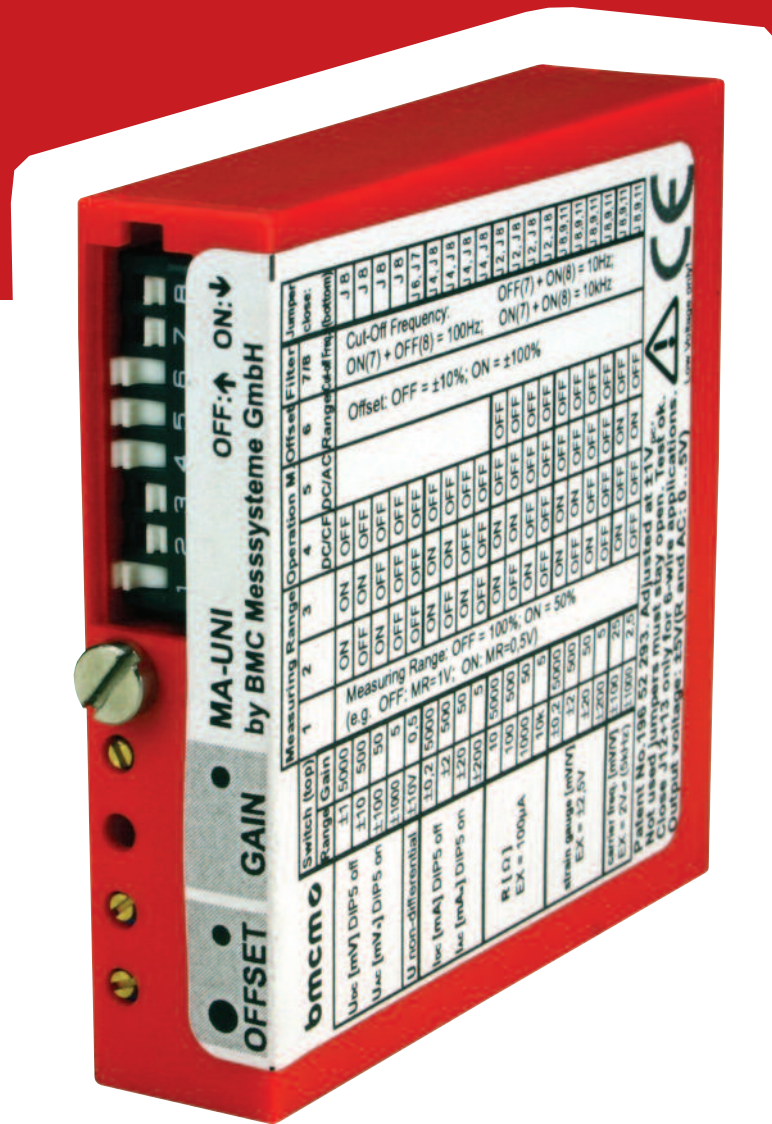


# AMPLIFIERS

MEASUREMENT AMPLIFIERS  
 AND CONNECTION TECHNOLOGY

MESSVERSTÄRKER UND ANSCHLUSSSYSTEME



AMPLIFIERS

# INTRODUCTION ABOUT US

**Das Team von bmcm** entwickelt und produziert messtechnische Produkte seit über 15 Jahren. Zuverlässigkeit, Bedienerfreundlichkeit und ein hervorragendes Preis-/ Leistungsverhältnis stehen im Vordergrund. Von Sensor bis zur Software stellen wir alle Komponenten der Messkette selbst her. Um höchste Kompatibilität zu gewährleisten haben wir die einzelnen Produktbereiche genau aufeinander abgestimmt und unsere Produkte halten sich an die gängigen Industriestandards.

*Since more than 15 years the team of bmcm develops and produces all kinds of components of measurement technology. Reliability, user-friendliness and an extraordinary price-performance ratio have top priority. From sensor to software we produce all components of the measuring chain. To guarantee highest compatibility we adjusted the various product groups carefully to each other and our products comply with current industrial standards.*



**quality  
made in**

# MEASUREMENT AMPLIFIERS AND BACKPLANES

## 5B AMPLIFIER TECHNOLOGY

**5B Messverstärker** ermöglichen die professionelle Anpassung von Signalen an ein Messsystem. Der Verstärkerausgang liegt im Bereich von  $\pm 5V$  bzw.  $0..5V$ . Die meisten Module sind galvanisch trennend und bieten eine Sensorspeisespannung. Auf den folgenden Seiten 4-7 sind sowohl universelle Mehrbereichsverstärker (Erfassungsgrößen: Spannung, Strom, Widerstand, PT100, DMS, Thermoelement (Typ K), Trägerfrequenz) als

auch Module mit spezieller Funktionalität (z. B. Filtermodule, Frequenz-/ Spannungswandler, Impulsformer, Spannungsversorgung) erhältlich. Passende Backplanes zum Anschluss und zur Stromversorgung der Module finden Sie auf Seite 10 und 11.

