 13 industry working groups covering 5 key thematic areas of Network & Connectivity, Business Competitiveness, Skills, Innovation & Technology and Trade & Investment. These groups have provided the catalyst for a level of collaborative working that drive the sector forward.

Our vision is for the North East to be to be recognised as a true automotive powerhouse which encompasses a very dynamic, forward looking and competitive supply chain; and incorporates strengths in research, development and innovation in new

automotive technologies and manufacturing processes.

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Website	www.northeastautomotivealliance.com

NOVA MODUS

Nova Modus developed the consortia and bid submissions for 4 of the UK's multi-million pound

collaborative research and development projects in Connected & Autonomous Vehicles.

Telephone	+44 7968 160453
Email	john.mcnicol@nova-modus.com
Website	www.nova-modus.com

With a background in electronics, and in bringing new technologies to market, NVM is supporting partners throughout the projects with advice on markets and the CAV industry, exploitation and commercialisation of R&D outcomes.

VENTURER – Testing Driverless Cars in Bristol and the West of England
www.venturer-cars.com

INSIGHT – Demonstrating autonomous shuttles in pedestrian environments, and for the visually impaired www.insight-cav.com

CAPRI – Developing a 'market ready' mobility service based on autonomous shuttles, with operational and legal recommendations

ROBOPILOT – An all-electric light commercial vehicle demonstrating Level 4 autonomous driving on all types of urban roads



Leading the transformation towards safe and securely connected mobility

NXP's domain-based architecture intelligently groups together the functions that let cars sense, think, and act-to manage complexity and separate concerns related to security, upgradability, and functional safety.

ADAS and highly automated driving :

Enabling the capabilities of sensing and thinking, while ensuring the safe and secure operation of the vehicle.

Infotainment & In-Vehicle Experience :

Delivering high-performance next-generation infotainment systems for a safer, more convenient, and enjoyable user experience.

Connectivity : Enabling vehicles to interact with each other and with the infrastructure- for safer, greener, and more efficient roads.

Body and comfort : Versatile and adaptive vehicle features that ensure the safety and comfort of everyone on board.

Powertrain and vehicle dynamics : Improving fuel economy and enhancing performance with robust and safe automotive qualified solutions.

Vehicle networking : Securely connecting and upgrading everything in the vehicle for an improved user experience.

Functional safety and automotive security :

At the heart of automotive innovation, our functional safety and security programs are essential to make self-driving cars a reality.

Find out more at www.nxp.com



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Website	www.nxp.com



As an innovator for MIM and microMIM technology, Parmaco produces millions of complex, high-precision steel parts yearly in Switzerland.

The fields of application are extremely diverse and include different branches such as medical technology, automotive industry, machine engineering, electronics, aeronautics, etc. we supply to customers worldwide.

The production takes place in Fischingen, located in the canton of Thurgau. The parts produced there using the Metal Injection Molding process have dimensions from 0,1 to 100mm. the basic raw materials are carefully composed and processed mixtures of selected metal powders as well as synthetic binders.

Through a multi-stage process including high temperature sintering, steel parts with high resilience as well as outstanding dimensional precision and surface qualities are produced. Upon request, the parts are then additionally processed, refined, and made into assembly groups with further components. The process is suitable for medium to large quantities. Thanks to extensive experience and intense further development, Parmaco can offer its customers custom-made solutions. Through additional services in the areas of counseling, optimization, and engineering, the requested MIM part becomes the perfect technological solution.

Automotive

MIM workpieces from Parmaco are used in many different areas and subsystems in the automotive engineering branch and fulfill the highest of requirements regarding quality and loading capacity, i.e. in the AdBlue system for emission control, as security elements in the steering column but also as hydraulic components in convertible soft tops for example. For the automotive industry, the Metal Injection Molding process is especially suitable due to the large quantities and the economic efficiency linked to that.



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Telephone	0808 1800 358
Email	info@phaedrus.com
Website	www.phaedrus.com

As the Internet of Things begins to explode, it is clear that system security is becoming a priority. As the UK's leading specialist in supporting engineers at all stages of embedded safety critical and

high-integrity projects, Phaedrus Systems is uniquely positioned to work with companies to create the development process best matched to their needs.

Consultants have experience working on automotive, rail and aerospace applications, meeting standards such as IEC 61508 SIL4, and D0178B.

When it is appropriate Phaedrus will recommend other tools than those it represents. The website also holds an expanding library of documents covering the issues in developing secure systems.

Backing this are tools for all stages of a project

- Requirement definition
- Capture
- Modelling and tracking
- Estimation software
- SIL3 RTOS and run-time RTOS analysis tools
- Hi-rel embedded database
- Software and compiler analysis
- Middleware including SSL stack
- Test, verification and debugging tools



When it is appropriate Phaedrus will recommend other tools than those it represents. The website also holds an expanding library of documents covering the issues in developing secure systems.

PRESTO

— E n g i n e e r i n g —



Presto Engineering provides outsourced operations for semiconductor and IoT device companies, helping its customers minimize overhead, reduce risk and accelerate time-to-market to give them a vital competitive advantage. The company is a recognized expert in the development of industrial solutions for RF, analog, mixed-signal and secured applications – from tape-out to delivery of finished goods.

Presto's proprietary, highly secure manufacturing and provisioning solution, coupled with extensive back-end expertise, gives its customers a competitive advantage. The company offers a global, flexible, dedicated framework with operations across Europe, the USA and Asia.

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Website
www.presto-eng.com


DEVELOPMENT TOOL SUPPLIER - TEST & CERTIFICATION FACILITIES - TIER 2 - COMPONENT DEVELOPERS & SUPPLIERS



Billions, maybe trillions of times a day...

That's how often people around the world touch something made better by Qualcomm. It could be the smartphone in your pocket, the tablet on your

coffee table, that wireless modem in your briefcase... it could even be that navigation system in your car or that action camera strapped to your chest.

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Website

www.qualcomm.com

Who is Qualcomm, and what do we do? We are engineers, scientists and business strategists. We are from many different countries and speak many different languages. We come from diverse cultures and have unique perspectives. Together, we focus on a single goal—we invent breakthrough technologies that transform how the world connects, computes, and communicates.

