

# Case Study

## Merlin works miracles for small animals....

*Support Centre helps Vetronics become a leading supplier of innovative veterinary products incorporating the very latest microelectronics technology.*



Just over ten years ago, Keith Simpson, a practising vet and an electronics enthusiast, perceived a need for a variety of innovative products that could support his own work and also the work of other veterinary practices specialising in the care of small animals, birds and reptiles. He founded Vetronic Services and went on to design, build and supply a range of electronic products which are now marketed successfully throughout the world.

These products range from anaesthetic, ECG and respiratory monitors to diagnostic ECG recorders, analysers and ventilators. In each case, Keith Simpson has set aside the conventional

approach of adapting products intended for human care and instead designed equipment specifically for the veterinary market. His increasing involvement in electronics design has also led him to undertake a Master's degree in electronics and to register as an Incorporated Engineer.

Vetronic Services recognised the potential benefits of introducing digital technology into its product range, which include greater flexibility, ease of use, higher reliability and precise control of all the respiratory parameters. The company approached the Electronics Design Support Centre at Bournemouth University and opened discussions on how the existing (analogue) products could be upgraded to incorporate microprocessor technology. The first product selected for evaluation was a ventilator for small animals weighing between 50g and 50kg.

A feasibility study undertaken by the Support Centre demonstrated the practicality of building an instrument incorporating a microcontroller that would offer several new features, including control of inspiratory time, volume and flow rate, in addition to the control of airway pressure and expiratory time offered by the analogue product. The digital instrument would also provide much more comprehensive feedback to the operator, with displays of airway pressure, compliance and flow rate, calculated volume and breathing rate. It offered greater precision of control, provision of safety alarms and a variety of special operator control facilities.

Keith Simpson decided to go ahead and build a prototype of the digital ventilator. The Support Centre gave advice on writing the detailed specification of the product, helped with the selection of a microcontroller, a stepping motor and its associated controls. A



**Electronics Design**



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prime consideration was to keep the cost of components to a minimum, whilst providing extensive analogue and digital signal processing and displays. In the case of the microcontroller, the PIC range was selected on the grounds of projected sales numbers, the low cost of development tools and the predicted rapid learning curve.

The Centre helped the company secure European Community funding for the ensuing development and, in spite of some delays in payments from Europe, which precipitated temporary cash flow difficulties, the project was completed within the 12 month target.

The prototype was a great success, and performance exceeded the original

specification. A fully engineered version the Merlin Ventilator - is now in production and on sale. With its truly novel features, this is beginning to find favour with Veterinary Schools and veterinary anaesthetists and a number are already in use.

However, this is just the beginning of the story, because Vetronic's experience with Merlin has now encouraged the company to introduce PIC microprocessors into six more of its products, boosting market share and profitability and establishing a reputation for the company as a leading supplier of innovative veterinary products incorporating the very latest microelectronics technology.



Further Information on the web:

<http://dec.bournemouth.ac.uk/ttc>

[Http://www.vetronic.co.uk/](http://www.vetronic.co.uk/)