*5B measuring amplifiers allow for the professional conditioning of signals to a measurement system. The amplifier output is in the range of  $\pm 5V$  or  $0..5V$ . Most of the modules are electrically isolating and provide sensor supply. On the following pages 4-7 multi-range amplifiers (measured quantities: voltage, current, resistance, PT100, strain gage, thermocouple (type K), carrier frequency) as well as modules with special functionality (e.g. filter modules, frequency/voltage converters, pulse shapers, power supplies) are available. You will find appropriate backplanes to connect and supply the modules on page 10 and 11.*

## MINIATURE AMPLIFIER TECHNOLOGY

**Die Messverstärker** der Serie MAL zeichnen sich besonders durch geringe Größe und Preis aus. Der Verstärkerausgang liegt im Bereich von  $\pm 5V$  bzw.  $0..5V$ . Die Miniaturverstärker eignen sich für die Erfassungsgrößen Spannung, Strom, Widerstand, PT100, DMS und Thermoelement (Typ K) und sind auf Seite 8 und 9 erhältlich. Zur galvanischen Trennung von Signalen stehen die isolierenden Miniaturmessverstärker der MAL-ISO Serie

zur Verfügung (s. S. 9). Nur die elektrische Isolation ermöglicht in vielen Fällen ein fehlerfreies Messergebnis bzw. macht potentialfreie Messungen möglich (Beispiel: Messungen an den einzelnen Zellen eines Akkumulators). Passende Backplanes zum Anschluss und zur Stromversorgung der Module finden Sie auf Seite 12 und 13.

*The measuring amplifiers of the MAL series are especially characterized by its small size and price. The amplifier output is in the range of  $\pm 5V$  or  $0..5V$ . The miniature amplifiers are suitable for the measured quantities voltage, current, resistance, PT100, strain gage and thermocouple (type K) and are available on page 8 and 9. For electrical isolation of signals the miniature amplifiers of the MAL-ISO series are provided (see page 9). In many cases only the electrical isolation produces an accurate measuring result or makes potential-free measurements possible (example: measurements at the individual cells of an accumulator). You will find appropriate backplanes to connect and supply the modules on page 12 and 13.*

## ACCESSORIES

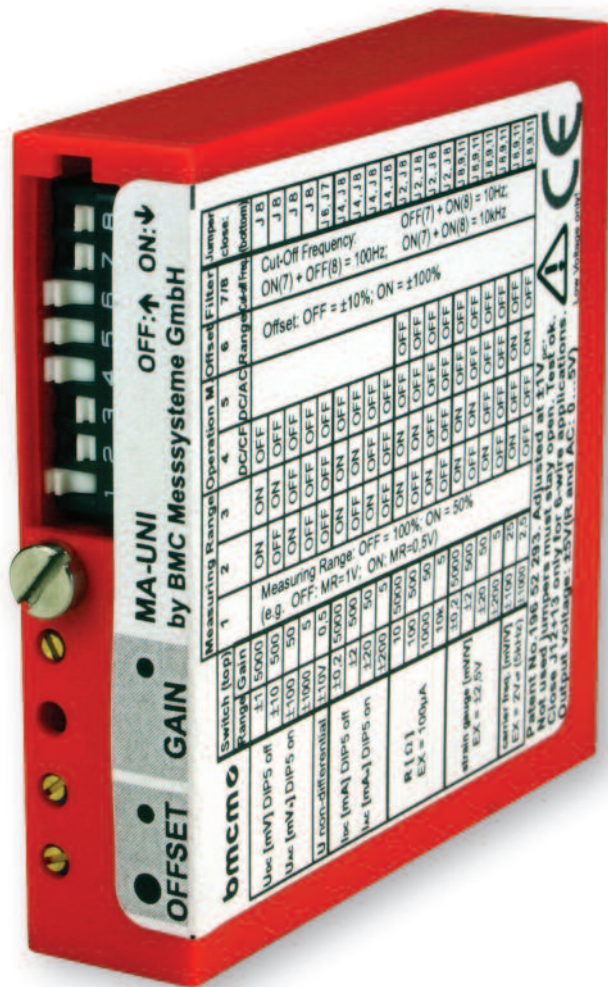
Oft im Hintergrund stehen die Zubehörprodukte. Diese leisten jedoch wertvolle Dienste einerseits zur Ergänzung Ihres Produkts, andererseits als Ersatzteil. Verschaffen Sie sich einen Überblick über erhältliches Zubehör für Messverstärker und Anslusstechnik auf Seite 14.

*Often in the background are the accessory parts. Those do a good turn on one hand by supplementing your product and on the other hand as a spare part. Get an overview of available accessories for measuring amplifiers and connection technology on page 14.*

