

A general purpose instrumentation amplifier for laboratory or field use. Easy to use with jumper-configurable settings including four pre-programmed gain values.

Applications

- ⇒ General purpose laboratory/workshop amplifier
- ⇒ Sensor signal amplification, e.g. Hall effect
- ⇒ Current monitoring
- ⇒ Bridge amplifier

Instrument	GPIA
Operation modes	Single ended / differential
Gain range	2 -1000
Bandwidth	350 kHz
CMRR (at DC)	115 dB
Power supply	+12V, 0V, -12V (5-pin DIN)

Table 1. General specifications.



The GPIA showing power entry and output screw-terminal connectors

The GPIA has screw-terminal inputs and outputs making it ideal for the engineering environment or for research laboratories. The GPIA is an economical alternative to high-cost instrumentation amplifiers yet it provides all the functionality necessary for basic engineering work. Many configuration options are possible including gain, input/output filters, coupling and input resistors. The unit was designed for amplifying Hall-sensor signals but can be used for many other purposes.

The GPIA has a bandwidth of over 300 kHz, Figure 1. The CMRR at DC is about 115 dB, frequency-dependent CMRR is shown in Figure 2.

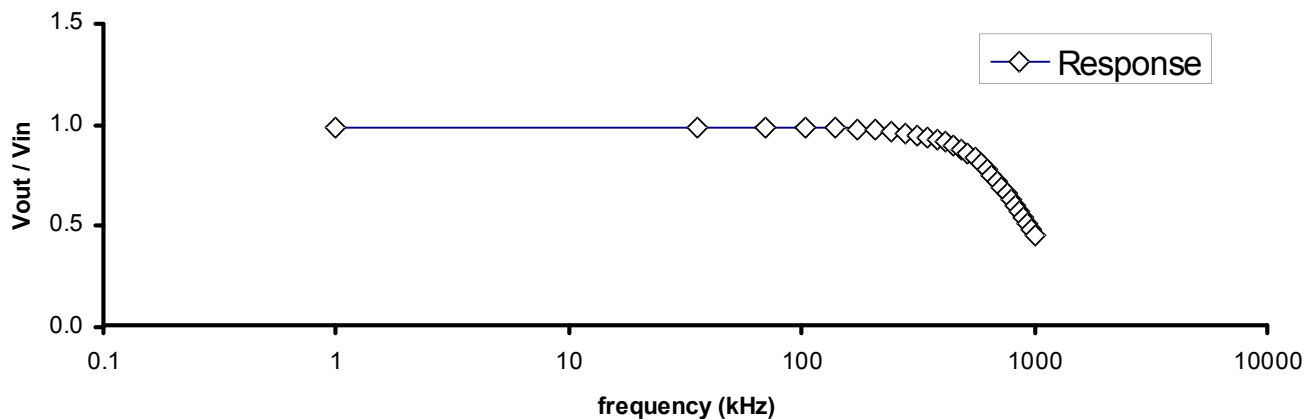


Fig. 1. The GPIA has a bandwidth of over 300 kHz

dimensions	5.12" x 2.56" x 1.70"
weight	6 oz.
style	ABS Flame Retardant Plastic UL-94V-0

Table 2. Physical parameters.

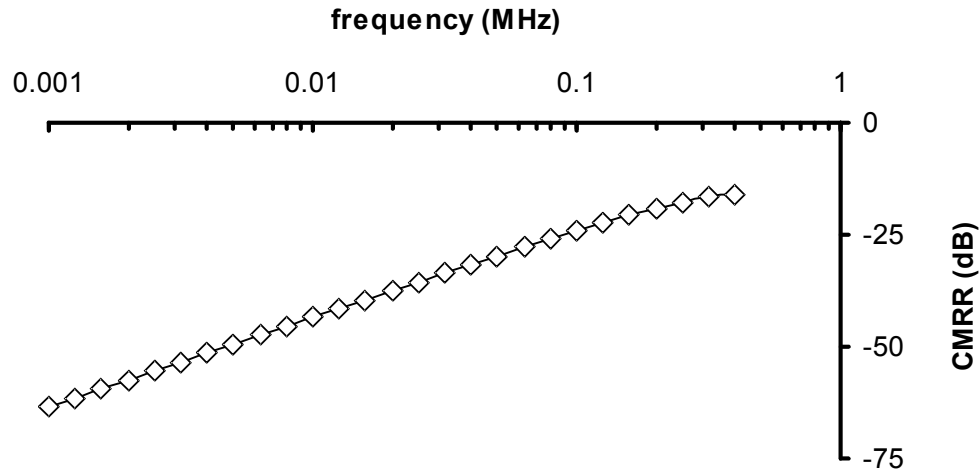


Fig. 2. CMRR as a function of frequency.

Configuration options

It is possible to fine-tune performance of the GPIA through the use of jumpers and additional components. These options are described below with the aid of Figure 3.

Gain

The GPIL is based on the AMP-02 integrated circuit from analog devices. Gain is set using just one resistor according to the equation;

$$\frac{50k\Omega}{R_G} + 1$$

Using the pre-installed resistors, the following gain settings are possible;

no jumper	1
Jumper 0 (top)	10
Jumper 1	100
Jumper 2	500
Jumper 3 (bottom)	1000

Table 3. Gain selection jumper settings.

In addition, the resistor associated with Jumper 3 is socketed and can be replaced with a custom value if required.

