

Design and Application of Bathtub Controller Test System

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With the use of hardware software co-design and hardware software co-verification technology, test bench is introduced to test bathtub controller. Bathtub controller includes two parts: Touch Panel Controller (TPC) and Main Electronic Controller (MEC). The task of test bench is to test these two controllers. With the help of application-specific integrated circuit (ASIC), LCD, touch panel and dedicated software, testing work can be convenient and reliable.

Keywords: Test System, Hardware Software Co-Design, Hardware Software Co-Verification

Testing is a crucial and essential part in any project development. Usually, it takes up at least half of the developing time. Due to hardware software co-verification, a lot of time can be saved.

The system under test is viewed as a black box to which stimulus signals are input and output signals are analyzed to evaluate the operation. At the same time, there is a single chip in the test bench and it runs program to help testing work. In ASIC verification, this is called Master Mode. It is the main mode of hardware software co-verification.

From Figure 1 we can know that the test bench also includes two functions. One is for testing MEC, and the other is for testing TPC. Figure 2 and Figure 3 show the functions of test bench.

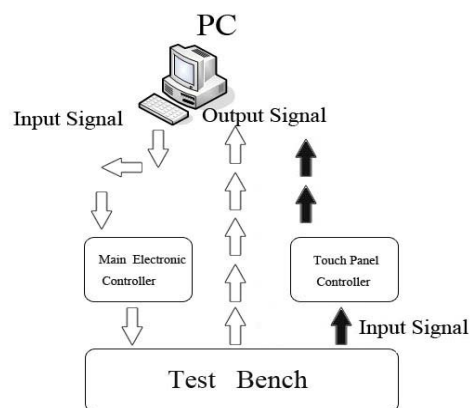


Fig.1: Global architecture

Figure 2: The input signal coming from the software in PC. When MEC receives the input signal, it determines which relay should be turned on. The signal collecting circuit will detect the state of relay and send the state of relay to Atmega 8515. At the same time, the information of water level sensor, temperature coming from the processor of MEC will be transmitted to Atmega 8515, too. Finally, Atmega 8515 will send back all the information to PC software, including the state of relay and the information of water level sensor, temperature.

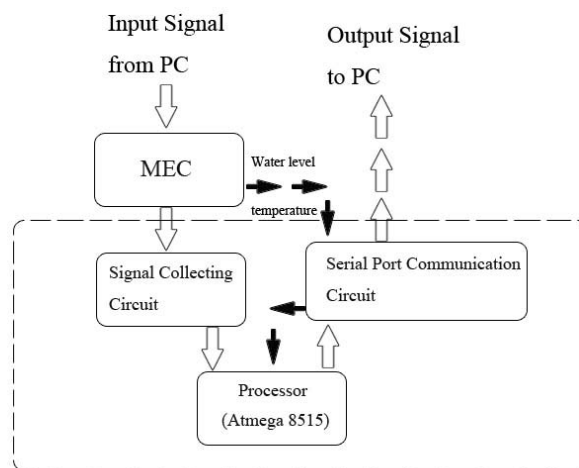


Fig.2: Function for testing MEC

Figure 3: The input signal coming from the actions on touch panel. The software in PC will collect the output signal coming for TPC. The function of test bench here is to offer a testing environment.

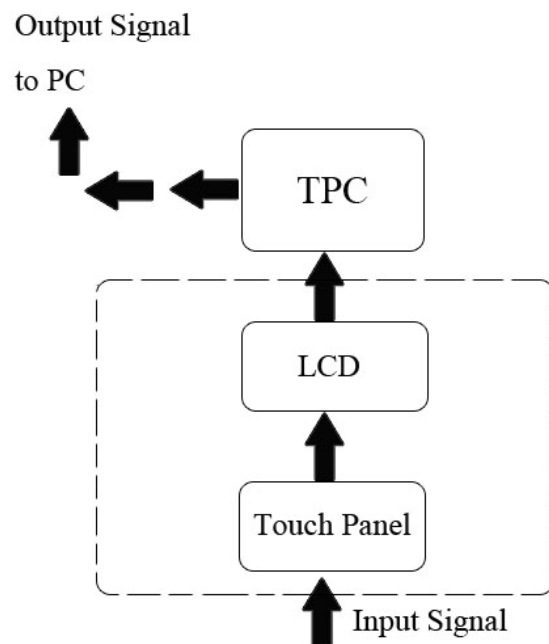


Fig.3: Function for testing TPC