# 5B AMPLIFIERS

INDUSTRIELLER MESSVERSTÄRKER KOMPATIBEL ZUM 5B STANDARD  
INDUSTRIAL MEASURING AMPLIFIER COMPATIBLE TO 5B STANDARD

AMPLIFIERS



## MA-UNI

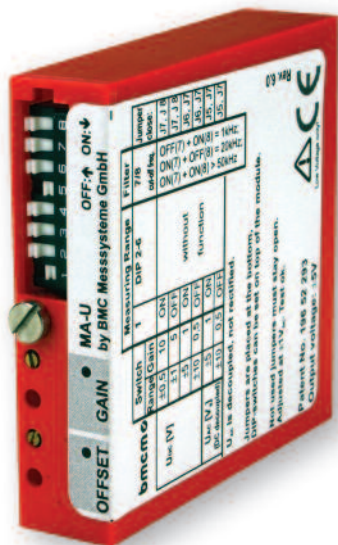
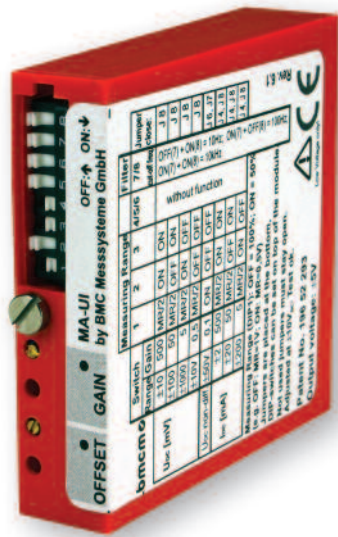
Der professionelle Universalmessverstärker mit galvanischer Trennung wird zur Messung von U, I, R, PT100, DMS und Trägerfrequenz eingesetzt und ist ideal insbesondere bei Verwendung passiver Sensoren.

*The professional universal measuring amplifier with electrical isolation is used for the acquisition of U, I, R, PT100, SG and CF and is perfect especially when using passive sensors.*

### TECHNICAL DATA

- ▶ 5B compatible
- ▶ 10kHz bandwidth
- ▶ electrical isolation
- ▶ 3 switchable filter cut-off frequencies
- ▶ 10 switchable measuring ranges (max.  $\pm 10V$ )
- ▶ AC rectification
- ▶ integrated sensor supply  $\pm 2.5V$  DC, 4mA, 100 $\mu A$ , 2V<sub>eff</sub> bei 5kHz AC
- ▶ DC or AC coupled
- ▶ adjustable with potentiometers

5b amplifiers



## MA-UI

Der isolierende Mehrbereichsverstärker ist ideal für Strom- und Spannungsmessungen und zur galvanischen Trennung von aktiven Sensoren.

*The isolating multi-range amplifier is perfect for current and voltage measurement and for the electrically isolated supply of active sensors.*

### TECHNICAL DATA

- ▶ 5B compatible
- ▶ 10kHz bandwidth
- ▶ electrical isolation
- ▶ 3 switchable filter cut-off frequencies
- ▶ 9 switchable measuring ranges (max. ±50V)
- ▶ integrated sensor supply (U and I) with different ranges
- ▶ DC or AC coupled
- ▶ adjustable with potentiometers

## MA-U

Der isolierende Spannungsmessverstärker mit 50kHz Bandbreite bietet alle Funktionen des 5B Standards.

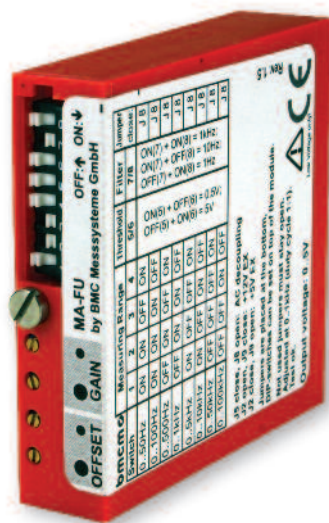
*The isolating voltage amplifier with 50kHz bandwidth features all functions of the 5B standard.*

### TECHNICAL DATA

- ▶ 5B compatible
- ▶ 50kHz bandwidth
- ▶ electrical isolation
- ▶ 3 switchable filter cut-off frequencies
- ▶ 4 switchable measuring ranges (max. ±10V)
- ▶ integrated sensor supply (U and I) with different ranges
- ▶ DC or AC coupled
- ▶ adjustable with potentiometers

# 5B MODULES

PROFESSIONELLE FUNKTIONSMODULE FÜR VERSCHIEDENE EINSATZBEREICHE  
PROFESSIONAL FUNCTION MODULES FOR DIFFERENT FIELDS OF APPLICATION



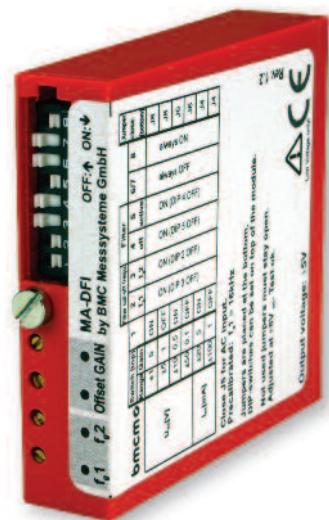
## MA-FU

Isolierender Frequenz-/Spannungswandler für Messungen im Bereich von 0..100kHz

*Isolating frequency/voltage converter for measurements in the range of 0..100kHz*

### TECHNICAL DATA

- ▶ 5B compatible
- ▶ electrical isolation
- ▶ 3 switchable filter cut-off frequencies
- ▶ 8 switchable measuring ranges
- ▶ integrated sensor supply  $\pm 12V$  or  $+5V$
- ▶ adjustable with potentiometers
- ▶ integrated sensor supply  $\pm 12V$  (unregulated),  $+5V$  (regulated)



