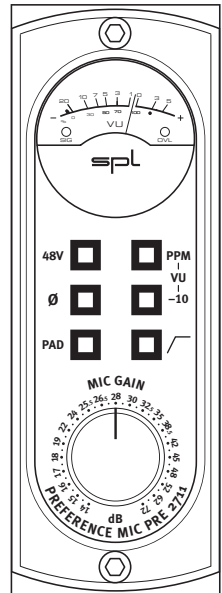




Manual



Preference Mic Pre

RackPack Module, Model 2711

Version 1.0 – 8/2007

Designer: Wolfgang Neumann

This user's guide contains a description of the product. It in no way represents a guarantee of particular characteristics or results of use. The information in this document has been carefully compiled and verified and, unless otherwise stated or agreed upon, correctly describes the product at the time of packaging with this document.

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CE Declaration of Conformity

Manufacturer: SPL electronics GmbH, Type of Equipment: Audio
Signal Processor, Product: RackPack/Preference Mic Pre, Model 2711,
Compliance Engineer: Wolfgang Neumann



Test Basis: EN50081-1:1992, EN50082-1:1992, EN60065:1993, EN61000-3-3:1995, EN60065:2002, EN5013:2001, EN5020:2002, EN61000-3-2:2000, 73/23 EWG; 93/68 EWG. We herewith declare, that the construction of the Preference Mic Pre, Model 2711, is in compliance with the standards and regulations mentioned above.

Notes on environmental protection

At the end of its operating life, this product must not be disposed of with regular household waste but must be returned to a collection point for the recycling of electrical and electronic equipment. The "wheelie bin" symbol on the product, user's manual and packaging indicates that. The materials can be re-used in accordance with their markings. Through re-use, recycling of raw materials, or other forms of recycling of old products, you are making an important contribution to the protection of our environment. Your local administrative office can advise you of the responsible waste disposal point.



WEEE Registration: 973 34988

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Important Security Information

Please note and retain this information. Carefully read and follow all of the safety and operating instructions before you use the machine. Be doubly careful to follow all warnings and special safety instructions noted in this manual and on the unit. The following information refers to modules built into the RackPack frame.

Connections: Only use the connections as described. Other connections can lead to health risks and equipment damage.

Water And Humidity: Do NOT use this machine anywhere near water (for example near a wash basin or bath, in a damp cellar, near swimming pools, or the like). In such cases there is an extremely high risk of fatal electrical shocks!



Insertion Of Foreign Objects Or Fluids: NEVER allow a foreign object through any of the machine's chassis openings. You can easily come into contact with dangerous voltage or cause a damaging short circuit. NEVER allow any fluids to be spilled or sprayed on the machine. Such actions can lead to dangerous electrical shocks or fire!



OPENING THE DEVICE: Open the device only to fit or exchange modules. The fitting and/or exchange of modules should only be carried out by qualified persons. In the light of possible physical damage or injuries any manipulation is at your own risk. In order to avoid any residual voltage, the device should be disconnected from any power source at least 5 minutes prior to opening it. If you handle the device improperly or ignore the manual (part of the delivery of the RackPack frame) you risk to damage the device or expose yourself to an electric shock. In these cases SPL electronics GmbH denies any responsibility.

Electrical Power: Run this machine ONLY from sources which can provide proper power at the prescribed rating. When in doubt about a source, contact your dealer or a professional electrician. To be sure you have isolated the machine, do so by disconnecting the power cord from your wall connection. Be sure that the power cord plug is always accessible. When not using the machine for a longer period, make sure to unplug it from your wall power socket.

Power Cord Protection: Make sure that your power cord is arranged to avoid being stepped on or any kind of crimping and damage related to such event. Do not allow any equipment or furniture to crimp this power cord.

Power Connection Overloads: Avoid any kind of overload in connections to wall sockets, extension or splitter power cords. Always keep manufacturer warnings and instructions in mind. Overloads create fire hazards and risk of dangerous shocks!

