Abstract

Every electronic hardware has its own purpose and thus functions. A test to verify the function of electronic hardware needs to be as specific as the tested hardware itself. Topic of this thesis was to develop a PCB functional test for the mainboard of a novel anesthesia device from Drägerwerk AG & Co. KGaA. The functional test shall ensure and increase the quality of the mainboard and its functions already during its development.

An evaluation matrix was used to evaluate different functional test types, including an external development, a VxWorks based functional test and a Linux based functional test and to develop the test strategy fitting best to the device under test.

Result is a Linux based functional test allowing to test most of the interfaces present on the mainboard, such as GPIO's, UART interfaces, two ADC's and an EEPROM. The test setup, consisting of the device under test, a processorboard running a Debian version 9 OS and a testboard, allows performing fast tests to verify the functions of the mainboard after reworks or revisions and ensures to easy extent the test with additional tests or to reuse parts of it for testing other devices in future.

The developed functional test and the performed evaluation of different test types is of high significance for the further development of the mainboard of a novel anesthesia device, as well as for the future development of other electronic hardware and it increases the internal quality of electronic hardware development.