While many of our breakthroughs reside “under the hood” of technology familiar to us today, our inventions have transformed the world in a big way. They have helped propel mobile to the forefront of the technology world and brought wireless innovations into new industries. They have created new opportunities for ecosystem players—the wireless device makers, the operators, the developers and the content creators of the world. And more recently, our inventions and breakthroughs have inspired fresh, new ideas from those companies—large and small.

We've been called dreamers, inventors, rebels, risk takers, pioneers and geeks. We embrace those labels because in many ways, they're true. We dream big. We invent bigger. And most importantly, we often do what many thought was impossible.



DEVELOPMENT TOOLS SUPPLIER - VEHICLE COMPONENT SUPPLIER



RDM Group, formed in 1993, supplies world class products and engineering services to the automotive industry.

Telephone	02476635818
Email	dkeene@rdmgroup.co.uk
Website	www.rdmgroup.co.uk

We have developed an excellent reputation and track record as a tier 1 supplier for high quality, innovative engineering solutions. RDM supplies some of the world's best known vehicle OEM's and their suppliers. We are IATF16949 accredited and operate to ISO 26262 automotive safety standards.

RDM Group has offices in the UK, Australia, USA and Canada. We offer clients ground up vehicle design, development and manufacturing services, product design and engineering consultancy services.

Specialist services include – Electronics design, Software engineering, EV systems development, EDS services, Safety critical systems development, Autonomous vehicles and systems, Specialist vehicle build services, Styling and model development, Wiring harness manufacture, Trim manufacture, Carbon fibre parts manufacture, Aluminium machining, Mechanical engineering etc.

AUTOMOTIVE CONSULTANCY, TIER 1 – SYSTEM DEVELOPERS & INTEGRATORS, TIER 2 – COMPONENT DEVELOPERS & SUPPLIERS - VEHICLE COMPONENT SUPPLIER



At Renesas, we make things - it's part of our DNA to be inventive, innovative & creative. We're providing solutions for our customers, who are all part of the connected world.

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01628 651700

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Email via the website

Website

www.renesas.com

OUR VISION

We create relationships of trust with customers and partners through our commitment, professionalism & high quality which ultimately creates the Renesas brand that we take so much pride in.

OUR MISSION

Our mission statements were created in synch with our business strategies and they act as a bridge between concrete, specific business strategies and our high-level Vision.

All mission statements place Customer Value at the core of our activities.

AUTOMOTIVE SOLUTIONS

As the number one supplier of vehicle control microcontrollers and SoC products for the automotive industry, we are focused on helping our customers realize their vision for the future of the automobile. With billions of SoCs and MCUs supplied to our global customers, Renesas is also a proven partner, true to our policy of "Quality First." Our technologies address the latest trends in fuel economy, engine efficiency, driver assist systems, body control, infotainment, connectivity, security and reliability.



VEHICLE COMPONENT SUPPLIER



Telephone	01223 223200
Email	info@ricardo.com
Website	www.ricardo.com

We are a global strategic engineering and environmental consultancy that specialises in the transport, energy and scarce resources sectors.

Our work extends across a range of market sectors – including passenger cars, commercial vehicles, rail, defence, motorsport, energy and environment – and we are proud to possess a client list that includes transport operators, manufacturers, energy companies, financial institutions and government agencies.

Through our multi-industry knowledge and deep technical expertise, we are uniquely positioned to handle our clients' toughest strategic and operational challenges, with assignments that have included strategy development, cost reduction, safety management, regulatory compliance and environmental impact assessments.

In addition to our technical consultancy services, we have in-house engineering capabilities that enable us to design and deliver high-quality prototypes and low-volume manufacturing of complex products and assemblies, including engines, transmissions, electric motors and generators, battery packs and fuel cell systems.

And, across everything we do, in every assignment we undertake, we remain committed to the ethos of our founder, Sir Harry Ricardo, one of the most innovative engineers of his time, who in 1915 set out on a mission to 'maximise efficiency and eliminate waste'.



Roke

Part of the
Chemring Group

Telephone	+44 1794 833000
Email	info@roke.co.uk
Website	www.roke.co.uk

Roke is recognised as a worldwide centre of R&D excellence.

Roke Manor Research is a world-class electronics engineering consultancy. We enable our clients to maximise their investments in science and technology. Trusted by government and industrial partners worldwide, we deliver technology-based R&D services, provide independent advice, and solve technically challenging problems.

Roke make it our business to understand their clients' key issues to provide end-to-end tailored solutions. With extensive experience in communications systems, electronic sensors, and information assurance and in both the civil and military domains, we understand the technical complexities of modern and future systems. Our team of over 350 engineering consultants develop new concepts, capabilities and systems to protect what matters most to our clients.

Established in 1956, Roke remains a British centre of excellence for world-class innovation and engineering, and was recently awarded a Queen's Award for Enterprise and Innovation. Since October 2010 Roke has been a wholly owned subsidiary of the Chemring Group plc.



AUTOMOTIVE CONSULTANCY



RoodMicrotec has 50 years' experience as an independent value-added microelectronics and optoelectronics service provider. We offer a one-stop shop proposition to fabless companies, OEMs and other business partners.

Telephone	+44 7968 948683
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Website	www.roodmicrotec.com

We have built up a strong position in Europe. Our services comply with the highest industrial and quality requirements as demanded by the high reliability aerospace &

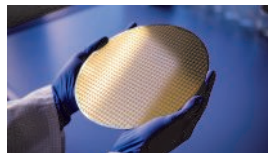
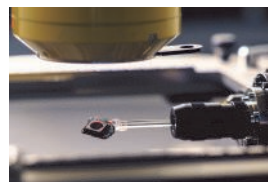
military, automotive, telecommunications, medical, IT and electronics sectors.

Value-added services include:

- Supply Chain Management which includes ASIC design services (working with specialist design partners), silicon manufacture, wafer probe, package, final test and qualification resulting in fully tested parts ready for product manufacture
- Reliability Competence Centre - dedicated support for supply to the automotive market
- Failure & Technology Analysis
- Qualification & Monitoring Burn-In
- Test & Product engineering
- Production Test (including device programming and end-of-line service)
- ESD/ESDFOS assessment & training
- Quality & Reliability
- Consulting

RoodMicrotec has an accredited laboratory for testing and calibration activities in accordance with the ISO/IEC 17025 standard and ISO 9001.

