

AURIX Driver Creation and Project Support Services

Written by The Hitex Design Group

The AURIX family are powerful 32-bit multicore microcontrollers aimed specifically at safety-related applications. They have a vast range of peripherals, evolved over several decades of meeting the needs of automotive and industrial applications. The 4MB FLASH ROMs allow the creation of huge and complex applications, often using modelling tools such as Matlab or UML where the software developer is quite remote from the underlying microcontroller.

With the range and necessary complexity of the peripherals and the issues arising from multicore operation, the effort required to implement the driver level of any application can be considerable. As an example, the TC275's GTM has around 3000 registers. Whilst most applications will not need anything like this number to realise their functions, configuring it to suit your application can be challenge. Using compiler toolchains to best effect with the multicore variants also takes some expertise to set up – 3-core linker control files can be complicated.

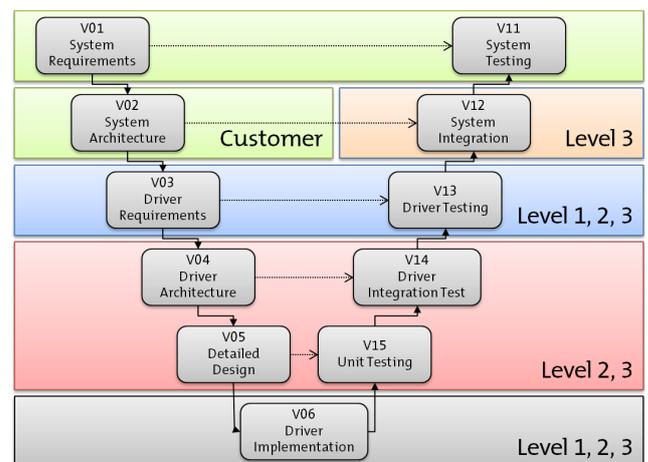
Most AURIX users are quite capable of configuring the TC275 but to get the best out of it does require some experience. The biggest barrier though is the implementation time. In many cases, it can take several iterations of a driver to get the best configuration and performance. Where the application is based on an autocoding tool or an RTOS, it is natural that there should be low-level hardware drivers or blocksets available. However with no two applications being the same, the custom implementation of drivers is usually required. This can represent a major overhead for a commercial project.

Quality and Experience Combined

As part of the Infineon group and the Preferred Design Partner for the UK and Germany, Hitex can assist with driver creation and tool configuration. We have access to in-depth technical information and experience across a range of applications that allows us to implement drivers rapidly and to a range of quality levels to meet ISO26262 and IEC61508 requirements.

Level 1:

Here drivers are created to an agreed software requirements specification (SRS). This is written by Hitex, based on an initial set of requirements supplied by the customer. The drivers are implemented using either our in-house MISRA 2004-derived coding standard or any other specified by the customer. A detailed design specification (DDS) and driver test specification (DTS) is created for each driver. Basic testing is carried out but system-level testing, stress testing and formal unit testing are not undertaken. The customer is responsible for the integration of the driver into the application.



The driver created can be used as an input to a full ISO26262 or IEC61508 development process plus its SRS, DTS and DDS can be incorporated into the customer's system documentation.

- Level 2:** As per level 1 but the testing includes formal unit testing with unit test specification (UTS), MCDC coverage reports and results data which can be included directly into the customer's documentation. It also includes formal integration testing from an integration test specification (ITS). Stress testing is carried out using a dummy application.
- Level 3:** As level 2 but includes the formal integration testing of the driver in the customer's application. The safety requirements for the driver are also defined and a safety case report for it supplied. A system test specification (STS) is provided for the right hand side of the V-model. At this level we would operate under the customer's own software development process

Variations on the above scheme are possible to suit specific customer needs.

Development Tools

For development tool and run time environment configuration, we can offer a range of services from installing the toolchain through configuring the startup and linker files to in-depth classroom training.

For multicore operation, the linker control file is critical, especially if link-time core association is to be used. The integration of the Infineon SafeTlib is especially important as it is the basis for any AURIX-related safety claim and Hitex can assist with this. As the UK distributors for the Tasking and HighTec compilers plus the PLS debuggers, we have access to a wide range of experts to complement our in-house resources.

Find out more

To find out more, or to discuss your specific requirements in more detail, please do not hesitate to contact us on 024 7669 2066.