## MA-DFI

Universelles galvanisch trennendes Filtermodul mit hoher Filtersteilheit

*Universal electrically isolating filter module with high filter gradient*

### TECHNICAL DATA

- ▶ 5B compatible
- ▶ electrical isolation
- ▶ 2 switchable filter cut-off frequencies
- ▶ 4 switchable voltage ranges, 2 current ranges
- ▶ with potentiometers continuously variable between 100Hz..20kHz
- ▶ Butterworth characteristics 60dB/oct.
- ▶ integrated sensor supply  $\pm 12V$  (unregulated),  $+5V$  (regulated) or 4mA
- ▶ DC or AC coupled



## MA-IF

Impulsformer-Modul zur Anpassung unterschiedlicher Pegel an einen TTL-Eingang (z. B. Zähler-eingang)

*Pulse-forming module for the adjustment of different levels to a TTL input (e.g. counter input)*

### TECHNICAL DATA

- ▶ housing and pin assignment 5B compatible
- ▶ pulse input 1Hz..100kHz
- ▶ TTL output
- ▶ ±15V power supply (unregulated, isolated)
- ▶ AC decoupling

## MA-P09 | MA-P12 | MA-P15

Diese preisgünstigen Module liefern je nach Version verschiedene Spannungen zur Versorgung von aktiven Sensoren. Das analoge Signal wird ohne galvanische Trennung 1:1 weitergeleitet.

*According to requirements these reasonable modules provide different voltages for the supply of active sensors. The analog signal is transmitted 1:1 without electrical isolation.*

### TECHNICAL DATA

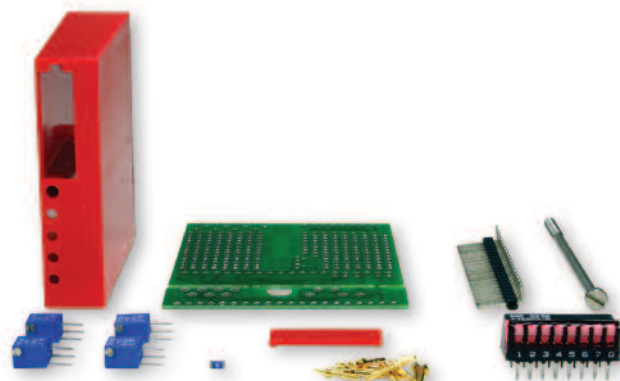
- ▶ 5B compatible
- ▶ sensor supply with unregulated ±9V, ±12V or ±15V, regulated +5V or 4mA



## MA-KIT

Zur individuellen Entwicklung eines 5B Moduls bietet BMC Messsysteme GmbH den Bausatz MA-KIT an, der in Bauform und Pinbelegung kompatibel zur 5B Modulserie ist. Sie erhalten unter anderem eine Leerplatine mit Lochrasterfeldern und SMD-PADs, die sowohl konventionell als auch mit SMD-Bauteilen bestückbar ist.

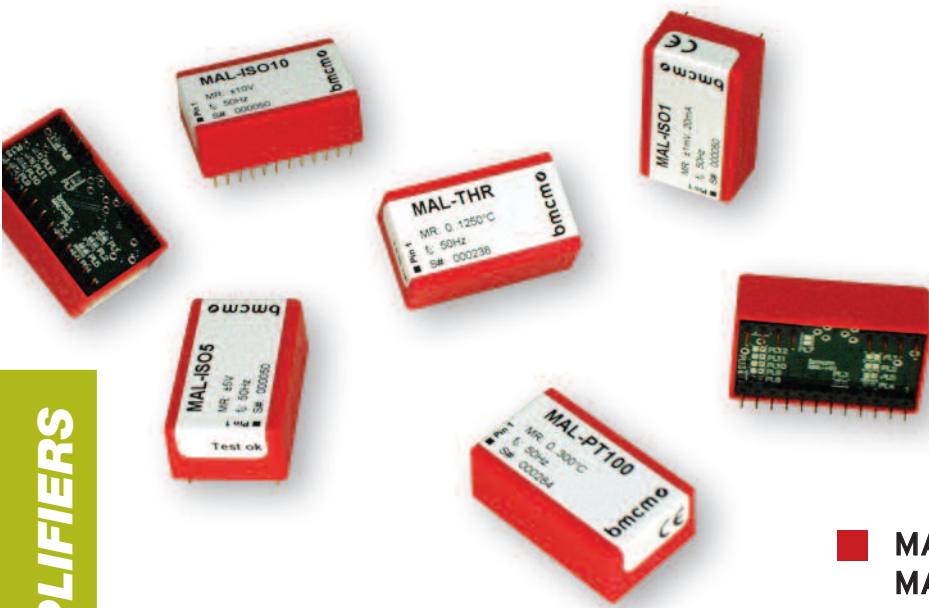
*For the development of a 5B module BMC Messsysteme GmbH offers the construction kit MA-KIT for your special needs. It is compatible to the 5B module series in type of construction and pin assignment. Among other things is included a blank card with breadboard fields and SMD pads which can be equipped both conventionally and with SMD components.*



Preise und Datenblätter: [www.BMCM.de](http://www.BMCM.de)