RoodMicrotec has locations in Germany (Noerdlingen and Stuttgart), the Netherlands (Zwolle) and UK (Bath).



**AUTOMOTIVE CONSULTANCY - POWERTRAIN CONSULTANCY - TEST & CERTIFICATION
FACILITY - TIER 1 SYSTEMS DEVELOPER & INTEGRATOR - TIER 2 COMPONENT DEVELOPER
AND SUPPLIER - VEHICLE COMPONENT SUPPLIER**

Red Alert Labs is an independent IoT security lab and a cybersecurity consulting agency.

We offer a broad range of services to improve the security of your connected vehicle's components.

- Security Risk Assessment and Security Profiles for your connected components and communication system (V2V, V2I, etc).
- Security Evaluations and Standard Certifications of the cars components such as ECU, TCU, Remote Opening, Tire Sensors, Multimedia device or mobile apps (Source code review, HW and SW penetration testing, Design and architecture analysis.
- Training courses to understand how to improve the security of your solution.

Our IoT Security Assurance and Certification Framework covers the whole IoT solution from Chip to Cloud and is tailored to the Automotive industry to address the commercial, technical and safety challenges.

For more information visit: <https://www.redalertlabs.com/transportation>



RED ALERT LABS IoT Security

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TEST & CERTIFICATION FACILITIES



At SafeTTy Systems, we help our customers to develop software for reliable space-based systems, automotive systems (including autonomous vehicles), industrial control systems, medical systems, railway systems, sports equipment ...

We do this using an industry-proven engineering process that integrates 'Time-Triggered' (TT) software architectures with patented run-time monitoring techniques.

The designs that we support are typically based on low-cost, off-the-shelf microcontrollers, provided by a range of different semiconductor manufacturers (our technology is not tied to any particular hardware platform).

Telephone	+44 (0)333 0115 501
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Website	www.safetty.net

Where required, we help our customers to achieve compliance with one or more international safety standards: ISO 26262, IEC 61508, ISO 13849, IEC 62304, IEC 60730 ...

We offer:

- our popular DuplicaTTor® Design Suite – enabling rapid product development (up to 'SIL 3' and equivalent);
- our new CorrelaTTor® Design Suite – enabling rapid product development (up to 'SIL 2' and equivalent) – available from Q4 2019;
- comprehensive design support at all project stages through our flexible consultancy service;
- ReliabiliTTy® Technology Licences, where our customers develop their own software designs using our technology;
- SafeTTy Solutions™ packages, where we work with our customer's development team to deliver the product software;
- various training courses on TT software architectures with a formal staff certification programme;
- our 'ERES2' book and associated 'Time-Triggered Reference Designs' (TTRDs).

We are a UK company with a worldwide customer base.



AUTOMOTIVE CONSULTANCY



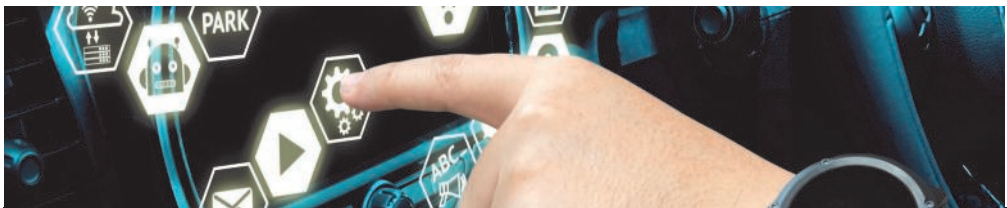
Telephone	+31 (0)88 888 31 00
Email	info@secura.com
Website	https://www.secura.com/



Secura is a cybersecurity center of expertise, focused on security testing, compliance, certification, audit and awareness.

Secura is covering a broad spectrum of security areas, including IoT, automotive, industrial systems, all the way to organization and process security. By being one of the licensed evaluation Technical Services involved in the UNECE regulations on Cybersecurity and Software Updates, Secura can support vehicle manufacturers, as well as supply chain providers, in assessing and achieving compliance with the applicable regulation requirements.

Secura is currently working with top vehicle manufacturers, having performed several compliance audits based on the UNECE regulations



TEST & CERTIFICATION FACILITIES

One of the world’s leading suppliers of sensing, electrical protection, control and power management solutions

Sensata are a key market player in automotive, appliance, aircraft, industrial, military, heavy vehicle, off-road, HVAC, data, telecom, RV, and marine markets.

Our vision is to be a world leader and early innovator in mission-critical sensor-rich solutions and electrical protection & first choice for our customers, employees, investors and neighbors.

Our Purpose is to help our customers safely deliver a cleaner, more efficient, electrified and connected world.

Sensata ship 1.1 billion devices per year (each highly engineered) .

We use sites in 11 countries and a staff over over 21,000 to manufacture and sell 15 of our own brands and we sell over 47000 different products.

For automotive systems, Sensata provide sensors to mission critical auto systems with 50+ devices per vehicle.

To find out more, **please visit the website.**



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SIEMENS

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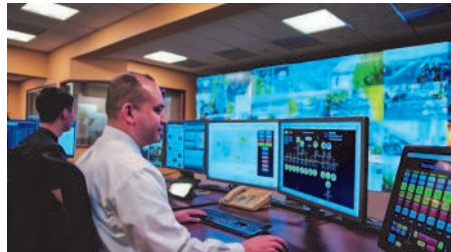
Telephone	+44(0)1202 782000
Email	Email via the Website
Website	www.siemens.co.uk/traffic/en/

On the threshold to the next mobility revolution, which is truly starting to gather momentum now with the rapid progress in the area of self-driving cars, old approaches are coming up against their limits. This is not the only reason, however, why the field of road transport keeps generating new questions that require new answers: smart answers that will help master increasingly complex tasks and simplify ever more complicated issues and open up new opportunities for municipal and regional authorities to actively shape the mobility world for the next generation instead of simply responding to changing conditions.

Re-thinking mobility

The comprehensive consulting expertise of Siemens ITS remains unmatched in the industry. No other company specializing in mobility can rely on such a wealth of experience and in-depth knowledge in all areas related to transport. In addition to a complete range of cutting-edge products for road infrastructure, including intelligent traffic control, management and information systems, the ITS experts working at Siemens bring a multi-modal approach into play. This ability to think out side the box arises from the continuous exchange of ideas with their colleagues from the Siemens Rail Systems units and makes it much easier for them to develop holistic mobility concepts.

