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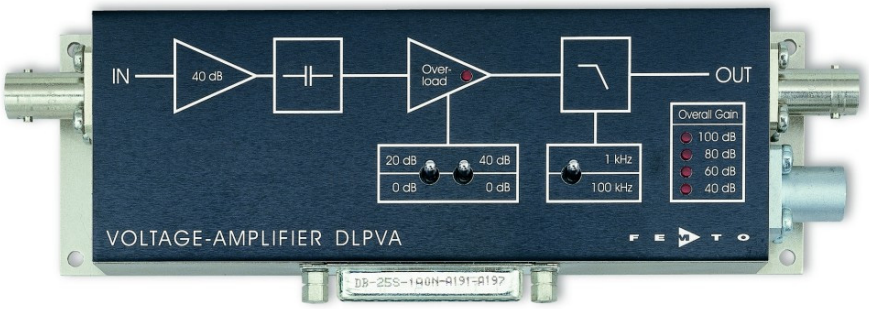
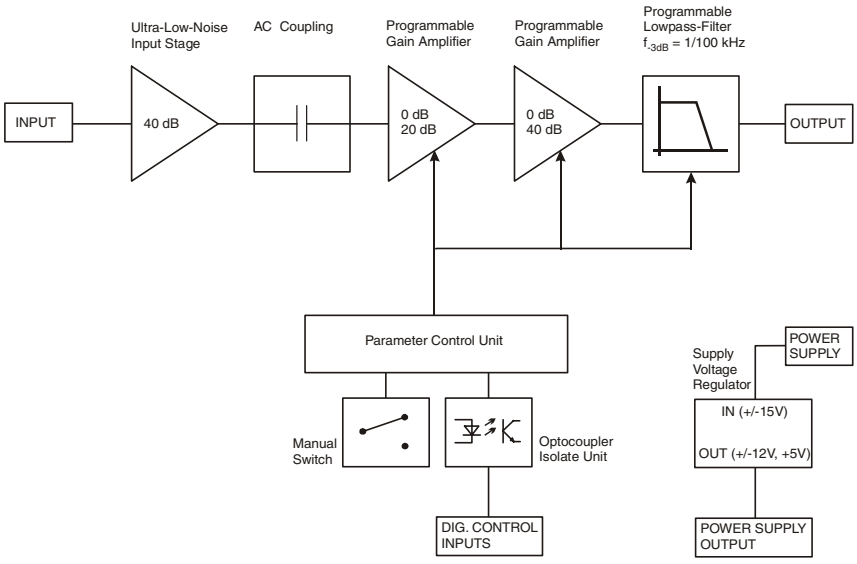
Datasheet DLPVA-100-BUN-S

Ultra Low Noise Variable Gain Low Frequency Voltage Amplifier



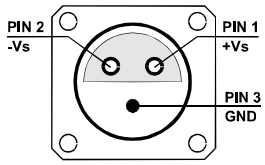
Features	• **Variable Gain 40 to 100 dB, Switchable in 20 dB Steps** • **Bipolar Input Stage, Recommanded for Low Impedance Sources Smaller than 50 Ω** • **Ultra low Input Voltage Noise: 400 pV/√Hz** • **AC Coupled, Single Ended** • **Bandwidth 1.5 Hz - 100 kHz, Switchable to 1 kHz** • **Local and Remote Control**
Applications	• **Ultra-Low-Noise Laboratory Amplifier** • **Pulsed Thermal EMF Analysis** • **Chopped Thermopiles / Bolometers** • **Industrial Sensors** • **Detector Preamplifier** • **Integrated Measurement Systems**
Block Diagram	