Important Security Information

Lightning: Before thunderstorms or other severe weather, disconnect the machine from wall power (but to avoid life threatening lightning strikes, not during a storm). Similarly, before any severe weather, disconnect ALL the power connections of other machines and antenna and phone/internet cables which may be interconnected so that no lightning damage or overload results from such secondary connections.

Air Circulation: Chassis openings offer ventilation and serve to protect the machine from overheating. NEVER cover or otherwise close off these openings. NEVER place the machine on a soft surface (carpet, sofa, etc.). Make sure to provide for a mounting space of 4-5 cm/2 inches when mounting the machine in racks or cabinets.

Controls And Switches: Operate the controls and switches only as described in the manual. Incorrect adjustments outside safe parameters can lead to damage and unnecessary repair costs. Never use the switches or level controls to effect excessive or extreme changes.

Repairs: Unplug the machine and immediately contact a qualified technician when you think repairs are needed – or when moisture or foreign objects may accidentally have gotten in to the housing, or in cases when the machine may have fallen and shows any sign of having been damaged. This also applies to any situation in which the machine has not been subjected to any of these unusual circumstances but still is not functioning normally or its performance is substantially altered.

In cases of damage to the power cord or its plug, first consider turning off the main circuit breaker before unplugging the power cord.

Replacement/Substitute Parts: Be sure that any service technician uses original replacement parts or those with identical specifications as the originals. Incorrectly substituted parts can lead to fire, electrical shock, or other dangers, including further equipment damage.

Safety Inspection: Be sure always to ask a service technician to conduct a thorough safety check and ensure that the state of the repaired machine is in all respects up to factory standards.

Cleaning: In cleaning, do NOT use any solvents, as these can damage the chassis finish. Use a clean, dry cloth (if necessary, with an acid-free cleaning oil). Disconnect the machine from your power source before cleaning.



Fitting A Module

The fitting and/or exchange of modules should only be carried out by qualified persons. Please read the manual of the RackPack frame. It contains all information needed to fit a module as well as all safety and notes and warnings. If you don't have the manual at hand, you can download it like all SPL product manuals from our web site <http://www.soundperformancelab.com>.



Symbols And Notes

IN THIS MANUAL A LIGHTNING SYMBOL WITHIN A TRIANGLE WARNS YOU ABOUT THE POTENTIAL FOR DANGEROUS ELECTRICAL SHOCKS – WHICH CAN ALSO OCCUR EVEN AFTER THE MACHINE HAS BEEN DISCONNECTED FROM A POWER SOURCE.



AN EXCLAMATION MARK (!) WITHIN A TRIANGLE IS INTENDED TO MAKE YOU AWARE OF IMPORTANT OPERATIONAL ADVICE AND/OR WARNINGS THAT MUST BE FOLLOWED. BE ESPECIALLY ATTENTIVE TO THESE AND ALWAYS FOLLOW THE ADVICE THEY GIVE.



The symbol of a lamp directs your attention to explanations of important functions or applications.

Attention

Do not attempt any alterations to this machine without the approval or supervision of SPL electronics GmbH. Doing so could nullify completely any and all of your warranty/guarantee rights and claims to user support.

Scope Of Delivery

The scope of delivery comprises:

- The module
- This manual
- Four Philips screws to mount the module to the back panel (if module is delivered separately from the frame). Further screws needed for mounting the module remain when you remove front and rear covers from the RackPack frame.

When recording acoustic instruments or vocals, using a microphone is inevitable. The actual output level of a microphone is very low and therefore has to be boosted to studio or line level (0dB) with a preamplifier. Sometimes signals have to be boosted by a factor of 2000 or more. As a consequence, the resulting sound quality provided by the preamp is of paramount importance, so a good microphone preamp that does not overdrive is the definitive requirement in order to record acoustic instruments or vocals with sufficient dynamics and untainted sound.

The section “Technology” from page 14 explains how the Preference Mic Pre meets these requirements.