To find out more, visit the website : www.siemens.co.uk/traffic/en/





smartpowersolutions
Power Electronics R&D, M/F and Test

Custom Engineered Power Electronics

Telephone	+44 (0) 1132 562 332
Email	enquiries@smartpowersolutions.com
Website	www.smartpowersolutions.com

Smart Power Solutions is based in Leeds in the UK and was founded in 2001.

We specialise in the design and manufacture of intelligent high-efficiency power electronics systems both for static and rotating applications.

We have taken our considerable experience gained working on sophisticated motor drive systems and applied it to power supplies, battery chargers, power conditioners and grid tied inverters. Our engineers have successfully tackled a wide variety of systems from high volume cost sensitive automotive and appliance applications all the way through to lower volume high power systems for industrial and railway traction auxiliaries applications.

On the Manufacturing side, we focus on providing a flexible, high quality CEM service for lower volume custom power electronic products. Ranging from low power (1kW) PCB based products, through to high power cabinet systems capable of powers in excess of 1MW and anywhere in between. Most of the products we manufacture have been designed for our customers in-house, however we are equally set up for manufacturing existing designs as a build to print service.

SOFINTSYS

At Sofintsys, we aim to make a difference for our clients. We aim to bring practical solutions that solve our clients' concerns.

Telephone	+44 1283 575609
Email	info@sofintsys.com
Website	www.sofintsys.com

We can partner with our clients to address the business and technical challenges inherent in developing complex software-intensive systems. Providing engineering and consulting services aligned to real business needs, borne of practical experience, and for application in various parts of the product lifecycle, its processes and organisation.

Leveraging Multi-Domain Experience

Sofintsys leverages over 35 years of experience working in leading industries such as Industrial Controls, Defence, Communications, Automotive, Aerospace and Nuclear. Sofintsys enables companies to accelerate their product development efforts, and drive more predictability and productivity into their businesses.

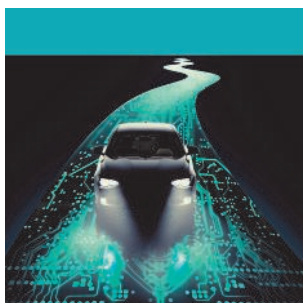
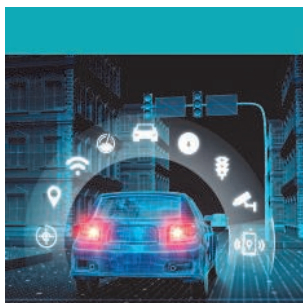
Sofintsys helps clients recognise how to develop products differently, develop products with a difference, and even develop different products to ensure they deliver the products their customers need and value, and maximise the market opportunity.

At Sofintsys, we're committed to helping our clients take control of the engineering and development of their systems and products, with insights into techniques and practical systems of management, competency and professional development as well as advice on organisational and leadership structure and behaviour.



sondrel

Success through partnership



Telephone	+44 (0)1189838550
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Website	www.sondrel.com

Sondrel is Europe's largest independent SoC and ASIC design consultancy providing complete semiconductor design solutions from concept to fully packaged silicon chips and specialised outsourced design services at the most advanced geometries. Sondrel designs semiconductor SoCs and ASICs for some of the world's leading technology companies and systems houses and is highly regarded for applications involving automotive functional safety, high definition video processing, AI, and secure, power-efficient IoT design.

Sondrel's ASIL-ready architecture and design team has in depth experience of safety-critical architecture for autonomous vehicles and a range of automotive designs serving leading manufacturers, Tier 2 suppliers automotive platform vendors.

Headquartered in the UK, with over 225 engineers in seven secure design centre locations including France, Morocco, India and China, Sondrel is an award-winning, privately owned semiconductor design business founded in 2002 by CEO Graham Curren.

Contact Sales to find out how we can help you transform your automotive ideas into market-ready silicon.

SUPPLYDESIGN

Supply Design Limited are power supply specialists.

Our patented three-phase to DC converter technology creates a groundbreaking new standard for three-phase AC to DC power conversion.

Our topology can perform in one conversion stage what our competitors require two power stages to do - leading to (up to) a 65% reduction in heat generating losses and a 33% increase in power density, without compromising power factor, harmonics or galvanic isolation performance.



Supply Design has grown in the last few years to include a broad range of staff and suppliers. In addition to the core team, we work with consultants and contractors who help us offer an impressive range of services to our clients.

We have partners in industry and academia, including the University of Strathclyde, Heriot Watt University, RenewNet and Scottish Enterprise.



INDUSTRIAL



ELECTRIC VEHICLES



AEROSPACE



SMART DC

POWERTRAIN CONSULTANCY - TIER 2 COMPONENT DEVELOPER AND SUPPLIER

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Website	www.testandverification.com



Helping our customers deliver world-class hardware and software products that are reliable, safe and secure.

Our test and verification services are built on a deep understanding of the latest methodologies, security threats and compliance landscape. Our years of practical experience has led to an enviable track record of success with customers trusting us across multiple projects.

Customers choose T&VS because of a demonstrated ability to exhibit thought leadership in the verification space. T&VS has a proven track record of delivering to clients for complex verification programs, active industry engagement through conferences and seminars and providing industry-leading verification training programs.

T&VS brings improvements to customer verification through a thorough verification process built on experience from the past 25 years. Customers have the flexibility to use the T&VS verification flow (which has been successfully proven at multiple customer locations) or to ask T&VS to follow their own process.

Focus in a niche area of expertise gives customers the confidence to outsource the complete verification activity to T&VS. A successful track record of delivering end-to-end verification programs for ASIC/SoC/FPGA has made T&VS a preferred verification partner.

- Customers have benefited from T&VS' ability to quickly ramp up to meet resource requirements.
- Customer confidence in T&VS' ability to build and retain stable, high performing verification teams has led to T&VS high client retention rates.
- T&VS provides custom-made VIP's in native System Verilog/UVM or e/ERM with the ability to interface with customer models in a very flexible manner.
- Customers can reduce their verification turnaround times by leveraging T&VS' in-house tools which are specifically developed to address verification pain points.
- Customers choose to work with T&VS because of a successful track record of verification execution at semiconductor majors.
- Customer training requirements in any verification area can be addressed via customized training programs .

