Company Overview

We are a global leader in advanced vehicle engineering, research and product testing. With over 70 years’ experience, we utilise the latest test facilities and simulation tools to make vehicles and journeys safer, cleaner, more efficient and rewarding.
About Us

We are a leading international vehicle engineering and test service provider and a world-class location for transport research and development.

We work passionately as a team to achieve our goal; that one day every journey in the world will be positively influenced by us.

Our business is focused on three key areas:

- Vehicle Engineering
- Test Engineering
- MIRA Technology Park
Vehicle Engineering

We are a centre of excellence for vehicle engineering, design, test and development. Supported by a unique combination of testing facilities, we deliver complete programmes from concept through to sign off.

Our breadth of engineering knowledge and proven programme management experience means we’re able to consistently deliver complex programmes from the pre-concept stage through to series production and launch support.

Our engineering professionals work alongside some of the world’s most prominent vehicle manufacturers to provide them with internationally recognised vehicle engineering expertise, both in the UK and overseas. We provide a highly flexible engineering service to customers in the global automotive industry.

Our Engineering Process

Our vehicle engineering services include:

Pre-programme support
- Target setting and benchmarking
- Feasibility studies

Engineering design and simulation
- Concept design
- Chassis and under-body design
- Dynamic simulation
- Structural simulation
- Thermal and aerodynamic simulation

Vehicle development
- Aerodynamics
- Thermal management
- Durability
- Road load data and acquisition analysis
- Vehicle dynamics
- Braking systems
- NVH

Additional services
- Benchmarking and teardown
- Customer perception quality appraisal
- Vehicle corrosion testing

Batteries
- Battery Design
- Battery Testing and Certification
- Battery Management Systems

Batteries and Battery Management Systems

We have extensive capability and experience in the design, development, build and testing of battery systems and can provide our customers with a complete turnkey solution.

The Battery Management System (BMS) is a key component in any high voltage battery system; it ensures optimal cell performance and maximises cell life. We can supply and integrate our own in-house developed BMS hardware and software as part of a customer’s battery system design and are able to optimise our BMS for each application by incorporating the cell characterisation data determined by in-house testing.

The extensive in-house battery testing facilities we operate provide customers with all the necessary testing required throughout the design, development and validation of high-voltage battery systems.
Test Engineering

We provide customers with comprehensive and independent testing facilities, and the engineering expertise required to design, test and certify class leading vehicles for the global automotive industry.

With over 38 major test facilities, we offer a comprehensive range of test and validation solutions for:
- Real Driving Emissions (RDE)
- Connected and autonomous vehicles
- Safety development
- Vehicle environmental
- Component environmental
- Electromagnetic compatibility (EMC) and electrical components
- Certification and Homologation
- Test facility development

We’re committed to providing our customers with access to the latest engineering services and facilities.

RDE
Our comprehensive service includes a robust set of test routes spanning the entire range of environmental boundary conditions, ensuring vehicle makers can achieve RDE sign-off with a high degree of confidence.

- Purpose-built Advanced Emissions Test Centre
- RDE test routes covering all areas of RDE measurement including extended boundary conditions
- UK routes verified for Type Approval by the VCA (UK Approvals Body) and RDW (Dutch Approvals Body)
- We’re able to develop RDE test routes for customers around the world

Connected and Autonomous Vehicles & Advanced Driver Assistance Systems
We help customers to define, design, build, validate and test their connected and autonomous vehicle solutions. By harnessing intelligent and connected vehicles and cooperative vehicle systems, we can address a number of the global challenges facing the automotive sector.

- Advanced driver and rider assist technology (ADAS and ARAS) testing and development
- City Circuit for testing, validation and demonstration of connected and autonomous systems
- Infrastructure product development

Kinematics and Compliance (K&C)
Our facility houses two moving body, fixed ground plane suspension test machines which measure suspension characteristics for the analysis and development of a vehicle’s ride, impact isolation, steering and handling.

Vehicle Environmental
Our range of facilities for vehicle environmental testing includes climatic wind tunnels and two vehicle chambers which can simulate temperatures from -40°C to +80°C and relative humidity from 5-95%. Wind speeds of up to 200kph can also be generated, as well as snow, driven rain and solar simulation.

- The facilities are used for testing:
  - Heating
  - Ventilation and air-conditioning
  - Powertrain cooling
  - Defrost and demist
  - Exhaust emissions
  - Water ingress
  - Snow packing and ingestion

Aerodynamics
We house the UK’s only independent, full-scale wind tunnel for aerodynamic test and development and is complemented by our Computational Fluid Dynamics (CFD) simulation capability.

Certification and Homologation
We help customers to ensure their products are fit for purpose before going on sale in international markets. Our experts provide automotive Technical Services for the UK VCA, Dutch RDW and Irish NSAI Type Approval bodies. We are also an accredited Notified Body for a range of EU directives.