Main Features

The Preference Mic Pre offers preamplification values of up to +72 dB with lowest noise operation and a high common mode rejection.

A **VU meter** with two modes for average levels (VU) and peak levels (PPM) displays the output levels.

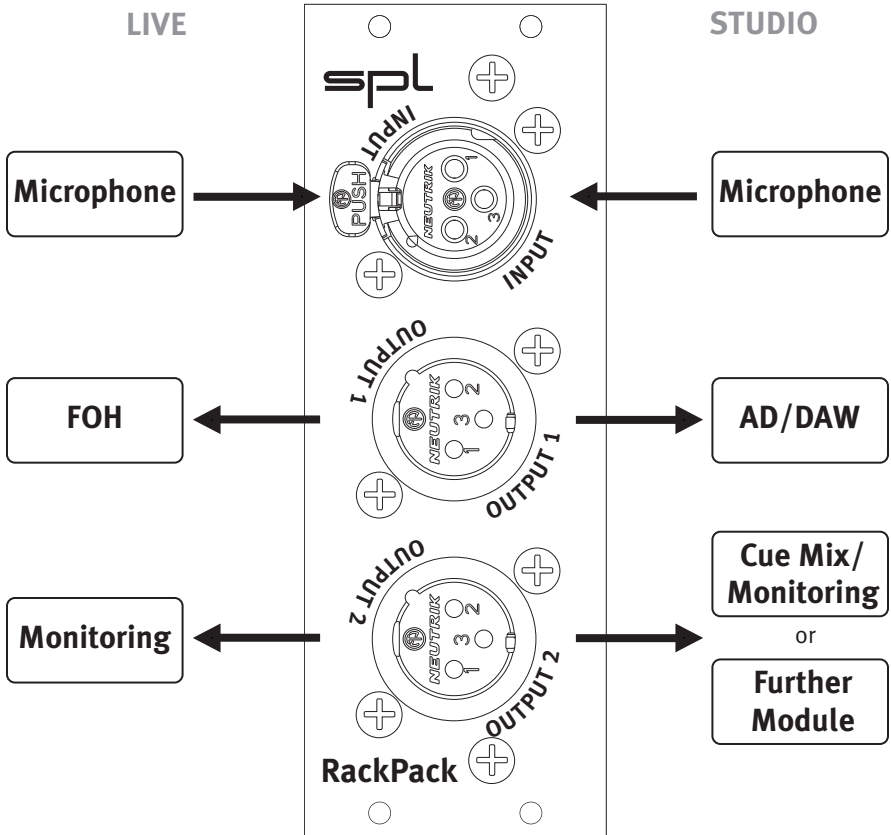
A very stable **phantom power supply** (48V) is provided to power condenser microphones.

The polarity of the microphone can be switched with the **phase reverse** switch.

A **high-pass filter** protects against low frequency interferences.

Two LEDs are placed into the VU window to concentrate all displays in one area.

The **signal LED** (SIG.) indicates that an input signal is present, the **overdrive LED** (OVL) warns against potential overdrives.

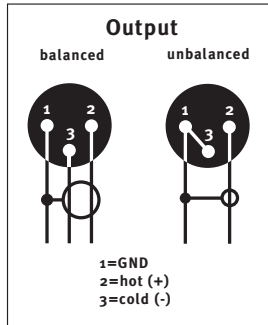


XLR Sockets

Connect your microphone to the electronically balanced XLR input. The outputs of the Preference Mic Pre are electronically balanced, too. You can use both XLR output sockets simultaneously.

- XLR pin wiring:**
- Pin 1 = ground**
- Pin 2 = hot (+)**
- Pin 3 = cold (-)**

The illustration shows the correct pin wiring of the balanced XLR sockets if an unbalanced wiring is required.



Channel Split

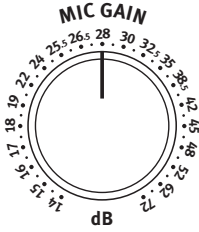
Since the Preference Mic Pre provides two independent outputs, it always offers you two routes for one input channel.