TKS

Partnerships

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TKS Partnerships (TKSP) provides consultancy in technology strategy, marketing strategy and business development for automotive, consumer and industrial markets.

TKSP is led by Tony King-Smith, a electronics industry veteran with 40 years experience in both R&D and senior marketing and business development roles. Tony is best known as the former CMO for Imagination Technologies. He was in this role for ten years following 25 years in R&D that included establishing and managing five chip design teams (both digital SoC and

mixed signal), consumer and automotive product development teams, and extensive global technology and business strategy involvement with leading global companies such as Panasonic, Hitachi/Renesas, LSI Logic, Inmos and British Aerospace.

Tony is currently engaged in the fields of AI hardware platform technology strategies for autonomous vehicles, hardware IP business development for automotive and industrial markets, and smart connected Industrial IOT products.

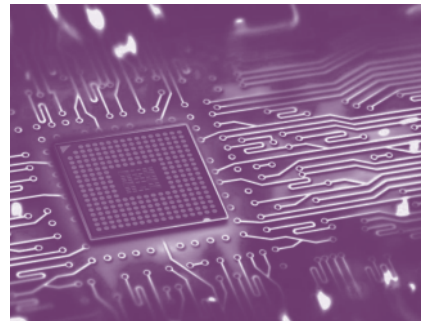
If you have a great technology that you need help to present to the broader market, TKSP can help.

If you are a growing startup moving to commercial production with products you want to market and launch globally, TKSP can help.

If you want to engage with the semiconductor industry commercially and/or technically, TKSP can help'.

And if you want someone who can bring both in-depth technical understanding of hardware, embedded software and systems design alongside marketing/PR expertise targeting global markets, customers and investors (both technical and non-technical executives), TKSP can definitely help.

If you think Tony's unique background can be of value to you, get in touch!



Contract Electronics Manufacturing Services

An operating business of Ultra Electronics Holdings plc, Ultra Electronics CEMS is a contract electronics manufacturing business focused on low and medium volume manufacturing for industry sectors demanding high reliability product including aerospace, defence, security, oil and gas exploration, scientific instrumentation, mass transportation, nuclear and other professional electronics

CEMS offers a wide range of capabilities including:

Rapid prototype manufacturing and new product introduction

Advanced surface mount assembly

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Test strategy development and manufacture

Whole of life product management (spares & repairs)

Ultra

ELECTRONICS

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Website

<http://ultra-cems.com>



TIER 1 SYSTEMS DEVELOPER AND INTEGRATOR

**TIER 2 COMPONENT DEVELOPER AND
SUPPLIER**

Who We Are

We're a small group of computer scientists with a ground breaking idea designed to contribute towards better software quality. We invented the ingeniously simple 'test action to next allowable test action' technique for testing software systems. Over several years we have helped successfully deploy this technique on digital industries most difficult test problems. Finding defects that other approaches miss and helping to auto-generate millions of new effective tests. Now after nine years of hard work and three generations of the tool, we have distilled this powerful auto-test generation technique into an ingeniously simple, incredibly easy to use, low cost and highly productive graphical test automation tool.

What We Do

The user defined test activity diagram describes test actions and allowable next test actions required to test your App, API or Software System. The data required by your test activity is captured into activity variable fields in the diagram to define values and ranges to auto-generate data for tests. The Vitaq test generator uses seed-based machine algorithms and user-defined weights to guide what next actions will be selected and what data will be generated each time you run the test activity to auto-generate new valid and useful tests. The tool monitors, measures and analyses test coverage.



Telephone	+44 1908 889715
Email	info@vitaq.io
Website	www.vitaq.io

Vitaq Test Automation Benefits

- Intelligently auto-generate tests
- Significantly reduce manual test effort
- Monitor, measure and analyse test coverage
- More efficient use of hardware resources
- Finds defects that other approaches miss

TEST AND CERTIFICATION FACILITY - TIER 1 SYSTEMS DEVELOPER & INTEGRATOR - TIER 2 COMPONENT DEVELOPER AND SUPPLIER



Setting the pace in the fastest-growing segment

As the only Tier 1 supplier devoted exclusively to cockpit electronics, and with the broadest product portfolio in this segment, Visteon is uniquely positioned to meet automakers’ needs for smart, digital cockpits for electric and automated vehicles. Our technology ensures drivers and passengers can interact easily, efficiently and more safely with features in the cockpit – and with the ecosystem around the vehicle.

Telephone	01245 395000
Email	mail via the website
Website	www.visteon.com

In the autonomous driving era, it will be the apps, the connectivity and ease of interaction with displays that will define the new user experience. We apply our software-driven expertise to excel in these areas – melding new technology with the best of the consumer electronics experience, while capitalizing on the automotive intellect and passion of our people. We also embrace collaboration, making it easy for the brightest app and algorithm developers to create game-changing applications for our platforms, from infotainment to autonomous driving.

Visteon helped the industry move beyond hard buttons and knobs to touch screens and haptic controllers. Today, we’re the first in the industry to address the proliferation of electronic control units (ECUs) through our SmartCore™ cockpit domain controller solution. Now, another transformation is underway, driven by requirements for autonomous vehicles. This new phase will be characterized by technology such as artificial intelligence, augmented reality, driver monitoring and interior sensing. We’re participating in this new era of technology in the same place we’ve always been – the fast lane.

Find out more at www.visteon.com

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NON-MEMBER LISTINGS

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AMS

ams develops and manufactures high performance analog semiconductors and sensors that solve its customers' most challenging problems with innovative solutions.

www.ams.com

API CAPACITORS

API Capacitors are the leading UK designer and manufacturer of high performance power capacitors.

www.api-capactitors.com

AVID TECHNOLOGY

AVID Technology Limited is a market leader in the design and manufacture of electrified ancillary and advanced thermal management systems for heavy duty and high performance vehicles and machinery.

www.avidtp.com

BITWISE

Bitwise develops software for specialist sectors that are typically characterized by a need for high quality and extreme reliability.

www.bitwisegroup.com

BLUEFRUIT SOFTWARE

Bluefruit Software are the UK's leading embedded software development specialists, delivering exceptional quality code to our demanding customers in a truly agile way.

