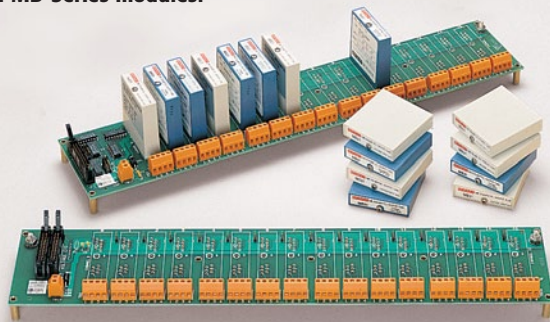


MB-Series

Signal Conditioning Modules and Interface Accessories

The MB-01 module mounting rack is shown with a variety of MB-Series modules.



- Convert raw industrial analog inputs to high-level analog outputs
- Accepts thermocouple, RTD, strain gage, voltage, current, frequency, potentiometer, and wide bandwidth voltage inputs
- ± 5 Volt or 0–5 Volt outputs
- 1500V rms transformer-based isolation
- Rugged fully-potted modules
- Simple mounting in 2-, 8-, and 16-channel mounting racks or in a 4-channel screw terminal accessory

APPLICATIONS

- Industrial data acquisition
- Process control
- Energy management
- Production testing
- Laboratory automation

Keithley's MB-Series signal conditioning modules provide a low-cost and high-performance method of interfacing real world industrial signals to an A/D conversion system. The modules convert raw sensor inputs to high-level analog outputs that are linear in engineering units. For example, the MB34-01 accepts a 100Ω platinum RTD input and provides 0 to +5V linearized output. Both ± 5 volt and 0 to +5 volt output ranges are available for most input types. In addition, a current output module is available for process control applications.

MB-Series modules provide 1500V rms of transformer-based isolation, protecting your system and allowing the measurement of small transducer signals on top of large common mode voltages. All modules are identical in size (2.25 in \times 2.25 in \times 0.60 in) and pin connections and have been hard-potted for mechanical strength. These features, along with the modules' high ($\pm 0.05\%$ of FS) accuracy, make MB-Series modules an ideal solution for industrial signal conditioning.

Up to 16 MB-Series modules can be plugged into one MB-01 rack. The MB-05 rack can accommodate up to 8 modules. Input modules can be of any type and mixed on a single mounting rack allowing the system to be tailored exactly to the application's requirements. For smaller applications, the MB-04 allows the mounting of one or two MB-Series I/O modules. The STA-MB screw terminal accessory allows 4 MB-Series modules to be connected to any DAS board with a 37-pin D-type connector.

The MB-01 and MB-05 direct connection module mounting racks are the best solution when the number of external I/O channels is equal to or less than the number of I/O channels on the system's A/D board. The MB-01 accepts 16 modules while the MB-05 accepts 8. The MB-05 is functionally equivalent to half of an MB-01. The MB-01/05 connects each MB-Series module to a separate channel on the A/D board. The MB-01/05 solution is ideal in applications with a small number of I/O points. For high-speed applications using the wide bandwidth MB-38 and MB-40/41 Series modules, the non-multiplexed MB-01/05 rack is ideal, since time is not wasted performing external enable/disable and multiplexing functions.

ACCESSORIES AVAILABLE

C-16MB1	DAS-1600/1400/1200 Series or STA-U/1800HC/1800U to MB-01 Cable
C1800	STA-SCM8/16 to DAS-800/1600 Series Cable straight through
C2600	MB-Series Interface Cable, 2 ft
CDAS-2000	DAS-1800A0/HR/ST to STA-1800U Cable
CJC-MB	Cold-Junction Temperature Sensor
CONN-1800HC	DAS-1800HC or KPCI-1800HC to MB-01 or MB-05 Adapter. Provides a breakout of a 100-pin connector to four 37-pin D-type male connectors
STA-1800HC	DAS-1800HC to MB-01 Interface Board
STA-U	Universal 37-pin to MB-01 Interface Board

See the following pages for MB modules.

