

PORTABLE INFUSION PUMP CONTROLLER

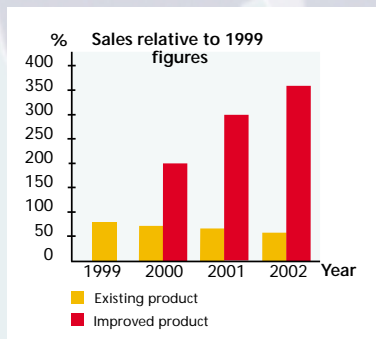
ASIC increases profits by 30%

Micrel Ltd has applied application specific integrated circuit (ASIC) technology into its MICROPUMP syringe driver infusion pump to increase the product's reliability using built-in redundancy features to assure safety whilst improving product performance. The improved product performance will result in a significant increase in market share, and increased profits of 30%.

Micrel Medical Devices designs, manufactures and sells infusion pumps for use in pain control, cancer chemotherapy and antibiotic infusion treatment in primary health care and hospital environments. The company produces two types of infusion pumps, a linear peristaltic pump and the MICROPUMP syringe driver.

MICREL MEDICAL DEVICES LTD	
Employees	20
Turnover	1 M€/year
Industrial Sector	Medical instruments NACE code: 33
Technical expertise before the project	Microprocessor
Technical expertise at the end of the project	ASIC

SIGNIFICANT ECONOMIC BENEFITS



Micrel projections indicated that growth in the sales of the existing product would be limited in the future as it competed with products offering similar technology solutions. The introduction of new features enabled by the ASIC development will improve the product's competitiveness, leading to a 255% increase in sales volume and increased market share. The prototype development was funded under the FUSE programme at a total cost of 91 K€. The company will recover the total investment cost within 24 months. The return on investment over the 10 year lifetime of the product is estimated as 1000%.

PRODUCT IMPROVEMENTS

The existing MICROPUMP system did not apply any redundant processing to increase the reliability of the product in its safety critical application. By using digital ASIC technology Micrel has developed an improved portable syringe driver infusion pump with increased safety and reliability, whilst incorporating the following product improvements:

- Reduced size resulting in a portable product.
- Improved user controls for adjusting dosage rates.
- Improved user interfaces, incorporating an LCD display and audible alarms.
- Lower power consumption enabling a longer battery life for the product.



How to go about it

CHOOSING THE RIGHT TECHNOLOGY

Micrel selected ASIC technology to implement the improved infusion pump because it offered the following benefits:

- The ability to incorporate built-in safety checking features to improve the safety of the product.
- High integration enabling a single device to achieve all of the required functions leading to a reduced product size.
- Reductions in power consumption of 20% compared to microcontroller technology solutions.
- Increased design security.

PROJECT OVERVIEW	
Main Activity	ASIC Design
Duration	21 months
Effort	701.5 person days
Overall prototype development costs	91 K€

A PARTNERSHIP FOR SUCCESS

Micrel conducted the project as a FUSE application experiment. The company's staff participated in all the project's tasks in collaboration with suitable subcontractors. The subcontractor provided support in the following areas:

- Selection of an appropriate ASIC technology.
- Training in ASIC design and the required CAD tools.
- ASIC specification.
- ASIC design and simulation.
- Evaluation of the FPGA prototype and ASIC device.

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

EFFORT & COST		
Task	Company's effort (days)	Subcontractors' costs (K€)
Management	76	
Specifications	77	4
Training	60	3
Design	270.5	24
Evaluation	218	4
Total	701.5	35

YOU CAN ALSO BENEFIT FROM MICROELECTRONICS

ASIC technology provided Micrel with the opportunity to improve its infusion pump controller product and increase its market share. 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.

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