## MULTIPLE SAMPLE DATA ACQUISITION SYSTEM FOR LOW RESISTIVITY MEASUREMENT USING FOUR POINT PROBE TECHNIQUE

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## ABSTRACT

This project presented a data acquisition system for simultaneous multiple sample resistance measurements using four point probe technique [1] [2]. The system uses the PCLD785B relay board controlled by parallel input-output 8255A PIA emulation through a PCL724B card to perform multiple sample measurements by signal switching. The system, which is controlled by a PC, is able to log and store temperature and resistivity measurements. Voltage versus temperature measurements for two ceramic samples were performed and compared.

# TABLE OF CONTENTS

CONTENTS			PAGE
Ackno	i		
Abstract			ii
Contents			iii-v
Abbreviation			vi
List of Figures			vii
List of Tables			viii
List of Graphs			ix
CHAPTER 1 : INTRODUCTION			
1.1	Object	ive	1
1.2	Introdu	1	
1.3	Four P	2	
CHAPTER 2 : SUPERCONDUCTORS			
2.1	Introdu	3	
2.2	Superconductivity		
2.3	Superconducting State		
CHA	PTER 3	S : SYSTEM DEVELOPMENT	
3.1	Hardw	vare	
	3.1.1	Model 197A Autoranging Microvolt DMM	10
	3.1.2	Lake Shore Model 120CS (Current Source)	17
	3.1.3	Series Pt-100 Platinum Resistance Thermometers	19

### **CHAPTER 1**

### INTRODUCTION

#### 1.1 Objective

The aim of this project is to build and design a data acquisition system for resistivity measurement using four point probe technique. The system able to measure 2 sample per run by using parallel input and output port. The backbone of this project is the method that's been used that is four-point probe technique. The four – point – probe measurement is performed by making four separate electrical connections which two represented voltage and the other two represented current. The detail for this technique is at chapter 4.

#### 1.2 Introduction

A data acquisition system for resistance versus temperature based on an 80486 microcomputer using the IEEE – 488 standard bus to connect to digital multimeters is constructed to measure resistance at low temperatures. The resistance measurements were made using the four-point probe technique.

The system is able to measure multiple sample resistance automatically and the result is more accurate as the measurements were done in the same environment such as in the same temperature. The system is efficient, reliable and cost effective.

The system runs simultaneous multiprotocol data communication using IEEE-488 bus and parallel input-output 8255A PIA emulation. The 80486 computer logs on to two digital multimeters through the IEEE-488 bus via a PCL848B [8] card and a relay daughter board PCLD785B through a PCL724B [11] card using the 8255A PIA emulation.