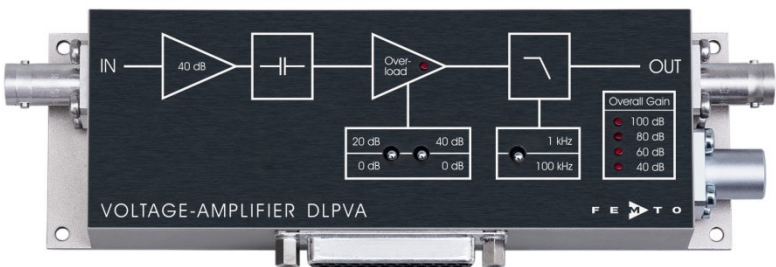


Datasheet

DLPVA-100-BUN-S

Ultra-Low-Noise Variable Gain
Low-Frequency Voltage Amplifier



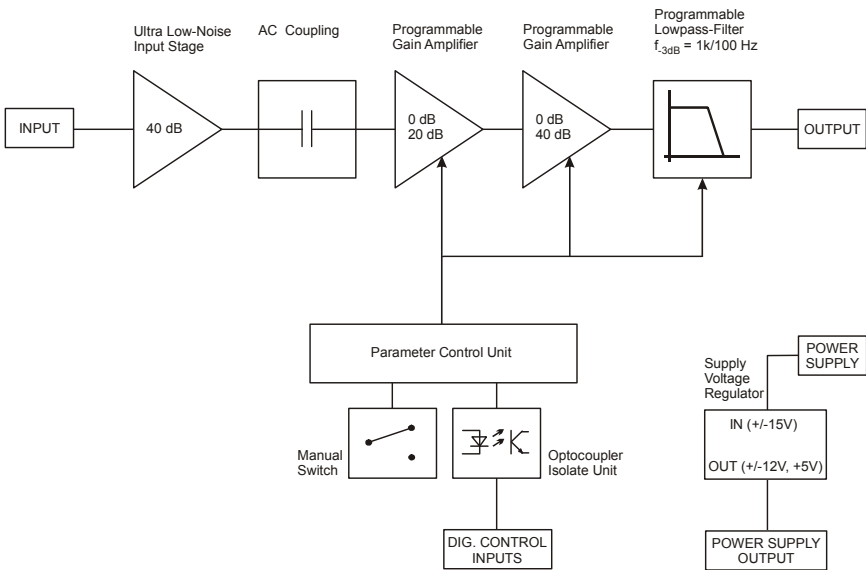
Features

- Variable gain 40 to 100 dB, switchable in 20 dB steps
- Bipolar input stage, recommended for low impedance sources smaller than 50 Ω
- Ultra low input voltage noise: 400 pV/√Hz
- AC coupled, single ended
- Bandwidth 1.5 Hz - 100 kHz, switchable to 1 kHz
- Local and remote control

Applications

- Ultra low-noise laboratory amplifier
- Pulsed thermal EMF analysis
- Chopped thermopiles / bolometers
- Industrial sensors
- Detector preamplifier
- Integrated measurement systems

