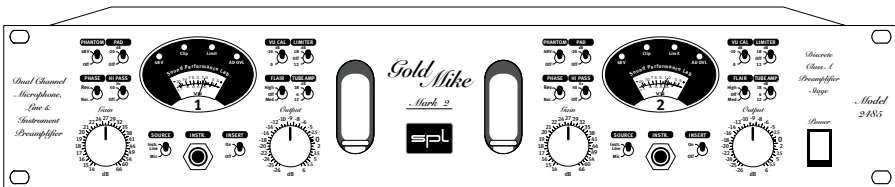




Manual



GoldMike Mk 2

Model 2485

Dual-channel microphone and instrument preamplifier

Version 1.2 – 12/2005

Designer: Ruben Tilgner

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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Introduction

The GoldMikeMK2 is the result of all our experience and knowledge from its successful predecessor and represents an improved, more flexible and, more modern version.

We have added technologies that have already proven to provide superior tonal results in other SPL products. For example, the instrument input is designed around a class A impedance converter which premiered in the SPL GainStation preamp.

A significant contribution to the success of the predecessor was the hybrid preamplifier concept. It combines transistor and tube preamplifier stages and specifically utilizes their technological and sonic advantages: The efficiency and low noise of a discrete transistor stage is enriched with musical coloration of a tube stage.

The transistor stage is composed of single transistors in a class A design. The circuitry is fully discrete, and each transistor is completely optimized for its specific task. You will not find any IC's in this preamplifier stage because they cannot be optimized for this specific application to the degree we aimed for. This all new discrete class A transistor stage is a genuine innovation in the entire preamplifier market at this price level.

The degree of tube pre-amplification is no longer the fixed +6 dB value of its predecessor. The GoldMike MK2 sports the selection of three different tube pre-amplifications: +6 dB remains the standard complemented by +12 dB and +18 dB. This allows creative variety with the tube saturation and limiting effects.

We have also added an extra setting to the popular Flair circuitry to give more flexibility to the presence improvement.

Because the GoldMikeMK2 is a dual channel preamplifier, its channel separation is of fundamental importance for the stereo image. Therefore the print-board layout is symmetrically mirrored around the power supply in the center from channel 1 to channel 2. This results in an identical signal flow to supporting a naturally balanced stereo image. Additionally the print-board provides extra-large ground areas maximizing the shielding against crosstalk and interference.

Before You Begin

IMPORTANT: Before you operate your GoldMike MK2, first check carefully whether the local voltage setting corresponds to the switch setting on the rear panel!

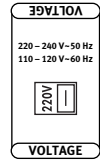
If not, and the voltage is in one way or another, incorrect, you will either experience an immediate fuse burn through (if the setting is lower than the supplied power) or, if the power is 110-120 V at a 220-240 V input switch setting, the GoldMike MK2 will simply not function correctly.

Moreover, make sure you remove the power plug from your GoldMike MK2 before changing this switch setting!

Always turn volume down or mute your speakers when connecting or repatching audio cables to avoid damage to your speakers and ears.

It makes good sense to think about where you place your MTC before connecting it. It should be positioned so that you can easily reach it, but there are other considerations. Try not to place it near heat sources or in direct sunlight, and avoid exposure to excessive vibrations, dust, heat, cold or moisture. It should also be kept away from transformers, motors, power amplifiers and digital processors. In addition, please:

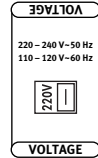
- Do not open the case. You may risk very dangerous electric shock and damage to your equipment.
- Leave repairs and maintenance to a qualified service technician. Should foreign objects fall inside the case, contact your authorized dealer or support person.
- To avoid electric shock or fire hazards, do not expose your unit to rain or moisture.
- In case of lightning, unplug the unit. Always unplug the cable by pulling on the plug only; never pull on the cable.
- Never force a switch or knob.
- Use a soft, lint-free cloth to clean the case, if necessary together with an acid-free cleaning oil. Avoid any cleaning agents as they may damage the surfaces of the unit.



