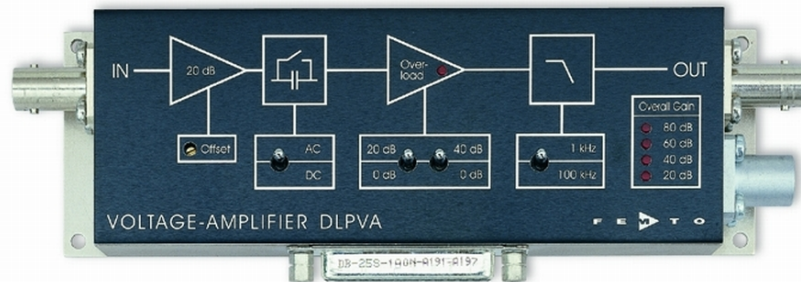




Datasheet

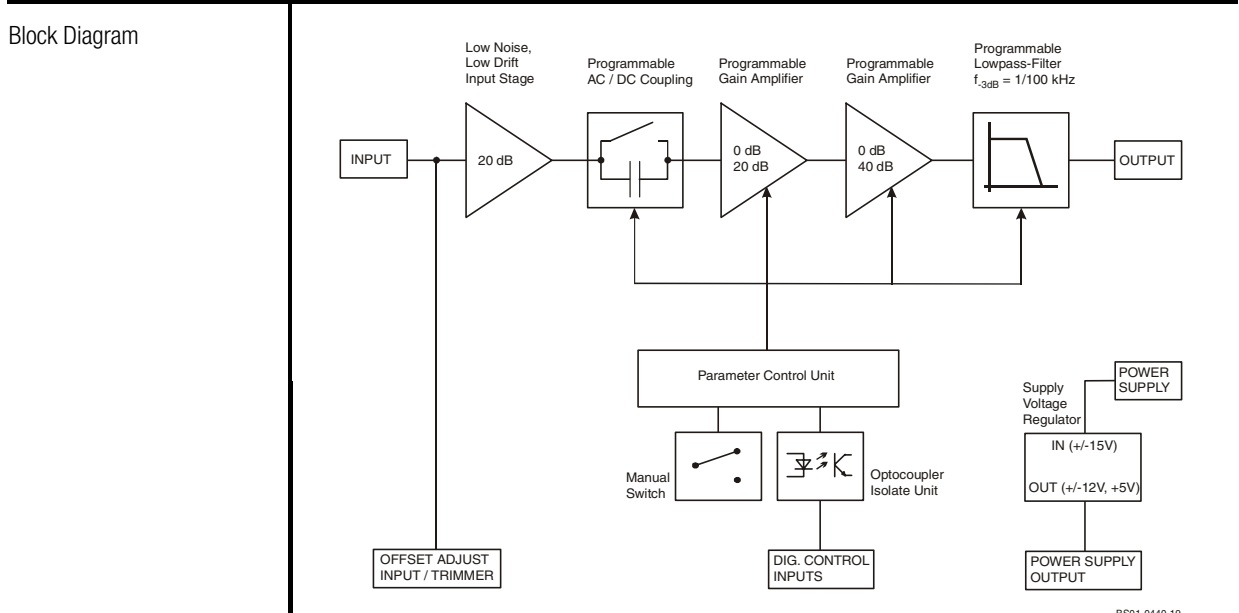
DLPVA-100-B Series

Variable Gain Low Frequency Voltage Amplifier



Features	<ul style="list-style-type: none"> • Variable Gain 20 to 80 dB, Switchable in 20 dB Steps • Bipolar Input Stage, Recommended for Low Impedance Sources Smaller than 1 kΩ • Single Ended and True Differential Input Models • Bandwidth DC - 100 kHz, Switchable to 1 kHz • 0.7 μV/°C DC-Drift • 120 dB CMRR • 2.4 nV/√Hz Input Noise • Switchable AC/DC-Coupling • Local and Remote Control
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Applications	<ul style="list-style-type: none"> • Universal Laboratory Amplifier • Automated Measurements • Industrial Sensors • Detector Preamplifier • Integrated Measurement Systems
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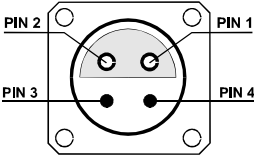
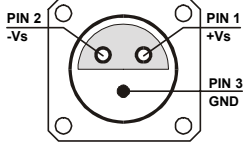
Variable Gain Low Frequency Voltage Amplifier