# MINIATURE AMPLIFIERS MAL

KOSTENGÜNSTIGE MINIATURMESSVERSTÄRKER IM IC-FORMAT  
REASONABLE MINIATURE MEASURING AMPLIFIERS IN IC FORMAT



AMPLIFIERS

8

■ MAL-UI | MAL-PT100 | MAL-R1K |  
MAL-SEIKA | MAL-SG2 | MAL-SG5 |  
MAL-THR

Miniaturmessverstärker für verschiedene  
physikalische Größen

*Miniature measuring amplifier for different  
physical quantities*

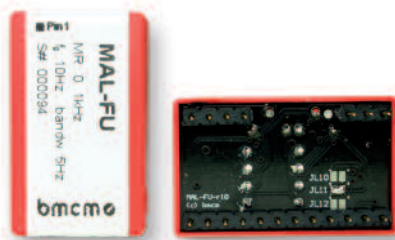
**TECHNICAL DATA**

- ▶ size: like 24-pole DIL-IC
- ▶ 50Hz bandwidth
- ▶ differential input
- ▶ output filter 6dB/oct.
- ▶ integrated sensor supply

Miniature Amplifiers	MAL-UI	MAL-PT100	MAL-R1K	MAL-SEIKA	MAL-SG2/SG5	MAL-THR
Physical quantity	voltage, current	temperature (PT100)	resistance	for SEIKA sensors	strain gauge (DMS)	thermocouple (type K)
Measuring range	±10V, ±5V, ±1V, ±20mA	0..300°C	0..1kΩ	±0.5V (offset: 2.5V)	±2mV/V or ±5mV/V sensitivity	0..1250°C
Additional features	5V excitation	linearized		2.5V mid-position	5V DC excitation	(non-linearizing)

miniatur





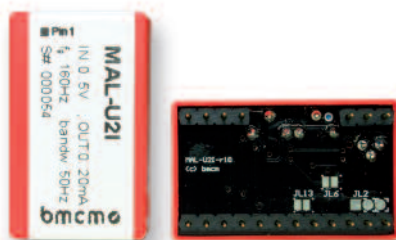
## MAL-FU

Isolierender Frequenz-/Spannungswandler für Messungen im Bereich von 0..10kHz

*Isolating frequency/voltage converter for measurements in the range of 0..10kHz*

### TECHNICAL DATA

- ▶ size: like 24-pole DIL-IC
- ▶ electrical isolation
- ▶ 1Hz bandwidth
- ▶ output filter 6dB/oct.
- ▶ measuring ranges 0..100Hz, 0..1kHz, 0..10kHz
- ▶ input 4..25V



## MAL-U2I

Miniaturmessumformer zur Wandlung von Spannung nach Strom

*Miniature measuring converter for transforming voltage to current*

### TECHNICAL DATA

- ▶ size: like 24-pole DIL-IC
- ▶ measuring ranges 0..10V, 0..5V
- ▶ output range 0..20mA
- ▶ output filter 6dB/oct.

# ISOLATING MINIATURE AMPLIFIERS MAL-ISO

KOSTENGÜNSTIGER MINIATURMESSVERSTÄRKER MIT GALVANISCHER TRENNUNG

REASONABLE MINIATURE MEASURING AMPLIFIER WITH ELECTRICAL ISOLATION



## MAL-ISO10 | MAL-ISO5 | MAL-ISO1

Miniaturmessverstärker mit galvanischer Trennung und verschiedenen Eingangsspannungsbereichen zur Spannungs- und Strommessung (nur MAL-ISO1)

*Miniature measuring amplifier with electrical isolation and different input ranges for voltage and current (MAL-ISO1 only) measurements*

### TECHNICAL DATA

- ▶ size: like 24-pole DIL-IC
- ▶ electrical isolation
- ▶ 50Hz bandwidth
- ▶ differential input
- ▶ measuring ranges  $\pm 10V$  (MAL-ISO10),  $\pm 5V$  (MAL-ISO5) or  $\pm 1V$  and  $\pm 20mA$  (MAL-ISO1)
- ▶ output filter 6dB/oct.

# BACKPLANES FOR 5B MODULES

DIE 5B MODULE BENÖTIGEN EINE TRÄGERPLATINE ZUR STROMVERSORGUNG UND ZUM SIGNALANSCHLUSS.  
 THE 5B MODULES REQUIRE A BACKPLANE FOR POWER SUPPLY AND SIGNAL CONNECTION.



