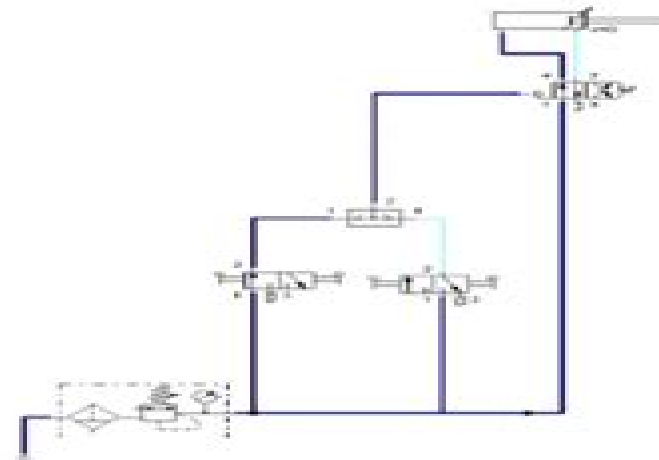




DEPARTMENT OF MECHANICAL ENGINEERING



AUTOMATION LABORATORY MANUAL

Prepared by

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FACULTY OF MECHANICAL ENGINEERING,AVIT

Mdu Mtech Automation Lab Manual

Tobias Bleicker



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Computer & Telecommunications Acronyms Julie E. Towell, Helen E. Sheppard, Gale Research Company, 1986
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Anadigm company www.anadigm.com These experiments support the Programmable Analog Design feature in the textbook The B experiments are also subdivided into independent Parts but Experiment 12 B Part 1 is a software tutorial and should be performed before any other B experiments This is an excellent way to introduce the ASP technology because no other hardware is required other than a computer running the downloaded software In addition to Experiment 12 B the first 13 steps of Experiment 15 B Part 2 are also tutorial in nature for the AnadigmFilter program This is an amazing active filter design tool that is easy to learn and is included with the AnadigmDesigner2 AD2 CAD software The ASP is part of a Programmable Analog Module PAM circuit board from the Servenger company www.servenger.com that interfaces to a personal computer The PAM is controlled by the AD2 CAD software from the Anadigm company website Except for Experiment 12 B Part 1 it is assumed that the PAM is connected to the PC and AnadigmDesigner2 is running Experiment 16 B Part 3 also requires a spreadsheet program such as Microsoft Excel The PAM is described in detail in the Quick Start Guide Appendix B Instructors may choose to mix A and B experiments with no loss in continuity depending on course objectives and time We recommend that Experiment 12 B Part 1 be assigned if you want students to have an introduction to the ASP without requiring a hardware purchase A text feature is the Device Application DA at the end of most chapters All of the DAs have a related laboratory exercise using a similar circuit that is sometimes simplified to make laboratory time as efficient as possible The same text icon identifies the related DA exercise in the lab manual One issue is the trend of industry to smaller surface mount devices which are very difficult to work with and are not practical for most lab work For example almost all varactors are supplied as surface mount devices now In reviewing each experiment we have found components that can illustrate the device function with a traditional one The traditional through hole MV2109 varactor is listed as obsolete but will be available for the foreseeable future from Electronix Express www.elexp.com so it is called out in Experiment 3 All components are available from Electronix Express www.elexp.com as a kit of parts see list in Appendix A The format for each experiment has not changed from the last edition and is as follows Introduction A brief discussion about the experiment and comments about each of the independent Parts that follow Reading Reading assignment in the Floyd text related to the experiment Key Objectives A statement specific to each Part of the experiment of what the student should be able to do Components Needed A list components and small items required for each Part but not including the equipment found at a typical lab station Particular care has been exercised to select materials that are readily available and reusable keeping cost at a minimum Parts There are two or three independent parts to each experiment Needed tables graphs and figures are positioned close to the first referenced location to avoid confusion Step numbering starts fresh with each Part but figures and tables are numbered sequentially for the entire experiment to avoid multiple figures with the same number Conclusion At the end of each Part space is provided for a written conclusion Questions Each Part includes several questions that require the student to draw upon the laboratory work and check his or her understanding of the concepts Troubleshooting questions are

frequently presented Multisim Simulation At the end of each A experiment except 1 one or more circuits are simulated in a Multisim computer simulation New Multisim troubleshooting problems have been added to this edition Multisim troubleshooting files are identified with the suffix f1 f2 etc in the file name standing for fault1 fault2 etc Other files with nf as the suffix include demonstrations or practice using instruments such as the Bode Plotter and the Spectrum Analyzer A special icon is shown with all figures that are related to the Multisim simulation Multisim files are found on the website www.pearsonglobaledition.com Floyd Microsoft PowerPoint slides are available at no cost to instructors for all experiments The slides reinforce the experiments with troubleshooting questions and a related problem and are available on the instructor s resource site Each laboratory station should contain a dual variable regulated power supply a function generator a multimeter and a dual channel oscilloscope A list of all required materials is given in Appendix A along with information on acquiring the PAM As mentioned components are also available as a kit from Electronix Express the kit number is

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Laboratory Automation in the Chemical Indus David G. Cork,Tohru Sugawara,2002-04-02 Featuring extensive calculations and examples this reference discusses theoretical and practical aspects of short circuit currents in ac and dc systems load flow and harmonic analyses to provide a sound knowledge base for modern computer based studies that can be utilized in real world applications Presenting more than 2300 figures tables and equations the author explores matrix methods for network solutions and includes load flow and optimization techniques He discusses ac and dc short circuit systems calculations in accordance with standards set by the American National Standards Institute ANSI and the International Electrotechnical Commission IEC Computer Automation, Module Guide Lab-Volt Systems,

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a clear copy of both sides of the credit card blank out the ccv number passport copy of the cardholder above authorization
 letter duly signed by cardholder you can e mail documents

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 authorize this person to used my credit card without