

The cooperation with Hitex was very important for the project to achieve the normative requirements and the time schedule. Both targets were met completely.

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The Tessa User: Friedrich Lütze GmbH

For more than 50 years the LÜTZE Group has been developing and building electronic and electro-mechanical components for the automation industry. For more than 20 years LÜTZE is also active in the field of railway technology.

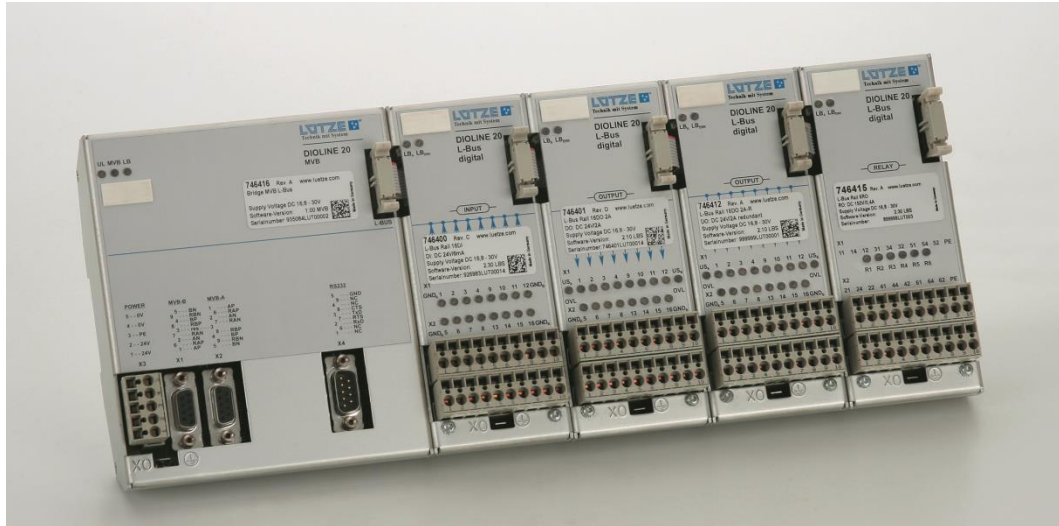


LÜTZE is IRIS certified

In 2010 LÜTZE was among the first 25 companies worldwide to obtain the new Railway Industry Standard IRIS 02 certification.

The Test Object: Railway Software

In this project, the software of the LÜTZE DIOLINE20 products was tested to obtain a certification according to DIN EN 50128 for SSAS 2. This testing was done using Tessy, a tool to automate module and integration testing of embedded software.



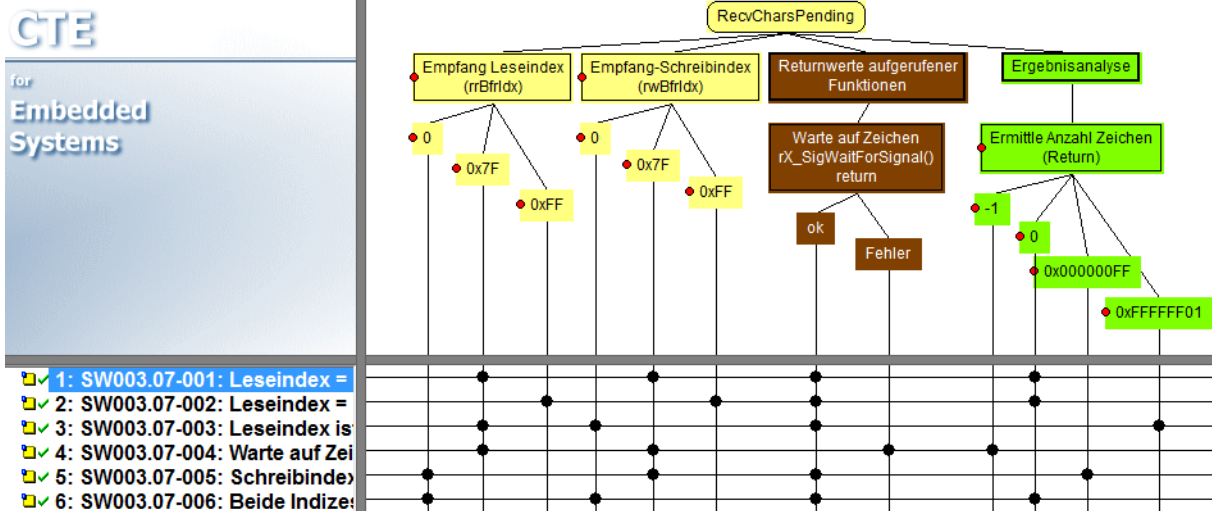
DIOLINE20 (Source: Lütze)

DIOLINE20 is an I/O system for use on rail vehicles. The DIOLINE20 system is equipped with a netX 100 microcontroller, a derivative of the ARM microcontroller family. The software was written in C and was compiled using the GNU compiler for ARM (gcc) in a configuration provided by Hitex. The code was debugged on the actual hardware, using the JTAG debugger TantinoARM and HiTOP IDE software from Hitex. The software comprised of 24 C source modules, each incorporating about 10 C code functions.

Test Service by Hitex

The actual module testing was not done by LÜTZE but was outsourced to Hitex, a service which they are able to provide as part of their module testing services. Such an approach does not only relieve the manufacturer from the testing effort, but also makes for independent testing by a third party. This also provided a review of the software specifications by Hitex, for ambiguities or omissions etc. The processes for distributed development and the testing were jointly developed by LÜTZE and Hitex. These processes were then subsequently integrated in the existing LÜTZE development process.

The testing took place from January to October 2011 at Hitex in Karlsruhe. More than 1500 test cases were specified, implemented and executed. The test case specifications were designed using the Classification Tree Method. This method is fully supported by Tessy, as Tessy has an integrated Classification Tree Editor (CTE) built into it.



Test case specification (excerpt) according to the classification tree method for DIOLINE20

Another requirement of DIN EN 50128 is to determine the test coverage for each tested module. The used test coverage measure was branch coverage. Tessy is able to measure branch coverage without additional effort. An overall branch coverage of 98.8% was reached eventually, with the remaining 1.2% being checked manually.

LÜTZE also possesses a Tessy license. With this license, LÜTZE was able to reproduce the testing results at their facility. LÜTZE is now also able to do regression testing and to develop the test further on. The test cases were delivered from Hitex to LÜTZE after finalisation of the test service.

Task Fulfilled

The module tests conducted by Hitex form an important part to obtain the required certification from the train manufacturer for which LÜTZE provided DIOLINE20.

The Future

Due to the good results and the excellent cooperation between LÜTZE and Hitex during the test service, Hitex is already working on the next LÜTZE project.

