zühlke
empowering ideas

Project Note

New functions for machinery with telematics module

Construction machinery was to be equipped with a telematics module featuring new functionality. The client placed high demands on functionality and robustness. Zühlke designed, developed and tested the solution.

Task

Liebherr develops and manufactures many types of construction machinery. The remote monitoring, fleet management and assignment management for the machines used around the globe, can be carried out via a central web portal. The company wished to make use of the telematics module to be developed in the project for its entire range of products. The module included the full range of functionality for real-time recording, evaluation and transfer of data. Zühlke developed and implemented the complete hardware and software required.

Implementation

The telematics module was implemented with a wide range of functions and consisted of a Linux-based modem, a GPS unit and a GSM unit. The module was designed to act independently, be flexibly configurable and be able to work in tandem with various control devices. The system was also designed to collect system-specific machine data and send this, as well as coping with power failures and checking adherence to any usage restrictions. Communication between the construction machinery and the central web portal was implemented using SMS/GSM and with TCP/IP via GPRS. Zühlke revised the hardware design (mechanics, electronics) and developed the firmware. The Zühlke experts made use of the possibilities offered by embedded Linux to construct the firmware in a modular fashion. They realised client-specific control tasks as autonomous programs – and used open source software for standard tasks. In order to make sure that everything would work as desired, the engineers checked the functionality on the target system with automated test routines. The client thus had a fully tested telematics module available after only a short period of development.

Customer benefits

- Zühlke managed the project in such a way that the software could be developed in parallel with the hardware thanks to intelligent encapsulation.
- The Zühlke proposal to integrate proven open source tools saved development time, simplified the test automation and provided support to the multi-platform strategy.
- The ultimate outcome was that the client received a telematics module suitable for use with a wide range of products with a variety of requirements.

LIEBHERR

Technical Data

Linux/kdevelop with gcc, scons, lint

Agile Development in a structured general process

Linux

Open Source

GSM/SMS

GPRS

GPS

TCP/IP

HTTP

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