Specifications	<i>Test Conditions</i>	<i>V_s = ± 15 V, T_a = 25°C</i>		
Gain	Gain Values	20, 40, 60, 80 dB indicated by four LEDs		
	Gain Accuracy	± 0.1 %	(between settings)	
		± 1 %	(overall)	
Frequency Response	Gain Flatness	± 0.1 dB		
	Lower Cut-Off Frequency	DC, switchable to 1.5 Hz		
	Upper Cut-Off Frequency	100 kHz, switchable to 1 kHz		
Time Response	Upper Cut-Off Frequency Rolloff	12 dB/Oct.		
	Rise / Fall Time (10% - 90%)	3.5 μs (@ BW = 100 kHz) 350 μs (@ BW = 1 kHz)		
Input	Input Impedance	1 MΩ		
	Input Voltage Drift	0.7 μV/K		
	Equivalent Input Voltage Noise	Gain Setting	DLPVA-100-B-S	DLPVA-100-B-D
		60, 80 dB	2.4 nV/√Hz	3.6 nV/√Hz
		40 dB	6.4 nV/√Hz	7.3 nV/√Hz
		20 dB	60 nV/√Hz	60 nV/√Hz
	Equivalent Input Current Noise	2 pA/√Hz		
	1/f-Noise Corner	80 Hz		
	Input Bias Current	0.8 μA		
	Input Bias Current Drift	6 nA/°C		
Input Offset Voltage	± 4 mV, adjustable by offset trimmer and external control voltage			
Output	<i>True Differential Input, Model "DLPVA-100-B-D" only:</i>			
	Common Mode Voltage Range	± 9 V		
	CMRR	120 dB	(@ 100 Hz)	
		100 dB	(@ 10 kHz)	
		80 dB	(@ 60 kHz)	
	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)		

Variable Gain Low Frequency Voltage Amplifier

Overload LED	<p>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.</p> <p>The Overload LED may also turn on under the following operating conditions:</p> <ul style="list-style-type: none"> - The amplifier is operated with open input or with a high source impedance. For proper operation please use a source impedance of less than 1 kΩ for model “B-S” and less than 10 kΩ for model “B-D”, respectively, or switch to a lower gain setting. - When using a DLPVA-B-D with differential input stage the Overload LED may turn on if the common mode input voltage exceeds ± 5 V or if the source is totally floating with respect to the amplifier ground. For proper operation make sure that the common mode voltage stays within ± 5 V with respect to the amplifier ground and make a valid connection between the source ground and the amplifier ground to ensure that the inputs cannot drift outside the tolerable common mode range. 														
Remote Offset Control	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Offset Control Voltage Range</td> <td>± 10 V, corresponds to ± 4 mV input offset</td> </tr> <tr> <td>Offset Control Input Impedance</td> <td>200 kΩ</td> </tr> </table>	Offset Control Voltage Range	± 10 V, corresponds to ± 4 mV input offset	Offset Control Input Impedance	200 kΩ										
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Remote Digital Control	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Control Input Voltage Range</td> <td>Low: - 0.8 ... + 0.8 V High: + 1.8 ... + 12 V, TTL / CMOS compatible</td> </tr> <tr> <td>Control Input Current</td> <td>0 mA @ 0 V, 1.5 mA @ + 5 V, 4.5 mA @ + 12 V</td> </tr> <tr> <td>Overload Output</td> <td>Non active: + 5 V, max. 1 mA, active: 0.8 V, max. -10 mA</td> </tr> </table>	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								
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Power Supply	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Supply Voltage</td> <td>± 15 V (± 14.5 V to ± 16 V)</td> </tr> <tr> <td>Supply Current</td> <td>± 75 mA typ. (depends on operating conditions, recommended power supply capability minimum 150 mA)</td> </tr> </table>	Supply Voltage	± 15 V (± 14.5 V to ± 16 V)	Supply Current	± 75 mA typ. (depends on operating conditions, recommended power supply capability minimum 150 mA)										
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Case	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Weight</td> <td>0.32 kg (0.7 lbs)</td> </tr> <tr> <td>Material</td> <td>AlMg4.5Mn, nickel-plated</td> </tr> </table>	Weight	0.32 kg (0.7 lbs)	Material	AlMg4.5Mn, nickel-plated										
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Temperature Range	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Storage Temperature</td> <td>- 40 °C to + 100 °C</td> </tr> <tr> <td>Operating Temperature</td> <td>0 °C to + 60 °C</td> </tr> </table>	Storage Temperature	- 40 °C to + 100 °C	Operating Temperature	0 °C to + 60 °C										
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Absolute Maximum Ratings	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Power Supply Voltage</td> <td>± 21 V</td> </tr> <tr> <td>Control Input Voltage</td> <td>+ 16 V / - 5 V</td> </tr> <tr> <td colspan="2"><i>Single Ended Input, Model “DLPVA-100-B-S” only:</i></td> </tr> <tr> <td style="padding-right: 20px;">Signal Input Voltage</td> <td>± 4.5 V</td> </tr> <tr> <td colspan="2"><i>True Differential Input, Model “DLPVA-100-B-D” only:</i></td> </tr> <tr> <td style="padding-right: 20px;">Signal Input Differential Voltage</td> <td>± 7.7 V</td> </tr> <tr> <td>Signal Input Com. Mode Voltage</td> <td>± 12 V</td> </tr> </table>	Power Supply Voltage	± 21 V	Control Input Voltage	+ 16 V / - 5 V	<i>Single Ended Input, Model “DLPVA-100-B-S” only:</i>		Signal Input Voltage	± 4.5 V	<i>True Differential Input, Model “DLPVA-100-B-D” only:</i>		Signal Input Differential Voltage	± 7.7 V	Signal Input Com. Mode Voltage	± 12 V
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Variable Gain Low Frequency Voltage Amplifier