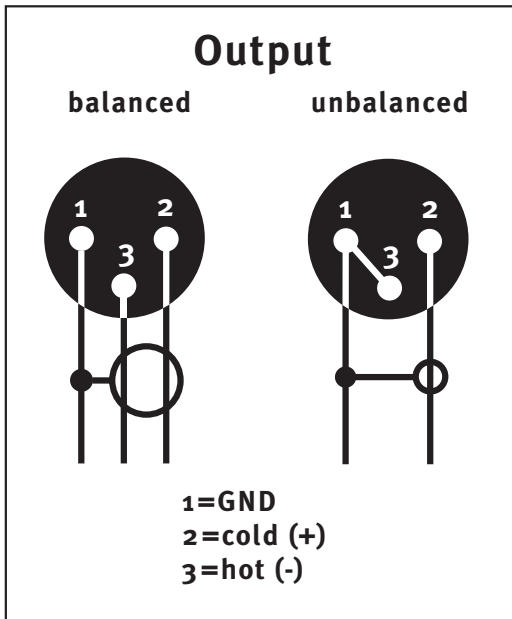
Again, while the GoldMikeMK2's housing is EMV-proof and protects against HF-interference, placement of the unit is very important since it amplifies microphone signals as well as other unwanted signals. Before connecting the GoldMike MK2 or any other equipment turn off all power.



IMPORTANT: Adjust the voltage setting on the back so that it corresponds with your local power conditions.



The following graph shows the correct wiring for connecting unbalanced signals to the balanced XLR connectors:



The Line Input connector is designed for unbalanced signals only.

The TRS output connectors (see "Outputs" on page 9) can be operated both with balanced and unbalanced wiring. Simply use a mono 1/4" plug for unbalanced operation.

Rear Panel/Connections



Mic Input 1/2

Dynamic, condenser or tube microphones can be connected to the Mic inputs. The 48V switch provides the phantom power necessary for some microphones (see also „Control Elements/ Phantom“ on page 11).

Alternatively the GoldMike MK2 can be equipped with optionally available transformer inputs from Lundahl (see “Lundahl Transformers“ on page 22).

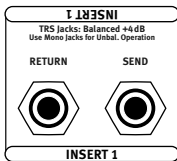


Line In 1/2

The unbalanced Line Inputs are dedicated to high-impedance, high-level signals such as A/D converters, synthesizers or samplers with an impedance of less than 1kOhm. Signals with an impedance of above 1kOhm, e. g. instruments like E bass, acoustic guitars with pickups or Fender Rhodes must be connected to the Instrument Input on the front panel.

The max. input level of the Line Inputs is +23 dB.

IMPORTANT: The Line Input is deactivated as long as an instrument is plugged into Instrument Input jack on the front. We recommend connecting the Line Input to a patchbay if sources need to be changed regularly.



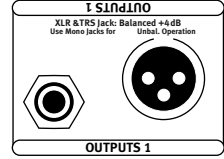
Inserts 1/2

The balanced TRS Insert connectors (Send and Return) are used to integrate further units (EQs, Compressors, Limiters, Effects ...) into the signal path of the GoldMike MK2. The Send connector is placed behind the tube stage and can also be used as direct out (without output level control). The Return connector is located in front of Limiter and Output control which allows to control the output level, e. g. for precise drive level of following A/D converters.

Rear Panel/Connections

Outputs 1/2

The preamplifier signals are fed to these electronically balanced outputs. Alternatively the GoldMike MK2 can be equipped with optionally available transformer outputs from Lundahl (see “Lundahl Transformers” on page 22).



Since the XLR and 1/4 inch TRS connectors are wired in parallel, an unbalanced connection at one connector will cause unbalanced operation in its parallel connector, e.g. if a mono 1/4 inch plug is inserted into the 1/4 inch jack, the corresponding XLR socket will also operate unbalanced.

GND Lift

The GND Lift switch separates internal ground from chassis ground. The switch can be activated to eliminate ground loop humming which may occur if the GoldMike MK2 is connected to units with a different ground potential.



The switch should normally be in the GND position to maintain the shielding effect of the metal housing for internal GoldMike MK2 electronics.

Front Panel/Connections

Instr. Input 1/2

The Instrument input jack is placed on the front panel for easy access. It should be used to connect instruments like E-bass, electric guitars, acoustic guitars with pick-ups etc.

INSTR.



The Instrument input features a 1 MOhm (one Mega Ohm) input impedance.

IMPORTANT: As long as an instrument is plugged into front Instrument input, the rear panel Line Input is deactivated.



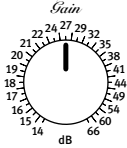
Control Elements

Power



Power

You guessed that: with the Power switch the GoldMike MK2 is activated, verified by the illuminating switch. Please read “Before You Begin” on page 5 before throwing in for the first time.