- CE marking
- Type approval
- Homologation services
- Global wireless approvals
- Legislation consultancy services
- Certification and homologation services

Test Facility Development
Our test facility engineering service offers complex test facility design and development across many industry sectors. Since 1982, we have developed a unique level of expertise in the field of automotive facility design and procurement.

Safety Development
We provide full passive safety integration and vehicle crash development for internal combustion engine, electric and hybrid vehicles.

- Crash testing
- Non-destructive vehicle rollover
- FMVSS 201/232
- Pedestrian protection
- Computer aided engineering
- Component testing
- Roadside restraint and roadside furniture testing
- Security barrier testing
- Full-scale rail crash testing and interior safety development
- Aerospace seat testing and development
- eCall testing and development

Component Environmental
Our dedicated component and environmental testing facility is the largest of its kind in the UK, offering Tier 1, Tier 2 and OEM customer independent validation testing for a variety of products across all engineering sectors.

- Battery performance and durability
- Body and trim testing
- Corrosion testing
- Component performance and durability
- Electro-hydraulic testing

EMC and Electrical
We provide EMC and electrical testing of components and vehicles such as full-load analysis and carry out thermal rise checks and insulation resistance measurements. We also provide component and vehicle sign-off to ISO 17025 quality standards.

- EMC test services
- Programme management
- DEF STAN 61-5 Power Quality Assessments
- Certification
- Hybrid vehicle electrical testing
- EMC design
- EM simulation
- EMC filter design and manufacture
- EMC test services
Vehicle Resilience

We use a hierarchial, structured and systematic approach towards safety, security and functional performance, building confidence in the development of our clients’ electrical and electronic systems.

Growing connectivity, autonomy and electrification is significantly increasing the complexity and fragility of modern vehicles. This poses significant challenges to vehicle manufacturers as poor performance can impact upon the customer and can damage brand reputation.

We use the engineering processes of ISO 26262 and SAE J3061 to define systems engineering throughout the product lifecycle from concept to decommissioning.

Vehicle resilience is a cohesive approach to systems engineering and combines 3 key disciplines:
- Functional performance to ensure acceptable levels of performance for mission critical functions
- Security to provide acceptable levels of cybersecurity against foreseeable threats
- Safety to offer acceptable levels of safety under normal and failure (functional safety) conditions

These elements of the engineering process are inextricably linked, creating a web of intertwined and hidden risks. Security and safety systems must remain functional, whilst safety systems and functional systems must remain secure from cyber threats.

Our vehicle resilience service covers the following key areas:
- Risk analysis and requirements
- Risk driven systems engineering
- Reliability engineering
- Verification, validation and resolution
- Through-life integrity

All of these elements combine to provide product integrity.

Through targeted research, development and investment, our experts help customers to deliver resilient systems and services to market that are safer, more secure and functional.

Functional Safety

Our team of system safety and automotive cybersecurity experts help clients to build confidence in the development of their electrical and electronic systems using a hierarchial, structured and systematic approach.

The functional safety discipline is integral to overall system safety and ensures systems operate correctly in response to their inputs.

The introduction of automotive systems with greater complexity, authority and autonomy (e.g. ADAS, Connectivity and Electrification) changes this as a malfunctioning behaviour may be caused by incorrect or incomplete specification. This is where the application of systems engineering principles ensure a complete and robust system specification.

Our functional safety and product integrity services include:
- Technical seminars and training courses
- Process review and refinement
- Engineering support and consultancy
- Functional safety audit and assessment

We also offer packaged solutions for implementing the requirements of standards, such as ISO 26262 and SAE J3061.
Automotive Cybersecurity

We provide our customers with automotive cybersecurity services covering the full product development lifecycle. These can be tailored as required and can be provided either as standalone cybersecurity engineering packages or integrated with our functional safety and systems engineering services.

Our technical experts are actively involved in the development of international standards on automotive cybersecurity, providing expertise to ISO TC22/SC32/WG11 and the ISO/SAE joint working group on cybersecurity engineering.

We provide our customers with automotive cybersecurity services covering the full product development lifecycle.

Our cybersecurity services include:
- Technical seminars and training courses
- Review of automotive cybersecurity processes, templates and tools
- Engineering consultancy, including implementation of recommended practices of J3061
- 'Concept phase' activities, including generation of feature definition, threat analysis and risk assessment, definition of cybersecurity goals and cybersecurity concept development
- 'Product development' activities, including threat modelling, vulnerability analysis (for example attack trees) and technical cybersecurity concept development
- Support verification activities, for example conducting cybersecurity design reviews
- Generation of cybersecurity assurance cases
- Cybersecurity validation
- Vehicle and component level vulnerability analysis
- Security analysis and penetration testing, covering wireless interfaces, wired / physical interfaces, in-vehicle networks, ECU hardware and software

We work in close partnership with our customers to support them throughout the development of these advanced new systems, helping them to:

- Define
- Design
- Test

Modern vehicles are incredibly complex. The design, development, test and validation costs for vehicles are becoming increasingly skewed towards embedded systems which present major challenges for OEMs, the supply chain and infrastructure providers alike.

