

FE-1823 Dual Dynamic Strain Amplifier

This dual channel A.C. coupled transducer amplifier incorporates two independent low noise constant current sources for strain gauge energisation. It is particularly intended for dynamic measurements where static information is not required. When this technique is used, long cables to the gauge may be used and the need for bridge balancing is avoided.

Each channel contains a high quality instrumentation amplifier providing the user with the facility to choose an optimum gain by altering the gain resistor mounted on the solder turrets. Gains may be preset by the user from 0.5 to 1000 with a bandwidth of 1.6 Hz to 40 kHz.

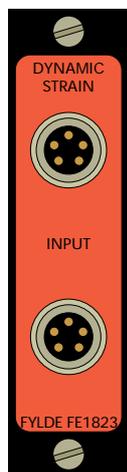
A three pole low pass active filter at each channel's output is also provided with user configurable components to allow the optimum signal to noise ratio to be obtained.

The output stage is capable of $\pm 10\text{v}$ with 5mA capability and will drive capacity load (10nF) without instability.

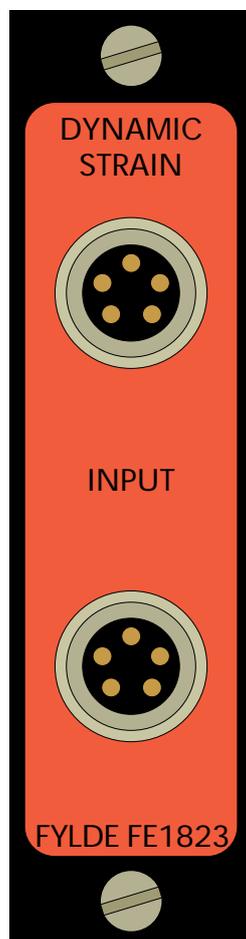
In common with other modules in the 1800 series a front panel mounted 5 pin lemo connector is used for amplifier inputs and bridge outputs.

Connection to the gauge may be simple twisted pair to single arm gauges or 4 wire to full bridge type gauges.

Up to eight FE1823 modules may be fitted in one of the FE1800 series crates. this provides a very compact signal conditioning package for both aircraft and vehicle use.



actual size



2X actual size

DESCRIPTION A Dual channel Dynamic Strain Gauge Amplifier for aircraft application.

Utilising an FET instrumentation amplifier differentially, the FE-1823SGA energises a remote strain gauge with an exact constant current. The dynamic signal is AC coupled and precisely amplified. The module carries a 3 pole Active filter which is set by resistor fitment. Frequency response extends from 1.69 Hz to 40kHz.

STRAIN GAUGE POWER SUPPLY **2 identical circuits**

Type	Constant Current	Symmetrical from $\pm 5V$ supply.
Current Setting		10mA $\pm 0.2\%$
Voltage	maximum	5V across gauge (500 max.)
Impedance		Approximately 100k
Stability		0.0025% / $^{\circ}C$
Noise		<10nA RMS (equiv. 1 μ Strain pk to pk in 350)

AMPLIFIER2 **2 identical circuits**

Input	Impedance	1M (Coupling 1 μ F and 1M)
	Noise	10 nV Hz @ 1-10 kHz, 10 μ V r.t.i to 40 kHz.
	Range	A 15v pk-pk signal will cause no spurious effects on the output, other than clipping.
	Protection	Against series and common mode overloads.
	Common Mode	Rejection
		>70 dB @ 50-400 Hz. (Gain <10)
		>90 dB @ 50-400 Hz. (Gain 100 to 1000)
		Range ± 7 Volts.
Gain	Range	x1 to x1000.
	Formula	Gain = 1 + (50k / Rg)
	Accuracy	$\pm 0.5\%$.
	Non-linearity	<0.02%.
	Stability	± 30 ppm/ $^{\circ}C$ ($\pm Rg$)
Bandwidth		1.69Hz to >40 kHz (-3 dB).
Low Pass Filter	Type	3 Pole Butterworth (-18 dB/octave)
	Programmable	By fitting of 3 resistors.
	Cut off (Fc.LP)	1kHz - 10 kHz (-3 dB)
	-5% point	0.69 Fc.
Output	Volts	$\pm 9.5V$ for linear operation (LK1 fitted). $\pm 4.75V$ for linear operation (LK2 fitted).
	Current	5mA typical.
	Impedance	<1 ohm (w.r.t. 0v).
	Offset	$\pm 5mV$ max.
	Noise	<1 mV RMS up to 40 kHz.
	Capacity Load	Up to 0.01 μ F, with no loss of stability.

ENVIRONMENT

Temperature	Range	-30 $^{\circ}C$ to +85 $^{\circ}C$.
Altitude		3.8 to 108 kPa.
Vibration		MIL-STD-810B. Fig. 514-2
Acceleration		100m/s ² in any axis.
Shock		1000m/s ² peak 1/2 Sine wave 6 ms.

CONNECTORS

Inputs	(Amplifier)	5 way socket LEMO type EHG 0B305.
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