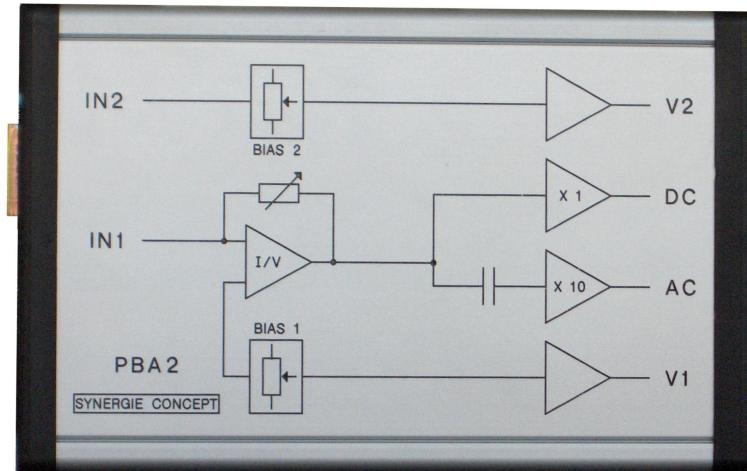
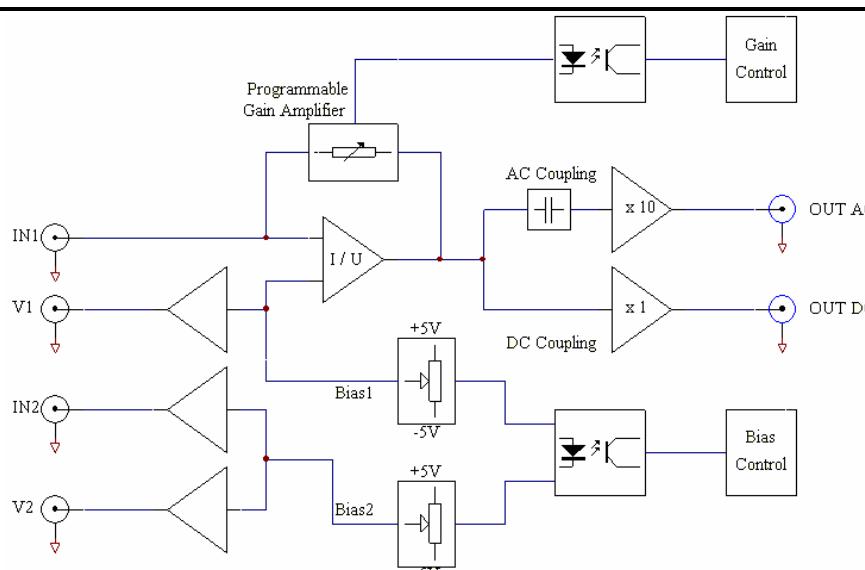


## Programmable Gain and Bias Amplifier Low noise I/V amplifier



Features	<ul style="list-style-type: none"> <li>• Programmable Gain from <math>1 \times 10^3</math> to <math>1 \times 10^8</math> V/A</li> <li>• Bandwidth DC / 1 Hz... 500 kHz</li> <li>• Two Programmable Voltage Outputs for Biasing</li> </ul>
Applications	<ul style="list-style-type: none"> <li>• Low Noise Current Amplifier</li> </ul>
Block Diagram	 <p>The block diagram illustrates the internal architecture of the PBA2. It features four input terminals (IN1, V1, IN2, V2) connected to an input stage. This stage includes an I/U converter and a programmable gain amplifier. The gain of the amplifier is controlled by a "Gain Control" potentiometer. Simultaneously, the signal passes through a biasing network consisting of two voltage-controlled voltage sources (Bias1 and Bias2), which are themselves controlled by "Bias Control" potentiometers. One output path from the I/U converter is coupled acoustically (AC Coupling) and amplified by a factor of 10 (x10) to provide the "OUT AC" signal. The other output path is coupled directly (DC Coupling) and amplified by a factor of 1 to provide the "OUT DC" signal.</p>



