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SIGNAL CONDITIONER AMPLIFIER MODEL SGA-0B(/M)(/WB)

Description:

The Mod. SGA-0B(/M)(/WB) Signal Conditioner Amplifier is a fully programmable high-precision analogue bridge amplifier which accepts inputs from strain gauges, strain gauge based transducers, potentiometers and general voltage sources.

The single channel version comes in EUROPE-card design. The multi-channel system rack contains a 24 VDC power supply which powers the amplifier plug-in units.

The USB interface and a dedicated software package allows for set-up, and programming of the system as well as measurement control via personal computer.

Features:

- Constant voltage bridge excitation
- Constant current bridge excitation (**SGA-0B/M version only**)
- Internal dummy resistors for strain gauge quarter and half bridge circuits with 120, 350 and 1000 Ω and transducer circuitry.
- Built-in shunt calibration circuits with internal switches for user-programmable calibration configurations.
- Internal software-programmable 4-pole-Butterworth low-pass filters.
- Internal software-programmable 4-pole high-pass filters (**SGA-0B/M version only**)
- Analogue bandwidth up to 120 kHz (**SGA-0B and SGA-0B/M**), up to 1 MHz (**SGA-0B/WB**)
- Software-programmable, ultra-wide, high-precision bridge balance.
- Fully programmable: Bridge excitation, gain, low-pass filters, calibration and bridge balance.
- All amplifier functions set up and controlled by High-Speed LOW Power CMOS Microprocessor, set-up data stored in a non-volatile EEPROM memory.

Specifications:

Analogue Inputs	Input Impedance:	DC-coupled: 100M Ω shunted by 450 pF AC-coupled: 1 μ F in series with 78 k Ω
	Configuration:	Strain gauge quarter-, half-, and full bridge circuits, transducers, voltage and current signals. Bridge completion resistors 120 Ω , 350 Ω , and 1000 Ω ; internal and external connections for shunt calibration resistors.
	Common Mode Voltage:	± 10 V
	Differential Voltage:	± 10 V
	Input Protection:	Protected against up to 40 V DC
Constant Voltage Bridge Excitation	Range:	0.0 V to 10.23 V, in steps of 2.5 mV (software programmable), current max. 40 mA
	Accuracy:	0.1 % \pm 5 mV in a range of 1.0V to 10.23 V
	Temperature Stability:	Better than 0.01 %/ $^{\circ}$ C
Constant Current Bridge Excitation	Range:	0.0 mA bis 20.040 mA, in steps of 0.005 mA (software programmable), Voltage max. 11VDC
	Noise:	1 μ A(p-p) + 10 μ V(p-p); DC to 20kHz
	Accuracy:	0.1% \pm 0,005mA in a range of 2,0mA bis 20,040mA
(only SGA-0B/M)	Temperature Stability:	Better than 0.01% / $^{\circ}$ C