If, for example, a RackPack is configured as a channel strip, one pre-amp output can feed the next module while the second output is used to record the direct preamp signal.

Another exemplary studio application is to send one signal directly into the A/D converter to be recorded in your DAW while the second signal is used for latency-free monitoring (e.g. cue mix for the singer).

In live applications Output 1 can be routed to Front Of House (FOH) while Output 2 feeds the monitoring mixer.





Mic Gain

With the Mic Gain control you can regulate the preamplification of the microphone signal. It ranges from +14 dB to +72 dB. The input stage can handle input levels of up to 18 dB. The value set with the Mic Gain control defines the output level equally for both Output 1 and Output 2.

When you set the MicGain you have to consider the type of microphone that you are using (dynamic or condenser microphone) as well as its sensitivity. The sensitivity of a dynamic microphone is at around 2 mV/Pa whereas the sensitivity of a condenser microphone can be up to 20 mV/Pa. The result is a difference in output of 20 dB.

You should also consider the sound pressure level of the sound source, the distance of the microphone to it and the acoustics of the room when you set the preamplification.

About Leveling

Initially you should always ensure to have deactivated the -10 dB button so that the VU meter displays correct values (see “-10 dB” on page 11). Now turn up the MicGain control until the VU meter displays maximum levels between 0 dB and +3 dB. At this level you don’t risk any overdrive when you experience sudden and unexpected peaks in the level of the source. Always remember that the VU meter only shows average values and that a peak level can be much higher (up to +10 dB). If necessary, turn on the PPM mode to see the actual peak levels.

Usually levels of around 0 dB and +3 dB are safe. If, however, you experience very high peaks already at minimum Mic Gain values (i.e. drums, brass instruments), you can activate the PAD function (see “PAD” on page 12). The input level is now reduced so that you can regulate MicGain again in a useful range.

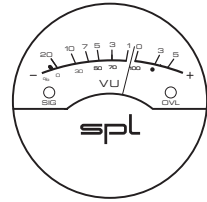
If you know in advance that the level will be very consistent you can always turn up MicGain. In this case you can activate the -10dB button to have more headroom in the display.



IMPORTANT: To exclude any audible distortion the OVL LED should only light up shortly. It starts illuminating 3 dB before a potential overload, so first illumination does not indicate an overload, but that the limit of leveling is reached. Avoid permanent illumination of the OVL LED to exclude overloads (also refer to “Overload LED” on page 13).

VU Meter

The VU meter displays the output level of the preamp. The gauge indicates levels from -20 dB to +5 dB. If necessary you can lower the sensitivity by 10 dB so that the gauge goes up to +15 dB output level (see “-10 dB” below and “About Leveling” on the previous page).



The VU meter is custom made to meet SPL specifications and assures a balanced optical perception thanks to its optimized ballistics.

An especially interesting feature is the option to switch between two display modes: VU mode and PPM mode. The VU mode (VU=Volume Unit) displays average levels, thus provides information on the overall loudness. The PPM mode (PPM=Peak Program Meter) displays the peak levels.

The integration time of the display complies with the BBC requirements. In VU mode the rise time up to 0 dB is approx. 300 ms. In PPM mode the rise time up to 0 dB is about 2 ms and the release time down to -20 dB is at a “slow” 1,5 seconds. This calibration ensures to display even short peaks up to about +6 dB since the needle does not have to travel the entire distance of the gauge every time.

PPM



The PPM button allows to switch the VU metering characteristics from VU display mode (button is deactivated and not illuminated) to PPM display mode (button is active and illuminated). A/D converter display also make use of the PPM mode. Monitoring peak levels is most important to avoid overloading the converter and to prevent audible distortion. Peak levels are always above the average levels. It may make sense in most cases to also press the -10 dB button to prevent the needle from getting stuck on the right side of the gauge.