GENERAL

The following specifications are shared by all MB-Series modules: (Specifications are typical unless specified.)

OVERALL ACCURACY: $\pm 0.05\%$ of FS.

NON-LINEARITY: $\pm 0.02\%$ of FS.

COMMON MODE VOLTAGE ISOLATION: 1500V rms continuous.

COMMON MODE REJECTION: 160dB (at 50 or 60Hz); 90dB (MB38, MB40, and MB41).

NORMAL MODE REJECTION: 90dB (50 or 60Hz) (N/A to MB38, MB40, and MB41).

INPUT BANDWIDTH: 4Hz (except for MB40, MB41, and MB38 Series, which have a 10kHz bandwidth).

INPUT PROTECTION: 240V rms (continuous); Meets IEEE-STD 472 (transient suppression).

OUTPUT SELECTION TIME: 20 μ s.

OUTPUT SELECTION INPUT

MAX LOGIC "0": +1V.

MIN LOGIC "1": +2.5V.

INPUT CURRENT ("0"): 0.4mA.

POWER SUPPLY VOLTAGE: +5V $\pm 5\%$.

EMC: Conforms to European Union Directive 89/336/EEC.

SAFETY: Meets EN61010-1/IEC 1010.

DIMENSIONS: 2.25 in \times 2.25 in \times 0.60 in.

OPERATING TEMPERATURE: -25°C to 85°C .

STORAGE TEMPERATURE: -40°C to 85°C .

RELATIVE HUMIDITY: 0 – 95% non-condensing.

RFI SUSCEPTIBILITY: $\pm 0.5\%$ of FS @ 400MHz, at 5W from 3 feet.

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MB-Series

Ordering Information

- MB-01** 16-Channel Direct-Connection Module Mounting Rack
- MB-04** Two Module Socket
- MB-05** 8-Channel Direct-Connection Module Mounting Rack
- MB-RES20ohm** 20 Ω replacement shunt resistor for use with MB32 Current Input Modules
- STA-MB** Screw Terminal Accessory for 4 Modules

Input Modules

See below for information about the input modules.

MB30 & MB31 mV AND V INPUT MODULES

Model	Input Range	Output Range
MB30-01	± 10 mV	± 5 V
MB30-02	± 50 mV	± 5 V
MB30-03	± 100 mV	± 5 V
MB30-04	± 10 mV	0 to +5V
MB30-05	± 50 mV	0 to +5V
MB30-06	± 100 mV	0 to +5V
MB31-01	± 1 V	± 5 V
MB31-02	± 5 V	± 5 V
MB31-03	± 10 V	± 5 V
MB31-04	± 1 V	0 to +5V
MB31-05	± 5 V	0 to +5V
MB31-06	± 10 V	0 to +5V
MB31-07	± 20 V	± 5 V
MB31-08	± 20 V	0 to +5V
MB31-09	± 40 V	± 5 V

MB32 CURRENT INPUT MODULES

Model	Input Range	Output Range
MB32-01	4–20mA	0 to +5V
MB32-02	0–20mA	0 to +5V

MB34 RTD INPUT MODULES

100 Ω Platinum $\alpha = 0.00385$

Model	Input Range	Output Range
MB34-01	–100°C to +100°C	0 to +5V
MB34-02	0°C to +100°C	0 to +5V
MB34-03	0°C to +200°C	0 to +5V
MB34-04	0°C to +600°C	0 to +5V

Signal Conditioning Modules and Interface Accessories

MB-01 AND MB-05 MODULE RACKS

All MB-Series modules are designed to install easily on both MB-01 and MB-05 module carrier racks. The MB-01 allows the installation of up to 16 MB-Series modules, while the MB-05 holds 8 modules and each includes screw terminal connections for all field wiring and cold-junction compensation sensors for thermocouples. The MB-01/05 rack provides independent connections to each module.

