



SB1000 DIGITAL SEEBECK CONTROLLER

Introduction

Designed with the user and ease of use in mind, the SB1000 Digital Seebeck Effect Controller offers a reliable platform for experiments using the cryogenic cooling and Joule-Thompson thermal stage systems of MMR Technologies, integrated with the Seebeck Vacuum Chamber.

The controller provides:

- ◆ Highly accurate and highly reproducible Seebeck Coefficient measurements - 50 nV
- ◆ Ease of measurement of samples ranging from metals to thin films.
- ◆ Automatic operation in a single step against an internal reference material.
- ◆ Small, compact size.
- ◆ Fully Automated control with built in Reference.
- ◆ Low Temperature and High Temperature stages available.



Features and Benefits

Several unique features of the SB1000 Digital Seebeck Controller provide significant user benefits:

- ◆ **Improved CMR ADC stability** - Enabling high-precision measurements.
- ◆ **Improved hardware communications** - Ensuring improved experiment accuracy.
- ◆ **Faster operation** - Improved speed for data collection.
- ◆ **Real-time voltage monitoring** - Displaying real-time sample stage voltages.
- ◆ **Stand-alone Seebeck Experiments at ambient temperature** - No requirement to connect with a temperature controller if only room temperature experiments are required.
- ◆ **Link cable** - A short ribbon cable is used to connect the SB1000 to the K2000 controller for adding temperature control.
- ◆ **Computer interface** - Computer interface for integrated software control through RS-232C or USB connections.
- ◆ **Small footprint** - The SB1000 Digital Seebeck controller is approximately 1/4 the size of the old SB100 controller
- ◆ **Chamber hot swap support** - The ribbon cable can be switched from one chamber to another, without powering down the software and controller, if multiple chambers are used in the lab.
- ◆ **Integrated software suite** - Included with every SB1000 Digital Seebeck Controller, this software provides a single software package that will work with both the K2000 and SB1000 controllers. Several new features including heat capacity experiments are available through this software suite.



Applications

Temperature dependent thermoelectric power (thermopower) measurements on electrically conductive specimens can provide information about the sign of the majority carrier, the mechanism of charge conduction, and in conjunction with appropriate theoretical models, information on the band structure of the material under investigation, providing very precise, very stable controlled temperature in the range of 70K to 730K.

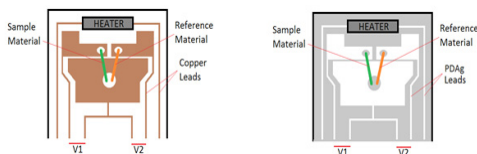
Thermopower measurements are also an effective way of determining the intrinsic properties of samples having an electrical conductivity that is dominated by an extrinsic defect structure.

A high sensitivity to structural change makes thermopower measurements an excellent technique for the study of structural phase conditions on the charge transport properties of a given material.



Specifications*

Stand Alone Operation:	Room Temperature Only
Resolution for Measurements:	50 nV (1000G, 300G, 100G and 30G Amplifiers available).
Power to Heat ample:	Generates a temperature difference across sample, power available Min: 0.01W, Max: 1W
Software Control:	MMR Technologies Integrated Software Suite
Data Output Options:	Reports can be generated directly through the Software Suite Exporting data to PNG, JPG, TXT and CSV options available
Computer Requirements:	Windows® based computer
Operating System:	Windows® XP, Windows® 7, Windows® 8
Computer Connections:	USB or Serial Port Available
Hardware:	32-Bit or 64-Bit
Dimensions:	Width: 8.75 inches (22.23 cm) Length: 14.25 inches (36.20 cm) Length with cables connected: 18 inches (45.72 cm) Height: 1.5 inches (3.81 cm)
Weight:	5 pounds (2.3 kg)
Rack Mount:	This controller is the size of a half-wide, full-length, standard rack mount. It can be integrated into a rack mounted cabinet with a shelf
Electrical Requirements:	Switching Power Supply (Dual Voltage) For North America: 110 - 120V, 50 - 60 Hz, 3.15 amps For Japan: 100V, 50 - 60 Hz, 3.15 amps For Europe and Asia: 220 - 230V, 50 - 60 Hz, 3.15 amps
Power Consumption:	< 300 Watts



*The SB1000 Digital Seebeck Controller specifications may be changed at any time by the manufacturer. Please contact the manufacturer for the latest information and specifications.

** Windows is a registered trademark of Microsoft Corporation in the United States and other countries.