-10 dB



With this button you can change the sensitivity of the VU display. If you press the -10 dB button (button is illuminated), the sensitivity of the display is lowered by 10 dB. With the needle for example at 0 dB, a value of +10 dB is displayed. Now you can read values of up to +15 dB.

You always have to add these 10 dB to the displayed values, for example if you compare these values with those of an A/D converter. Remember that A/D converters show peak levels, not average levels. For comparison press the PPM button to activate the PPM mode.



48 V Phantom Power Supply

The Preference Mic Pre provides 48 volt phantom power for microphones requiring external current (generally condenser microphones). Such microphones are dependent upon a clean, consistent and noise-free power supply for optimal operation and audio quality. The Preference Mic Pre continuously delivers precisely 48 V and a maximum current of 14 mA, which will power all microphones.



IMPORTANT: All microphones with balanced, ground-free outputs can be used with the phantom power activated. Unbalanced microphones may only be used with phantom power deactivated.

Phantom power should only be activated when using microphones that require it. Please be sure to deactivate phantom power with all other microphones (including tube microphones which are supplied from their own power supply, thus need no extra phantom power supply).



ALWAYS FOLLOW THESE RULES WHEN WORKING WITH PHANTOM POWER – THE INPUT STAGES OF THE PREMIUM MIC PRE CAN BE DAMAGED IF YOU DO NOT ACT ACCORDINGLY:

- 1) First connect the microphone to the Preference Mic Pre.
- 2) Then activate phantom power – you can start working now.
- 3) When you have finished recording, turn the phantom power off first.
- 4) **DO NOT disconnect the microphone from the Preference Mic Pre UNTIL phantom power has been switched off for a minute and all residual current is discharged.**



Pad

The Pad function allows you to attenuate the input signal by 20 dB so that you can process even very high levels, i.e. from drums or brass instruments.

If the VU meter shows levels above +3 dB even while MicGain is set very low (and the -10 dB button deactivated), the time has come to press the Pad button. It illuminates when it is activated.

Phase Reverse

With the phase reverse button you invert the polarity of the microphone signal. When not pressed (button is not illuminated) the polarity is in phase. After pushing the button (button is illuminated) the polarity is inverted.

The phase reverse feature comes in very handy if you have to switch the polarity of the XLR input according to the polarity of the microphone or the microphone cable. The pin wiring of the XLR sockets are as follows: Pin 1 = ground, Pin 2 = hot (+), Pin 3 = cold (-).

Sometimes it is useful to switch the polarity of a microphone, for example in the case of M/S miking. A second classic application is the miking of a snare drum with two microphones that are placed above and below the snare: Since both drum heads move in the same direction when the drum is played, the microphones are out of phase. Switch the polarity of the bottom mic and you avoid any cancellations when you join both signals in the mix.



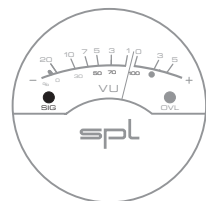
High-Pass Filter

The high-pass filter, also known as rumble filter, helps to eliminate any interferences within the lowest frequencies. The first order filter operates smoothly with 6 dB per octave, starting from 75 Hz with -3 dB. This characteristic usually helps in most cases and has the least sonic disadvantages. If you need to filter on a more extreme scale, even second order filters (12 dB/octave) are overstrained frequently and sonic disadvantages become more and more apparent. In those cases a variable filter is the means of choice.



Signal LED

The signal LED (SIG) indicates immediately whether an input signal is existent or not. The LED starts responding at a minimum level of -25 dB.



Overload LED

The overload LED (OVL) warns 3 dB before a potential internal overload, thus indicates that a headroom of 3 dB is left. **Avoid overloads as they may result in unwanted distortions.** As soon as the OVL LED illuminates permanently you have to reduce the amplification with the MicGain control until the LED turns off or only lights up shortly (also refer to “About Leveling” on page 10).