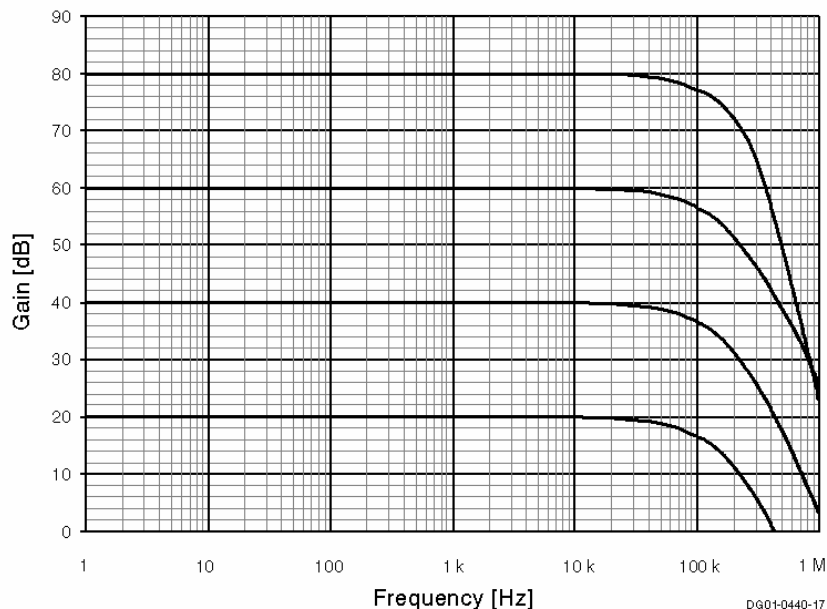
Connectors	<p>Input</p> <p><i>Single Ended Input, Model "DLPVA-100-B-S":</i> BNC</p> <p><i>True Differential Input, Model "DLPVA-100-B-D":</i> LEMO series 1S, 4-pin fixed socket</p> <p>Pin 1: non inverting input Pin 2: inverting input Pin 3: GND Pin 4: N.C.</p> 
	<p>Output</p> <p>BNC</p>
	<p>Power Supply</p> <p>LEMO series 1S, 3-pin fixed socket</p> <p>Pin 1: + 15V Pin 2: - 15V Pin 3: GND</p> 
	<p>Control Port</p> <p>Sub-D 25-pin, female, qual. class 2</p> <p>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: offset control voltage input 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: digital control input: AC/DC Pin 14: digital control input: 100 kHz / 1 kHz Pin 15 - 25: NC</p>