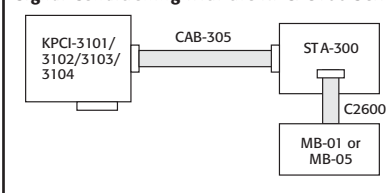
DIMENSIONS: MB-01: 17.4" (44.2cm) \times 3.47" (8.81cm). MB-05: 10.0" (25.4cm) \times 3.47" (8.81cm). MB-01/05 include 0.75" standoffs.

MB-04

The MB-04 holds two modules. You can cluster these backplanes for larger groups of modules.

DIMENSIONS: 1.37" (3.48cm) \times 4.25" (10.8cm).

Signal Conditioning with the KPCI-3100 Series



STA-MB SCREW TERMINAL ACCESSORY

The STA-MB Screw Terminal Accessory provides sockets for four MB-Series modules. Two parallel 37-pin D connectors provide interfaces for DAS boards and accessories. The MB-Series module inputs and outputs as well as the I/O connector pins are brought out to screw terminals. You can wire the MB-Series outputs to pins on the I/O connectors according to the requirements of your application. The STA-MB can be used with the DAS-800 Series and DAS-1600 Series.

DIMENSIONS: STA-MB: 6.7" (17.0cm) \times 5.2" (13.2cm)(with enclosure).

MB38 STRAIN GAGE INPUT MODULES

Model	Excitation	Input Range	Output Range
Full Bridge			
MB38-02	+10 V @ 3 mV/V	300–10 k Ω	–5V to +5V
MB38-05	+10 V @ 2 mV/V	300–10 k Ω	–5V to +5V
MB38-07	+10 V @ 10 mV/V	300–10 k Ω	–5V to +5V

MB39 CURRENT OUTPUT MODULES

Model	Input Range	Output Range
MB39-01	0 to +5V	4–20 mA
MB39-02	–5V to +5V	4–20 mA
MB39-03	0 to +5V	0–20 mA

MB40 & MB41 WIDE BANDWIDTH mV AND V INPUT

Model	Input Range	Output Range
MB40-01	± 10 mV	± 5 V
MB40-02	± 50 mV	± 5 V
MB40-03	± 100 mV	± 5 V
MB41-01	± 1 V	± 5 V
MB41-02	± 5 V	± 5 V
MB41-03	± 10 V	± 5 V
MB41-05	± 5 V	0 to +5V
MB41-07	± 20 V	± 5 V
MB41-09	± 40 V	± 5 V

MB47 LINEARIZED THERMOCOUPLE INPUT MODULES

Model	Input Type	Range	Accuracy ¹ (typ.)	Output Range
MB47-B-11	Type B	+500°C to +1750°C	$\pm 2.5^\circ\text{C}$	0 to +5 V
MB47-J-01	Type J	0°C to + 760°C	$\pm 1.1^\circ\text{C}$	0 to +5 V
MB47-J-02	Type J	–100°C to + 300°C	$\pm 0.5^\circ\text{C}$	0 to +5 V
MB47-K-04	Type K	0°C to +1000°C	$\pm 1.3^\circ\text{C}$	0 to +5 V
MB47-K-05	Type K	0°C to + 500°C	$\pm 0.6^\circ\text{C}$	0 to +5 V
MB47-R-09	Type R	+500°C to +1750°C	$\pm 2.5^\circ\text{C}$	0 to +5 V
MB47-S-10	Type S	+500°C to +1750°C	$\pm 2.4^\circ\text{C}$	0 to +5 V
MB47-T-06	Type T	–100°C to + 400°C	$\pm 1.4^\circ\text{C}$	0 to +5 V
MB47-T-07	Type T	0°C to + 200°C	$\pm 0.5^\circ\text{C}$	0 to +5 V
MB47-E-08	Type E	0°C to +1000°C	$\pm 1.7^\circ\text{C}$	0 to +5 V

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