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CODEPLAY

Experts in heterogeneous systems with many years of experience implementing OpenCL™, SYCL™, Vulkan™ into complex processor systems.

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DRIVERLESS.GLOBAL

Driverless.Global is the Driverless / Autonomous Technology Business Directory

Fully featured Free Listings for businesses and professionals involved within the Driverless vehicle sector and related technologies

www.driverless.global

ETPS ENGINEER ELECTRONIC POWER SUPPLY AND TEST SYSTEMS

ETPS engineer electronic power supply and test systems. Application specific equipment is available for battery emulation, cranking curve simulation, battery cycling, electric drive testing, super capacitor simulation and fuel cell loading.

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Hitex UK offers a varied range of products and services including development tools, PCB design, boards, modules, consultancy, complete product design services and automation solutions.

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Intercede is a cyber-security company specializing in digital identity, derived credentials, and trusted application management for a hyper-connected increasingly mobile world.

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Lauterbach GmbH is the world largest producer of hardware assisted debug tools. Our engineering team has more than 35 years experience in making world class debuggers and emulators.

www.lauterbach..com

LORIT CONSULTANCY

Lorit Consultancy provides functional safety and regulatory compliance consultancy and training to organisations in the Automotive, Medical and Aviation industries.

www.lorit-consultancy.com

LOTUS CARS

As an engineering consultancy and manufacturer of premium cars designed to excite and perform, our breadth of technical knowledge and understanding is unrivalled.

www.lotuscars.com

M&M QUALTECH

M&M Qualtech was founded in 1988 by Mike Connolly Senior. The one-man start-up began life as a small niche manufacturer of cable assemblies and has evolved to become a comprehensive, high technology electronics manufacturing provider.

<http://www.mmqualtech.ie>

MCS

We combine our expert knowledge and state-of-the-art materials analysis tools to solve your materials, manufacturing and reliability problems

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MDL TECHNOLOGIES

MDL Technologies Limited is an independent company providing sales, consultancy, distribution, project management, installation and testing of electronic test equipment and facilities to the UK and Ireland

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MICROLEASE

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www.nanoscopeservices.co.uk

NCC GROUP SERVICES

NCC Group is a global expert in cyber security and risk mitigation, working with businesses to protect their brand, value and reputation against the ever-evolving threat landscape.

www.nccgroup.trust/automotive

NEXOR

Nexor enables organisations deploying the Internet of Things to understand the cyber security aspects of sharing information in high assurance environments and to manage the associated risks.

www.nexor.com/

ONESPIN

OneSpin Solutions provides advanced verification solutions based on an industry leading formal technology platform to target the toughest of verification problems.

www.onespin.com

PRQA (Programming Research)

PRQA supplies the highest performing code quality management solution for embedded software,.

<http://www.prqa.com/>

QA SYSTEMS

QA Systems tools automate unit testing, code coverage, integration testing and static analysis to optimise safety and business critical embedded software and accelerate standards compliance.

www.qa-systems.com

RINF TECH

MATT is a complete testing solution for automotive infotainment devices that incorporate any physical input such as touchscreens or buttons. MATT was designed with the reliability and robustness of an industrial robot, combined with the flexibility and compactness that would make the testing process easier and faster, in complex and highly routinized scenarios.

www.mattrobot.ai | www.rinftech.com

ROHDE & SCHWARZ UK

Rohde & Schwarz UK Ltd is an independent sales, service and solutions provider to customers in the fields of test & measurement, radio & TV, broadcasting, IT Security, radio monitoring and radio location, as well as mission-critical radio communications.

www.rohde-schwarz.com

SANMINA

Sanmina makes some of the most complex and innovative optical, electronic and mechanical products in the world. .

www.sanmina.com

SENSEYE

Senseye™, the machine Uptime as a Service product is a cloud-based tool to help manufacturers avoid downtime and save money by automatically forecasting machine failure without the need for expert manual analysis.

www.senseye.io

SENTICLE

We help build the impactful functionalities that the automotive industry deserves. Instrument Cluster. Driver Assistance. Infotainment. Touch Display Implementation, Testing & Calibration. Embedded Apps. Hardware Integration.

www.senticle.com

STRATEGY ANALYTICS

Strategy Analytics offers detailed market research, forecasts and consultancy across all areas of automotive electronics and user experience.

www.strategyanalytics.com/access-services/automotive

SYNOPSYS

Synopsys, Inc. (Nasdaq: SNPS) is the Silicon to Software™ partner for innovative companies developing electronic products and software applications .

www.synopsys.com/

VECTOR

Vector provides OEMs and suppliers of automotive and related industries a professional and open development platform of tools, software components and services for creating embedded systems.

For 25 years, Vector has been your partner for development of embedded electronics.

<http://www.vector.com/>

XILINX

Xilinx is the world's leading provider of All Programmable FPGAs, SoCs, MPSoCs and 3D ICs, enabling the next generation of smarter, connected, and differentiated systems and networks. Driven by the industry-wide shifts towards Cloud Computing, SDN/NFV, Video Everywhere, Embedded Vision, Industrial IoT, and 5G Wireless, Xilinx innovations enable these applications that are both, software defined, yet hardware optimized.

<http://www.xilinx.com/>

The UK Connected and Automated Mobility Roadmap to 2030 provides direction for decision makers, investors and policy makers for the mobile future. The roadmap is a tool, created by and intended for multiple sectors, forging new relationships and achieving collaboration across industries. With a single vision of interdependencies, the roadmap addresses developments needed to achieve connected and automated mobility (CAM) at scale by 2030.

UK Connected and Automated Mobility Roadmap

to 2030



**We have a common goal,
a vision of the future,
towards which we can
all align and collaborate
to 2030**

150+ organisations
contributed
to the roadmap

What makes the roadmap unique?

- It cuts across many traditional sectors, showing how all should work together to achieve a common vision
- 'Golden Threads' are used to allow all to find their journey and bespoke path to 2030 through interconnected 'Milestones'

THE ROADMAP IS MADE UP OF

500+ 
milestones

By 2030, the UK is benefitting from proven connected and automated mobility, with an increasingly safe and secure road network, improved productivity and greater access to transport for all.

Next-generation services and technology are designed and developed in the UK, powered by high value skills and a strong supply chain, and driven by public demand, we are a world leader.