SSM 2019

The Preference Mic Pre is suitable for all common dynamic and condenser microphones. It works along the principles of an instrumentation amplifier which is a technology that is also used in measurement and medical equipment due to its high common mode rejection of stray pick-ups. It is based on the semiconductor SSM 2019 which sounds more balanced than available alternatives. Low noise and distortion values as well as a broad bandwidth and a fast slew rate are its forte.

Servo Drive Design

The main focus during the development of the Preference Mic Pre was its acoustic transparency and its natural representation of the source signal. Reducing DC offsets in the audio signal paths is a decisive part of this design job.

DC offsets are produced in relatively large amounts especially when amplifying a microphone signal because the signal is amplified by extreme factors from the pico volt range to odB nominal level. DC offsets impair the signal quality as they induce noise and distortion that lead to a diffuse sound.

The Preference Mic Pre's servo drive design minimizes these problems much more effectively than the common solution based on capacitors by setting the DC offset to almost 0mV. In addition to that, the active servo drive circuitry tends to produce less distortions than passive capacitors.

The servo drive design incorporates three operational amplifiers. The SSM 2019 is the first op-amp. The second op-amp acts as a sensor to detect voltage differences. These differences are then compensated for in a third op-amp working as summing stage.

Of course an elaborate active servo drive circuitry is a more expensive solution than simply using passive capacitors, but especially in a microphone preamplifier this effort pays off with improved sound quality.

Foil And Styroflex Capacitors

Only the best MKP and styroflex capacitors are used in the various circuits. They sound more open and dynamic in contrast to the conventional ceramic capacitors.

Outputs

Both output stages are electronically balanced and can be used independently. They are capable of driving very long cables (up to a few hundred yards, depending on the capacity of the cables and the input stages on the other end). The maximum output level is +22 dBu.

Channel Split

Since the Preference Mic Pre has two independent outputs, it always offers you two routes for one input channel.

If, for example, a RackPack is configured as a channel strip, one output can feed the next module while the second output is used to record the direct preamp signal.

Another exemplary studio application would be to send one signal directly into the A/D converter to be recorded in your DAW while the second signal is used for latency-free monitoring (e.g. cue mix for the singer).

Copy Master: Recall Settings

Artist:

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Album:

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Title:

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Engineer:

