

GPA4

4 channels general purpose amplifier



User Manual

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1. GENERAL FEATURES

1.1. GENERAL DESCRIPTION

The GPA4 is a four channel general purpose amplifier. It can amplify and filters any referenced single ended signal (i.e. signal referred to ground).

The four channels are completely independent and can be used simultaneously.

1.1. TECHNICAL SPECIFICATION

The GPA4 is a programmable amplifier with selectable high pass filter, low pass filter, gain and offset compensation.

The GPA4 technical specifications are reported in Table 1.

Selectable High pass filter	DC coupled
	1 Hz (II order)
	10 Hz (II order)
Selectable Low pass filter	25 Hz (VIII order)
	40 Hz (VIII order)
	100 Hz (VIII order)
	500 Hz (VIII order)
Selectable Gains	1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k, 5k V/V
Gain error	< 5 %
Input resistance	> $10^{12} \Omega$
Input range	$\pm 4 \text{ V}$
Output range	$\pm 4 \text{ V}$
Output offset	< 5 mV
Offset compensation	$\pm 6.5 \text{ V}$, when DC coupled

TAB. 1: Amplifier technical specification

2. DETAILED DESCRIPTION

2.1. FRONT PANEL

Figure 1 shows connectors switches and selectors of the GPA4. The four channels are separated by vertical lines and the corresponding channel number is reported in the upper part of the front panel.

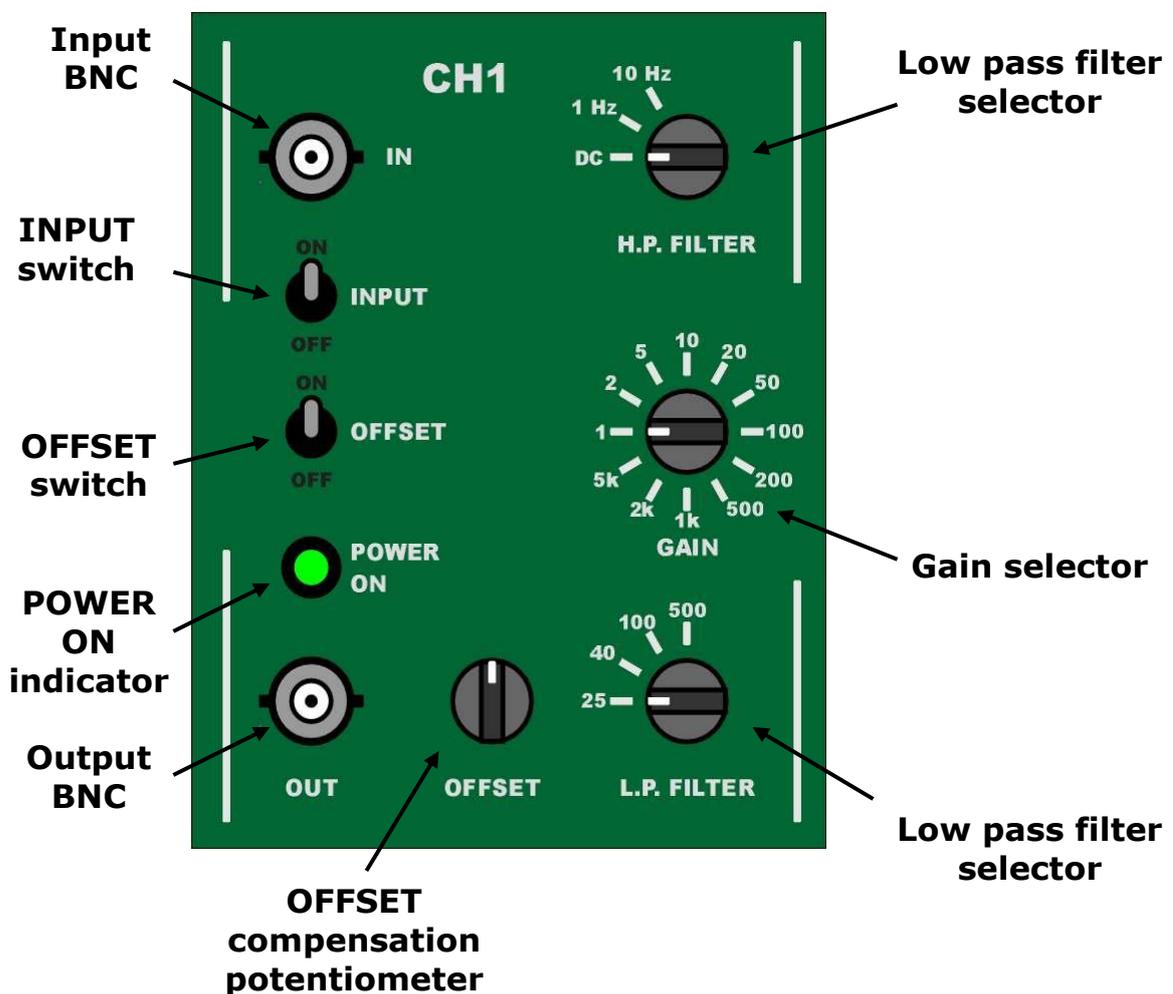


FIG. 1: Detail of GPA4 front panel reporting the first channel

Any indication reported in the following description can be associated to any GPA4 channel except when expressly indicated.

Input BNC

This connector is the input for the corresponding amplifier channel.