		<b>Programmable Gain and Bias Amplifier</b>							
<b>Specifications</b>		<b>Test Conditions</b>		<b>T<sub>a</sub> = 25°C</b>					
Gain		Transimpedance Gain Accuracy		1 x 10 <sup>3</sup> ... 1 x 10 <sup>8</sup> V/A ± 1%					
Frequency Response		Lower Cut-Off Frequency Upper Cut-Off Frequency Gain Flatness		DC / 0.5 Hz Up to 500 kHz ( See Table Below ) ± 0.1 dB					
Input		Equ. Input Noise Voltage Input Bias Current		4 nV / √Hz ( @ 100 Hz ) 1 pA typ. ( maximum 3 pA )					
Performance depending on Gain Setting		Sensitivity ( A/V ) Sensitivity ( A/V )	DC AC	10 <sup>-2</sup> 10 <sup>-3</sup>	10 <sup>-3</sup> 10 <sup>-4</sup>	10 <sup>-4</sup> 10 <sup>-5</sup>	10 <sup>-5</sup> 10 <sup>-6</sup>	10 <sup>-6</sup> 10 <sup>-7</sup>	10 <sup>-7</sup> 10 <sup>-8</sup>
		Upper Cut-Off Frequency (-3dB) Equ Input Noise Current (A/√Hz) Max. biasing Current (±) Max. Offset Voltage		500 kHz 200 pA 10 mA 100 μA	480 kHz 98.2 pA 10 mA 10 μA	510 kHz 10.1 pA 1 mA 1 μA	290 kHz 1.1 pA 100 μA 0.1 μA	138 kHz 168 fA 10 μA 10 nA	33 kHz 44.9 fA 0.1 μA 1 nA
Output		Output Voltage Output Voltage for Biasing Output Impedance Maximum Output Current		± 10 V ( @ 10 kΩ Load ) ± 5 V ( 0.1% Precision ) 50 Ω ± 20 mA					
Digital Control		Control Input Voltage Range Control Input Current		Low : - 0.8 V ... + 1.2 V, High : 2.3 V ... + 5.25 V 1.5 mA @ 0 V, 4.5 mA @ + 5 V					
Power Supply		Supply Voltage Supply Current max Stabilized Power Supply Output		± 14 V + 100 mA / - 100 mA ± 12 V, maximum 100 mA, + 5 V, maximum 40 mA					
Case		Weight		380 gr.					
Temperature Range		Storage Temperature Operating Temperature		- 40 °C + 100 °C 0 °C + 60 °C					
Absolute Max. Ratings		Control Input Voltage Power Supply Voltage		+ 5.25 V ± 15 V					



## Programmable Gain and Bias Amplifier

Connectors	Input	BNC, Isolated
	Output	BNC isolated
	Power Supply	LEMO Series 0S, 3-pin fixed Socket Pin 1 : - 15 V Pin 2 : GND Pin 3 : + 15 V
		
Control Port		Sub-D 15-pin, female, Quality Class 2 Pin 1 : Potentiometer Low F Pin 2 : Potentiometer Hight R Pin 3 : Incrementation Input 1 G Pin 4 : Incrementation Input 2 H Pin 5 : Up / Down D Pin 6 : Selection Gain C C Pin 7 : Selection Gain B B Pin 8 : Selection Gain A A Pin 9 : + 5 V Pin 10 : Bias 2 Sens +/- Pin 11 : Bias 1 Sens +/- Pin 12 : NC Pin 13 : NC Pin 14 : NC Pin 15 : GND