Block Diagram

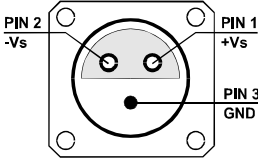


BS01-0445-20_R2

Ultra-Low-Noise Variable Gain Low-Frequency Voltage Amplifier

Specifications	Test conditions	$V_s = \pm 15 \text{ V}$, $T_A = 25 \text{ }^\circ\text{C}$, load impedance = $1 \text{ M}\Omega$		
Gain	Gain values	40, 60, 80, 100 dB indicated by four LEDs		
	Gain accuracy	$\pm 1 \%$		
Frequency Response	Lower cut-off frequency	1.5 Hz		
	Upper cut-off frequency	100 kHz, 12 dB/Oct switchable to 1 kHz, 6 dB/Oct.		
Time Response	Rise/fall time (10 % - 90 %)	3.5 μs (@ BW = 100 kHz)		
		350 μs (@ BW = 1 kHz)		
Input	Input impedance	1 k Ω typ.		
	Equivalent input voltage noise	Gain setting	Noise	
		100 dB	400 pV/ $\sqrt{\text{Hz}}$	
		80 dB	420 pV/ $\sqrt{\text{Hz}}$	
		60 dB	800 pV/ $\sqrt{\text{Hz}}$	
		40 dB	6 nV/ $\sqrt{\text{Hz}}$	
	Equivalent input current noise	5,5 pA/ $\sqrt{\text{Hz}}$		
	1/f-noise corner	100 Hz		
	Input bias current	30 μA		
	Maximum input DC-offset voltage for linear amplification	$\pm 90 \text{ mV}$		
	Important notice: The input must see a source impedance below 200Ω .			
	Output	Output impedance	<100 Ω (terminate with > 100 k Ω load for best performance)	
		Output voltage range for linear amplification	$\pm 10 \text{ V}$ (@ > 100 k Ω load)	
Output current (max.)		$\pm 20 \text{ mA}$		
Output overload recovery time		0.5 ms (after 20x overload)		
Overload LED	The amplifier features a LED to signalize an overload condition. The Overload LED will turn on if the signal level within the signal path exceeds the linear operating range. In order to ensure the correct operation of the amplifier without signal distortions reduce the gain setting until the Overload LED turns off.			
	The Overload LED may also turn on when the amplifier is operated with open input or with a high source impedance, e. g. external AC coupling. In this case the bias current may cause a considerable input voltage. For proper operation please use a source impedance of less than 100 Ω or switch to a lower gain setting.			
Remote Digital Control	Control input voltage range	Low: $-0.8 \dots +0.8 \text{ V}$ High: $+1.8 \dots +12 \text{ V}$, TTL / CMOS compatible		
	Control input current	0 mA @ 0 V, 1.5 mA @ +5 V, 4.5 mA @ +12 V		
	Overload output	Non active: +5 V, max. 1 mA, active: 0.8 V, max. -10 mA		
Power Supply	Supply voltage	$\pm 15 \text{ V}$ ($\pm 14.5 \text{ V}$ to $\pm 16 \text{ V}$)		
	Supply current	$\pm 55 \text{ mA}$ typ. (depends on operating conditions, recommended power supply capability min. $\pm 150 \text{ mA}$)		

Ultra-Low-Noise Variable Gain Low-Frequency Voltage Amplifier

<p>Specifications (continued)</p> <p>Case</p> <p>Temperature Range</p>	<p>Weight 0.32 kg (0.7 lbs)</p> <p>Material AlMg4.5Mn, nickel-plated</p> <p>Storage temperature -40 °C to +70 °C</p> <p>Operating temperature 0 °C to +55 °C</p>
<p>Absolute Maximum Ratings</p>	<p>Power supply voltage ± 21 V</p> <p>Control input voltage +16 V / -5 V</p> <p>Signal input voltage ± 4 V</p> <p>Overvoltage at the signal input can severely degrade the noise performance or destroy the amplifier!</p>
<p>Connectors</p>	<p>Input BNC jack (female)</p> <p>Output BNC jack (female)</p> <p>Power supply</p> <p>Lemo® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)</p> <p>Pin 1: +15V</p> <p>Pin 2: -15V</p> <p>Pin 3: GND</p>  <p>Control port</p> <p>Sub-D 25-pin, female</p> <p>Pin 1: +12 V (stabilized power supply output, max. 60 mA*)</p> <p>Pin 2: -12 V (stabilized power supply output, max. 60 mA*)</p> <p>Pin 3: AGND (analog ground)</p> <p>Pin 4: +5 V (stabilized power supply output, max. 15 mA*)</p> <p>Pin 5: digital output: overload</p> <p>Pin 6: NC</p> <p>Pin 7: NC</p> <p>Pin 8: NC</p> <p>Pin 9: DGND (ground f. digital control Pin 10 - 25)</p> <p>Pin 10: NC</p> <p>Pin 11: digital control input: gain, LSB</p> <p>Pin 12: digital control input: gain, MSB</p> <p>Pin 13: NC</p> <p>Pin 14: digital control input: 100 kHz / 1 kHz</p> <p>Pin 15 - 25: NC</p> <p>*check power supply for maximum deliverable current</p>

Ultra-Low-Noise Variable Gain
Low-Frequency Voltage Amplifier

Remote Control Operation

General

Remote control input bits are opto-isolated and connected by logical OR to local switch setting. For remote control set the corresponding local switch to “0 dB” and “1 kHz” and select the wanted setting via a bit-code at the corresponding digital inputs.
Mixed operation, e.g. local gain setting and remote controlled bandwidth setting, is also possible.

Gain setting

<u>Gain</u>	<u>Pin 11</u>	<u>Pin 12</u>
40 dB	low	low
60 dB	high	low
80 dB	low	high
100 dB	high	high

Bandwidth setting

<u>Bandwidth</u>	<u>Pin 14</u>
1 kHz	low
100 kHz	high

Typical Performance
Characteristics

