

Power Module Type 12AP

Product Data and Specifications

Features and uses

- **All-digital control**
- **Powers preamplifiers for mics. and amplifiers for loudspeakers.**
- **Straddles paths of outgoing and received signals**
- **Electro-acoustics tests of hearing aids, telephones, loudspeakers**

The G.R.A.S. Power Module Type 12AP (Fig. 1) is a power supply and conditioning amplifier for simultaneously powering a preamplifier for a condenser microphone and an amplifier for a loudspeaker (suitably, any sound source using a loudspeaker/earphone/coupler). By design, it will avoid system-generated noise, e.g. from ground loops.

The Type 12AP is remotely controlled entirely via its RS232 interface and, for this purpose, is delivered with a control program for Microsoft Windows®.

In a measurement set-up (e.g. as shown in Fig. 4), the Type 12AP straddles the paths of (a) the signal sent out to the loudspeaker and (b) the resulting acoustic signal picked up by a condenser microphone fitted to the preamplifier. In both cases, its set-up for handling these signals independently comes under external control, as the following will show.

Front Panel (Fig. 1)

On the loudspeaker side, there are LEDs for indicating:

- Voltage overload (red)
- Current overload (red)

Overloads can be latched and read via remote control, in which case they are cleared when read.

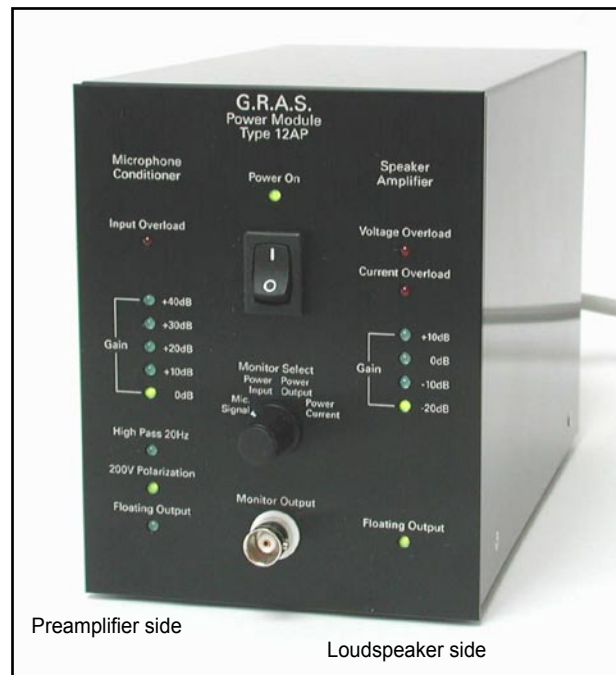


Fig. 1 Power Module Type 12AP

Or

Overload messages signalled to remote control, displayed briefly and cleared.

- Gain (green)
+10 dB, 0 dB, -10 dB, or -20 dB
- Floating output (affirmative when green) otherwise set to non-floating. To ensure low noise in the system, the current output should float with respect to common ground.

These are determined via remote control.

On the preamplifier side, there are LEDs for indicating:

- Input overload (red)

Overloads can be latched and read via remote control, in which case they are cleared when read.

Or

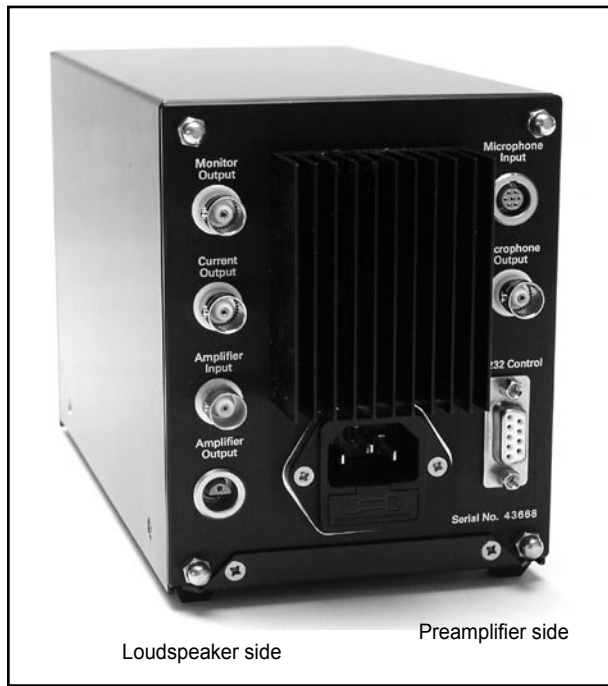


Fig. 2 Rear panel of the Power Module Type 12PA

Overload messages signalled to remote control, displayed briefly and cleared.