Ultra Low Noise Variable Gain Low Frequency Voltage Amplifier

Specifications	*Test Conditions*	*Vs = ± 15 V, Ta = 25°C*	
Gain	Gain Values	40, 60, 80, 100 dB indicated by four LEDs	
	Gain Accuracy	± 0.1 %	(between settings)
		± 1 %	(overall)
	Gain Flatness	± 0.1 dB	
Frequency Response	Lower Cut-Off Frequency	1.5 Hz	
	Upper Cut-Off Frequency	100 kHz, switchable to 1 kHz	
	Upper Cut-Off Frequency Rolloff	12 dB/Oct.	
Time Response	Rise / Fall Time (10% - 90%)	3.5 µs (@ BW = 100 kHz) 350 µs (@ BW = 1 kHz)	
Input	Input Impedance	1 kΩ	
	Equivalent Input Voltage Noise	Gain Setting	Noise
		100 dB	400 pV/√Hz
		80 dB	420 pV/√Hz
		60 dB	800 pV/√Hz
		40 dB	6 nV/√Hz
	Equivalent Input Current Noise	3 pA/√Hz	
	1/f-Noise Corner	100 Hz	
	Input Bias Current	30 µA	
	Maximum Input DC-Offset Voltage for Linear Amplification	± 90 mV	
	Important Notice: The input must see a source Impedance below 200 Ω to function properly!		
Output	Output Impedance	50 Ω (terminate with > 10 kΩ for best performance)	
	Output Voltage Range for linear Amplification	± 10 V (@ > 10 kΩ load)	
	Output Current (max.)	± 20 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. 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 ...+ 0.8 V High: + 1.8 ... + 12 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	± 15 V (± 14.5 V to ± 16 V)	
	Supply Current	± 55 mA typ. (depends on operating conditions, recommended power supply capability minimum 150 mA)	
Case	Weight	0.32 kg (0.7 lbs)	
	Material	AlMg4.5Mn, nickel-plated	

Ultra Low Noise Variable Gain Low Frequency Voltage Amplifier

Temperature Range	Storage Temperature Operating Temperature	- 40 °C to + 100 °C 0 °C to + 60 °C
Absolute Maximum Ratings	Power Supply Voltage Control Input Voltage Signal Input Voltage	± 21 V + 16 V / - 5 V ± 4 V
	Overvoltage at the signal input can severely degrade the noise performance or destroy the amplifier!	
Connectors	Input Output	BNC BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND
	Control Port	Sub-D 25-pin, female, qual. class 2 Pin 1: +12 V (stabilized power supply output, max. 100 mA) Pin 2: -12 V (stabilized power supply output, max. 100 mA) Pin 3: AGND (analog ground) Pin 4: +5 V (stabilized power supply output, max. 50 mA) Pin 5: digital output: overload Pin 6: NC Pin 7: NC Pin 8: NC Pin 9: DGND (ground f. digital control Pin 10 - 25) Pin 10: NC Pin 11: digital control input: gain, LSB Pin 12: digital control input: gain, MSB Pin 13: NC Pin 14: digital control input: 100 kHz / 1 kHz Pin 15 - 25: NC



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 a switch setting, 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

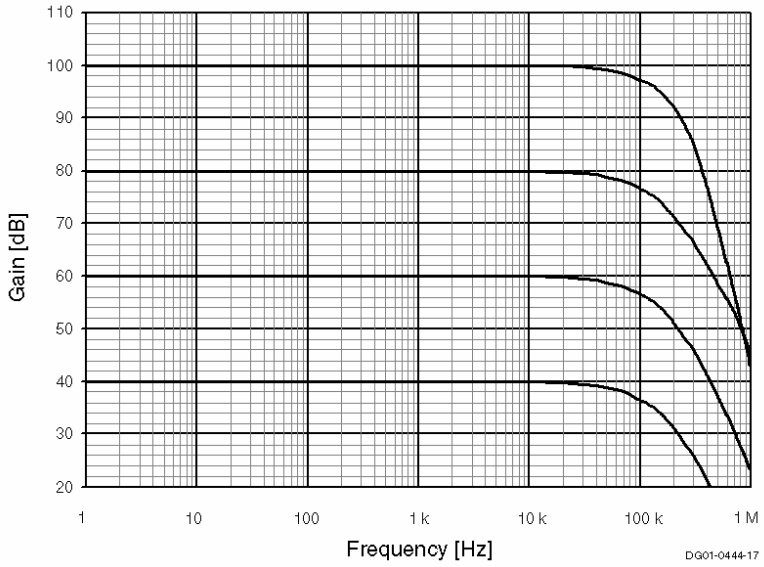
Gain	Pin 11	Pin 12
40 dB	low	low
60 dB	high	low
80 dB	low	high
100 dB	high	high

