

## GRAS 12AD

### 1-Channel Power Module



12AD is a 1-channel, battery-operated, microphone power module. It has a 7-pin LEMO 1B input connector for a microphone preamplifier and one BNC output socket. It can provide a polarization of 200 V for externally polarized or 0 V for prepolarized microphone cartridges.

A battery indicator is included to monitor battery condition as well as an input socket for an external power supply.

## GRAS 12AR

### 2-Channel Power Module



12AR is a 2-channel, battery-operated, microphone power module. It has two 7-pin LEMO 1B input connectors for microphone preamplifiers and two BNC output sockets. It can provide a polarization of 200 V for externally polarized or 0 V for prepolarized microphone cartridges.

A battery indicator is included to monitor battery condition as well as an input socket for an external power supply.

Specifications	12AD
Input Channels	7-pin LEMO 1B connectors
Output Channels	BNC socket
Preamplifier Supply	$\pm 15$ V
Output Impedance	Depends on preamplifier
Polarization Voltage	0 V or 200 V
Frequency Response	0.05 Hz – 200 kHz
Power Supply	4 x AA alkaline batteries (included) or 4.5 – 24 V DC mains adapter 115/230VAC) (not included)

Specifications	12AR
Input Channels	2 x 7-pin LEMO 1B connectors
Output Channels	2 x BNC sockets
Preamplifier Supply	$\pm 15$ V
Output Impedance	Depends on preamplifier
Polarization Voltage	0 V or 200 V
Frequency Response	0.05 Hz – 200 kHz
Power Supply	4 x AA alkaline batteries (included) or 4.5 – 24 V DC mains adapter 115/230 VAC) (not included)



## GRAS 12AK

### 1-Channel Power Module with Gain, Filters and SysCheck Generator



12AK is a 1-channel, battery-operated, microphone power module, amplifier and filter unit. It has a 7-pin LEMO 1B input connector for a microphone preamplifier and a BNC output socket. It has both instantaneous and latched overload indicators and a gain that can be set to 0dB, +10dB, +20dB, +30dB, +40dB or +50dB.

The A-weighting network fulfills the requirements of IEC 60651 for Type 0 and IEC 61672 Class 1 Sound Level Meters. The high pass filter is a 3-pole Butterworth filter with a cut-off frequency at 20 Hz.

A battery indicator is included to monitor battery condition as well as an input socket for an external power supply. It also has a built-in 1 kHz precision calibration generator with adjustable level for activating the SysCheck function in the 26AJ and 26AL preamplifiers. The generator can be activated either via a front-panel button or remotely via an input on the back of the module.

12 of these Power Modules can be mounted in the AK0040 Standard 19" Rack Kit.

Specifications	12AK
Input Channel	7-pin LEMO 1B connectors
Output Channel	BNC socket
Gain Settings	0 dB, +10 dB, +20 dB, +30 dB, +40 dB, +50 dB
Preamplifier Supply	28 V or 120 V
Output Impedance	30 $\Omega$
Polarization Voltage	0 V or 200 V
Frequency Response	3.5 Hz – 200 kHz
A-weighting Network	IEC 60651 Type 0 and IEC 61672 Class 1
Power Supply	10 x AA alkaline batteries (included) or 12 – 18 V DC mains/line adapter for 115/230 VAC (included)

## GRAS 12AA

### 2-Channel Power Module with Gain, Filters and SysCheck Generator



12AA is a 2-channel, battery-operated, microphone power module, amplifier and filter unit. It has two 7-pin LEMO 1B input connectors for microphone preamplifiers as well as two BNC output sockets. Both channels have an overload indicator and a gain that can be set to -20dB, 0dB, +20dB or +40dB.

The A-weighting network fulfills the requirements of IEC 60651 for Type 0 and IEC 61672 Class 1 Sound Level Meters. The high-pass filters are 3-pole Butterworth filters with a cut-off frequency at 20 Hz.

A battery indicator is included to monitor battery condition as well as an input socket for an external power supply. It also has a built-in 1 kHz precision calibration generator with adjustable levels for both channels for activating the SysCheck function in the 26AJ and 26AL preamplifiers. The generator can be activated either via a front-panel button or remotely via an input on the back of the module.

12 of these Power Modules can be mounted in the AK0040 Standard 19" Rack Kit.

Specifications	12AA
Input Channel	2 x 7-pin LEMO 1B connectors
Output Channel	2 x BNC socket
Gain Settings	-20 dB, 0 dB, +20 dB, +40 dB
Preamplifier Supply	28 V or 120 V
Output Impedance	30 $\Omega$
Polarization Voltage	200 V or 0 V
Frequency Response	3.5 Hz – 200 kHz
A-weighting Network	IEC 60651 Type 0 and IEC 61672 Class 1
Power Supply	10 x AA alkaline batteries (included) or 12 – 18 V DC mains/line adapter for 115/230 VAC (included)



## GRAS 12AG

### 8-Channel Power Module with Gain, Filters and SysCheck Generator



12AG is an 8-channel mains/line operated power module, but can also be powered by an external DC supply. It is built for multi-channel acoustic measurements, using pre-amplifiers and condenser microphones.