- Gain (green)
0 dB, +10 dB, +20 dB, +30 dB, or +40 dB
- High pass 20 Hz (affirmative when green) otherwise set to 1 Hz
- 200 V polarization (affirmative when green) otherwise set to 0 V
- Floating output (affirmative when green) otherwise set to non-floating. Floating output with respect to common ground will ensure low system noise.

These are determined via remote control.

Finally, there is a BNC output socket for monitoring one of the following:

- Microphone signal
 - Power input
 - Power output
 - Power current
- as selected by the Monitor Select switch.

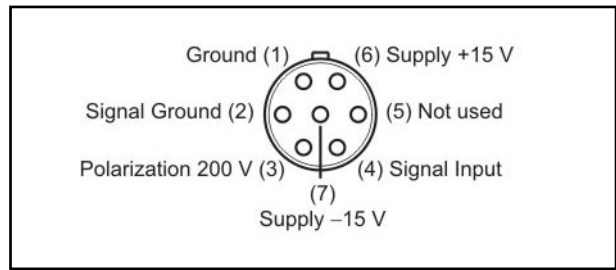


Fig. 3 7-pin LEMO female socket 1B (external view)

Rear Panel (Fig. 2)

On the loudspeaker side, there is a BNC input for an external signal generator and a 2-pin LEMO output for the loudspeaker. There is also a BNC socket for measuring the output current to the loudspeaker.

On the preamplifier side, there is a 7-pin LEMO socket which is wired up (see Fig. 3) for G.R.A.S. microphone preamplifiers, e.g. Types 26AB, 26AC, 26AJ and 26AK, but is also compatible with other available makes of similar microphone preamplifiers, and an a BNC output socket for the microphone’s signal.

Finally, there is a 9-pin D-sub socket wired up for connecting directly to the RS232 port of a computer; thus enabling software to make use of the remote control facilities of the Type 12AP.

Installing the Control Program

The Type 12AP is delivered with a control program for Microsoft Windows®.

Important: switch off the Type 12AP first before connecting RS232.

At first, the program will default set the Type 12AP to “overload messaging mode” and with no COM port selected. The COM port must be selected in the Setup-menu of the application window. Some COM ports have special features regarding hardware handshake and may need to be disabled.

The program will initialise the 12AP with the following exceptions:

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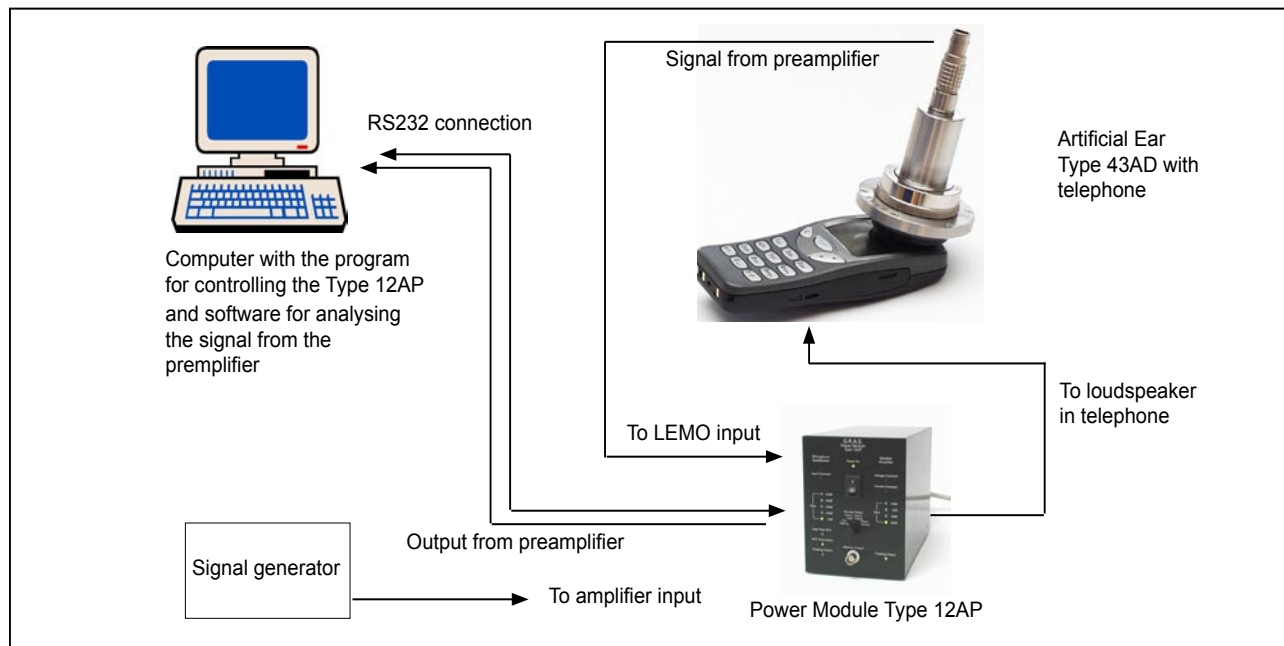