Bandwidth Setting

Bandwidth	Pin 14
1 kHz	low
100 kHz	high

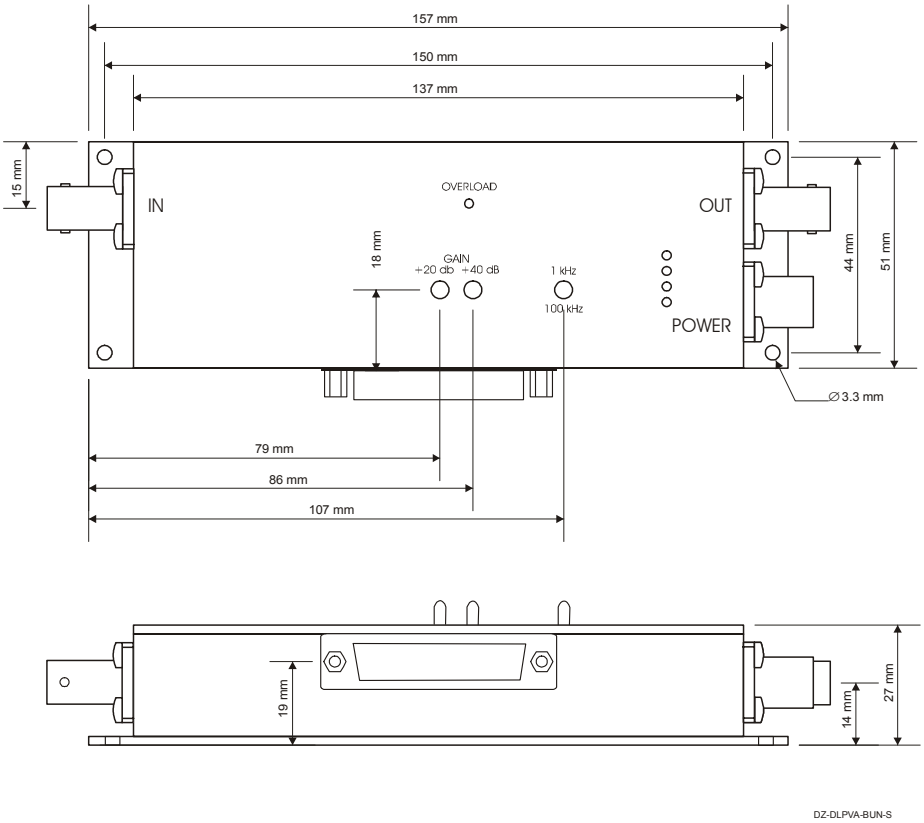
Typical Performance Characteristics

Frequency Response (Logarithmic)