Our City Circuit provides a safe, comprehensive and fully controllable connected urban and sub-urban environment dedicated to the testing, validation and demonstration of connected and autonomous systems.

Connected and Autonomous Vehicles

Our independent experts draw upon unparalleled vehicle engineering experience to solve these transport sustainability challenges. By helping our clients in the automotive sector to develop connected and autonomous vehicles, we’re making sure journeys of the future are safer, efficient and more convenient.
Proving Ground

Our extensive proving ground is specifically designed for product development and validation. We have over 100 kilometers of different surfaces that enable customers to carry out a wide range of tests on cars, motorcycles, commercial, off-highway and military vehicles in a controlled and secure environment.

Test Facilities
- Ride and handling surfaces
- Performance circuits
- Dry handling areas
- Wet handling circuits
- Durability surfaces
- Special features
- ISO noise test
- Cross-country and off-road circuits
- Connected and autonomous vehicles

Driver Training
Our globally recognised driver training system extends the boundaries of vehicle control to allow the driver to safely operate at the limit of friction, regain directional control as desired and predict vehicle behaviour instead of reacting to it. We provide professionally qualified subject-matter experts, in a range of specially adapted vehicles, using a combination of high and low friction surfaces to provide the optimum learning environment.

Events
We are an ideal venue for hosting product launches, dealer training days and corporate events. The combination of modern conference facilities, dedicated events team and exclusive proving ground setting ensures for a successful and memorable event.

Workshop Units and Garages
A range of secure workshop units are available for customer hire or lease. Workshops range from a single bay, through to large triple-bay units, each including dedicated office space. There are also a range of large garage units available.
Set amongst the beautiful Midlands countryside, MIRA Technology Park is a comprehensive automotive technology park which enables companies a simple and effective means to establish a technical presence in the UK.

- Government recognised and supported UK Centre of Excellence with Enterprise Zone status
- 1.75 million sq ft (162,500 sqm) of space spread across a 840 acre (340 hectare) estate – the largest automotive technology park in Europe
- Professional property development team providing a full capability to design and deliver bespoke tenant facilities
- A range of property solutions – ranging from serviced office space through to bespoke designed new buildings
- Proximity to the automotive OEMs and supply chain based on the Technology Park and the wider Midlands Region
- Unequaled R&D facilities and one of the most comprehensive proving grounds in Europe with over 100 km of proving ground test track facilities and 38 major laboratory facilities
- Access to skilled labour – the MIRA Technology Institute is working towards satisfying the ever increasing demand for specialist skills in the automotive sector. It is helping to create specialist skills in some of the new disruptive technology areas such as electrification and driverless car technologies, ensuring a sustainable supply of future technical specialists and engineers. Our on-site Skills Manager can also provide advice and guidance on all matters related to skills provision and development.
Capabilities and Facilities

**Vehicle Engineering**
- Concept development and feasibility
- Vehicle benchmarking and target setting
- Whole vehicle development
- Body in white design for crashworthiness, durability and NVH
- Safety integration programmes for EuroNCAP rating enhancement
- Chassis engineering design and development
- Thermal management design and development
- Ride, handling and NVH programmes
- Specification, design and development of braking systems
- Bespoke HVAC development

**Computer Aided Engineering**
- Strength and durability
- Vehicle dynamics
- NVH and acoustics
- Impact analysis
- Aerodynamics, HVAC
- Electromagnetic simulation

**Defence Vehicle Engineering**
- Platform development
- Vehicle conversions
- IED / mineblast protection
- Seat development
- Vehicle dynamics and braking

**Unmanned Ground Vehicles**
- Platform development
- Vehicle conversions
- Command and control systems

**Control and Electronics**
- Functional safety
- Architecture design and analysis
- Electronic control unit design
- Electrical harness design
- Systems integration
- Prototype build and test
- Component and system validation

**Connected and Autonomous Vehicles**
- Vehicle testing and development
- Intelligent infrastructure
- Transport information

**Low Carbon Vehicle Engineering**
- HEV, BEV, PHEV, HEV, FCEV, REV system design
- Batteries and battery management
- Optimised powertrain systems
- Thermal management systems
- Weight reduction
- Aerodynamic optimisation
- Safety analysis

**EMC Engineering**
- Design, review and problem resolution
- Test programme design management
- Electromagnetic simulation
- Filter design and manufacture

**Component Testing**
- High and low voltage battery pack and hydrogen fuel cell testing
- Temperature and humidity environmental chambers
- Multi axis vibration testing
- Corrosion, dust and ingress
- Interior and exterior trim testing – full vehicle
- Electro-hydraulics laboratory
- Verification and validation planning
- Component testing for validation, legislation, characterisation, and durability

**Proving Ground**
- Specialist test facilities for testing and developing vehicle performance, durability, NVH, ride quality, braking and chassis development
- City circuit for research and development of connected and autonomous vehicles, intelligent infrastructure and transport information

**Test Facility Development**
- Proving ground design
- Test laboratory design

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