Fig. 4 A set-up for testing the loudspeaker of a mobile telephone using the Type 12AP with a G.R.A.S. Artificial Ear Type 43AD

- if the program has already been started
- if the Type 12AP has been switched on without an RS232 connected

In which case the program will not know that there is a Type 12AP connected. The solution is either to restart the program or switch the Type 12AP off, connect the RS232 and switch it on again. The program stores the settings in the windows registration base, and will always start as it was closed.

Whenever switched on, the Type 12AP powers up in the following default mode:

- gain preamplifier section: 0 dB
- output preamplifier section: floating
- polarization voltage: 0 V
- high pass filter: 1 Hz
- gain speaker amplifier: -20 dB
- current output speaker amplifier: floating
- overload messages not sent
- overload mode: latching

Examples of Commands

Commands are in upper case and executed by striking the Enter <cr>

Gn<cr>

set gain on preamplifier side to n dB
($n = 0, 10, 20, 30$ or 40)

FLOAT<cr>

set output on preamplifier side to floating

NOFLOAT<cr>

set output on preamplifier side to non-floating

P200<cr>

set polarization voltage to 200 V

P0<cr>

set polarization voltage to 0 V

HP1<cr>

set high-pass filter on preamplifier side to 1 Hz

HP20<cr>

set high-pass filter on preamplifier side to 20 Hz

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LATCH<cr>

latch overloads on preamplifier side, these are cleared when read and no overload messages are sent

SGn<cr>

set gain on loudspeaker side to n dB
($n = -20, -10, 0, \text{ or } 10$)

CFLOAT<cr>

set current output on loudspeaker side to floating

CNONFLOAT<cr>

set current output on loudspeaker side to non-floating

SLATCH<cr>

latch overloads on loudspeaker side, these are cleared when read and no overload messages are sent

CLATCH<cr>

latch current overloads on loudspeaker side, these are cleared when read and no overload messages are sent

Special commands

There are also special commands to control the behaviour of the Type 12AP with respect to overload messages as well as to extract instrument data such as identification, serial number firmware.

Specifications

Preamplifier section	Gain: -20 to +10 dB (remote controlled in 10 dB \pm 0.2 dB steps)
Input connector: 7-pin LEMO	Bandwidth (-3 dB): DC to 80 kHz
Preamp. power: \pm 15 V	Phase shift (in/output) \pm 1°: DC to 30 kHz
Input impedance: 100k Ω	Max. output voltage: \pm 14 V
Output connector: BNC (remote controlled – non-floating/floating with 2k Ω to power ground)	Max. output current: \pm 1.4 A
Output impedance: 100 Ω	Overload detection: red LEDs (remote controlled: voltage and current)
Gain: 0 – 40 dB (remote controlled in 10 dB \pm 0.2 dB steps)	Current output socket voltage/current ratio: 1 V/1 A
Bandwidth (-3 dB): 1 Hz to 200 kHz	Monitor output output connector: BNC
Noise floor (rel. input): 6 μ V RMS 20 – 20 kHz	output impedance: 100 Ω
Polarization voltage: 0 V/200 V (remote controlled)	Power supply: Mains/line: 110 VAC or 240 VAC
High-pass filter: 1 Hz 1 st order/20 Hz 3 rd order butterworth (remote controlled)	Fuse: 500 mA (Slow), 250 V
Overload detection: red LED (remote controlled)	Dimensions: ($\frac{1}{4}$ of a standard 19-inch rack)
Speaker-amplifier section	Height: 132.6 mm (5 $\frac{1}{4}$ in)
Input connector: BNC	Width: 104.5 mm (4.1 in)
Input impedance: 10k Ω	Depth: 237.0 mm (9.3 in)
Output connector: 2 pin LEMO	Weight: 2.5 kg (5.5 lbs)
Current output connector: BNC (remote controlled – non-floating/floating with 2k Ω to power ground)	Accessories available: 19-inch Rack-mounting System: AK0040

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice

G.R.A.S.
Sound & Vibration

Skovlytoften 33
2840 Holte, Denmark
Tel +45 45 66 40 46 Fax +45 45 66 40 47
e-mail: gras@gras.dk www.gras.dk