Each channel offers a choice of linear response, A-weighting and high pass filters, and has a built-in 1000 Hz oscillator, which enables a complete channel check when used in conjunction with preamplifiers having SysCheck or similar facility. The polarization voltage can be set to either 200 V or 0 V allowing the use of either externally polarized and prepolarized microphone cartridges. The preamplifier supply voltage can be selected internally to either 28 V or 120 V.

Each channel has a 7-pin LEMO 1B input connector for a microphone preamplifier, as well as indicators for instantaneous and latched overloads.

The gain in each channel can be selected individually in steps of 10 dB from 0 dB up to +50 dB. The high-pass filters are 3-pole Butterworth filters with a -1dB cut-off frequency at 20 Hz to remove unwanted low frequency signals, for example caused by wind-induced noise around the microphones. Two of these Power Modules can be mounted in the AK0040 Standard 19" Rack Kit.

Specifications	12AG
Input Channels	8 x 7-pin LEMO 1B connectors
Output Channels	8 x BNC sockets
Gain Settings	0 dB, +10 dB, +20 dB, +30 dB, +40 dB, +50 dB
Preamplifier Supply	28 V or 120 V
Polarization Voltage	0 V or 200 V
Frequency Response	3.5 Hz – 200 kHz
A-weighting network	IEC 60651 Type 0 and IEC 61672 Class 1
Output Impedance	30 $\Omega$
Power Supply	12 – 18 V DC mains/line adapter for 115/230 VAC (included)

## GRAS 12AB

### 2-Channel Power Module for GRAS Intensity Probes



12AB is a 2-channel, battery-operated, microphone power module for use with the GRAS 50AI-B/-C/-D Sound Intensity Probe.

It has a 12-pin LEMO 1B input connector for direct connection with the intensity probe and two BNC output sockets for the microphone signals. It also has a 9-pin D-sub socket for connecting to the RS-232 port of a computer for software control of the remote control facilities of the GRAS 50AI Sound Intensity Probe.

A battery indicator is included to monitor battery condition as well as an input socket for an external power supply.

12 of these Power Modules can be mounted in the AK0040 Standard 19" Rack Kit.

Specifications	12AB
Input Channels	2 via 12-pin LEMO 1B connectors
Output Channels	2 x BNC sockets and 9-pin D-sub socket
Preamplifier Supply	28 V or 120 V
Polarization Voltage	0 V or 200 V
Frequency Response	0.05 Hz – 200 kHz
Power Supply	10 x AA alkaline batteries (included) or 12 – 18 V DC mains/line adapter for 115/230 VAC (included)



## GRAS 12AQ

**2-Channel Universal Power Module  
with Signal Conditioning and PC Interface**



12AQ is a 2-channel power module for powering microphone preamplifiers requiring a constant-current or constant voltage power supply. 12AQ is for general use in acoustic measurements as well as for intensity measurements, both in the laboratory and in the field. It has facilities for both manual control and remote control. Manual control is via front-panel switches and push buttons. Remote control is via RS-232 interface.

If a special filter function such as a HP-filter, LP-filter or BP-filter is required, it can easily be implemented in the module, as 12AQ is prepared with slots for extra filters.

Specifications	12AQ
Traditional preamp. input:	
Connector	7-pin LEMO
Power Supply	$\pm 15\text{V}$ or $\pm 60\text{V}$
Polarization	0 V or 200 V
CCP Preamplifier Input:	
Connector	BNC coaxial
Power Supply	4 mA sourced at 28 V DC
Signal Output	BNC coaxial connector
Gain	Adjusted, steps of 10 dB from -20 dB to +70 dB
Frequency Range	2 Hz to 200 kHz $\pm 0.2\text{ dB}$
Filters	HP filter 20 Hz. A-weighting IEC 61672 Class 1
Control Interface to host	Smart RS-232, MSG line
Power Supply	6 x LR14 alkaline batteries (included) or 8 – 18 V DC mains adapter for 115/230 VAC (included)

## GRAS 12AL

**1-Channel CCP Power Module  
with A-weighting Filter**



12AL is a 1-channel CCP Power Module for powering microphone preamplifiers requiring a constant-current power supply, e.g., 26CB and 26CA. It can also power the 40SC Probe Microphone as well as the 40PH and 40PL Array Microphones.

12AL covers the frequency range from 1 Hz to 200 kHz and has a switchable A-weighting network and overload indicator. It is powered either by two internal batteries (LR6-AA) or by an external 3–6 V DC supply.

Specifications	12AL
Input Channel	BNC socket
Output Channel	BNC socket
Transducer Supply Current	4 mA sourced from 28 V
Frequency Response	1 Hz – 200 kHz
A-Weighted Network	IEC 60651 Type 0 and IEC 61672 Class 1
Power Supply	2 x AA alkaline batteries (included) or 3 – 6 V DC mains adapter for 115/230 VAC (not included)



## GRAS 12AN

### 4-Channel Power Module



12AN is a 4-channel power module for general use. It is a cost-effective solution with direct coupling (no filters), and is therefore ideally suited for infra-sound measurements. It can be used with all standard LEMO microphone sets and standard front-ends or acquisition units.

