

# WHEELCHAIR LIFT FOR THE DISABLED

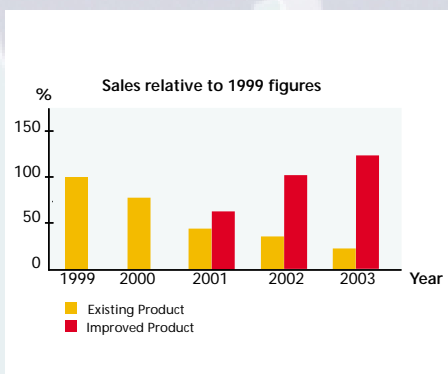
## FPGA reduces costs by 20%

*Thyssen de Reus has applied FPGA (Field Programmable Gate Array) and microcontroller technology to design a new generation of safer, more flexible and less costly wheelchair lifts for disabled people. The reductions in manufacturing, installation and servicing costs will enable the company to achieve significant increases in sales revenue and profit.*

Thyssen de Reus BV, part of the Thyssen group, specialises in the design, development, manufacture and sales of specialised lifts, including munitions elevators, elevators for buildings, ships and theatres, and lifts for elderly or disabled people.

THYSSEN DE REUS BV	
Employees	400
Turnover	45 M€/year
Industrial Sector	lifting and handling equipment NACE code: 31
Technical expertise before the project	PCB and discrete components
Technical expertise at the end of the project	Microcontroller and FPGA

## SIGNIFICANT ECONOMIC BENEFITS

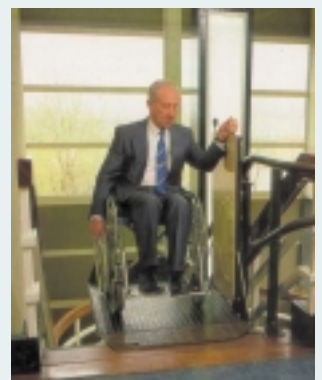


Thyssen de Reus projected that sales of its existing disabled people lifts would decline due to increasing competition unless significant product improvements were realised. The introduction of microcontroller and FPGA technology has realised enhanced functionality, improved service capabilities and reduced manufacturing costs by 20%. The improved competitive position and increased sales profits will repay the prototype development costs of 78 K€, funded by the FUSE programme, within eight months of product introduction. A return on this investment of over 1,100% will be achieved in 4 years. Industrialisation costs were 91.5 K€.

## PRODUCT IMPROVEMENTS

The company's existing platform wheelchair lift used mechanical and electro-mechanical controls which resulted in high material costs. The introduction of FPGA and microcontroller technology has enabled a reduction in manufacturing costs, in the range of 20%, to be achieved whilst delivering the following benefits:

- Remote control operation instead of a fixed cable installation, enabling significant cost savings in the installation of the lifts.
- Improved man-machine interface to assist in the use of the equipment.
- facilities to support the service and maintenance of the product, including the potential in future for remote diagnostics to be performed via a modem link.
- Improved safety features to provide a fail-safe system.



# How to go about it

## CHOOSING THE RIGHT TECHNOLOGY

Thyssen de Reus used FPGA and microcontroller devices to improve its wheelchair platform lifts because they offered the following advantages:

- The ability to process the large number of switch inputs and serial communications interfaces required in platform lift installations.
- The ability to perform real time logical safety checks for the system.
- The lowest manufacturing costs achieved by removing electromechanical parts.
- The capability to implement algorithms to control and synchronise motor operations.
- The flexibility to customise products easily to meet specific applications in the future.

PROJECT OVERVIEW	
Main Activity	Microcontroller and FPGA development
Duration	12 months
Effort	172 person days
Overall prototype development costs	78 K€

## A PARTNERSHIP FOR SUCCESS

Thyssen de Reus conducted the project as a FUSE application experiment. The company's staff participated in all of the project tasks in collaboration with selected subcontractors.

The subcontractors provided support in:

- Training in microcontroller and FPGA technologies.
- Specification development.
- Hardware design and FPGA design methodologies.
- Software programming, debugging and implementation.
- Prototype testing.

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

EFFORT & COST		
Task	Company's effort (days)	Subcontractors' costs (K€)
Technical management	11	
Training	16	2.8
Specification	24	2.5
Design	66	20.3
Evaluation	55	1.6
Total	172	27.2

## YOU CAN ALSO BENEFIT FROM MICROELECTRONICS

FPGA technology provided Thyssen de Reus with the means of improving its wheelchair lift and enhancing its market position. 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

GEMAC,  
Zwickauer Strasse 227, 09116 Chemnitz, Germany  
Tel: ++49 371 3377 104, Fax: ++49 371 3377 272  
email: info@gemac-chemnitz.de



### The Company

Thyssen de Reus BV  
Van Utrechtweg 99  
2921 Krimpen a/d IJssel  
Holland



### The FUSE Secretariat

European Commission  
DG Information Society – N105  
200, rue de la Loi  
B-1049 Brussels  
Belgium  
www.fuse-network.com

