

AURIX - Hitex in at the start

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Although the Infineon AURIX™ family of multicore safety microcontrollers are only now just starting to be adopted outside of the major automotive manufacturers, Hitex has been working closely with it since July 2010, before real silicon devices existed.

This was through a collaboration with Infineon Technologies to develop the first operational version of the AURIX™ architecture built on a Xilinx Virtex-6 FPGA and capable of running two CPU cores; named Meridian this development hardware was used extensively by Infineon and leading automotive suppliers.



Although only running with a soft core clock speed of 25MHz rather than the current 200/300MHz, Meridian coupled with the first AURIX™ Multi-Core compiler from HighTec EDV-Systeme, allowed leading Automotive Tier-1 suppliers to develop their first demonstration models of safety-critical applications. In accordance with the ISO26262 standard,

verification and validation of safety concepts were achievable at a very early stage in the product development cycle.

Following closely on from the first soft core implementation, Hitex designed and manufactured the first ECU based on real AURIX™ silicon, the TC275. Named Oikos, it debuted in early 2012 with the capability to run with 3 cores at a core speed of 200MHz. Real safety critical automotive applications could be developed and validated for functions such as Electric Power Steering (EPS), Electronic Steering Lock and Electric Vehicle Battery Charging and Management. Full Multi-Core debugging was also supported by the PLS UDE/UAD debugger family to aid Oikos software development.

Since the first Oikos, several application specific variants have been developed including:

- A dedicated (Electronic Power Steering) EPS version with a 1kW power stage
- A high-pressure direct injection fuel injection controller for Gasoline and Diesel engines
- A full 4-cylinder engine management version for GDI engines



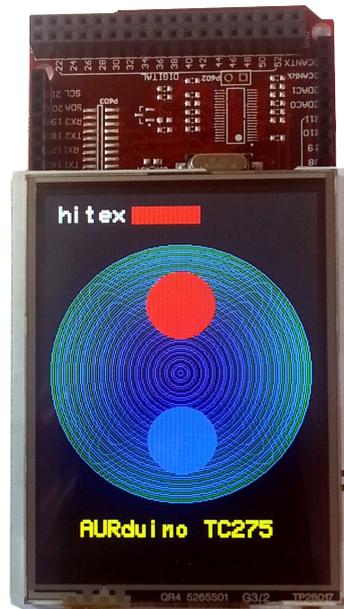
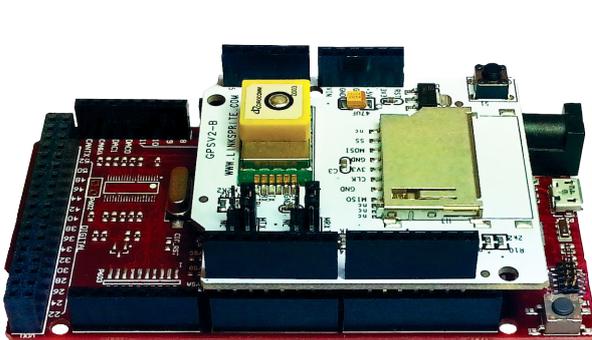
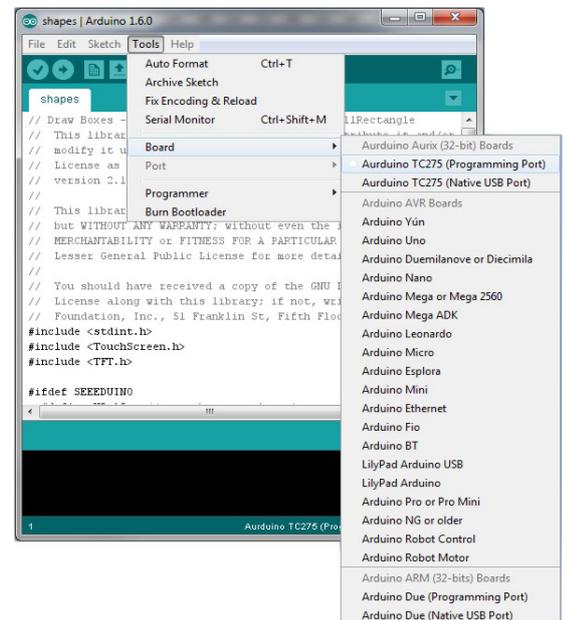
If not the most technically challenging but probably the most entertaining is our recent attempt to get the AURIX™ into the slightly chaotic world of the Arduino™. This slightly crazy project was a spin-off from the Oikos series of ECUs and represents a minimal design to get the AURIX™ running. However with its safety-critical roots, the AURduino (as it has been dubbed) retains the option of a CIC61508 safety monitor and the hardware design measures required to eliminate common cause failures and ensure isolation of critical sections.



The idea for this project was prompted by a work-experience student complaining that the standard 8-bit AVR-based Arduino™ was not fast enough for what he wanted to do. In the best of British tradition of putting huge powerplants in small sports cars (e.g. AC Cobra), we decided to drop an AURIX™ TC275 onto the Arduino™ form factor on the basis that a triple 32-bit cored 200MHz

microcontroller should keep even the most ambitious student happy - for a while at least.

Perhaps the most interesting part of this unofficial project was the porting of the Arduino™ Processing language and IDE to the AURIX™. The C++-based Processing language uses simple IO functions to allow the CPU peripherals to be accessed. These have been attached to the Infineon iLLD library set. The net result is that users can get access to the TC275 peripherals in a limited way without having any knowledge of the AURIX™ itself. In fact for trying out ideas, this is in some ways an advantage as learning the bits and bytes of a possibly unfamiliar microcontroller does not get in way of successful experimentation.



Specialist AURIX™ services from Hitex UK Ltd

With the early introduction of Multi-Core support from PLS debuggers, Tasking and HighTec compilers and the advanced nature of Hitex engineering capabilities, we are able to offer complete development tool packages, consultancy support, training and complete product development for AURIX™ based designs.

Specifically, we can offer professional services in the areas of:

- Schematic review
- Layout review
- Complete hardware design
- Complex driver development
- Simulink Blockset development
- SafeTlib integration
- RTOS integration
- Safety architecture planning
- Bespoke training

As part of the Infineon group of companies, Hitex UK has been nominated as the Infineon Preferred Design House scheme member for the UK and Ireland. This gives us access to all the support resources within Infineon plus normally hard-to-get low-level technical information. Our mission under this scheme is to remove technical roadblocks from customers' AURIX™ projects and ensure their ultimate success.

To find out more, or to discuss your ideas and projects please contact us on 024 7669 2066 or email us at aurix@hitex.co.uk