Configuration

For differential operation, link **PL16** should be installed. For single-ended operation, link **PL17** should be installed and the unit's +ve input used. **PL16** and **PL17** should not be both installed at the same time.

Input resistors

Sockets are provided (**R3** and **R4**) for input resistors to ground. This feature is useful for amplifying certain Hall-sensor signals and for terminating signal lines.

Input filters

High- and low-pass passive filters are provisioned for. Low-pass filters can be configured using **R2, C3** and **R1, C4** for the -ve and +ve inputs respectively. High-pass filters can be configured using **C1, R6** and **C2, R5**. The two jumpers labeled **J2** and the two labeled **J1** can be used to bypass these input filter components.

Output filter

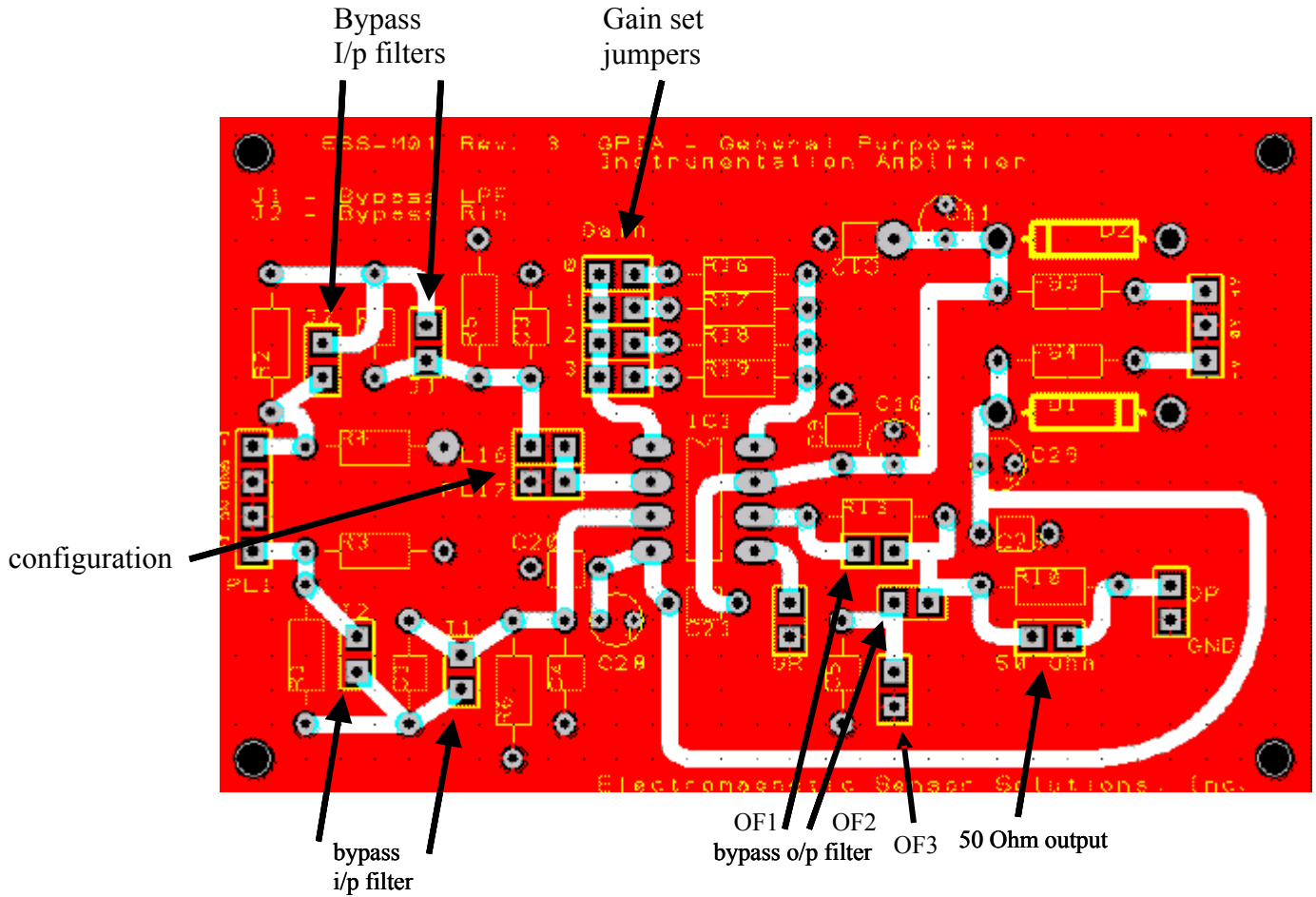
Components **R13** and **C5** form a low pass passive filter on the output. When these components are installed, the jumper labeled **OF1** should be open and **OF2** should be installed for filter operation. Reverse to disable filtering. Jumper **OF3** should never be installed.

50 Ohm output

Install for low output impedance or remove for 50 Ohm.

Ordering options

The GPIA comes with screw-terminal connections (for both input and output) as standard. The GPIA can be shipped with BNC connectors for input, output or both; please specify at time of ordering. The GPIA requires a dual 5—18V regulated power supply. A wall-mount module can be ordered (GPIA-PSU) or a separate cable can be supplied (GPIA-CAB) for direct connection to a regulated DC power source.



Optional components

R3, R4: Input resistors (to ground)

R1, C4, R2, C3: Input low-pass filters

C1, R6, C2, R5: Input high-pass filters

R13, C5: Output low-pass filter

R10: 50 Ohm output resistor

Fig. 2. PC board layout showing jumper locations and optional filter components.