

BIOMEDICAL FREEZER CONTROL SYSTEM

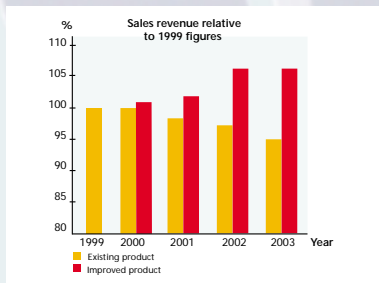
FPGA reduces circuit board requirements by 50%

Planer Products Ltd. has applied FPGA (Field Programmable Gate Array) technology in the control system of its biomedical freezer to deliver a product with reduced size and lower manufacturing costs. This has enabled the company to protect and further develop its position in the biomedical freezer market, and to increase its sales in a highly competitive market.

Planer Products designs, manufactures and sells controlled rate freezers, and specialised equipment including thermal profiling, inspection and laser measurement systems. The controlled rate freezer products are used in human in-vitro fertilisation (IVF) and animal embryo, human bone marrow, and biological cell-line freezing applications.

PLANER PRODUCTS LTD	
Employees	32
Turnover	5 M€/year
Industrial Sector	Biomedical equipment NACE code: 33
Technical expertise before the project	PCB and discrete components
Technical expertise at the end of the project	FPGA

SIGNIFICANT ECONOMIC BENEFITS



Planer's market share of IVF controlled rate freezers was under stiff competition from imported products. The reduction in size and costs achieved by the adoption of FPGA technology will enable the company to protect its market share in the IVF application area, and to increase its sales of controlled rate freezers in the bone-marrow, animal embryo and biological freezing markets. The prototype development was funded under the FUSE programme at a cost of 59 K€. The increased sales will result in a payback period of 15 months for these prototyping costs. The return on investment is estimated at 350% over 5 years of sales. An additional 30 K€ was required to industrialise the product.

PRODUCT IMPROVEMENTS

Planer's controlled rate freezers used two separate enclosures for the chamber and the controller. The introduction of FPGA and Surface Mount Technology devices have resulted a more compact design removing one circuit board and providing the option to eliminate one enclosure. Additionally, the following benefits have been gained:

- The use of a graphics LCD display, enabling the removal of external equipment required for temperature chart plotting.
- The use of a more sophisticated memory management method, providing a protected memory area for the system.
- The ability to perform field upgrades through the use of a re-programmable FPGA device.



How to go about it

CHOOSING THE RIGHT TECHNOLOGY

Planer Products selected FPGA technology to improve its controlled rate freezer product because it:

- Offered a low cost method to integrate the digital functions in the existing controller.
- Provided a reasonably low cost development route.
- Development support CAD tools were widely available.
- VHDL design entry methods were compatible to the company's previous software design expertise.
- The re-configurable FPGA technology enabled design errors to be corrected at low cost.

PROJECT OVERVIEW

Main Activity	FPGA development
Duration	12 months
Effort	165 person days
Overall prototype development costs	59 K€

A PARTNERSHIP FOR SUCCESS

Planer Products conducted the project as a FUSE application experiment. The company's staff collaborated in all the project's tasks with suitable subcontractors. The subcontractors provided support in the following area:

- Training in FPGA and VHDL design methods.
- Specification development at system and circuit board level.
- FPGA design.
- Prototype evaluation.
- Management assistance in selecting and sourcing components.

The main project tasks, effort and costs are listed in the adjacent table.

EFFORT & COST

Task	Company's effort (days)	Subcontractors' costs (K€)
Management	15	3.0
Specification	30	7.0
Training	10	2.0
Design	50	8.0
Evaluation	60	2.0
Total	165	22.0

YOU CAN ALSO BENEFIT FROM MICROELECTRONICS

FPGA technology provided Planer Products with the opportunity to improve its freezer controller system, to reduce costs and to develop new markets. You can also achieve significant benefits by acquiring the right microelectronics technology and utilising it in your product or manufacturing process. You can get help from FUSE to realise this.

FUSE is a technology transfer programme, funded by the European Commission to stimulate the wider use of microelectronics technologies by European enterprises to increase their competitiveness and enhance their economic growth. The demonstrator described here is one of many examples in the public FUSE portfolio covering the whole spectrum of microelectronics technologies and spanning a wide range of applications and industry sectors.

FUSE provides you with:

- **Best practice in acquiring specific microelectronics technologies and conducting full development projects through the FUSE portfolio of real life demonstrator documents.**
- **Local training and expert support to plan your innovation realistically and help you conduct your project successfully.**

Further information and support relating to this and other demonstrators can be obtained from the addresses below.

The Technology Transfer Node

University of Hertfordshire, ERDC, College Lane
Hatfield Herts., AL10 9AB, United Kingdom.
Tel: +44 (0)1707 284157, Fax: +44 (0)1707 284185
e-mail: ttn@herts.ac.uk



The Company

Planer Products Ltd
110 Windmill Rd, Sunbury, Middlesex,
TW16 7HD, United Kingdom.



The FUSE Secretariat

European Commission
DG Information Society – N105
200, rue de la Loi
B-1049 Brussels
Belgium