## GRAS 12AX

### 4-Channel CCP Power Module



12AX is a 4-channel power module for production line testing. It has three gain settings for optimization of the signal-to-noise performance. It can be used with all standard CCP microphone sets and standard front-ends or acquisition units.

Specifications	12AN	12AX
Input Channels	4 x 7-pin LEMO 1B connector	4 x BNC sockets
Output Channels	4 x BNC sockets	4 x BNC sockets
Gain	-	0 dB, +20 dB, +40 dB
Preamplifier Supply	+/- 15 V	5 mA @ 28 V
Polarization	0 V or 200 V	0 V
Frequency Response	0.05 Hz – 200 kHz +/- 0.2 dB	1 to 300 kHz (+1/-3 dB @ Gain = 0 dB)
Power Supply (included)	4 x AA batteries or 6 – 20 V DC mains adapter for 115/230 VAC	6 – 20 V DC mains/line adapter for 115/230 VAC



## GRAS 12AU

### 1-Channel Universal Power Module with Signal Conditioning and Power Amplifier



12AU is a combined power module and power amplifier, optimized for production line testing of micro-speakers and receivers.

It will supply a CCP or a LEMO microphone set and condition the measured signal. In addition, it will drive a loud-speaker and continuously monitor the current and voltage for easy derivation of typical loudspeaker test parameters.

It is remotely controlled via its USB interface and, for this purpose, is delivered with a control program for Microsoft Windows®.

It can be mounted in a 19" rack.

Specifications		12AU
Traditional input	Connector	7-pin LEMO 1B series
	Power Supply	$\pm 15$ V
CCP Input	Connector	BNC
	Power Supply	28 V / 4 mA
Polarization		0 V / 200 V (remote controlled)
Output		BNC floating (2 k $\Omega$ /100 nF to power ground)
Gain		0 – 50 dB in 10 dB steps ( $\pm 0.2$ dB) (remote controlled)
Bandwidth (-3dB)		1 Hz to 100 kHz
Noise (relative to input) Input shorted ( $\geq 20$ dB gain) Input loaded with 20pF dummy mic.		< 1.5 $\mu$ Vrms (20 Hz – 20 kHz) < 5 $\mu$ Vrms (20 Hz – 20 kHz)
High Pass Filter (remote controlled)		1 Hz (1. order) or 20 Hz (3. order Butterworth)
Max Output Current		+/- 1.4 A
Overload Detection (voltage & current)		LED indicators (remote controlled reading and reset)
Current Output (voltage/current ratio)		1 V DC/1 A or 10 V DC/1 A
Power Supply		115/230 VAC





## GRAS 12BA, 12BB and 12BE

### 1-, 2-, and 4-Channel CCP Power Modules with TEDS



GRAS 12BA, 12BE and 12BB are USB-powered CCP power modules with one to four channels, respectively. they provide power to microphone sets without signal degradation, gain modification, or attenuation.

Power for these modules is provided through the USB cable using a USB 2.0 or USB 3.0 port on the PC and a USB-C port on the power module.

They are a simple and cost-effective interface between TEDS-enabled measurement microphones and any Audio Precision APx series analyzer that will automatically extract TEDS data. They also enable full SysCheck2TM functionality when connected to APx500 release v7.0 Measurement Software and an Audio Precision APx series analyzer, or with an Audio Precision APx series analyzer with CCP and TEDS read/write capability.

However, these power modules can also be used with other brands. In this case, a TEDS utility program provides access to TEDS data on a PC.

Specifications		12BA	12BE	12BB
Input Channels	BNC socket	1	2	4
Output Channels	BNC socket	1	2	4
Preamplifier Supply	mA	4 @ 24 V		
Polarization Voltage	V	0		
Frequency Response	Hz	10 – 200 k		
Power Supply	V via USB	5		

## GRAS 12BC, 12BD and 12BF

### 1-, 2-, and 4-Channel LEMO Power Modules with TEDS



GRAS 12BC, 12BF and 12BD are USB-powered LEMO power modules with one to four channels, respectively. they provide power to microphone sets without signal degradation, gain modification, or attenuation.

Power for the 12BB is provided through the USB cable using a USB 2.0 or USB 3.0 port on the PC and a USB-C port on the power module. A power adaptor is included.

It is intended as a simple and cost-effective interface between TEDS-enabled measurement microphones and any Audio Precision APx series analyzer that will automatically extract TEDS data for seamless integration.

However, it can also be used with other brands. In this case, a utility program provides access to TEDS data on a PC.

Specifications		12BA	12BE	12BB
Input Channels	LEMO	1	2	4
Output Channels	BNC socket	1	2	4
Preamplifier Voltage	V DC	±15 @ 30 mA		
Polarization Voltage	V	200		
Frequency Response	Hz	10 – 200 k		
Power Supply	V via USB	5		