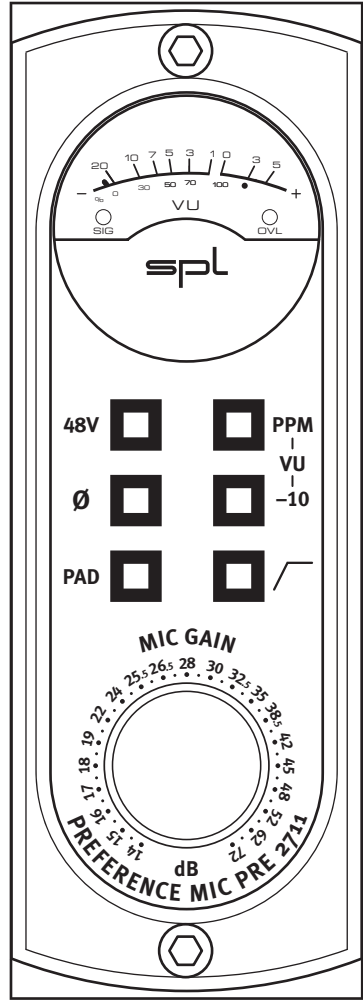
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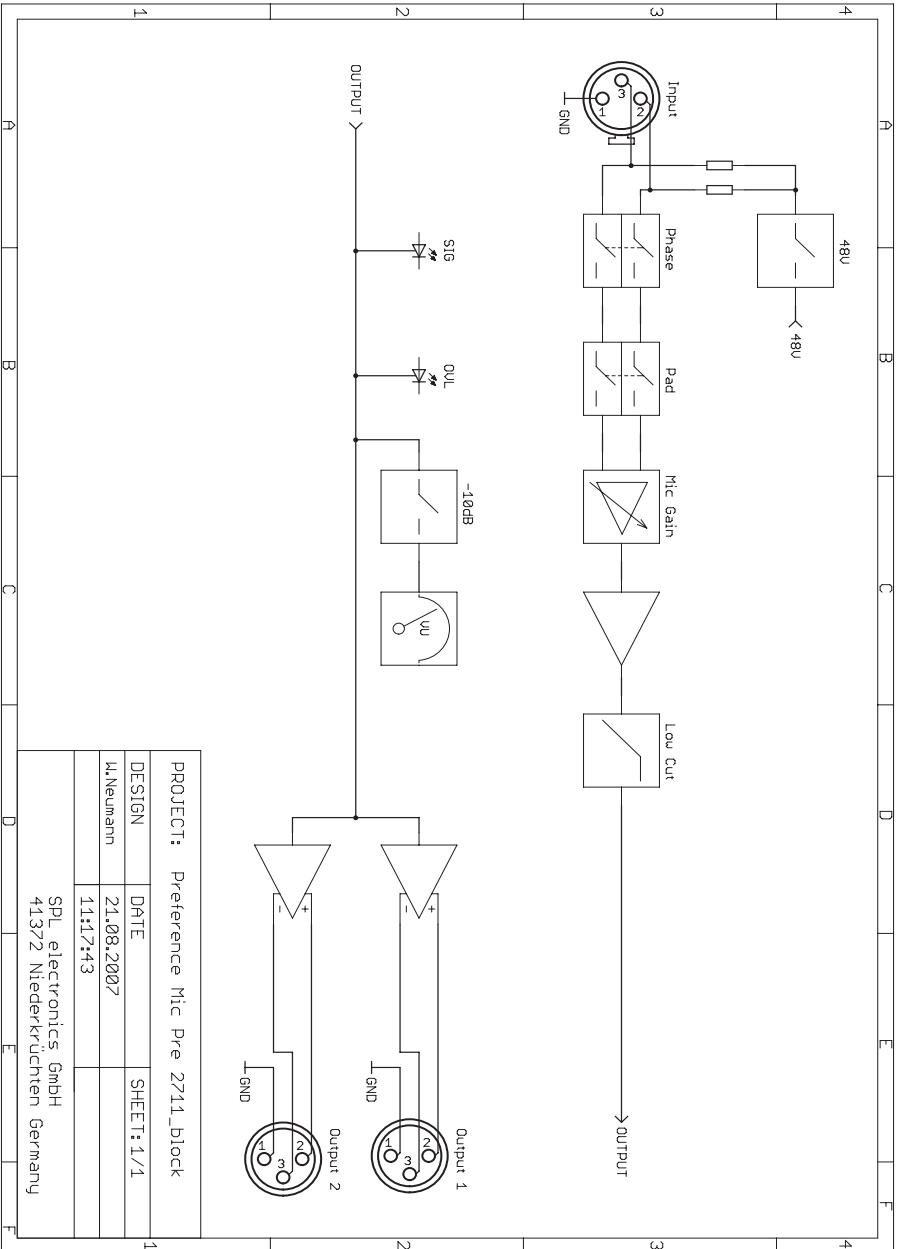
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Block Diagram



Specifications

Audio

Frequency Range	10 Hz bis > 200 kHz	
CMRR	-84 dBu	
(at 1kHz with -30 dBu input level and 30 dB Gain)		
THD & N @ 1kHz		
Input Level	Gain	THD & N
-30dBu	30dB	0,0035%
-60dBu	60dB	0,047%
Noise	Gain	Noise Level A-weighted
	72dB	-57,0dBu
	60dB	-69,0dBu
	30dB	-91,7dBu
E.I.N. (Equivalent Input Noise)	-129,0dBu	
Dynamic Range	114,0 dB	

Input

XLR connector, electronically balanced	
Impedance unbalanced	ca. 1,6kOhm
Impedance balanced	ca. 3,2kOhm
Max. Input Level	+18dBu, +38dBu with Pad activated

