Anion has successfully adopted mixed signal application specific integrated circuit (ASIC) technology to improve its smoke detectors. The improved smoke ionisation (DIH) and rate of heat rise (DTVT) detectors with their enhanced reliability, additional features and reduced costs will enable the company to increase its share of the Spanish market to 20% within 3 years. This will reverse the decline in sales experienced by the company in recent years.

ANION S.A. designs and manufactures electronic equipment for fire and gas detection including thermal and smoke detectors with the corresponding control panels. The company also manufactures detection devices for specific gasses such as hydrocarbons, alcohol and carbon monoxide. Its products are sold to both industrial and domestic installations.

ANION’s share of the Spanish market has dropped in the previous three years from 20% to less than 16%. This tendency was expected to continue if no improvements were introduced in its smoke detectors. The new ASIC-based smoke detectors with their reduced manufacturing costs and improved safety and reliability will enable the company to restore its previous market position and increase its sales as shown in the chart. The development work, up to the prototype stage, was funded under the FUSE programme at a total cost of 103 K €. The increased sales of the new products will enable the company to recover the costs within 18 months. The return on the prototype development investment is estimated at 300% over a period of 3 years.

ANION’s existing smoke ionisation (DIH) and rate of heat rise (DTVT) detectors suffered from performance and reliability limitations and high manufacturing costs due to the large number of components used. The mixed signal ASIC developed in this project has resulted in significant advantages to both products including:

- common printed circuit board for both products.
- Simplified product assembly and reduction in manufacturing costs by 15%.
- Simpler ionic detector adjustment.
- Higher reliability and repeatability.
- Power fault detection and enhanced alarm functions.
Mixed signal ASIC technology was selected by ANION to improve its smoke detectors because it offered the following benefits:

- High level of integration with a reduction in the number of components from 35 to 23 for the DTVT, and to 17 for the DIH.
- Analogue and digital circuitry in the same chip leading to improved reliability.
- Better control of very low bias currents.
- Suitable for use in the company’s other products.
- Cost effective for the detectors’ production volume.

ANION has conducted the project as a FUSE application experiment. The company was supported by suitable subcontractors, including an ASIC vendor, in the following areas:

- ASIC specification.
- Training on ASIC development.
- Design and cell layout development.
- Prototype testing

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

Mixed signal ASIC technology has enabled ANION to overcome the limitations of its smoke detection products and enhance 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.