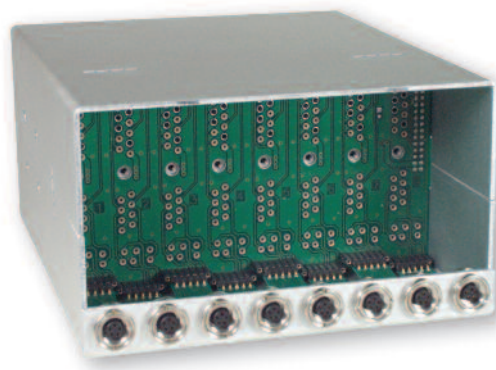
## ■ AP2 | AP8

Trägerplatine für zwei (AP2) bzw. acht (AP8) 5B-Module

*Carrier board for two (AP2) or eight (AP8) 5B modules*

### TECHNICAL DATA

- ▶ 2 (AP2) or 8 (AP8) channels
- ▶ 5B compatible
- ▶ 7-pole input terminals
- ▶ integrated wide-range power supply unit 9..45V
- ▶ 8 direct switches for operation without modules (AP8)
- ▶ with holder for hat rail mounting



## ■ AAB-II

Äußerst kompaktes Messverstärkergehäuse für acht 5B-Module

*Extremely compact measuring amplifier box for eight 5B modules*

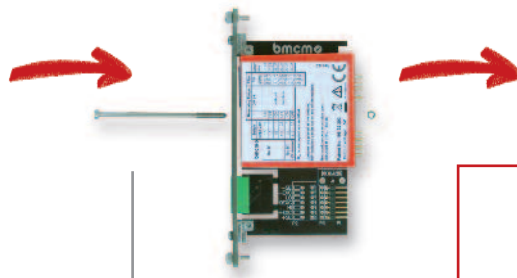
### TECHNICAL DATA

- ▶ 8 channels
- ▶ 5B compatible
- ▶ 5-pole binder sockets for input signals
- ▶ integrated wide-range power supply unit 9..45V
- ▶ 7 direct switches for operation without modules
- ▶ aluminum housing
- ▶ installable in two 5 1/4" bays of a PC placed upon each other
- ▶ registered protection of utility patents



**OPTIONAL CASSETTES:**

- ▶ AMS-K-BIN5
- ▶ AMS-K-BNC
- ▶ AMS-K-CO5
- ▶ AMS-K-THK



mount 5B amplifier  
on the cassette



**AMS42/84**

Modulares Messverstärkersystem mit individuellen Steckverbindern. Ermöglicht die professionelle Benutzung von 5B-Messverstärkern in einem 19"-Rack. Erhältlich in halber (42TE) oder voller (84TE) Baubreite. 42TE-Version mit Aufstellfüßen. 84TE-Version mit Befestigungswinkeln zur Rackmontage.

*Modular measuring amplifier system with individual plug connectors for professional use of 5B measuring amplifiers in a 19" rack. Available in half (42TE) or full (84TE) construction width. 42TE version with rectable feet. 84TE version with fastening brackets for rack mounting.*

**TECHNICAL DATA**

- ▶ stable 19" rack with 42TE (AMS42) or 84TE (AMS84) width
- ▶ 8 (AMS42) or 16 (AMS84) slot for plug-in cassettes
- ▶ extendable to 16 (AMS42) or 32 (AMS84) slots for cassettes
- ▶ 5B compatible
- ▶ plug-in cassettes with different connectors available as accessory



insert cassette in the plug-in  
position of the amplifier rack



optional: handle

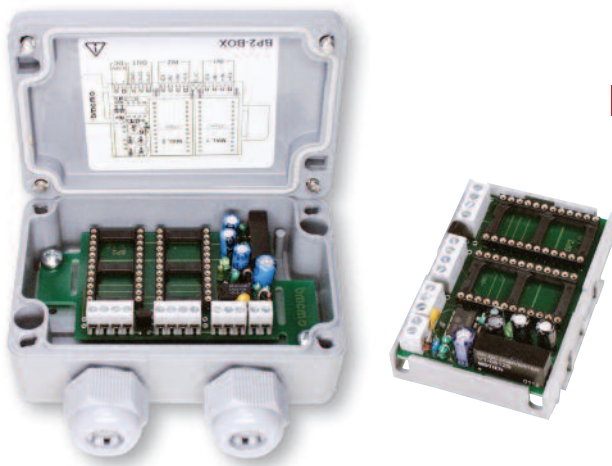


also available as a complete solution with  
integrated USB or LAN data acquisition system

# BACKPLANES FOR MAL MODULES

DIE TRÄGERPLATINEN ERMÖGLICHEN DEN FLEXIBLEN EINSATZ DER MAL-MESSVERSTÄRKER FÜR DIE UNTERSCHIEDLICHSTEN ANWENDUNGEN.

THE BACKPLANES ALLOW FOR THE FLEXIBLE USE OF THE MAL MEASURING AMPLIFIERS FOR THE MOST DIFFERENT APPLICATIONS.

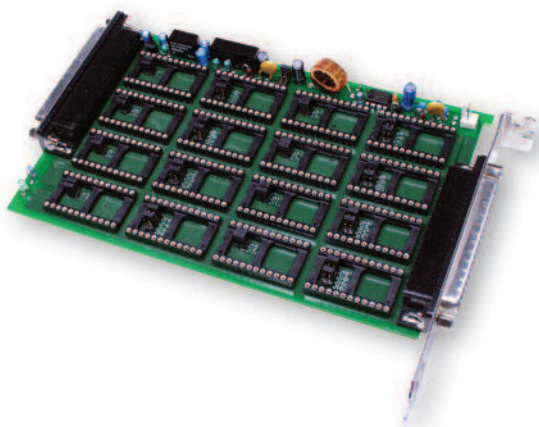


## ■ BP2 | BP2-BOX

Kleine Trägerplatine für zwei MAL-Module  
*Small backplane for two MAL modules*

### TECHNICAL DATA

- ▶ 2 DIL sockets for MAL amplifiers
- ▶ connection via screw terminals
- ▶ isolating power supply 9..45V DC
- ▶ DIN rail carrier (BP2) or IP65 housing (BP2-BOX)



