

Strain gauge amplifier / DMS amplifier

DM2

Characteristics:

- Linearity error < 0,005%
- For compressive and tension force
- For full bridges $\geq 120\Omega$
- Universal 6 wire technique
- Adjustable transmission frequency 15Hz; 1,3kHz; 3 kHz
- Adjustable output $0 \dots \pm 10V$, $0 \dots \pm 20mA$, $4 \dots 20mA$
- Offset and gain adjustable, coarse / fine
- Power supply 24VDC
- Mountable on 35mm cap rail TS35
- Clear terminal labeling
- Narrow design
- High reliability, 5 years warranty



Description:

The devices of the strain gauge amplifier series DM2 are used for the connecting of strain gauge full bridges in 6 wire-technique, with sensitivities from 0,2mV/V to 40mV/V and to convert them into a norm signal $0 \dots \pm 10V$, $0 \dots \pm 20mA$ or $4 \dots 20mA$. It is possible to use bridges with a load resistance of $\geq 120\Omega$. You can connect more than one bridge in parallel as long as the complete resistance is more than 120 Ω . Based on the bipolar output, compressive and tension force can be measured. If you need to measure compressive and tension force, but you have no bipolar analogue input in your system the Dip-switch S1-9 can be set to „on“. The output of the DM2 is now set to unipolar output. Negative input force = 0V / 0mA out and positive force = 10V / 20mA out, force zero = 5V / 10mA. The bridge supply voltage is selectable via DIP-switches between 5V and 10V. By the external sense lines of the bridge supply it is guaranteed, even if the lines are long, that a constant voltage is applying to the strain gauge sensor and therefore there is a high measurement accuracy. To adjust the zero point and the gain, there are two 20-turn spindle-operated potentiometers for coarse and fine adjusting. In addition to these potentiometers Dip-switches are used to set the coarse gain. The output signal and the transmission frequency is also set by Dip-switch. The units are in a 22.5 mm housing which can be snapped onto TS35 mounting rail.

Application:

Measurement for compression and tension forces, for example curlers.

Weighing systems, test benches and wherever strain gauge (DMS) in a bridge circuit are used.

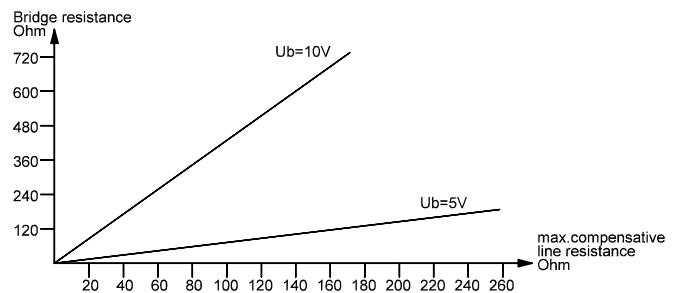
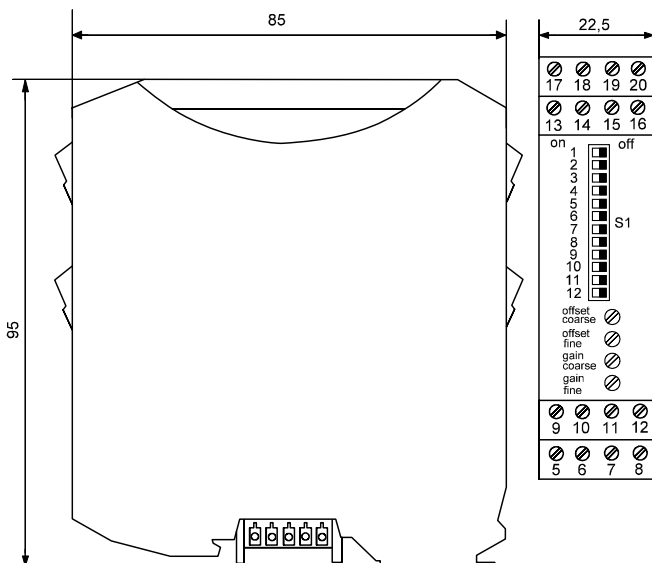
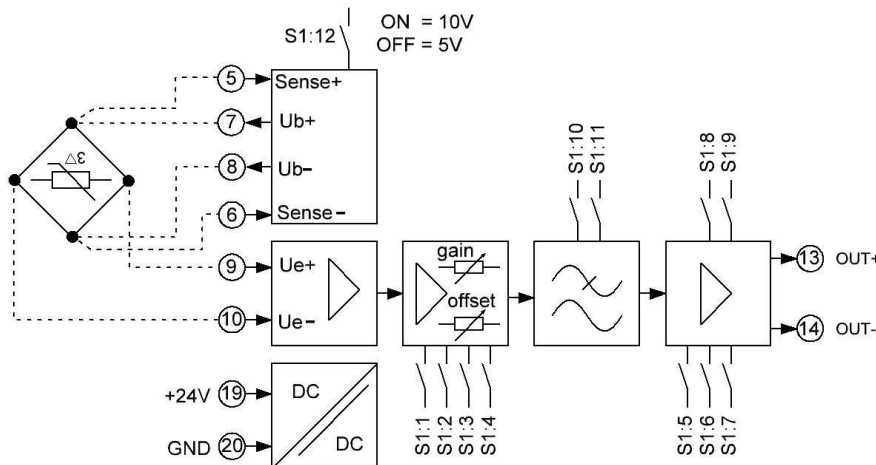
Switch ● = on	with 10V bridge supply	with 5V bridge supply	S1			
Gain	Bridge sensitivity	Bridge sensitivity	1	2	3	4
50 ... 160	20mV/V ... 6,25mV/V	40mV/V...12,5mV/V				●
140 ... 540	7,2mV/V ... 1,8mV/V	15mV/V ... 3,7mV/V			●	
450 ... 1700	2,2mV/V ... 0,6mV/V	4,5mV/V ... 1,2mV/V		●		
1450 ... 5400	0,7mV/V ... 0,2mV/V	1,4mV/V ... 0,4mV/V	●			