Variable Gain Low Frequency Voltage Amplifier

Remote Control Operation	<p>General</p> <p>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", "AC" 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.</p>															
Gain Setting	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="border-bottom: 1px solid black;">Gain</th> <th style="border-bottom: 1px solid black;">Pin 11</th> <th style="border-bottom: 1px solid black;">Pin 12</th> </tr> </thead> <tbody> <tr> <td>20 dB</td> <td>low</td> <td>low</td> </tr> <tr> <td>40 dB</td> <td>high</td> <td>low</td> </tr> <tr> <td>60 dB</td> <td>low</td> <td>high</td> </tr> <tr> <td>80 dB</td> <td>high</td> <td>high</td> </tr> </tbody> </table>	Gain	Pin 11	Pin 12	20 dB	low	low	40 dB	high	low	60 dB	low	high	80 dB	high	high
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AC/DC Setting	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="border-bottom: 1px solid black;">Coupling</th> <th style="border-bottom: 1px solid black;">Pin 13</th> </tr> </thead> <tbody> <tr> <td>AC</td> <td>low</td> </tr> <tr> <td>DC</td> <td>high</td> </tr> </tbody> </table>	Coupling	Pin 13	AC	low	DC	high									
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AC	low															
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Bandwidth Setting	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="border-bottom: 1px solid black;">Bandwidth</th> <th style="border-bottom: 1px solid black;">Pin 14</th> </tr> </thead> <tbody> <tr> <td>1 kHz</td> <td>low</td> </tr> <tr> <td>100 kHz</td> <td>high</td> </tr> </tbody> </table>	Bandwidth	Pin 14	1 kHz	low	100 kHz	high									
Bandwidth	Pin 14															
1 kHz	low															
100 kHz	high															

Typical Performance Characteristics

Frequency Response (Logarithmic)



Variable Gain Low Frequency Voltage Amplifier

<p>Dimensions</p>	
<p>Ordering Information</p>	<p>Available Models</p> <p>Model No.: DLPVA-100-B-S - Bipolar, single-ended input (BNC-connector input)</p> <p>Model No.: DLPVA-100-B-D - Bipolar, true differential input (LEMO-connector input)</p>

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Datasheet

LUCI-10

USB to D-Sub Control Interface for FEMTO Amplifiers



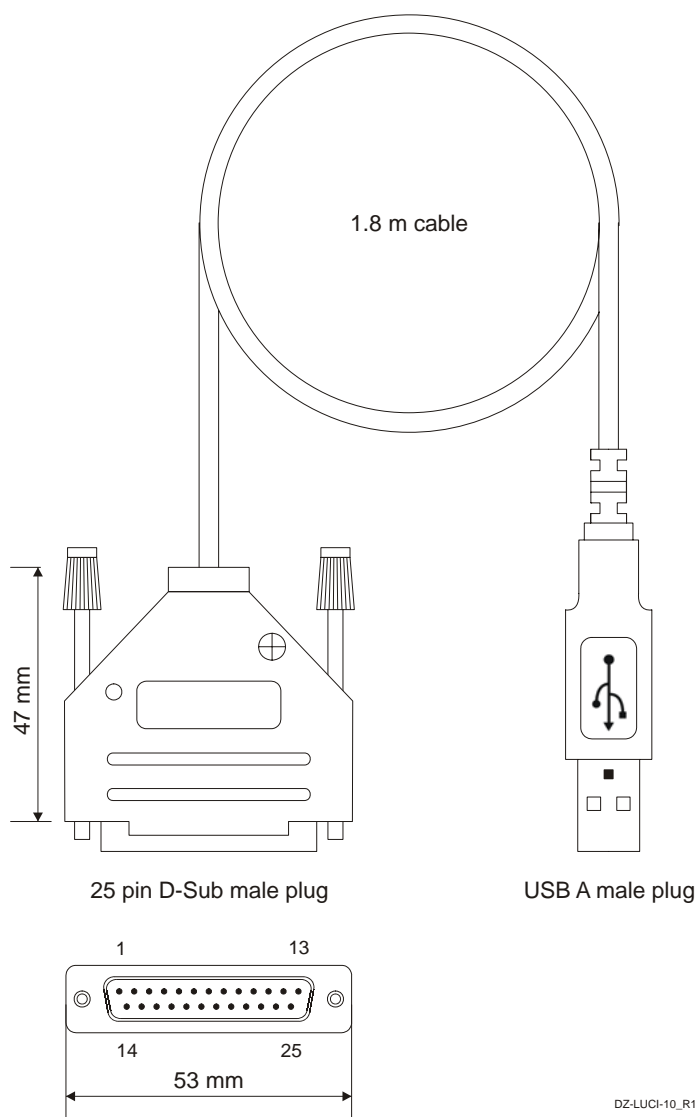
Features	<ul style="list-style-type: none"> • Compact Digital I/O Interface for USB Remote Control of FEMTO Amplifiers • Supports Opto-Isolation of Amplifier Signal Path from PC USB Port • 16 Digital Outputs, 3 Opto-Isolated Digital Inputs • Bus-Powered Operation • System Driver, Application Software and VI's for use with LabVIEW™ Included 																											
Applications	<ul style="list-style-type: none"> • Remote Control of FEMTO® Amplifiers and Photoreceivers Directly from a PC 																											
Block Diagram	<p style="text-align: right; font-size: small;">BS-LUCI-10_R1</p>																											
Hardware Specifications	<table border="0"> <tr> <td data-bbox="259 1617 470 1648">General Characteristics</td> <td data-bbox="535 1617 730 1648">Bus Interface</td> <td data-bbox="844 1617 1055 1648">USB 2.0 (full-speed)</td> </tr> <tr> <td></td> <td data-bbox="535 1648 730 1680">Digital I/O Channels</td> <td data-bbox="844 1648 1055 1680">16 output lines 3 opto-isolated input lines</td> </tr> <tr> <td></td> <td data-bbox="535 1701 617 1732">Supply</td> <td data-bbox="844 1701 1299 1764">PC USB port, + 5 V, typ. 100 mA, bus-powered (no auxiliary power supply required)</td> </tr> <tr> <td></td> <td data-bbox="535 1764 649 1795">Connectors</td> <td data-bbox="844 1764 974 1795">USB type A D-Sub, 25 pin, male</td> </tr> <tr> <td></td> <td data-bbox="535 1816 600 1848">Cable</td> <td data-bbox="844 1816 1055 1848">AWG 28, length 1.8 m</td> </tr> <tr> <td data-bbox="259 1869 324 1900">Output</td> <td data-bbox="535 1869 730 1900">Number of Channels</td> <td data-bbox="844 1869 1380 1932">16 output lines, supporting opto-isolation inside FEMTO amplifiers and photoreceivers</td> </tr> <tr> <td></td> <td data-bbox="535 1932 730 1963">Output Voltage Range</td> <td data-bbox="844 1932 1380 1984">LOW bit: 0 ... + 0.5 V (@ 0 ... 2 mA output current) HIGH bit: + 4 ... + 5.5 V (@ 0 ... 2 mA output current)</td> </tr> <tr> <td></td> <td data-bbox="535 1984 665 2016">Max. Current</td> <td data-bbox="844 1984 1055 2016">6 mA per channel</td> </tr> <tr> <td></td> <td data-bbox="535 2016 665 2047">Writing Rate</td> <td data-bbox="844 2016 1136 2047">max. 800 operations per second</td> </tr> </table>	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
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USB to D-Sub Control Interface for FEMTO Amplifiers

