

Sophisticated Novel Software Package for Yachts Navigation

AREA OF COMPETENCES: Embedded Systems and Microelectronics
INDUSTRY: Navigation

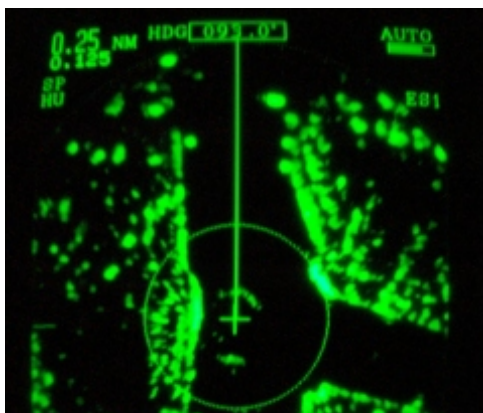
CHALLENGE



The challenge was to build an entire software package for a navigation computer device that contains also entertainment features. The software should control a heterogeneous hardware platform that had to be prototyped at the half of the software development time. IP Devel's engineering team was involved in the software package high level design and architecture.

SOLUTION

The hardware platform includes an application processor, a communication processor, a radar processor and an echosounder module. The application processor is an x86 running Windows XP Embedded, performing application level processing as well as controlling the Radar and I/O processors through PCI and respectively USB interfaces. The I/O processor is an ARM7 based microcontroller including CAN, USB, UART, SPI, ADC and GPIO interfaces.



Its main purpose is to hook in CAN network and connect to various external/internal devices and act as an I/O proxy for the application processor. The Radar processor is a soft-core FPGA interfacing with the radar hardware and connecting to the application processor through PCI. Echosounder module is also controlled by the I/O processor.

The software package is split on per processor basis. The application processor runs multiple software layers written in C# and C++ covering all the aspects from GUI and application levels to other processor and hardware interface control. The application software includes GIS, weather, radar, engine/fuel monitor, navigation, and multimedia.

The I/O processor runs a bareboard application containing drivers for all peripherals and various marine/proprietary protocol code covering the communication on specific interfaces. This software package has strong real-time requirements and is able to safely sustain/handle traffic on all interfaces.

The Radar processor (FPGA) is configured as a soft core and an additional PCI block. It runs a conversion and forwarding software handling the radar data.

As main benefits to the client, IP Devel engineering team managed the complexity of the project and delivered on time, assuring proper staffing and skill set. One of the major outcomes of this assignment were the economies of specialization combined with reduction of associated R&D risks.

ABOUT OUR CLIENT

Simrad is one of the world's largest manufacturers of marine electronics for the yachting, fishery and commercial marine markets, offering sales and service worldwide. Simrad offers a complete range of marine electronics including auto steering, navigation, hydro acoustic and communication equipment for pleasure boating, fishing and commercial craft.