GLE/SGA-4 Four Channels Wide Bandwidth Conditioner for Strain Gages

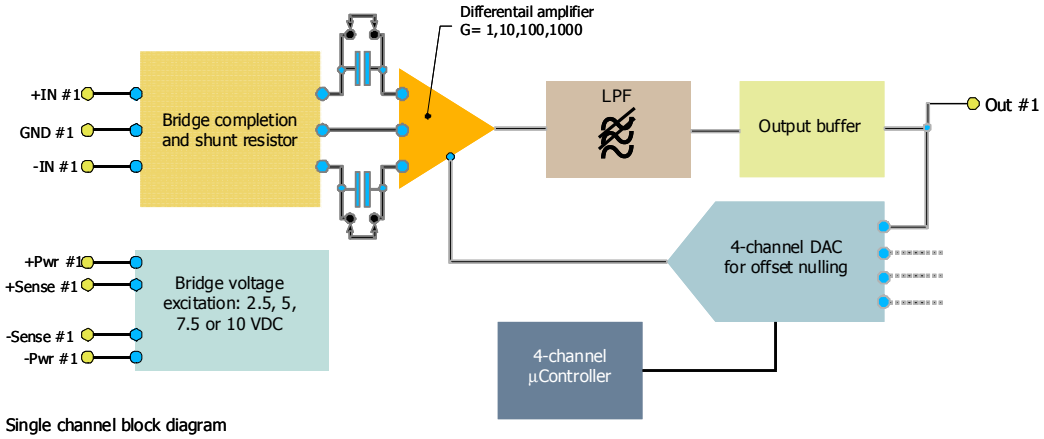
- Four input channels per card for ¼, ½ and full bridge configurations (ICP compatible sensors option).
- Particularly suitable for:
  - structural analysis, both static and dynamic,
  - fatigue analysis,
  - mechanical experimentation,
  - test benches,
  - testing on vehicles,
  - destructive or not control on materials.
- Low-pass active filter; different cut-off frequencies (from AC to 40kHz) can be set by resistors plug-in.
- Wide bandwidth up to 100kHz.
- Selectable bridge voltage supply (with sense) in 4 steps: 2.5, 5, 7.5 or 10VDC.
- Selectable input sensitivity in 4 steps: ±1mV/V, ±10mV/V, ±100mV/V, ±1V/V @10VDC.
- Automatic offset nulling through 12bit internal DAC.
- 19" 3U rack mounting

Overview

The GLE/SGA-4 quad channel amplifier belongs to the family of modular conditioners developed by GreenLake Engineering for the measurement of dynamic signals incoming from strain-gauge bridges.
GLE/SGA-4 is a wide bandwidth conditioner (100kHz; -3dB@gain=100) specifically designed to offer an accurate and convenient solution both for stress analysis and for measurements by strain-gage transducers (including accelerometers, load cells, potentiometers, pressure transducers).
When combined with stand-alone or PC-based data acquisition systems, GLE/SGA-4 is ideal as pre-conditioning unit, both for static and dynamic measurement environments.

The gain and the voltage supply to sensor bridge are user-definable on single channel basis. The gain is selectable from 1 to 1000 with 4 steps, while constant voltage excitation provided to the bridge can be set equal to one of the following values: 2.5, 5, 7.5 or 10VDC. Moreover, a DAC-based circuit provides automatic zero suppression capability that can be activated separately or not for each channel, as depicted in the block diagram reported below.

The GLE/SGA-4 encompasses a 4th-order Butterworth active low-pass filter. The cut-off frequencies can be change in the range 500-50000Hz, simply substituting the removable resistors on the plug-in. One resistor circuit is included accomplishing the cut-off frequency defined by the user at the order.