Ultra Low Noise Variable Gain Low Frequency Voltage Amplifier

Dimensions



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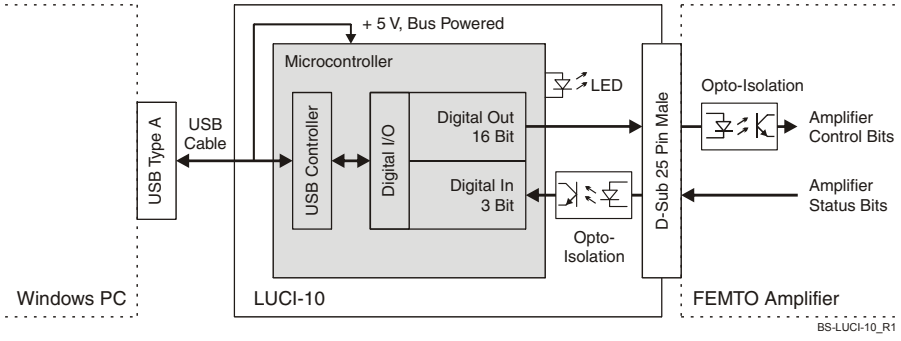
Datasheet LUCI-10

USB to D-Sub Control Interface for FEMTO Amplifiers

Features	• **Compact Digital I/O Interface for USB Remote Control of FEMTO Amplifiers** • **Supports Opto-Isolation of Amplifier Signal Path from PC USB Port** • **16 Digital Outputs, 3 Opto-Isolated Digital Inputs** • **Bus-Powered Operation** • **System Driver, Application Software and VI's for use with LabVIEW™ Included**
Applications	• **Remote Control of FEMTO® Amplifiers and Photoreceivers Directly from a PC**

Block Diagram



Hardware Specifications

General Characteristics	Bus Interface	USB 2.0 (full-speed)
	Digital I/O Channels	16 output lines 3 opto-isolated input lines
	Supply	PC USB port, + 5 V, typ. 100 mA, bus-powered (no auxiliary power supply required)
	Connectors	USB type A D-Sub, 25 pin, male
	Cable	AWG 28, length 1.8 m
Output	Number of Channels	16 output lines, supporting opto-isolation inside FEMTO amplifiers and photoreceivers
	Output Voltage Range	LOW bit: 0 … + 0.5 V (@ 0 … 2 mA output current) HIGH bit: + 4 … + 5.5 V (@ 0 … 2 mA output current)
	Max. Current	6 mA per channel
	Writing Rate	max. 800 operations per second

USB to D-Sub Control Interface for FEMTO Amplifiers

Input	Number of Channels	3 opto-isolated input lines
	Input Voltage Range	LOW bit: - 20 … + 1.5 V HIGH bit: + 3 … + 20 V
	Switching Current	1 mA typ. @ 5 V
	Reading Rate	max. 400 operations per second
Power Supply	USB Port, Bus Powered	+ 4.5 … + 5.5 V DC
	Active Current	max. 200 mA / typ. 100 mA
	Suspend Current	< 0.5 mA (standby mode of Windows®)
Case	D-Sub Case	metal hood (EMI/RFI shielding), with jack screws
	Weight	130 g (0.3 lb.)
	Material	zinc die-cast, nickel plated
Temperature Range	Storage Temperature	- 40 … + 100 °C
	Operating Temperature	0 … + 50 °C
Absolute Maximum Ratings	Max. Voltage at Input	+/- 30 V
	Max. Short Circuit Output Current	+/- 20 mA per channel, 200 mA total
	Max. Isolation Voltage	+/- 60 V (Input Ground to Output Ground)
Connectors	Device Port	D-Sub, 25 pin, male Pin 1: NC Pin 2: NC Pin 3: GND (IN) Pin 4: NC Pin 5: Digital IN Pin 6: Digital IN Pin 7: Digital IN Pin 8: NC Pin 9: GND (OUT) Pin 10: Digital OUT Low Byte, LSB Pin 11: Digital OUT Low Byte Pin 12: Digital OUT Low Byte Pin 13: Digital OUT Low Byte Pin 14: Digital OUT Low Byte Pin 15: Digital OUT Low Byte Pin 16: Digital OUT Low Byte Pin 17: Digital OUT Low Byte, MSB Pin 18: Digital OUT High Byte, LSB Pin 19: Digital OUT High Byte Pin 20: Digital OUT High Byte Pin 21: Digital OUT High Byte Pin 22: Digital OUT High Byte Pin 23: Digital OUT High Byte Pin 24: Digital OUT High Byte Pin 25: Digital OUT High Byte, MSB
	PC Port	USB type A