Switch ● = on	S1			
Output	5	6	7	8
0...±10 V	●		●	
2 ...10 V	●		●	●
0...±20 mA		●		
4 ... 20 mA		●		●

Switch ● = on	S1	
cut off frequency	10	11
15 Hz	●	
1,3 kHz		●
3 kHz		

Switch ● = on	S1
Bridge supply	12
10 V	●
5 V	

S1-9: ON = bipolar input / unipolar output



Technical Data

Supply:

Voltage supply : 19, 2...30VDC
Power consumption : 2VA

Input:

Input : DMS full bridge $\geq 120\Omega$, 6-wire technique
Bridge sensitivity : 0,2mV/V to 40mV/V
Input absolute : 0mV to 200mV / $1M\Omega$
Zero adjustment : max. $\pm 50\%$ from endpoint
Bridge supply : 5V or 10V adjustable, short circuit proof
Gain : min.50 / max. 160, 540, 1700, 5400

Output:

Voltage output : 0... $\pm 10V$ / max. 20mA
Current output : 0(4)... $\pm 20mA$ / Burden max. 500Ω
Ripple : $< 5mV$
Cut-off frequency : 15Hz / 1,3kHz / 3 kHz adjustable
Bridge supply : 5V or 10V switchable, regulated, short circuit proof
Line resistance : max. 24Ω with 120Ω Bridge and 10V supply can be compensated (other values see diagram)

Accuracy:

Linearity error : $< 0,005\%$
Temperature coefficient: $< 0,002\%$ / K

General data:

Operating temperature : 0... $50^{\circ}C$
Storage temperature : $-25...+85^{\circ}C$, condensation before putting into operation is not allowed
MTBF : 68 years mean time between failures – according to EN 61709 (SN 29500).
Requirements: Stationary operation in clean rooms, average ambient temperature $40^{\circ}C$, no aeration, continuous operation
CE conformity : EN 61326-1, EN 61000-4-2/3*/4/5/6*, EN 61000-6-4
* during measurements are small deviations possible

Housing:

Dimension : See drawing, 22,5mm adjoin body, 22,5x95x90,5mm (with terminals)
Material : PA / V0
Protection category : IP20
Connection : M3-screw-type terminal 0, 14 - $2,5mm^2$, flexible or inflexible
Fixing : Snap-on mounting for norm rail TS35
Weight : 120g

Note on safety:



Disconnect the power supply before attempting to open the unit.

During the operation of this module it is possible that parts of the module, even there is extra-low voltage, (for example shunt measurement) are under dangerous voltage! Therefore a non-observance of this caution may cause damage of property or physical injury.

Only trained qualified personnel should install or operate the unit. Before installation the qualified personnel should read the documentation and should familiarize themselves with the unit.

If there is visible damage to the body of the unit it should be immediately replaced and not put into operation.



Please ensure that there is a sufficient prevention against electrostatic discharge during installation of the unit.

Installation Information:

Pay attention and make sure the unit is far away from mounted sources that may disturb the device such as magnetic coils, transformers, frequency converters etc.

Wiring advice:

Use only shielded cables. The shield is to be connected extensively to ground. Do not mix power- and signal-wires/cables in the same cable tray.

Limited warranty:

The LEG Industrie-Elektronik GmbH warranted that the product does not have any material or processing defects in a period of 5 years after date of delivery.

It is up to the choice of LEG to repair or to exchange an inoperative unit.

Subsequent damages or any claim for indemnification above the functionality of the unit are excluded.

This limited warranty is only valid if ...

1. the product was installed and put into operation according to the LEG operation documentation;
2. the technical configuration of the power supply was abided;
3. the product was not used for unintended purposes;
4. there were no unauthorized modifications or manipulations, misuse or repairs without previous agreement from LEG .

Our Terms of Trade are based on the “General Conditions for the supply of products and services of the Electrical and Electronics Industry” including the “Complementary Clause: Extended Reservation of Property” of the ZVEI e.V. (German Association of Electrical Manufacturers).

Miscellaneous:

We expressly reserve the right, without previous notice, to correct errors contained in any data of this information brochure, and to make alterations to the program and technical modifications.