250+ individuals
contributed
to the roadmap

Created and intended for multiple sectors and industries



**Want to find out how the roadmap can
benefit your organisation and CAM projects?**

Download the
roadmap
report at
zenzic.io/roadmap

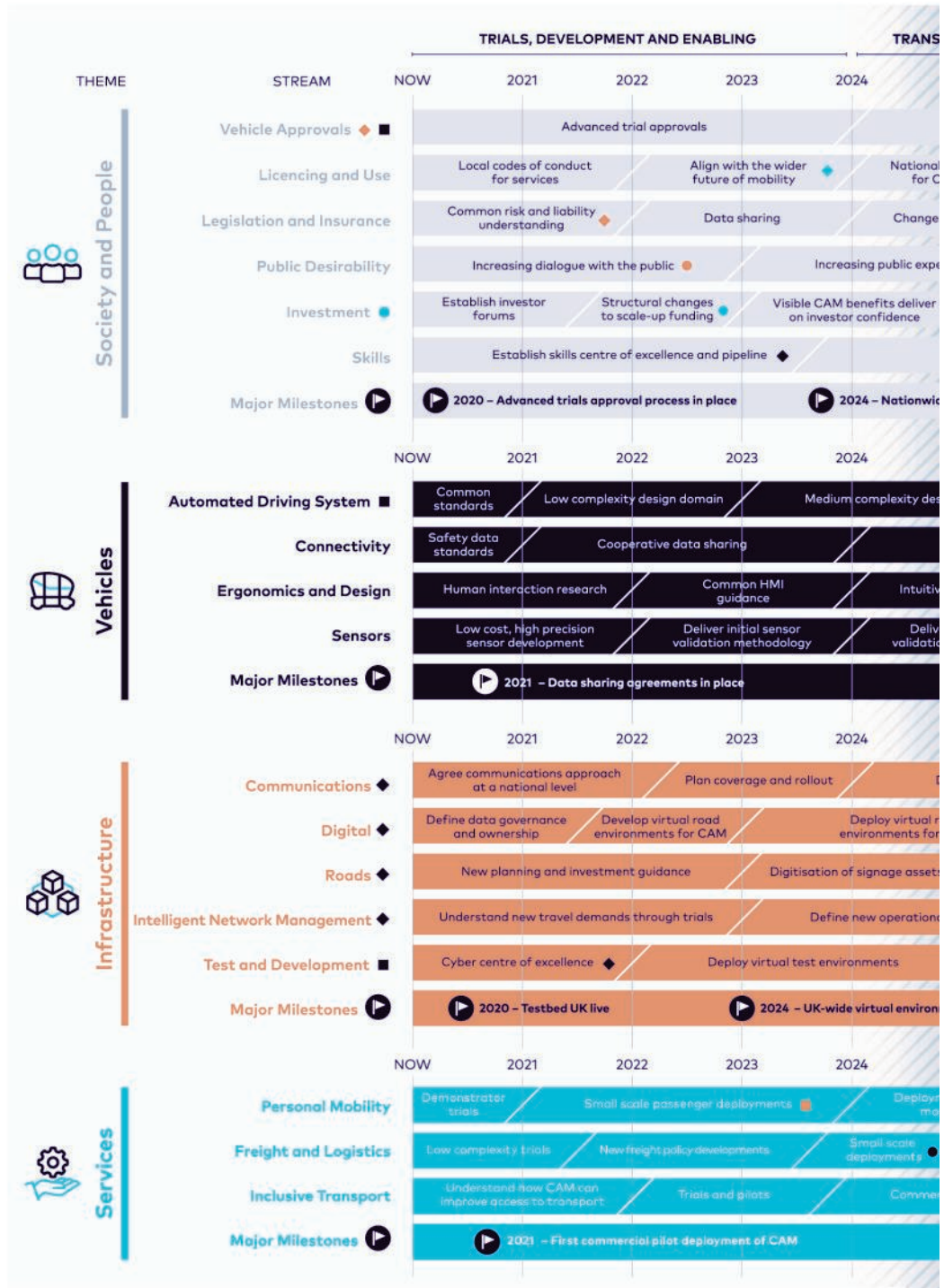


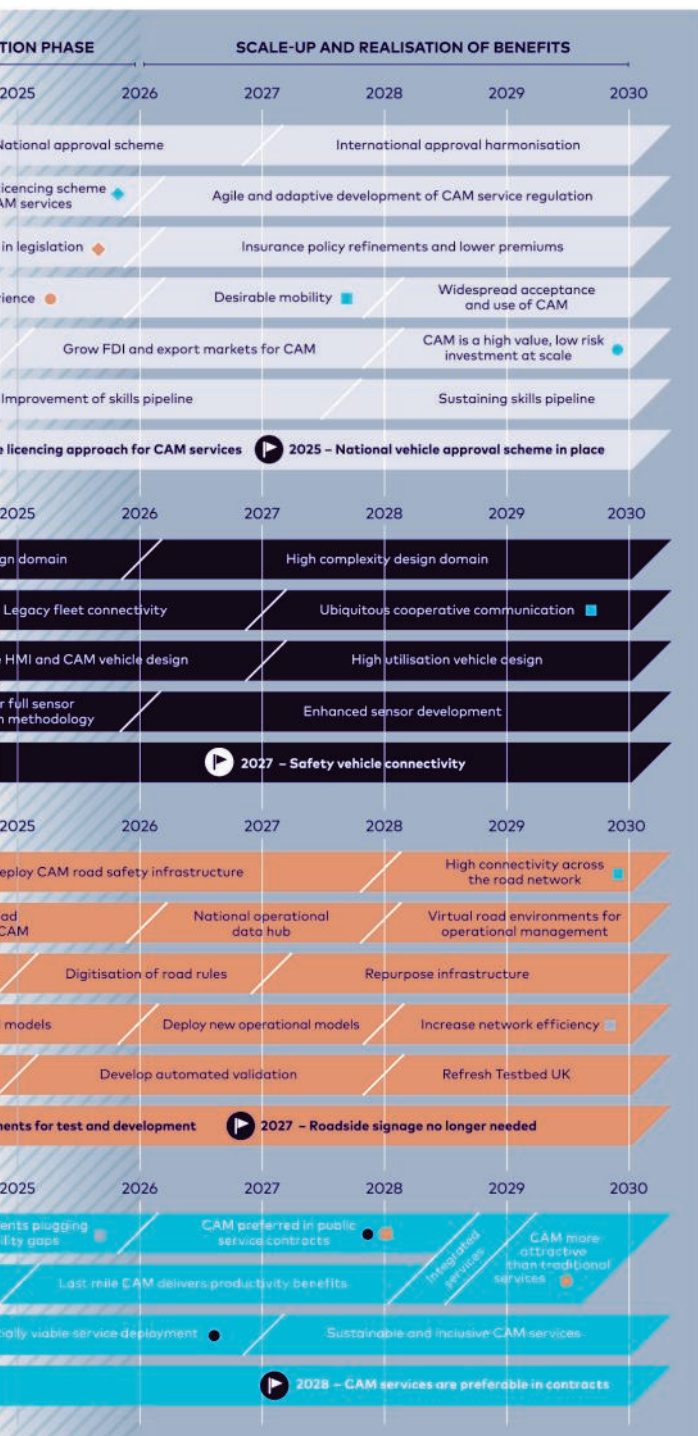
Access the
interactive
roadmap at
zenzic.io/roadmap