Software Specifications	<p>Device Driver dynamic link library (DLL) for integration in Microsoft Windows® operating system for use with C/C++, LabWindows™ /CVI™ or LabVIEW™</p> <p>Application Software GUI (graphical user interface) programs for simple remote control of FEMTO amplifiers and photoreceivers provided as executable programs and LabVIEW projects</p> <p>LabVIEW Programs sample programs to control and test the LUCI-10 hardware (including front panel and block diagram)</p> <p>LabVIEW Library special VI toolkit for integration in LabVIEW development environment</p> <p>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.</p>
System Requirements	<p>Operating System Microsoft Windows XP with Service Pack 2, or higher</p> <p>Processor Intel Pentium III or AMD Athlon, or better</p> <p>System Memory 512 MB of RAM, or more</p> <p>Hard Disk Space about 200 MB</p> <p>Interface Port USB 1.1 or USB 2.0</p> <p>Supported FEMTO Modules any standard FEMTO amplifier or photoreceiver with 25 pin D-Sub socket, except model HLVA-100</p>
Optional Requirements	<p>For development of own application programs an additional development environment like LabVIEW Version 8 (or higher) or C/C++ is required.</p>
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USB to D-Sub Control Interface for FEMTO Amplifiers

Dimensions



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e-mail: info@femto.de
<http://www.femto.de>

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Datasheet

LUCI-10

USB to D-Sub Control Interface for FEMTO Amplifiers



Features	<ul style="list-style-type: none"> • 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 																											
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**USB to D-Sub Control Interface
for FEMTO Amplifiers**