Outputs

Output 1: XLR connector, electronically balanced	
Impedance unbalanced	ca. 75 Ohm
Impedance balanced	ca. 150 Ohm
Max. Output Level	+22 dBu

Output 2: XLR connector, electronically balanced	
Impedance unbalanced	ca. 75 Ohm
Impedance balanced	ca. 150 Ohm
Max. Output Level	+22 dBu

Control Elements

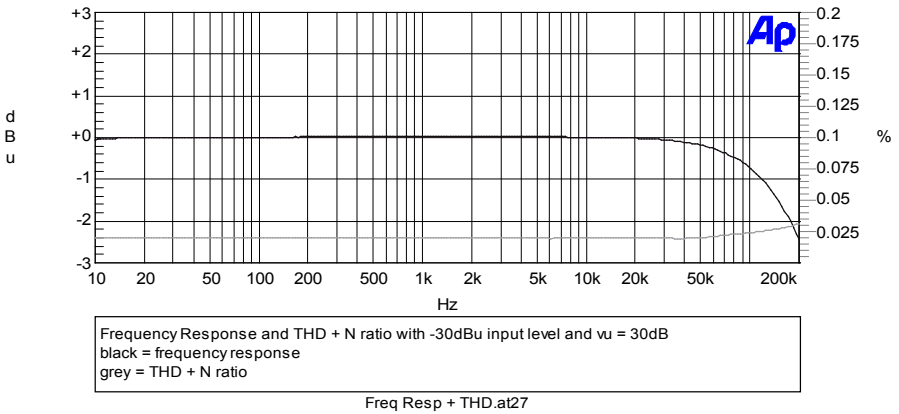
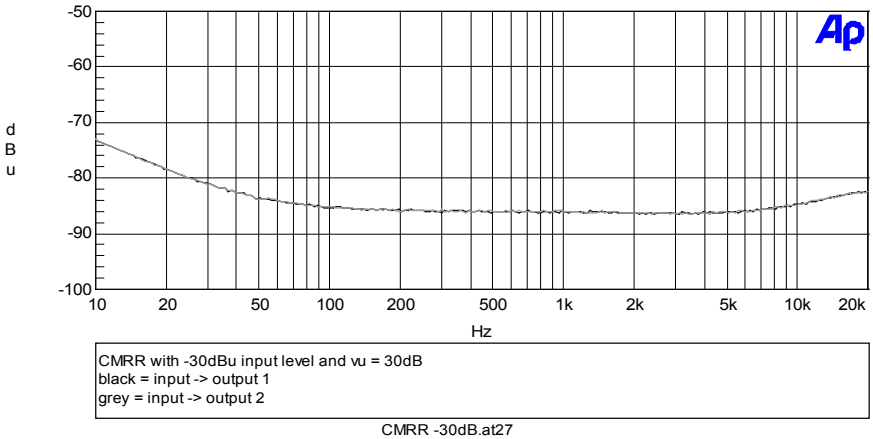
Mic Gain Range	18dB to 72dB
Pad	-20dB
High-Pass	fg = 75 Hz (-3dB)
Phantom Power Supply	48V

Dimensions & Weight

Height x Width x Depth	132 mm x 46,9 mm x 315 mm/ 5.2 x 1.84 x 12.4 inches
Weight	0,3kg/0,66 lbs

Note: 0 dBu = 0.775 V. Specifications are subject to change without notice.





All SPL products come with a two-year manufacturer's guarantee against defects in material or assembly from the date of purchase. End users are supported in the two-year guarantee through their distributor or dealer. In such cases, please contact your dealer for full guarantee conditions and service.

Direct SPL product support requires product registration. Please fill out the guarantee card enclosed in the package legibly in printed letters and send it directly to SPL. Or use the **online registration** form that may be reached at **www.soundperformancelab.com** (international clients) or **www.spl-usa.com** (US clients).