## ■ BP16-PC

Trägerplatine im Euroformat für 16 MAL-Module  
*Euro-sized backplane for 16 MAL modules*

### TECHNICAL DATA

- ▶ 16 DIL sockets for MAL amplifiers
- ▶ for PC mounting
- ▶ signal connection at 37-pole Sub-D female connector
- ▶ amplifier outputs at 37-pole Sub-D female connector compatible to bmcm measurement systems
- ▶ isolating power supply 12V DC from PC

## ■ BP16

Trägerplatine im Alugehäuse für 16 MAL Messverstärker

*Backplane in aluminum housing for 16 MAL measuring amplifiers*

### TECHNICAL DATA

- ▶ 16 DIL sockets for MAL amplifiers
- ▶ compatible to bmcm measurement systems
- ▶ signal connection at 37-pole Sub-D female connector
- ▶ power supply directly from bmcm devices or 9..45V DC



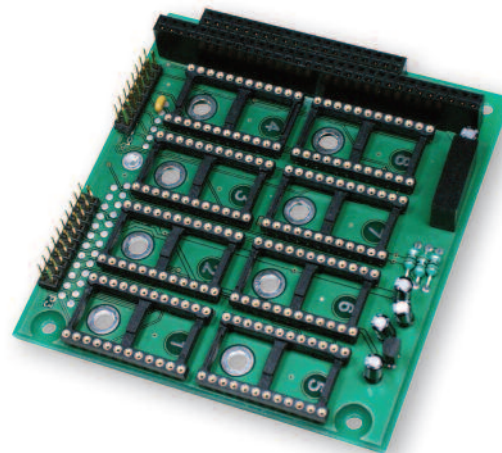
## ■ BP104

PC/104-Platine für acht MAL-Module

*PC/104 backplane for eight MAL modules*

### TECHNICAL DATA

- ▶ 8 DIL sockets for MAL amplifiers
- ▶ connection of the inputs/outputs via pin connectors
- ▶ integrated power supply electrically isolated from PC/104 bus



# ACCESSORIES



## ZU-PW10W

Steckernetzteil mit 3-poliger DIN-Buchse zur Versorgung von bmcm Geräten mit Kleinspannung  
*Plug power supply with 3-pole DIN socket to supply bmcm hardware with low voltage*

### TECHNICAL DATA

- ▶ electrically isolated from 230V<sub>AC</sub> mains supply
- ▶ IN: 200-240V<sub>AC</sub>, max. 20VA
- ▶ OUT: 12V<sub>DC</sub>, 1A, unregulated, 12W

### USE FOR:

- ▶ AAB-II
- ▶ AP2, AP8
- ▶ BP2, BP2-BOX, BP16



## ZU-PW70W

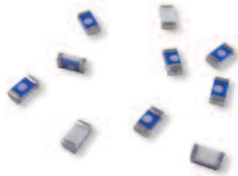
Tischnetzteil mit 3-poliger DIN-Buchse und Netzkabel zur Versorgung mit Kleinspannung  
*Plug power supply with 3-pole DIN socket and power cable for the supply with low voltage*

### TECHNICAL DATA

- ▶ electrically isolated from 230V<sub>AC</sub> mains supply
- ▶ overload protected
- ▶ IN: 90-260V<sub>AC</sub>, max. 85VA
- ▶ OUT: 24V<sub>DC</sub>, 2.92A, regulated, 70W

### USE FOR:

- ▶ AMS42
- ▶ AMS84



## ZU-SI375M

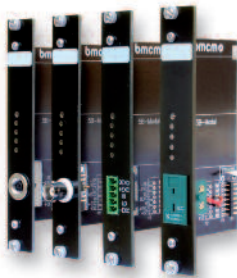
Packung mit 10 Sicherungen  
*Package of 10 fuses*

### TECHNICAL DATA

- ▶ max. 375mA
- ▶ solderable

### USE FOR:

- ▶ MA-UNI, MA-UI, MA-U
- ▶ MA-FU, MA-DFI, MA-IF
- ▶ MA-PO9, MA-P12, MA-P15
- ▶ MA-KIT



## AMS-K

Kassetten für 5B Module mit Blenden und individuellen Anschlussbuchsen  
*Cassettes for 5B modules with brackets and individual connector sockets*

### TECHNICAL DATA

- ▶ AMS-K-BIN: with 5-pole Binder female connector
- ▶ AMS-K-BLANK: blank bracket
- ▶ AMS-K-BNC: with BNC female connector
- ▶ AMS-K-CO5: with 5-pole terminal connector
- ▶ AMS-K-THR: with thermocouple connector type K

### USE FOR:

- ▶ AMS42
- ▶ AMS84



## ZU-TR

Temperaturreferenzsensor für Thermoelementmessungen mit Ausgleichstelle  
*Temperature reference sensor for thermocouple measurements with compensation*