Single channel block diagram

Bridge completion (both for ¼ and ½ bridges) could be done directly on each board, where an appropriate area has been foreseen in order to accommodate the needed resistors

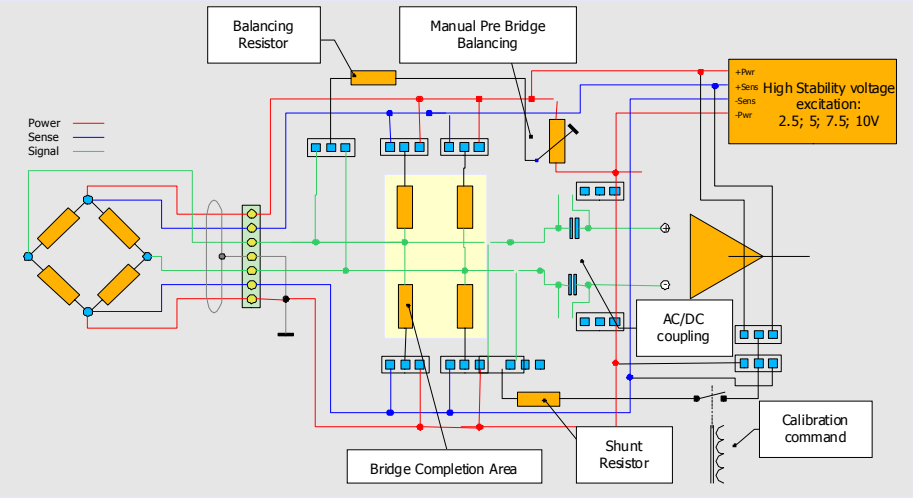
To verify the strain-gages measurement systems, an internal shunt resistor can be introduced through a special digital line activated by a relay. The shunt resistor is then connected to one bridge arm, in order to introduce a known bridge unbalancing and perform calibration. User can easily change the value of the shunt resistor, which is removable and mounted in an accessible area on each board.

The GLE/102-DySA cards are designed to be plugged into the 19" 3U rack mountable chassis GLE/EuroRack. Optionally the GLE/SGA-4 amplifiers can be provided with constant current excitation for ICP transducers and/or with input Galvanic isolation.

Technical Specifications- GLE/SGA-4

Number of input channels	4
Input type	Differential
Coupling	AC or DC (selectable)
Impedance	≅ 10 MΩ
Input configurations	¼; ½ and full bridge with on-board completion
Input full scale	±1mV/V, ±10mV/V, ±100mV/V, ±1V/V. Gain selectable (on-board) among: 1, 10, 100 and 1000, according to the input full scale
Excitation voltage	2.5, 5, 7.5 or 10VDC, on-board selectable on single-channel basis (35mA maximum current for each channel).
Excitation voltage sense	Yes
Offset nulling	Automatically activated by digital command line or by switch on GLE/EuroRack-8. Zero control circuit comprises a 12bit DAC (range=±1V/gain r.t.i.) It is also possible to manually pre-balance through an on-board trimmer.
Shunt calibration	An user-defined parallel resistor can be mounted directly on-board shunting one arm of the bridge (positive or negative). This can be done by means of relay controlled by digital line or of a switch on the GLE/EuroRack-8 front panel.
Bandwidth	DC/AC ÷ 100kHz (-3dB) @ gain=100; Pass-band ripple ≤±0.2dB
Low-pass filter	4 poles Butterworth. One cut-off frequency must be specified at the order (fc >500Hz <50kHz @ -3dB); fc can be modified via plug-in module replacement
Linearity	0.1 % FS or better
Gain accuracy	0.1 % FS @1000Hz
Output impedance	<< 50 Ω
SNR (Typ.)	≅ 72 dB @ G=100;(f_C≤40kHz)
Stability	±50ppm/°C r.t.o. ±2.5ppm/°C r.t.i., typ
Power supply	From GLE/EuroRack-8 (90W max)
Power consumption	5W /card (sensors included)
Operating temperature	-20 ÷ +50°C
Card dimension	EuroCard 100 x 280 mm
GLE/EuroRack-8 dimension	19" x 3U x 325 mm (L x H x P).
Input connectors	Screw terminals (Phoenix 12-poles) on the GLE/EuroRack-8 rear panel
Output connectors	Multiple poles on the GLE/EuroRack-8 rear panel (BNC as option)

Due to continuous developments specifications subject to change without prior notice.



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