Gain

The Gain control determines the pre-amplification of the microphone signal. The pre-amplification values cover a range from +14dB up to +67dB.

IMPORTANT: If Lundahl input transformers are fitted the scale values are to be increased by up to +14dB (depending upon microphone in use).



About Gain Adjustments

Amplifying a signal to line level should principally be done solely with the Gain control. The Output level control is used to adjust the proper drive level for subsequent equipment.

The VU Cal switch should be set to 0dB (Note: The VU displays the pre-amplification, not the output level).

Now turn up the Gain control until the VU shows values between 0dB and +3 dB. There is still enough headroom to prevent clipping at varying input levels. Note that the VUs show average levels instead of peak levels (which can be up to 10dB higher).

Thus, in recording high-level signals such as snare and kick etc. it may be necessary to engage the Pad switch.

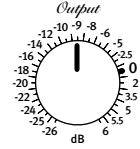
You can drive the Gain harder if you know that unexpected input level changes are unlikely to occur. Watch if the Clip-LED indicates clipping in the preamplifier stages and set the VU Cal to -10dB to adjust the VU meter range accordingly.

IMPORTANT: The Clip-LED should never illuminate during a recording session to avoid distorted results.



Output

This potentiometer adjusts the output level for devices following in the chain or to the converter. The Output Level control allows an additional +6 dB of amplification or -26 dB of reduction. Output level values set with the output level control are not indicated by the VU meters, which indicate pre-amplification levels before this final stage.



Phantom

The GoldMike MK2 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 GoldMike MK2 continuously delivers precisely 48V and a maximum of 14mA, which will power all microphones.



VERY IMPORTANT: All microphones with balanced, ground-free outputs, including tube microphones, can be used with the phantom power activated. Phantom power should only be activated when using microphones that require it. Please be sure to deactivate phantom power with all other microphones. Unbalanced microphones may only be used with phantom power deactivated.



PLEASE ALWAYS FOLLOW THESE INSTRUCTIONS TO ACTIVATE AND DEACTIVATE PHANTOM POWER: First connect the microphone to the GoldMike MK2, then activate phantom power. When finished, first deactivate phantom power and wait at least until the 48V LED has gone out completely before disconnecting the microphone! This ensures residual current will be discharged. Furthermore, when changing microphones, you should wait until the 48V LED is completely dark before re-patching. **THE GOLDMIKE MK2'S INPUT STAGES CAN BE DAMAGED IF YOU IGNORE THESE PROCEDURES!**



Control Elements

PHASE



Phase

The phase reverse function reverses the polarity of the microphone signal, inverting the phase (by 180°) to correct phase-inverted signals caused by multiple signal sources. A voice-over artist, for example, hears himself during recording through the headphones and simultaneously through the bones in his head. Phase inversion will cause an unnatural sound, and even minimal variations in distance to the microphone will cause drastic variations in the sound. Phase inversion is also commonly encountered when using multiple microphones on a single sound source. We recommend checking for correct polarity before each recording.

PAD



Pad

The Pad switch attenuates the input by -20dB. High-level input signals can be attenuated in order to prevent overdriving the preamplifier. The GoldMike MK2 has a minimum pre-amplification of +14 dB. But with miked signals such as drums and brass or high level line input signals, this may already be too much. Engaging Pad attenuates the minimum pre-amplification (Gain control fully counter clockwise) to -6 dB, thus providing a useful Gain control range for loud input signals.

HI PASS



Hi Pass

This switch activates the integrated high-pass filter, which operates at a 50Hz center frequency and 12dB/octave (often called a „rumble filter“). The filter is entirely passive, avoiding additional active circuitry that could potentially degrade the signal, and cuts 6dB pre- and 6dB post-solid-state stage pre-amplification to prevent the amplification of unwanted low-frequency signal components.

Flair

As with its predecessor, the model 9844 GoldMike, the GoldMike MK2 features our sound-optimizing Flair circuitry. This circuitry takes advantage of a combined coil and tube filtering to enhance signal presence. In comparison to simple EQ manipulation, this intensified presence sounds very natural and unobtrusive, and is particularly suited for optimizing the overtones in voice and acoustic instruments.

Through Flair, a recorded signal gains richness in detail, presence, intelligibility (for voice) and in an increased ability to cut through in a mix. In such mixes, a Flair-processed signal stands out without resort to conventional processing often unsuited to the task, saving both time and a need for artificial processing.

Flair works through an emphasis in the 1.5-20 kHz range centered around 6 kHz.