Balance	Type:	Internal micro controller electronic balance circuitry
	Activation:	Activated by software or by front-panel button
	Range:	$\pm 10240 \mu\text{m/m}$ (5.12mV/V) RTI for gains: 50, 100, 200, 400, 500, 1000, 2000, 4000, 5000, 10000V/V. $\pm 512\,000 \mu\text{m/m}$ (256mV/V) RTI for gains: 1-40, 80 mV/V.
Calibration	Internal shunt calibration resistors:	RC1 = 499.0 k Ω 0.1%, 1000 $\mu\text{m/m}$ (0.50 mV/V) for 1000 Ω and gauge factor K=2.00 RC2 = 174.8 k Ω 0.1%, 1000 $\mu\text{m/m}$ (0.50 mV/V) for 350 Ω and gauge factor K=2.00 RC3 = 59.94 k Ω 0.1%, 1000 $\mu\text{m/m}$ (0.50 mV/V) for 120 Ω and gauge factor K=2.00
	Calibration procedure:	Calibration resistors can be switched via software
	calibration level:	Bipolar $\pm 1000 \mu\text{m/m}$ for half- and quarter bridges
Amplifier	Gain:	1, 2, 4, 8,10, 20, 40, 50, 80, 100, 200, 400, 500, 1000, 2000, 4000, 5000 and 10000 (only SGA-0B and SGA-0B/M) 1, 2, 4, 8,10, 20, 40, 50, 80, 100, 200, 400, 500, 1000, 2000 (only SGA-0B/WB)
	Accuracy:	$\pm 0.2 \%$
	Linearity:	0.02 % of full scale range
	Frequency Response Input:	DC to 50kHz: -0.5 dB typically at all gains setting and full output, DC to 120kHz: -3 dB max at all gains setting and full output. (only SGA-0B and SGA-0B/M) DC to 1 MHz, - 3dB max. at all gains setting and full output. (only SGA-0B/WB)
	Slew Rate:	4 V/ μs
	Noise:	0.5Hz - 20kHz: 2.5 mV _{rms} max, referred to Input, 0.5Hz - 120kHz: 6 mV _{rms} max, referred to Input (RTI, 350 Ω source impedance, DC-coupled).
	Temperature coefficient of zero:	$\pm 1 \mu\text{V}/^\circ\text{C}$ max. for gain: 50, 100, 200, 400, 500, 1000, 2000, 4000, 5000 and 10000; $\pm 5 \mu\text{V}/^\circ\text{C}$ typical for gain: 1-40, 80 V/V
	Common-Mode Rejection:	G=1 CMR=80dB; G=10 CMR=90dB; G=100 CMR=100dB; G=1000 CMR=120dB (G = gain)
	Output:	$\pm 10 \text{ V}$ (full short circuit protection) (only SGA-0B and SGA-0B/M) $\pm 5 \text{ V}$ (full short circuit protection) (only SGA-0B/WB)
	Low-pass filter:	4-pole Butterworth low-pass filter -3 dB; software selectable; bandwidth: 2 kHz, 5 kHz, 10 kHz, 20 kHz and Wideband (120 kHz or 1 MHz)
	High-pass filter: (only SGA-0B/M)	4-pole Butterworth high-pass filter -3 dB; software selectable; bandwidth: 100 Hz, 250 Hz, 500 Hz, 1 kHz and off
	AC Coupling:	Cut-off frequency (- 3 dB) 2.0 Hz
	Design	Dimensions:
Weight:		0,6 kg
Power supply:		$\pm 15 \text{ VDC}$, $\pm 120 \text{ mA max.}$; + 5 V, 100 mA
Connector and indicator	LED:	Shows the current state of the bridge amplifier (three-colour: red/green/yellow).
	Connector (input):	15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon
	Connector (output):	BNC connector on the front panel, additional output on the connector of the EUROPE-card (DIN 41612 type C, 32 pins)
Program- ming inter- face	Type:	USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used
Software	Driver:	USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions
	Amplifier setting:	SGA0BTST.EXE program; Alternative: open setup software (Possible integration with user software, type of DLL)
	Adjustment of the calibration:	Software for automatic adjustment of the calibration function of user-specific data

Comparative overview of the various versions of the amplifier series SGA-0B:

	SGA-0B	SGA-0B/M	SGA-0B/WB
Constant Voltage Bridge Excitation:	0 to 10.23 V	0 to 10.23 V	0 to 10.23 V
Constant Current Bridge Excitation:	unavailable	0 to 20.40 mA	unavailable
AC/DC Input coupling:	standard	standard	standard
Bridge balance range:	$\pm 10\ 240\ \mu\text{m/m}$	$\pm 10\ 240\ \mu\text{m/m}$	$\pm 10\ 240\ \mu\text{m/m}$
Input configuration:	Quarter, half and full bridge circuits	Quarter, half and full bridge circuits	Quarter, half and full bridge circuits
Calibration for all input configurations:	standard	standard	standard
Voltage input range:	$\pm 10\ \text{V}$	$\pm 10\ \text{V}$	$\pm 5\ \text{V}$
Gain:	1 to 10 000 V/V	1 to 10 000 V/V	1 to 2000 V/V
Frequency range (- 3 dB):	DC to 120 kHz	DC to 120 kHz	DC to 1 MHz
Selectable low-pass filter:	standard	standard	standard
Selectable high-pass filter :	unavailable	standard	unavailable
Output voltage range :	$\pm 10\ \text{V}$	$\pm 10\ \text{V}$	$\pm 5\ \text{V}$
Software-programmable via USB interface:	standard	standard	standard
Manual bridge balance with key:	standard	standard	standard



View amplifier plug SGA-0B



View of an 8-channel amplifier system

Subject to technical changes and modifications without notice!