INPUT switch

This switch can be used to turn on or off the amplifier input. When the switch is in the ON position the signal present at the BNC input is the input for the corresponding amplifier channel. When the switch is in the OFF position the input of the corresponding amplifier channel is connected to ground and the BNC input is disconnected from the circuit and in a floating condition.

The INPUT switch can be used to turn off the input and evaluate the offset amount introduced by the internal offset compensation at the amplifier channel output.

It is suggested to turn off the unused inputs to reduce the coupling of external interference to the instrument.

OFFSET switch

When the channel is DC coupled the offset compensation can be turned on or off using this switch.

Note that this switch has no effects when the high pass filter is used.

POWER ON indicator

The indicator is a green led that is on when the amplifier is powered. The indicator is common for all channels when on indicate that all channels are on.

Output BNC

This connector is the output for the corresponding amplifier channel.

OFFSET compensation potentiometer

This multi-turn potentiometer controls the offset compensation. To activate the offset compensation the channel have to be DC coupled (refer to LOW PASS FILTER selector) and the OFFSET switch have to be placed in the ON position.

Note that the offset is multiplied by the gain selected and the potentiometer sensitivity increase with the gain.

The offset value, introduced by the offset compensation circuit, can be sent to the output BNC and measured. The input signal has to be excluded by positioning the INPUT switch in the OFF position and the channel gain has to be set equal to 1.

HIGH PASS FILTER selector

This three positions selector allows to select the -3 dB corner frequency of the second order high pass filter. The DC position indicates that no high pass filters are introduced and the channel is DC coupled. Available frequencies are: 1 Hz and 10 Hz.

The frequency values are theoretical, refer to the "Modulo di collaudo" for the real values.

GAIN selector

This twelve positions selector allows to select the channel gain. Available gains are: 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000.

The gain values are theoretical, refer to the "Modulo di collaudo" for the real values.

LOW PASS FILTER selector

This four positions selector allows to select the -3 dB corner frequency of the eighth order low pass filter. Available frequencies are: 25 Hz, 40 Hz, 100 Hz and 500 Hz.

The frequency values are theoretical, refer to the "Modulo di collaudo" for the real values.

2.2. BACK PANEL

Fig. 2 shows the GPA4 back panel.

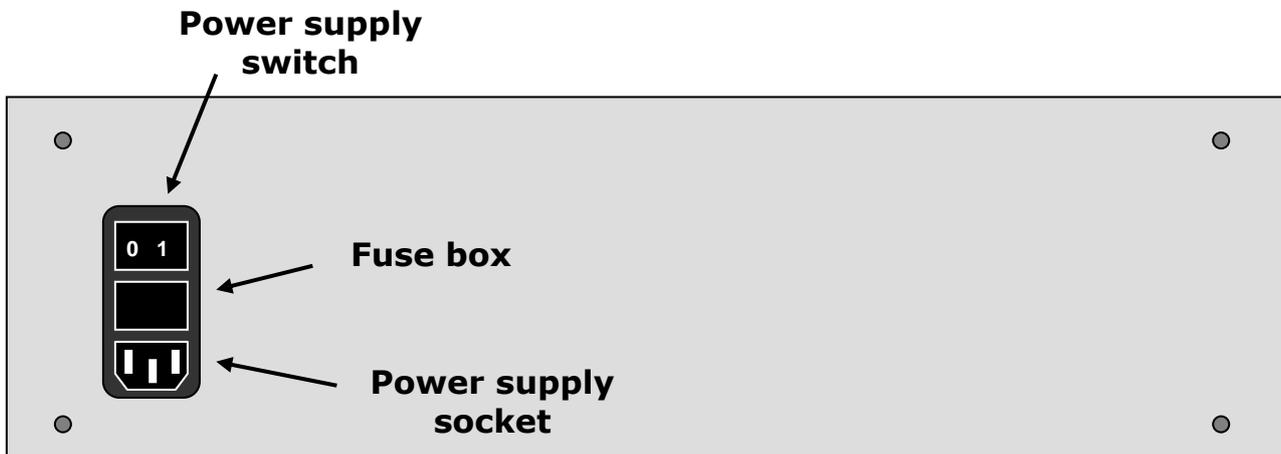


FIG. 2: Back panel of GPA4

Power supply socket

Connect the power supply cable to this socket. The GPA4 system can be supplied with a supply voltage ranging from 90 to 260 VAC, 50÷60 Hz; it is very important that the supply cable includes the earth connector.

DANGER: The use of extension cords or multiple sockets or adaptors can affect the performance of the instrumentation. The connection to sockets without earth connection or with a low quality earth connection can affect the performance of the instrumentation and cause potential harm to operators.

Power supply switch

On the back panel, together with the power supply connector, the power supply switch can be found. To switch the GPA4 on, move the power supply switch to position 1; to switch it off, move it again to position 0. For higher safety, the switch interrupts connection to both power conductors.

When the system is not used, this switch should be off.

Fuse box

On the back panel, together with the power supply connector, a box containing the two power supply fuses (one for each cable) can be found. In normal working conditions the two supply fuses must not be interrupted; the interruption of connection in either of them can occur only when the system is damaged; this means that the device could no longer be in compliance with the security standards, even if the fuses have been replaced correctly.

DANGER: In case of interruption of one or both fuses, do not replace them by yourself, but immediately contact the Technical Assistance Service of Ottino Bioelettronica.

Besides, replacing the fuses with others of different type can be dangerous. Always remove the power cable before testing the fuses.

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