

The utmost take of automated end-measuring and test systems' used by the industry is to adjust, calibrate, control, qualify, and to generate test reports from the result of the manufactured product's function. According to the traceability requirements, the generated data set is stored typically in a multilevel database. In simple cases, as to implement the test tasks fixed in the specification, it might be enough to construct a virtual instrument that consist of some automated measure and signal generation equipment. However, for testing more advanced circuits, it is more expedient to opt for an automated test system configuration that is consists of modular hardware elements.

In my thesis I explore the advantages and disadvantages of the two trends. Moreover, I introduce the objectives that need to be considered while planning an automated test system that is resulting in a function test.

In order to exemplify such a functional test system, in this paper I develop a program system that automatically analyzes a Universal Software Radio Peripheral unit, also known as USRP. The program system integrates the USRP device and all the hardware needed for its functional testing within the LabVIEW platform, which is a PXI chassis built of microwave modules. The program system beyond mere testing of the USRP device's microwave elements, also performs a data transfer check. In this case, the program system uses the PXI chassis like a receiver and it draws an eye diagram. According to the traceability requirements, the program system records the eye diagram. Embedded in the PXI chassis there is a spectrum analyzer and a digital receiver. The first provides for measurement tasks and the latter tests the transmission's quality. Nota bene, that these two function work simultaneously. However, due to hardware compatibility issue the USRP device and the PXI chassis have to be controlled by separated computers that transfer the data and command messages to each other via serial port.

The program system documents and automatically saves each and every measurement information and graph into an Excel spreadsheet in respect of the traceability requirements.