

What is the SPEED Consortium?

SPEED (Scottish Power Electronics and Electric Drives) is a grouping of industrial companies with a common interest in electric machines, power electronics and motor drive technology. By means of an annual subscription, they support a range of R&D projects in the Power Electronics Laboratory at Glasgow University, focussed in the area of motor drives.

What's special about SPEED and Glasgow University?

Glasgow's Department of Electronics and Electrical Engineering is a large department with international-class research in several areas of electronics and electrical engineering. The SPEED Consortium has the following specially attractive features for company interaction:

- We have R&D projects in several areas of motors and drives, *not confined to a single technology*
- We combine *advanced research with practical applications*
- We assist companies to build their *own expertise*; we are not in the business of technology licensing
- We try to be *responsive to real world needs*, and to be accessible.



UNIVERSITY
of
GLASGOW



How to join the SPEED Consortium

SPEED membership is governed by a *Memorandum Agreement*. An information pack, including details of membership, demonstration disks and a sample agreement is available from the SPEED Laboratory. The membership structure is designed to protect confidential and proprietary company information and to regulate the use of SPEED software.

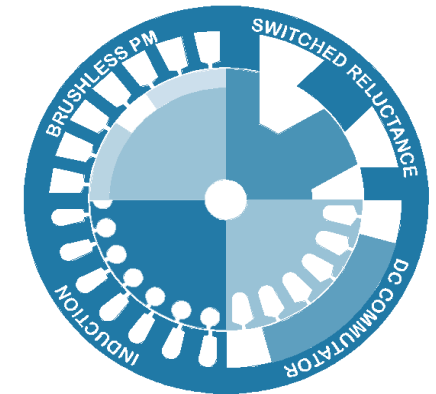
Enquiries: please contact Prof. TJE Miller at:

SPEED Laboratory

University of Glasgow
Dept. of Electronics & Electrical Eng.
Rankine Building, Oakfield Avenue
Glasgow, G12 8LT, UK
Phone: +44 (0)141 330 3157
Fax: +44 (0)141 330 3158
Email: saffron@elec.gla.ac.uk

SPEED Laboratory

The SPEED Consortium



The SPEED Research Partnership

SPEED member companies can participate in

1. *Software* for designing and analysing electric motors and their drives/controls, covering switched-reluctance (PC-SRD), brushless-DC (PC-BDC), DC commutator motors (PC-DCM), induction motors (PC-IMD), synchronous reluctance motors (PC-SREL) and others under development. The programs are supplied with extensive manuals and direct support—including engineering support—from SPEED Lab. Specialists. The programs are used by leading companies all over the world, and are continually updated and improved by interaction with SPEED companies and through development, validation programs, and test projects. SPEED software in the Consortium is one of the main vehicles for publishing our research and interacting with colleagues in the industry.
2. *Reports*, annually, describing development projects in the SPEED Laboratory.
3. *Consulting* on motor drives, power electronics and the use and application of SPEED software. This includes typically one visit per annum by SPEED staff. We make frequent visits to the USA, Japan and Europe.
4. Attendance at the SPEED *annual meeting*. Usually held at the end of September in Glasgow, with a smaller gathering at the IEEE-IAS meeting in the USA in October. The main meeting includes workshops along with a complete review of our software and other research programs.
5. *Custom software*, including custom versions of PC-SRD, PC-BDC, PC-IMD, PC-DCM and other SPEED programs.
6. *Special projects*, usually confidential and separately costed, with complete proposals and negotiated IPR arrangements, in which the SPEED Lab designs, builds and delivers prototype hardware or custom software, including controllers, motors and complete systems in brushless DC, switched reluctance, or synchronous AC motor drives from the smallest sizes up to 50kW. We have built numerous controllers, motors, complete drive systems and test equipment.

7. Opportunity to participate in *patents* taken out under general SPEED Lab R&D projects.
8. *Seminars and training*—on site or in the University.
9. Preprints of *research papers* are provided to SPEED companies in advance of publication. Sometimes we publish jointly authored papers with colleagues from member companies.
10. *Information* about developments in power electronics and drive systems. The SPEED Consortium has proved itself to be a useful forum for interaction between subscribing companies, often on a vendor/purchaser basis.
11. Closer *interaction* with our government— or EC-funded programmes—for example in power electronics CAD, synchronous motor drives etc.
12. *Recruitment* of graduates and postgraduates from any of the Department's six main first-degree programmes (B.Eng, M.Eng) and Ph.D. programmes. Postgraduates in particular have intensive experience of company-related projects.

What does it cost?

There are two levels of membership:
Standard and *Extended*

(see Memorandum Agreement for definitions).

These subscription rates equate to annual fees of £7,500 and £10,000 respectively. In addition to the subscription, new members pay an entry fee of £2,500.

Special projects, which are confidential in nature, are negotiated separately and typically are in the range of £10,000—£100,000.

What technologies are covered?

1. Motors and drives, especially switched reluctance, brushless DC, synchronous PM, synchronous reluctance and AC motors and drives generally.
2. Power electronics.
3. Precision dynamometry and instrumentation for power electronics.

Who else is in the SPEED Consortium?

A O Smith, Aichi Emerson, Aisin Seiki, Ametek, Arcelik, Control Techniques Dynamics, DaimlerChrysler, Daewoo, DANA, Danfoss, Delphi, Eaton, Elektro Magnetix, Embraco, Emerson, Emotron, Erland Persson, FHP Motors, Ford, General Dynamics, General Electric, Globe Motors, Groschopp, Grundfos, Hamilton Sundstrand, Hansen Corp., Hathaway Corp Emoteq Inc., Honeywell, Invensys Brook Crompton, ITT Bell & Gossett, Kollmorgen, LEMAC, Matsushita, Nidec Corp., Norcroft Dynamics, NMB (UK), NSK, Oriental Motor, Otis Elevator, Picanol, REIVAJ, Robert Bosch, Rockwell Automation, Rolls-Royce, SEM, SOLE, Tecumseh, Tridelta, TRW Automotive, United Technologies Research, Valeo, Vickers Systems, Warner, Yamaha.

Do members have any obligations?

Only to pay the subscription, to observe the normal protocol of confidentiality, and to return software if the subscription is terminated. There is no obligation to divulge any company information to SPEED staff. Companies vary widely in their level of interaction. Some join purely to acquire the CAD software. Others have active hardware and software development projects on a regular basis, and spend considerable time on joint projects. There is also no obligation to continue the subscription: it is renewable annually. About 80% of members maintain their memberships over a long period (more than four years).

What about confidentiality?

All company information is *automatically* regarded as confidential. The SPEED Lab is a University research lab and does not depend on commercial information in order to function. The work of the lab is not divulged or published outside SPEED except in the form of conference or learned-society papers or books; these usually cover aspects of engineering science, but sometimes we publish co-authored papers for publicity reasons to the benefit of our members. Occasionally a member company requests—and we sign—a confidentiality agreement.