

Siemens Rail Communication Interface

Written by The Hitex Design Group

The embedded systems consultancy side of Hitex UK Ltd, known as Hitex Design UK, has announced their collaboration with Pebble Bay in the development of a new Siemens Mobility Control Unit for the rail and utility industries.

The new design replaces an existing control unit that was becoming costly and hard to manufacture due to parts obsolescence. With enhanced networking capabilities and processing power, the new control unit is able to handle more demanding applications and will greatly extend the life of existing systems in the field.



architectures considered. We could then advise Siemens on the best way forward for them, allowing all parties to form a strong partnership and deep understanding for the project.”

Ian Willats, Managing Director of Pebble Bay, highlights the benefits of this groundwork: “The end results speak for themselves – everything was up and running on the first hardware revision within hours, with no major hardware changes required.”

“We initially made contact with Siemens to discuss off-the-shelf processor cards, but it quickly became apparent to both sides that a deeper investigation, covering multiple types of implementation, would be highly beneficial,” said Richard Gledhill, Hitex Design Manager. “Together with Pebble Bay, we investigated various options from a single PCB system through to off-the-shelf systems, with all

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Hardware selection

Hitex and Pebble Bay selected the hardware technology to be used, based on Siemens’ criteria for performance, unit cost and lifetime. They then developed a complete replacement platform on which Siemens are able to re-use their extensive library of existing application software. Hitex acted as the lead partner for the development and management of the project and developing the hardware, as well as managing production of prototypes and ensuring full readiness of boards for volume production. Pebble Bay developed an RTOS Board Support Package and device drivers to support all necessary interfaces and devices.

“The system was analysed as a whole, rather than seeking to replace individual parts,” said Richard Gledhill. “This allowed us to design the best possible solution for Siemens. The Hitex-Pebble Bay partnership really allowed for a far more technically-optimised and lower-cost solution to be developed, which gives Siemens the best of all worlds; a solution that is cheaper, more powerful, more flexible and with no obsolescence issues.”

“I am very impressed with the level of success”

Colin Tiller, Head of Product Support and Development



The project uses the VxWorks RTOS running on a Freescale PowerQUICC II Pro, offering a powerful combination of computing power, i/o capabilities, lower cost, lower power dissipation and a long shelf life. This platform also enables multiple Ethernet interfaces, multiple asynchronous serial interfaces running many industry-standard protocols and a high-speed, multi-drop SDLC bus communicating with i/o modules.

Strength of partnership

Hitex and Pebble Bay were chosen for this project due to the strength of their partnership, which is further enhanced by their complementary skills and experience. Previous successful designs by Hitex used a similar approach and Pebble Bay's in-depth knowledge of the RTOS technology and the processor hardware selected proved key to the successful delivery of the project. Both companies also have a reputation for having a disciplined approach to project management and quality, which gave Siemens confidence and re-assurance that the project was in safe hands.

"Rapid prototyping was used to verify risky areas of the hardware and software design very early in the project," said Ian Willats. "This provided good feedback that the choice of hardware was valid. The software and hardware were then developed in parallel, with very close co-operation."

ISO9001:2008-accredited processes

Thanks to Hitex's ISO9001:2008-accredited development process, thorough design reviews and proven work-flows ensured that the first prototypes were virtually fully functional "out-of-the-box", which allowed complete hardware validation within a few days as opposed to weeks or months. Alongside this, Pebble Bay had prototypes running the RTOS within a day of the hardware being delivered, and a complete set of drivers within a week. Thorough acceptance tests at Siemens' site followed, in the form of successful long-term soak tests.



"I have to say, I am very impressed with the level of success," concluded Colin Tiller, Head of Product Support and Development, Siemens Mobility. As a result of this success, a follow-on project is in the pipeline to revitalize another system in the same way. Siemens are now in a position to look to the future with their developments and are able to do so knowing the foundation technology is not only in place, but also very stable.

Find out more

For more information, please contact the Design Team via the details shown below.