The GoldMike MK2 provides for two different settings, with a “High” setting of +2.5 dB and a “Med.” with +1.5 dB emphasis. An Off setting allows you to deactivate the Flair circuit entirely.



Tube Amp

The Tube Amp switch varies the degree of tube pre-amplification added to the discrete class A pre-amplification, which itself is set with the Gain control. The switch allows for three settings: +6 dB (standard) +12 dB and +18 dB. In each setting, the output of the tube is automatically reduced in proportion to the increased input, thus eliminating affects to the overall output level - there is no need to recalibrate. This allows for instant comparison between varying Tube Amp values and their sonic effects (see „About Gain Adjustments” on page 10).





Using the Tube Amp switch

Engaging the Tube Amp switch tends to have a significant impact on the overall sound, as it directly changes the sonic character of the tube. The higher the Tube Amp value, the more you will have tube saturation and harmonic distortion, in addition to limiting effects. These effects can be used creatively to shape a sound.

Subtle overdrive of the tube creates moderate saturation effects and relatively little harmonic distortion—the limiting effects are already present. If this behavior is desired, try a +12 dB setting with the Gain control also set to moderate pre-amplification.

For a more dramatic tube sound the Tube Amp switch should be set to +18 dB. This results in a very audible saturation and harmonic distortion. The intensity can then be fine-tuned with the Gain control: The more gain, the more phatt ...

Tube limiting controls peaks in a musically advantageous fashion and can be used to complement the Limiter. The tube limiting is not as accurate and sonically neutral as the Peak-Limiter because harmonic tube distortion is added to the signal.

To fully protect connected converters you should keep the Peak-Limiter active and monitor the action of the VU meter, the Clip- and Limiter-LED.

Limiter



The GoldMike MK2 offers a peak limiter that operates before the output level control. This ensures that the limited signal can be controlled as perfectly as possible for the internal—or an external—converter.

The peak limiter operates with special diodes that convert signal peaks into a pleasant-sounding saturation. Depending on the signal, this allows for an effective and subtle level limiting. Diode-based limiting works very quickly (much faster than common VCA- or FET-based limiters), reliably limits even micro-second-long transients, and is very effective for drums and percussion. The peak limiter also enables maximum loudness. Its degree of activity is displayed via the Limit LED.

The peak limiter is ideally suited to limit signals with a high degree of transients such as snare, kick, brass and other percussion instruments. Sine-wave like signals such as vocals, flute and layer sounds can also be protected, but the degree of increased loudness is limited.



Overdriving the peak limiter will be audible as distortion, an effect quite similar to overdriving the preamplifier. In order to avoid irritations please monitor the Clip-LED. If the Clip-LED is not illuminating, the distortion is coming from the peak limiter. In that case reduce the Threshold value. There are two threshold values to choose from: +12 dB and +18 dB. Limiting is less when selecting the +18dB threshold and intensified when choosing +12 dB. If the Limit LED illuminates constantly, you should select the +18dB setting or reduce the Gain control setting (also see “Limit-LED“ on page 17).

After setting the Limiter you can adjust the output level signal for equipment coming next in your chain. If you have opted for the internal A/D converter, you should keep an eye on the A/D Ovl LED. When this LED illuminates, the internal A/D converter is clipping. Reduce the output level until the A/D Ovl LED goes out. If external converters are used, check their clipping LEDs when setting the output level.

This placement of the limiter before the output level control helps exploit the headroom of A/D converters to the maximum while at the same time offering a signal peak safety margin.

Control Elements



VU-Cal

The display range of the VU meter can be shifted using the -10dB VU Cal switch position.

If the VU Cal switch is set to its 0dB position and the output level control is also set to 0dB with the limiter switched off, the output level will effectively be 0dBu. With the VU Cal set to -10dB the 0dB mark on the VU meter will represent a +10dBu output level. This way you can display audio level higher than +6dB (up to +16dB) on the VU meter.



Source

This switch allows you to select between the Mic and Line/Instrument inputs. All inputs can remain connected at all times, regardless of which input is selected. You can choose the Line input as source as long as the Instrument Input is not being used.

If you engage this switch first after powering up the unit, there can be a noticeable pop due to the discharge of residual current. This is normal and no cause for concern.



Central Display

The display consists of all status LEDs and the VU meter so that all important information can be viewed without distraction.

