ADVANCED LINEAR DEVICES, INC.

MB1S(MB1SA2V)/MB1SA20V

Single Board Precision DVM with direct PC Interface

The ALD MB1S is a precision +/-5½-digit Digital Voltmeter (DVM) printed circuit board that contains the ALD500R/ALD521D A/D Converter chipset that directly plugs into the parallel printer port of a PC computer. It features calibrated analog input (w/scalable input ranges), and digital circuitry to communicate with PC or other microprocessors. It is designed to be used as a stand-alone, embedded system component in a variety of applications including digital panel meters, customized instrumentation displays, temperature monitoring, high resolution DVM's, weigh scales and others. Direct Full-scale analog input range is +/-2.00000V DC with a linearity of 0.005%. ALD's 18-bit plus sign integrating dual-slope analog processor (ALD500) functions as the input device and the ALD521D microprocessor IC implements the digital conversion, control mode and I/O functions.

The MB1S supports two optional versions, each populated with different components and configurations:

- Mode A – calibrated reference used primarily for measurements against a calibrated reference voltage typically required in precision voltmeter applications. Mode A is the default version of MB1S.

- Mode B – ratio-metric intended for measurements against a ratio-metric reference voltage, such as those required in weigh scale applications. Mode B is a simple application specific adaptation of the standard MB1S.

The MB1S board has a provision for PC interface (DB25), BASIC interface modules, and input resistor divider network for input scaling. Optional MS-DOS Software (P/N - MBCDROM) is also available for user setup and calibration. Only one copy of the software is necessary, regardless of the number of boards in use. DC Inputs are single ended or optionally fully differential, and features automatic zero and automatic input polarity detection. A DB25 connector is provided on-board, to conveniently interconnect the MB1S to a personal computer (PC) via the parallel printer port for operation, initial setup, and calibration.

Hardware and Software Features

- Directly plug into a PC parallel printer port and displays readings on the monitor.
- Measurement Range: +/-2.00000V DC direct input.
  (Other ranges are user configurable and scalable, using both hardware and software scaling)
- Self-powered from PC computer or external +5V DC power source
- All solid-state construction.
- 24-bit serial output. (23-bit plus sign bit)
- User selectable +/-3½ to +/-6½ digits.
- Differential analog inputs with auto-polarity and auto-zero.
- Simple to install and operate.
- Calibration for positive and/or negative inputs.
- Provision for input voltage scaling attenuator network.
- Smart Input Filtering (Sample Averaging) selection for noise reduction and accurate displays.
- Optional MS-DOS software for user operation, setup, and calibration is sold separately.

Key Specifications

MB1S (MB1SA2V)

- Direct Full Scale Analog Input Range: +/- 2.00000V DC
- Input Impedance: 1GΩ min, 100GΩ typical.
- Optional on-board input resistor divider network for wide input voltage ranges
- Resolution: +/- 1 digit, (+/-10µV) @ Vin = 1.00000V (16x input averaging)
- Overvoltage Protection: 20V DC
- Conversion Sample Rate: 3-samples/sec (from 1 sample/min. to 10 samples/sec.)
- No external power source necessary, draws power directly from the PC printer port
- Optional external Power Supply: +4.5 to +5.5V max @ 6mA max.
- Accuracy +/-0.01% (After 2 hour warm-up)
- Linearity +/-0.005% full-scale (23º C, +/-1º C).
- Logic Compatibility: CMOS inputs and outputs.

MB1SA20V

- Direct Full Scale Analog Input Range: +/-20.000V DC
- Input Impedance: 10MEGΩ nominal
- Optional on-board input resistor divider for wide input voltage ranges
- Resolution: +/-1 digit, (+/-100µV) @ Vin = 10.0000V (16x input averaging)
- Overvoltage Protection: 200V DC
- Conversion Sample Rate: 3-samples/sec (from 1 sample/min. to 10 samples/sec)
- No external power source necessary, draws power directly from the PC printer port
- Optional external Power Supply: +4.5 to +5.5V max @ 6mA max.
- Accuracy +/-0.02% (After 2 hour warm-up)
- Linearity +/-0.01% full-scale (23º C, +/-1º C).
- Logic Compatibility: CMOS inputs and outputs.

Applications

Applications for the MB1S Board include embedded digital panel meters, customized instrumentation displays, temperature monitoring, high resolution DVM's, weigh scales, signal conditioners, laboratory data-logging, process monitors, portable/field troubleshooting and calibration.

Configuration & Outline Drawing

MB1S boards include a DB25 pin connector that plugs directly into the parallel printer port of a desktop or laptop PC computer for operation, initial setup & calibration. The board outputs 24 bit serial data (23-bit serial data plus sign bit) to the PC or other digital processors for further data processing.

ALD500/ALD521D Chipset

For complete technical information and operating specifications for the ALD chipset as well as other ALD products, you can download complete datasheets on-line.

Environmental

- Operating Temperature range: 0 to 50º C.
- Storage Temperature range: -40 to +85 ºC.
- Humidity: To 90% (no condensation).
- Protection: No shielding - open board construction.

Mechanical

- Outline Dimensions: 2.00 in. x 2.40 in. x 0.5 in.
- Mounting Holes: 0.125 in. diameter @ 0.125 in from 4 corners
- Weight: 1 ounce (28 grams) Nominal

Ordering Information

- MB1S or MB1SA2V (MODE A, DVM Mode)
- MB1S-ND Tyyyy
  where Tyyyy is a Custom Part Number designator
- MB1SAxxV (Custom Option)
  where xx specifies the input voltage range,
  e.g. xx=20 for +/- 20V input voltage range
- MBCDROM (optional MS-DOS software for user operation, setup, and calibration,
  and user design documentation.)

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