USB to D-Sub Control Interface for FEMTO Amplifiers

Software Specifications

Software (included on CD)

Device Driver	dynamic link library (DLL) for integration in Microsoft Windows® operating system for use with C/C++, LabWindows™ /CVI™ or LabVIEW™
Application Software	GUI (graphical user interface) programs for simple remote control of FEMTO amplifiers and photoreceivers provided as executable programs and LabVIEW projects
LabVIEW Programs	sample programs to control and test the LUCI-10 hardware (including front panel and block diagram)
LabVIEW Library	special VI toolkit for integration in LabVIEW development environment

Note: A National Instruments LabVIEW™ license is not included in this software package. For use of the GUI application programs the LabVIEW Run-Time Engine is required. If not detected on the host PC during the installation process the LabVIEW Run-Time Engine will be installed automatically from the CD.

System Requirements

Operating System	Microsoft Windows XP with Service Pack 2, or higher
Processor	Intel Pentium III or AMD Athlon, or better
System Memory	512 MB of RAM, or more
Hard Disk Space	about 200 MB
Interface Port	USB 1.1 or USB 2.0
Supported FEMTO Modules	any standard FEMTO amplifier or photoreceiver with 25 pin D-Sub socket, except model HLVA-100

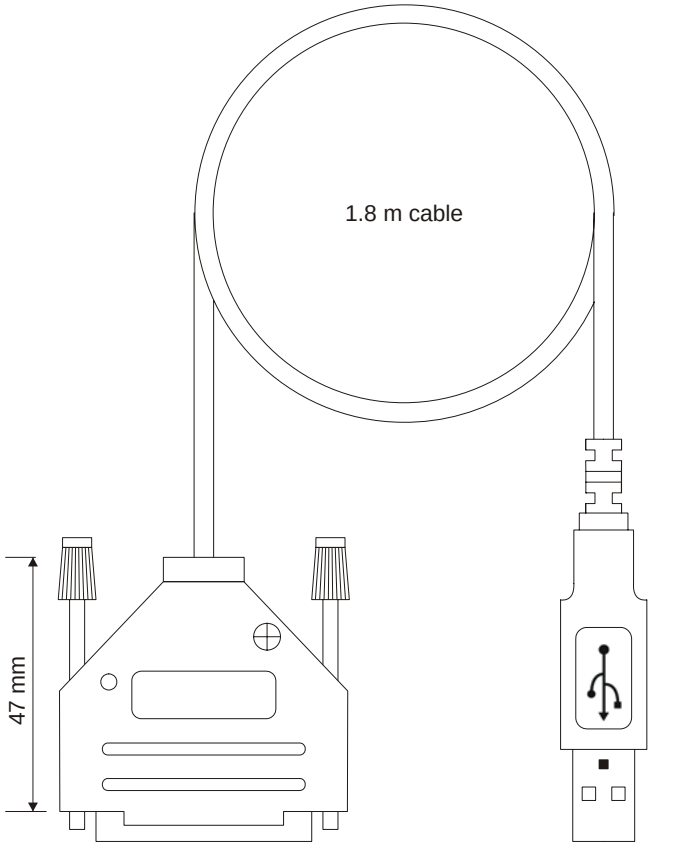
Optional Requirements

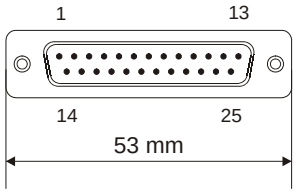
For development of own application programs an additional development environment like LabVIEW Version 8 (or higher) or C/C++ is required.

Legal Notice

USB to D-Sub Control Interface for FEMTO Amplifiers

Dimensions





DZ-LUCI-10_R1

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