

AUTOMATED DATA ACQUISITION SYSTEM FOR MEASUREMENT RESISTIVITY USING VAN DER PAUW TECHNIQUE

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ABSTRACT

This paper presented an automated data acquisition system for resistivity measurement by Van Der Pauw method (1). The system designed to measure the resistivity of superconductor at room temperature and low temperature. For low cost efficient measuring tool we integrated equipment standard such as I/O cards, sensors, constant current source and digital multimeter. This automated data acquisition system was written in Turbo Pascal.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The designed system run simultaneous multi protocol data communication using IEEE-488 bus and parallel input output using 8255A Parallel Interface Adapter (PIA) emulation. The controller 80486 computer is used to send commands two Digital Multimeter (DMM) through the IEEE-488 bus via a PCL-848B card and relay daughter board PCLD785B through a PCL724B card using the 8255A PIA Mode 0 emulation. The relay daughter board is wired based on a 4–wire multiplexing protocol to provide the reading switching and also to remotely switch on/off the dc current supply and digital multimeter (DMM2). The system also has an automated current switching capability to measure resistivity of setup-1 and setup-2 simultaneously. The Van Der Pauw method, which is used to measure resistivity allows the variation in temperature and voltage but the current supply is constant

1.2 Objective

The aimed of this project to develop the automated data acquisition system for resistivity measurement at room and low temperature using Van Der Pauw technique. The system are given more advantage and easy to handle for Faculty of Science. Before that, the faculty is measured by manually. Then the system is limited to one set-up reading per run and only measured resistivity at room temperature. Occur from that, we try to help the Faculty of Science. Then from the development of system, that can measure the resistivity by automatically. Beside that the automated system can measurement resistivity at room and low temperature and two set-ups per reading with upgrade capacity.