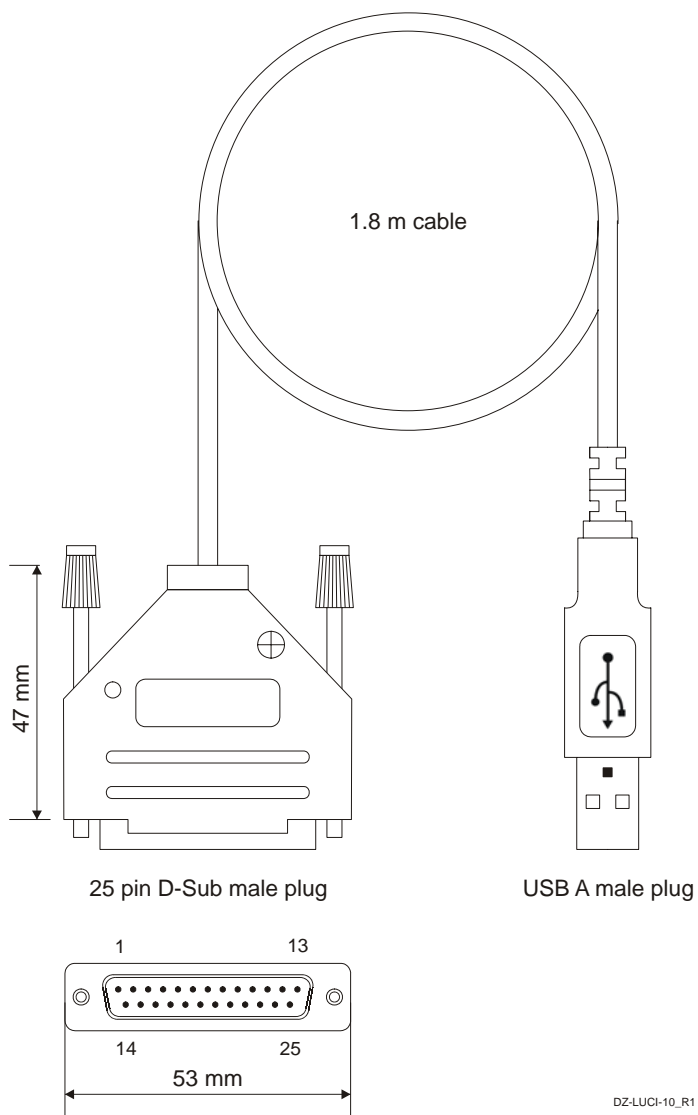
Input	Number of Channels	3 opto-isolated input lines
	Input Voltage Range	LOW bit: - 20 ... + 1.5 V HIGH bit: + 3 ... + 20 V
	Switching Current	1 mA typ. @ 5 V
	Reading Rate	max. 400 operations per second
Power Supply	USB Port, Bus Powered	+ 4.5 ... + 5.5 V DC
	Active Current	max. 200 mA / typ. 100 mA
	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	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">Software (included on CD)</td> <td style="padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">Device Driver</td> <td style="padding: 5px;">dynamic link library (DLL) for integration in Microsoft Windows[®] operating system for use with C/C++, LabWindows[™] /CVI[™] or LabVIEW[™]</td> </tr> <tr> <td style="padding: 5px;">Application Software</td> <td style="padding: 5px;">GUI (graphical user interface) programs for simple remote control of FEMTO amplifiers and photoreceivers provided as executable programs and LabVIEW projects</td> </tr> <tr> <td style="padding: 5px;">LabVIEW Programs</td> <td style="padding: 5px;">sample programs to control and test the LUCI-10 hardware (including front panel and block diagram)</td> </tr> <tr> <td style="padding: 5px;">LabVIEW Library</td> <td style="padding: 5px;">special VI toolkit for integration in LabVIEW development environment</td> </tr> </table> </td> </tr> </table> <p style="margin-top: 10px;">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.</p>	Software (included on CD)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">Device Driver</td> <td style="padding: 5px;">dynamic link library (DLL) for integration in Microsoft Windows[®] operating system for use with C/C++, LabWindows[™] /CVI[™] or LabVIEW[™]</td> </tr> <tr> <td style="padding: 5px;">Application Software</td> <td style="padding: 5px;">GUI (graphical user interface) programs for simple remote control of FEMTO amplifiers and photoreceivers provided as executable programs and LabVIEW projects</td> </tr> <tr> <td style="padding: 5px;">LabVIEW Programs</td> <td style="padding: 5px;">sample programs to control and test the LUCI-10 hardware (including front panel and block diagram)</td> </tr> <tr> <td style="padding: 5px;">LabVIEW Library</td> <td style="padding: 5px;">special VI toolkit for integration in LabVIEW development environment</td> </tr> </table>	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		
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Optional Requirements	<p>For development of own application programs an additional development environment like LabVIEW Version 8 (or higher) or C/C++ is required.</p>												
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USB to D-Sub Control Interface for FEMTO Amplifiers

Dimensions



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