Display/VU Meter

The VU meter shows the internal gain level (not the output level). Its scale ranges from -20dB to +6dB. If needed, the sensitivity can be reduced by 10dB, which extends the scale to +16dB (see "VU Cal" above). Please refer as well to the information "About Gain Adjustments" on page 10.

Display/48 V LED

The 48V-LED indicates that the phantom power supply is activated. The 48V-LED will slowly dim before going out to indicate that it takes some time for residual current to discharge.

VERY IMPORTANT: The connection between microphone and GoldMikeMK2 should not be disengaged before the LED is completely dark! **To avoid damages, please note also the phantom power supply usage information on page 11.**



Display/Clip LED

The Clip LED shows internal clipping of the GoldMike MK2. To avoid distorted results the Clip-LED should never illuminate during a recording session (also refer to “About Gain Adjustments“ on page 10).

Display/Limit LED

The Limit LED shows the activity of the Peak Limiters. The Limiter threshold can be set to 12 or 18 dBu, and for optimal operation, should only illuminate in very short intervals. If the LED is illuminating too often even at the 18 dB position, you must reduce the Gain value (and possibly afterwards, further adjust the output level) to achieve unobtrusive results—unless, of course, you really want this effect (also see the chapter „Limiter“ on page 15).

Display/AD OVL LED

This LED is only active when the optional AD converter module is installed. It displays clipping in the internal AD converter and illuminates at approximately 0.5 dB before 0 dBfs. This LED should never illuminate when using the internal or an external converter. If it does, the output level must be reduced accordingly. For further information on the converter module see page 22, “Optional Digital Output: 24/96 AD converter, model 2376“. With external converters in use, please always check their internal clipping displays.

Solid state and tube stages

The solid stage preamp section is based on a fully discrete, balanced instrument amplifier and operates 12 single transistors in class A mode. A sophisticated circuitry ensures a nearly constant frequency response at any gain level. With an impressive slew rate of more than $200\text{V}/\mu\text{s}$ the solid stage is capable to amplify highest frequencies and fastest transients with almost no distortion, which is crucially important to achieve a realistic sound experience. Coupling condensers were used as sparingly as possible to avoid their inherent disadvantages such as diffuse sound, slurring and loss of dynamics. To eliminate DC artifacts, these are replaced by servo circuits operating outside of the audio signal paths.

An op-amp subsequently converts the instrument amplifier's output signal into an unbalanced one, which is then fed to the tube. Here an additional +6dB tube amplification is added, switchable to +12 and +18dB with the Tube Amp function.

The tube type—a Sovtek® 12 AX7 LPS—was also selected after extensive measurements and listening tests. This tube type outclasses the standard 12 AX 7 by far and delivers an open, transparent sound, excellent noise values and is especially reliable. An impedance converter adapts the tube's high-impedance signal to the following stages.

Output Stage

The output stage can drive very long connections (depending on cable capacities, up to several hundred yards). The max. output level is at +26 dBu, allowing plenty of headroom to drive subsequent converters.

Class A Instrument Input

The Instrument Input is a fully discrete impedance converter that also operates in class A mode. It is based on a low-noise field effect transistor that, due to its extremely high input impedance, is especially well suited to this task.

Relay switching

In order to ensure the shortest possible signal paths, nearly all switching functions are handled by optimally positioned, encapsulated relays with gold-plated contacts (the switches themselves only trigger the relays). Since resistors also greatly affect audio quality, the entire audio signal path utilizes painstakingly selected resistors with 0.1% tolerance.

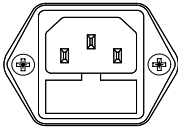
Foil condensers

The op-amp circuits use premium FKP foil condensers, which sound much more open than ceramic types and provide more natural dynamic response.

Power Supply

In the case of the power supply, no expense was spared. After all, the power supply is one of the primary factors in the audio quality and overall sound of any device. Just like the best coffee beans in the world will not produce a good cup of coffee with poor water, the best circuits can't produce a great sound with unreliable, inconsistent current. The transformer delivers three different voltages, each of which is separately screened and regulated: 250-V anode current for the tube, 48V for phantom power and 2 x 15V for the audio signal path.

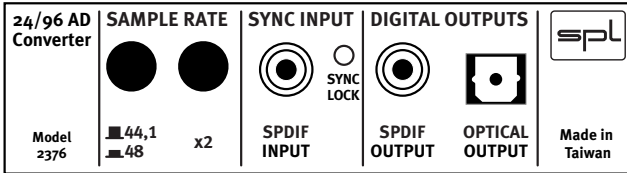
Critical currents are stabilized via a 100-nF MKP foil condenser, to ensure sufficient current for even the shortest impulses. The transformer is encompassed by double shielding to keep magnetic stray fields to an absolute minimum.