### TECHNICAL DATA

- ▶ LM35DZ semiconductor sensor
- ▶ ±1°C absolute accuracy

### USE FOR:

- ▶ MAL-THR



## ZU-SCHI

Set zur Hutschienen- oder Wandbefestigung für BP16  
*Kit for wall or DIN rail attachment*



## ZU5S712

5-poliger Stecker zum Anschluss von Analogsignalen an die AAB-II  
*5-pole plug to connect analog signals to the AAB-II*



## AAB-KAPC

Kabelsatz zur internen Verkabelung der AAB-II mit interner PC-Messkarte und PC-Netzteil  
*Cable kit for internal cabling of the AAB-II with internal PC measuring card and PC power supply*

# QUICK SELECTION GUIDE

5B AMPLIFIERS	MA-UNI	MA-UI	MA-U	MA-FU	MA-DFI	MA-IF	MA-P09/12/15
Electrical isolation	+	+	+	+	+	-	-
Voltage measurement DC	±0.5mV..±10V 10 MR	±5mV..±50V, 9 MR	±0.5V..±10V, 4 MR	100mV..60V (sensitivity)	±1V..±50V, 4 MR	±1V..±15V (TTL/CMOS)	-
Voltage measurement AC	±0.5mV..±10V 10 MR	±5mV..±50V, 9 MR	±5V, ±10V	-	-	-	-
Current measurement DC	±0.1..±200mA, 8 MR	±1..±200mA, 6 MR	-	-	±20mA, ±100mA	-	-
Current measurement AC	±0.1..±200mA 8 MR	±1..±200mA, 6 MR	-	-	-	-	-
Resistance measurement	5..10000Ohm, 8 MR	-	-	-	-	-	-
Potentiometer meas.	±0.5mV..±10V 8 MR	-	-	-	-	-	-
Strain gage meas. bridge	±1..±200mV/V 8 MR	-	-	-	-	-	-
Carrier frequency	±0.05..±1V/V, 4 MR	-	-	-	-	-	-
Adjustment	3 potentiometers	2 potentiometers	2 potentiometers	4 potentiometers	4 potentiometers	-	-
Excitation (voltage output)	±2.5V; 0.1mA, 4mA	5V, ±12V, 4mA	5V, ±12V, 4mA	5V, ±12V	5V, ±12V, 4mA	-	5V, ±9V/±12V/ ±15V, 4mA
Frequency input	-	-	-	0..100kHz, 8 MR	-	1Hz..100kHz	-
Filter	10Hz, 100Hz, 10kHz	10Hz, 100Hz, 10kHz	1Hz, 20Hz, 50kHz	1Hz, 10Hz, 1kHz	0.1.. 20kHz adjustable	-	-
Amplifier output	±5V	±5V	±5V	0V..5V	±5V	TTL	-

MINIATURE AMPLIFIERS	MAL-UI	MAL-PT100	MAL-R1K	MAL-SEIKA	MAL-SG2/5	MAL-THR	MAL-ISO1/5/10/50
Electrical isolation	-	-	-	-	-	-	+
Voltage measurement DC	±1V, ±5V, ±10V	-	-	2 .. 2.5 .. 3V	-	-	±1V, ±5V, ±10V, ±50V
Current measurement DC	±20mA	-	-	-	-	-	MAL-ISO1:±20mA
Resistance measurement	-	-	0..1kOhm	-	-	-	-
Strain gage meas. bridge	-	-	-	-	±2mV/V / ±5mV/V	-	-
Excitation (voltage output)	-	1mA	1mA	-	5V	-	-
Thermocouple (type K)	-	-	-	-	-	0..1250°C	-
PT100	-	0..300°C	-	-	-	-	-
Filter	160Hz	160Hz	160Hz	160Hz	160Hz	160Hz	160Hz
Amplifier output	±5V	0V..5V	0V..5V	±5V	±5V	0V..5V	±5V

## MR: Messbereich / measuring range

BACKPLANES	AP2	AP8	AAB-II	AMS42/84	BP104	BP2-BOX	BP16/BP16-PC
Slots	2x 5B	8x 5B	8x 5B	8/16x 5B	8x MAL	2x MAL	16x MAL
Supply (DC)	5V; 9-45V	5V; 9-45V	5V; 9-45V	9-45V	5V	9-45V	BP16: 5V; 9-45V BP16-PC: 12V
Inputs	terminals	terminals	Binder connectors	user-defined	20-pole pin connector	terminals	37-pole Sub-D female
Outputs	terminals	16-pole pin connector	37-pole Sub-D female	37-pole Sub-D female	16-pole pin connector	terminals	37-pole Sub-D female
Override	-	8 direct switches	7 direct switches	-	-	-	16 jumpers
Installation	DIN rail	DIN rail	housing or PC mounting	standalone; 19" rack (AMS84)	PC/104 system	BP2: DIN rail BP2-BOX: standalone	BP16: standalone BP16-PC: PC mounting

Alle Verstärker (5B- und Miniaturverstärker) liefern am Ausgang eine Spannung im Bereich von ±5V bzw. 0..5V.

All amplifiers (5B- and miniature amplifiers) produce an output voltage between ±5V or 0V..5V.

AMPLIFIERS

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