Contact the team to book a meeting or workshop and find your route through the roadmap – info@zenzic.io

UK Connected and Automated Mobility Roadmap to 2030





What does the roadmap tell me?

Business view

- **Should I invest?** By focussing on the investment landscape, the roadmap draws out a credible path to large scale adoption, where CAM is no longer a high risk venture. This will provide confidence in the growing market.
- **What relationships do I need to be successful?** The roadmap shows numerous stages of deployment which are potential routes-to-market. Whether you are delivering components, integration or services, the roadmap can bring to life the interdependencies from supply chain management to market exploitation.
- **How do I build desirable products?** Compelling services and products drive sustainable business models. Public dialogue is key to engage and understand public needs, and to ensure CAM services are desirable.

Consumer view

- **Will CAM be safe?** Safe and secure technology and services are the foundation of all trials and approvals. All development and deployments must pass through stringent testing processes.
- **What does CAM do for me?** CAM will unlock personal productivity through releasing lost driving hours and more efficient road networks. It will also unlock benefits and increase access to transport for all.
- **How will CAM make travelling easier?** CAM will deliver affordable mobility, increasing travel options and bringing together a more connected transport system.
- **Will CAM arrive all at once?** CAM will be introduced gradually, with initial deployments in 2021, increasing through to 2024. From there, deployments will scale up to significant numbers by 2030. Education programmes on interacting with varying levels of automation in vehicles is key to migrate to a highly automated future.

Government view

- ◆ **How does this fit with the rest of transport policy?** Defining licencing frameworks that work nationally and locally is critical, they must fit with the wider future of mobility, promoting appropriate travel options.
- ◆ **When do we need legislation changes?** Legal changes must begin to be made now to enable safe and secure deployment, with clear responsibilities and liabilities in place, continuing to align at an international level.
- ◆ **How can government support CAM?** By drawing together a comprehensive view of the future, it becomes clearer where there are market failures and places where support is needed. This is particularly relevant in areas where collaboration is essential.



UK Electronics
Skills Foundation



Connect with Electronics Students through the UKESF

"The UKESF raises the profile of Electronic Engineering and provides the best students from the best universities to companies looking for interns. Students benefit from having a great experience in the workplace, so it's a win-win for everyone."

Renesas



The **UKESF** connects leading employers with the most capable Electronics students at top UK universities

Working with the UKESF, leading employers in the Electronics sector are able to stay ahead of the game by engaging with young people at school and through university to graduate employment.

How can the UKESF help me?

- We increase the quality of your summer interns;
- We raise awareness of your company among Electronics undergraduates at the leading UK universities;
- Our scholars are all highly capable with the right personal skills and mindset to be ready for the workplace;
- Our scholars promote Electronics and STEM subjects in schools to inspire the next generation of Electronic engineers.

Since its inception in 2010, the UKESF has awarded almost **500** scholarships, and over **50** companies have already benefited by sponsoring a UKESF scholar. Over 83% of graduated scholars are working in the Electronics/Technology sector, with half being employed by a UKESF Sponsor Company. Another 14% are undertaking further study or research.

To find out more, please visit: www.ukesf.org/employers



"My experience as a UKESF scholar has been fantastic, and I recommend the scheme to anyone considering a career in the Electronics industry."

Ricki Tura,
UKESF Scholar of the Year 2018

"This summer has given me the chance to get some valuable experience and build my confidence ... I learnt key work experience skills that I wasn't being taught at university."

UKESF Scholar, 2017-20

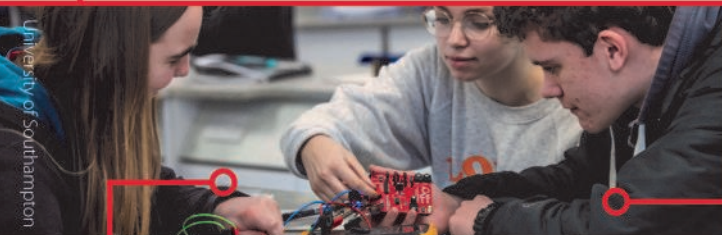


The UKESF is tackling the skills shortage with an ever-expanding programme of Electronics activities, inspiring students about Electronics at school and encouraging them to pursue STEM subjects through to A-level.

Companies can make a real difference and help promote Electronics by:

- Supporting our "Electronics Everywhere" project by purchasing classroom resources for their local secondary school.
- Publicising and promoting our #TurnOnToElectronics campaign.
- Supporting Summer Schools for A-level students – contribute speakers, deliver a hands-on Electronics challenge or host a visit.

To get involved, please visit: www.ukesf.org/donate



"The UKESF is the body responsible for skills and education in the UK Electronics sector. We've been really impressed with the quality of people coming through the UKESF."

Arm

The following AESIN member companies already sponsor UKESF Scholarships:





Whether through the production of high integrity control systems, market leading electrification technologies or accelerating development cycles through our world class Vehicle Dynamics Simulator – We provide the latest technology with the freedom to innovate, to differentiate, to build a competitive advantage.

McLaren
APPLIED TECHNOLOGIES

AUTOMOTIVE PRODUCTS