An AC power cord is included for connection to the standard 3-prong IEC connector. The transformer, power cord and IEC connector are VDE, UL and CSA approved. The AC fuse is rated at 315 mA for 220/240 V and 630 mA for 110/120 V.

- 24-Bit/96kHz A/D converter (upgrades after sale can be done by clients).
- Lundahl input and output transformers (upgrades after sale by authorized service personnel or SPL only).

24/96 A/D Converter



The optional 24/96 Converter module (model 2376) provides a digital output for the GoldMike MK2 in the form of an S/P-DIF output with RCA and optical connectors (in parallel). The converter transmits 24-bit signals.

The module is based on a 24-bit converter by AKM® with a variable sample rate of up to 96 kHz. All common sample rates can be selected (see below). Highly accurate quartz oscillators ensure a clean, low-jitter master clock.

Sample Rate

The 24/96 AD converter module allows you to select among the four most common sample rates of 44.1, 48, 88.2 and 96 kHz.

Using the 44.1/48 button, select one of the two basic sample rates (out: 44.1 kHz; in: 48 kHz). The x2 button doubles these sample rates to select 88.2 or 96 kHz respectively.

Dig. Out

The converted S/P-DIF signal is routed in parallel to the RCA and optical outputs. The signal is in professional format with no sample rate data in the status block.

Sync Input

The SYNC input allows you to feed an external signal into the converter to control the sample rate (since this is an AD converter, the SYNC Input is no audio signal input). Connect an S/P-DIF output from your master source (e.g. sound card) to the SYNC input. The AD converter will automatically switch to the same sample rate that is received. The 2376 is not equipped to accept Word Clock synchronization.

The yellow Sync Lock LED illuminates when a valid sync signal is present at the Sync input and the converter is automatically synchronized to the external sample rate.

To prevent interference, the internal oscillators are automatically disabled when an external clock signal is present. If the sync signal is no longer present (e.g. in the case of a dropout), the converter automatically reverts to the sample rate selected via the converter's control switches.

Lundahl-Transformers

Transformers have characteristics usually associated with other analog components like tubes or coils—they sound “warmer”, and punchier especially in the bass and mid area and deliver improved presence without boosting the top end. One reason for this is that transformers cancel out a large amount of odd harmonics (those portions of an audio signal that sound harsh to human ears).

Equipping the GoldMike MK2 with transformer-based inputs and outputs means you benefit from their unique characteristics.

IMPORTANT: The GoldMike MK2's input transformer delivers up to +14dB of additional passive gain, which must be added to the printed values.



Specifications

Frequency response <10 Hz to 90 KHz (-3 dB)

Input impedances

Microphone, XLR 2,8 KOhm
Line In, TRS 10 KOhm
Instr. In TRS 1 MOhm

Output impedances XLR and TRS connectors 50 Ohm

THD+N

Input level	Gain	
-30 dBu	30 dBu	0,016 %
-40 dBu	40 dBu	0,017 %
-50 dBu	50 dBu	0,022 %
-60 dBu	60 dBu	0,048 %

Noise, A weighted, R=40 Ohm

Gain	
30 dB	-91,2 dBu
40 dB	-86,6 dBu
50 dB	-78,7 dBu
60 dB	-69,3 dBu

Dynamic range, 30 dB Gain 110 dB

E.I.N 128 dBu

Max. Input level

Mikrophone, XLR +7 dBu
Mikrophone, XLR +PAD +28 dBu
Line In, TRS connector +23 dBu
Instr. In TRS connector +7 dBu
Instr. In TRS connector +PAD +14 dBu

Max. output level

Balanced, XLR+TRS +26,8 dBu
Unbalanced, XLR+TRS +21,5 dBu

CMRR

1 KHz, Gain 30 dB >75 dB
10 KHz, Gain 30 dB >75 dB

Power consumption 25 W

Dimensions B x H x T 482 x 88 x 210 mm/19.28 x 3.52 x 8.4 in

Weight 4,1 Kg/9.02 lbs

Specifications subject to change without notice.

Guarantee

SPL products are guaranteed for a period of one year against faults in materials or workmanship. Refer to your local supplier for full sales and guarantee terms.

