

Preface

At times, the proper use of a synchronized set of instruments becomes indispensable for scientists and engineers in developing an accurate measurement or test setup. Also, the need for automated execution is always felt in day-to-day work in measurement laboratories for faster execution and reduced manual interference in the measurement process. If we consider the microwave measurements, in particular, it involves the use of advanced electronics, embedded systems, and micro-controllers. Proper use of such advanced devices in synchronization becomes important for the development of measurement facilities in laboratories such as NMIs and defense research institutes, where accuracy and precision play one of the most crucial roles. This book guides the readers for developing a standalone graphical user interface (GUI) and explains the software development process for effective microwave measurements. An effort is made to develop such a software application, which is independent of the measurement setup and measurand, i.e., the quantities intended to be measured. The critical considerations for quality assurance of the developed system are studied and illustrated in a way, which is suitable for beginners and experts in measurement laboratories. A worked out example is used throughout the book, which is used for various test procedures with different sources, receivers, and devices under test (DUT). The measurement results are illustrated for comparison of automated and manual execution of the measurement process. The approaches required for optimizing the tests for time, reliability, and throughput are formulated and used during the development process. All in all, the book is an easy guide for scientists and engineers for development of automated laboratory measurements with quality assurance, efficiency optimization, and adherence to the quality standards for using the software in metrological applications.

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Satyakesh Dubey
Naina Narang
Parmendra Singh Negi
Vijay Narain Ojha

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Dubey, S.K.; Narang, N.; Negi, P.S.; Ojha, V.N.

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