

- modelling and simulation
- control design
- system troubleshooting
- technology transfer and training
- energy efficiency investigation
- software tools

Services for Automotive: Independent Control Consultancy, Technology and Training Services

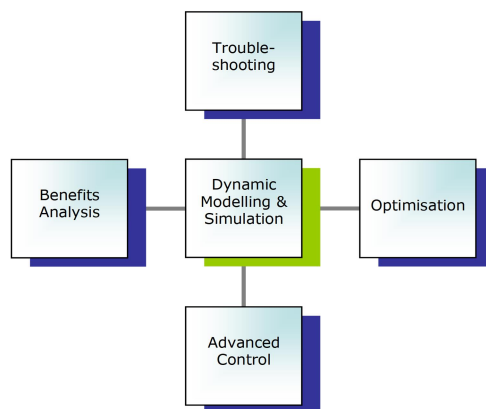
ISC provides independent, high quality control engineering consultancy and training services to the automotive industry. With a multidisciplinary team of individuals, we specialize in troubleshooting, advanced control strategy investigation, optimisation and benefit analysis using high-fidelity, well validated dynamic models.

We thrive on:

- Solving challenging and practical control problems
- Providing our clients with an insight into system responses through high-fidelity models
- Optimising control design processes, methods and parameters to yield the best possible operations.

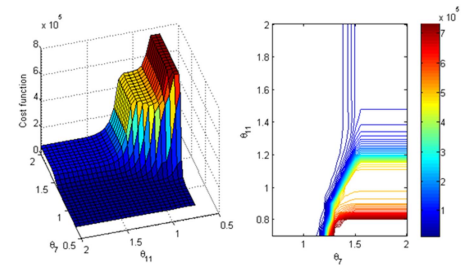
Solutions can range from simple classical feedback/feedforward to advanced control, such as model-based methods like MPC. Nevertheless, simplicity remains a key objective in our solutions, providing performance criteria can be met.

ISC also provides support for the development of real-time engine control, through the NI dedicated Powertrain Controls Software and Hardware. This provides a comprehensive set of actuator drivers, sensors modules and customized software operating in LabVIEW to provide fast and flexible implementation of core ECU functions. It is typically used within R&D various types of engine development (SI, Diesel and Hybrid).



Example NXP: HEV and EV Range Extension by Energy Optimization

The implementation of an advanced control method on the NXP Green Box II development board was considered in this project involving NXP Semiconductors (NXP) and Industrial Systems and Control Ltd (ISC). The advanced controller developed by ISC can be used in different applications but was demonstrated on a hybrid vehicle energy management system. The controller has been shown to be very effective in a range of operating conditions providing improved battery results with respect to standard energy management methods. The benefits of using advanced controls, and the possibility of real-time implementation on the latest NXP microcontrollers, are being demonstrated using Processor-In-the-Loop (PIL) comparisons with existing well-tuned benchmark solutions. By using MPC the performance of HEVs can be improved in terms of fuel economy and significantly in terms of battery degradation.



Our Expertise

- In-depth understanding of control technologies
- Extensive experience in diverse industrial applications
- High-fidelity modelling of system behaviour
- Expert analysis of complex problems
- Proven project management and research skills

Our Core Competencies

- Dynamic modelling & simulation
- Control strategy design and implementation
- Optimization
- Algorithm development
- Benefits analysis and technology review
- Research & Development
- Troubleshooting
- Training

Our Philosophy

- Approaching problems with an open mind
- Dedicated to identify practical and innovative solutions without compromising performance
- Imparting understanding and empowering clients to drive improvements themselves

If you are interested in any of the above services, please contact us by phone, e-mail or online.

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Consultancy Service Examples

- General Motors - SI engine control
- General Motors - SCR system identification
- General Motors - Control model calibration
- Toyota - Diesel engine control
- Ford – Autonomous vehicles
- FCA – Thermal control of engines.
- Torotrak - Variable transmission system
- Visteon - Applying LabVIEW to automotive power control

Training Services

ISC has delivered highly regarded training on control engineering to clients throughout the UK, Europe and USA. Our courses represent the most comprehensive available in the field of control engineering and can be focused on particular requirements of the client company. We offer:

Scheduled Courses • On-Site Courses • Bespoke Courses

We train at all levels, from introductory material for technicians, refresher for engineers, to new or advanced control techniques for research groups.

We have developed and delivered bespoke training courses for clients in the automotive, defense and aerospace and marine industries, covering a wide range of subjects including upstream process control.

What delegates said about our recent training courses ...

"By far one of the best that I have taken"

"Very stimulating - well done!"

"Examples were very good and showed how to apply theory"

"Well run and presented"

Applied Control Technology Consortium (ACTC)

The ACTC helps member companies pursue a policy of understanding and appropriately applying control technologies. It has been self-financing since 1993 and has grown to become truly international, providing control technology support to companies operating in industries as diverse as Automotive, Aerospace & Defense, Chemical & Petrochemical, Energy, Marine, Metal Processing, Food and Drink manufacturing.

ACTC Service Examples

- Control Fundamentals: Theory & Practice
- Introduction to Estimation and Kalman Filtering
- Robust and Reliable Control Systems Design
- System Identification
- Hybrid and Predictive Control for Nonlinear Industrial Applications
- ACTC/NI Control Design Workshop
- Optimization and System Identification
- Advances in Real-Time Control of Nonlinear Systems

Clients Include

- General Motors
- Chrysler
- Ford
- NXP - Freescale
- Jaguar
- Ricardo
- Torotrak
- Toyota
- Visteon

Course Examples

- Control Fundamentals (Theory and Practice)
- Predictive Control
- Optimisation and System Identification
- Kalman Filtering
- Overview of Modern Control
- Introduction to Robust and Multivariable Control Design
- Introduction to Nonlinear Control
- Servo Systems and Control
- Introduction to LabVIEW and Control Design/Simulation Toolkit
- Fundamentals of Dynamic Control using LabVIEW

ACTC Membership

- Training course entitlement
- Site visits by consultants for problem solving
- Free access to members-only software and technical dissemination reports
- Access to industrial forum for networking and promotion of services and products

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