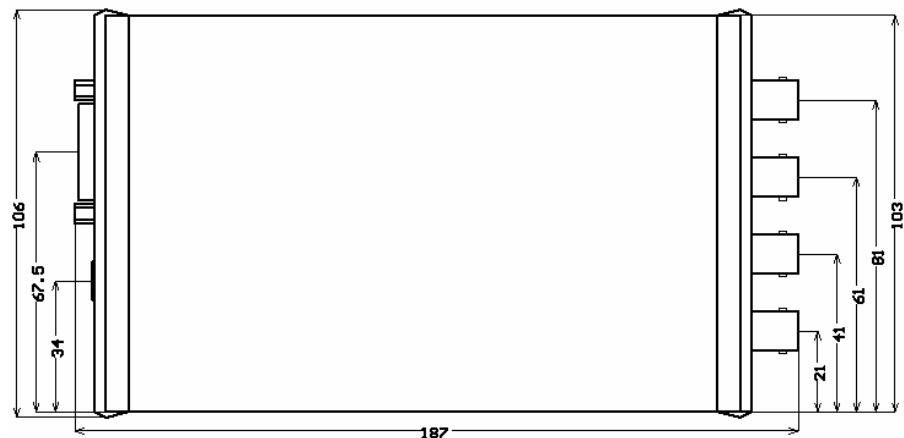
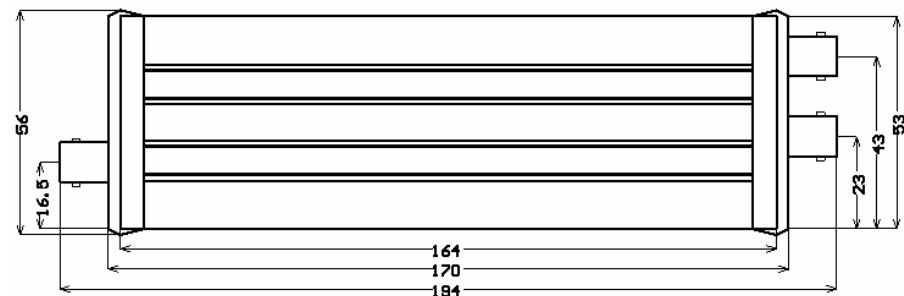
## Programmable Gain and Bias Amplifier

Remote Control Operation	Gain Setting	A	B	C			Gain ( DC )	Gain ( AC )		
		OFF	OFF	OFF						
		ON	OFF	OFF			$10^2$	$10^3$		
		OFF	ON	OFF			$10^3$	$10^4$		
		ON	ON	OFF			$10^4$	$10^5$		
		OFF	OFF	ON			$10^5$	$10^6$		
		ON	OFF	ON			$10^6$	$10^7$		
		OFF	ON	ON			$10^7$	$10^8$		
Bias Voltage Setting		U/ D	CS / PL	CS / PH	INC1	INC2	Mode	Incrementation Value		
		ON	ON	ON				Stand By		
		OFF	ON	OFF				Incrementation - 50,5 mV		
		OFF	ON	OFF				Input 1 Incrementation - 50,5 mV		
		OFF	OFF	ON				Input 2 Incrementation - 5,05 mV		
		OFF	OFF	ON				Input 1 Incrementation - 5,05 mV		
		ON	ON	OFF				Input 2 Incrementation + 50,5 mV		
		ON	ON	OFF				Input 1 Incrementation + 50,5 mV		
		ON	OFF	ON				Input 2 Incrementation + 5,05 mV		
		ON	OFF	ON				Input 1 Incrementation + 5,05 mV		
CS Potentiometer Low CS Potentiometer Hight Incrementation Input 1 Incrementation Input 2 Up / Down					CS / PL CS / PH INC 1 INC 2 U / D					
		Bias Sens +/-		Logic Level		Mode				
		Bias 1		Low ( 0V )		negative polarization				
		Bias 1		Hight ( 5V )		positive polarization				
		Bias 2		Low ( 0V )		negative polarization				
		Bias 2		Hight ( 5V )		positive polarization				



## Programmable Gain and Bias Amplifier

Dimensions



SYNERGIE CONCEPT  
 7 Chemin des Près – 4403 ZIRST  
 38240 Meylan – France  
 Tel. : (33) 04 – 76 – 41 – 88 - 58  
 Fax : (33) 04 – 76 – 41 – 36 - 37  
 e-mail : synergie.concept@free.fr