

Dynamic DX2 Joystick Embedded Prototype and Test

Background

Dynamic started life in 1972 as a small company specialising in the design and manufacture of speed controls for industrial forklift trucks and personnel carriers.



1981 saw controllers for powered wheelchairs added to the product portfolio and seven years later Dynamic launched the "DM" - the world's first power chair controller based on the new microprocessor technology. Internationally acknowledged as the first in a new generation of controllers, the DM's success firmly established Dynamic as the world leader in the specialised niche market of controls for mobility products.

The spectacular growth that began with DM led to equally innovative new generations of power chair and mobility scooter controllers, as well as diversification into contract manufacturing of electronic assemblies in the medical and general electronics markets.

Dynamic invests heavily in the latest design, manufacturing and product technology to surpass the highest international regulatory standards and give them the international edge.

Nightside Test Design has a long working relationship with Dynamic, including an eight month project developing test software scripts for the Shark Power chair controller. The Shark range is operated by a simple joystick and driven by a power module, which is the brains of the unit.

This prototype & test project is related to the DX2 range of Power chairs, a much more sophisticated product designed for a higher-end user with extremely limited mobility and/or input capability. This controller is more versatile and has a wider range of functionality built in.

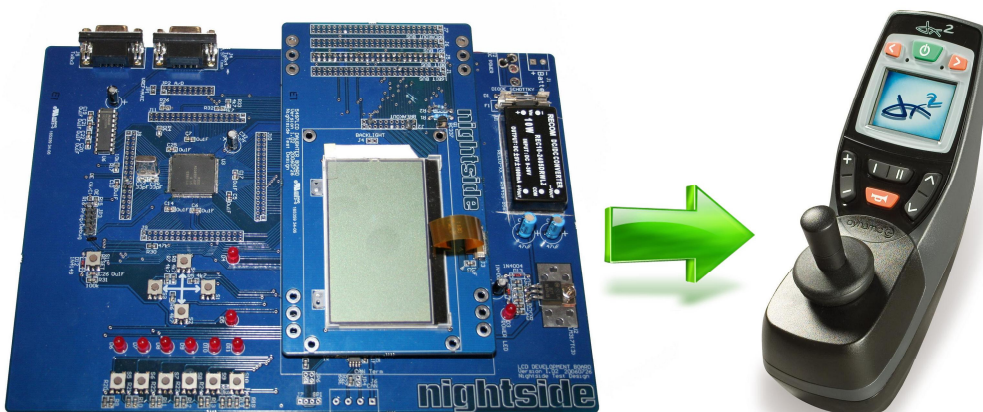


Figure 1: Prototype Platform to Product

The Challenge

Dynamic wanted to add an LCD display to a new joystick module for their DX2 range of Power chairs. The display needed to be easy to read both indoors and outdoors, similar in many ways to a cell-phone display. Dynamic needed confirmation that the concept would work before committing an engineering development team onto the project.

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The brief to Nightside was to rapidly build a test platform for a range of different LCD display modules that claimed to be usable in sunlight/outdoors. (Colour and monochrome displays were evaluated using the system).

Dynamic had previously reviewed a number of LCDs and wanted to confirm the manufacturers' capability claims - and given that outdoor use was critical to the product's success they needed to be confident that it would work.

A secondary aim was to provide Dynamic with a platform to develop their product using their current family of microprocessors.

The Technology

Nightside completed an embedded development including both hardware and software which involved research, evaluation and integration of the Ramtex LCD driver (supplied by third party company) which supported the majority of LCD modules being considered. They also developed software to enable Dynamic to plot simple graphics on the screen for evaluation.

An interface was provided to the third party company and Nightside staff managed the project when modifications to the driver software were needed.

Nightside also designed electronics hardware and PCB layout for a high end Renesas microprocessor with external memory, communication buses, Input buttons, Output indicators and removable daughter boards for the LCD display modules.

At the final stage of the project, Nightside provided a handover to Dynamic's engineering department so they could pick up where Nightside got to and continue on with the project.

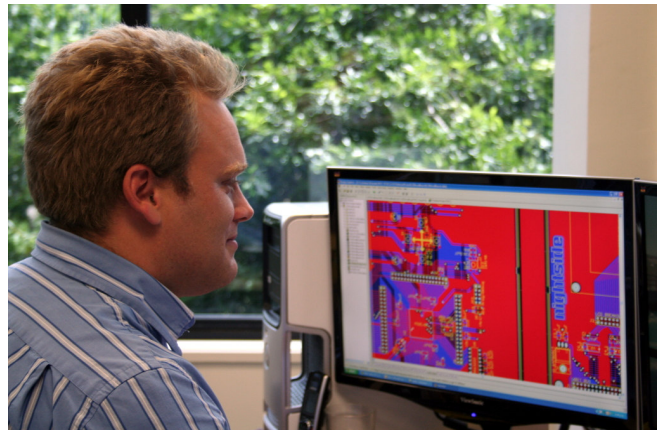


Figure 2: Geoff Callander working on the prototype PCB layout

Results

Nightside developed a platform to enable testing and design-in of the LCDs. This testing was completed by Dynamic staff by viewing the LCD screen in various lighting conditions and determining if it could be read.

Project Manager Steve Hill from Dynamic Controls, commented that Nightside delivered on the specification in full and on time.

"They performed both the high and low level integration and completed all debugging necessary so that the team at Dynamic could immediately work with the LCD at an application level. There was some significant application level optimisation that we needed to do but that was always going to be the case.

"The outsourcing of this software task was very much a success. Nightside were flexible enough to work on this project at the right point in the project timescales allowing us to develop other key deliverables at the same time.

"The project had a large proportion of new IP to be developed and having Nightside there to help out was a key component that enabled us to deliver the project. Nightside are a pleasure to work with. The staff are courteous and always act in a professional manner," Steve said.

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