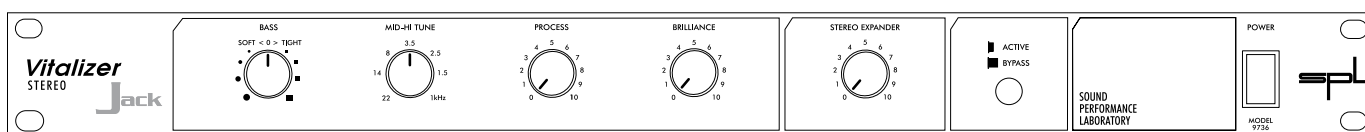




soundperformancelab.com



Manual



Vitalizer[®]
STEREO
Jack
Model 9736

Programm-Equaliser

Manual

By Hermann Gier and Paul White

Version 2.2 - 6/1999

The information in this document has been carefully verified and is assumed to be correct. However Sound Performance Lab (SPL) reserves the right to modify the product described in this manual at any time. Changes without notice. This document is the property of SPL and may not be copied or reproduced in any manner, in part or full without the authorisation of SPL.

Limitations of Liability:

In no event will SPL be liable for any damages, including loss of data, lost profits, cost of cover or other special, incidental, consequential or indirect damages arising from the use of the unit, however caused and on any theory of liability. This limitation will apply even if SPL or an authorised dealer has been advised of the possibility of such damage.

SPL electronics GmbH

P.O. Box 12 27

D- 41368 Niederkruechten, Germany

Phone +49 - 21 63 / 98 34-0

Fax +49 - 21 63 / 98 34-20

eMail: info@soundperformancelab.com



soundperformancelab.com

Foreword	3
Thanks	3
Introduction	4
Operation safety	4
Connections	5

Applications

Recording Studio	5
Sound Reinforcement	7
Video & Film Post Production	7

First steps

Starting positions	8
--------------------------	---

Control elements

Active	9
Bass	9
Mid-Hi Tune	9
Process	10
Brilliance	11
Stereo Expander	12
Specifications	13
Warranty	14

Dear customer,

thank you for the confidence you have shown towards SPL electronics GmbH by purchasing the SPL Stereo Vitalizer Jack, one of the most powerful and creative signal processors currently available. The Stereo Vitalizer Jack is a first-rate sound processor with exemplary performance, unrivalled sound quality and excellent workmanship.

Please read this manual carefully to ensure ease of use and operation.

We wish you every success with the Stereo Vitalizer Jack.

Your SOUND PERFORMANCE LAB-Team

I would like to start with my thanks to all our staff, who created what is to be described here. The importance of their exceptional qualification and talents can not be overestimated.

Our products are often tested and compared in many publications and by our customers themselves and constantly valued with best results. I would like to pass on this broad appreciation to those, who deserve it – my excellent colleagues.

Hermann Gier

Foreword

Thanks

Introduction

The new Stereo Vitalizer Jack, model 9736, is an entirely re-designed and improved version of the successful predecessor, model 9319.

The Stereo Vitalizer Jack is an equaliser concept which makes use of audiometric technology to process audio signals. The unique combination of dynamic equalisers, amplitude-controlled phase correction, harmonic filtering and stereo expanding opens up a whole new listening dimension by adapting the sound pattern to the non-linearities of the human ear.

The new Stereo Vitalizer Jack represents the entry level of the Vitalizer product range, but utilises the same principles as employed in the more professional models. It is the ideal choice in cost-conscious situations for processing stereo signals, for example in project studios, audio edit suites and small sound reinforcement systems.

The Stereo Vitalizer Jack is built to the same high manufacturing standards as all SPL units, using 1% metal film resistors, MKT capacitors and a toroidal transformer. The control topography has been streamlined to give easy access to the Vitalizer functions without compromising on flexibility or audio quality, freeing the engineer to be creative.

The design is optimised for ease and speed of use with one set of controls handling both channels; this approach also ensures both channels are processed identically.

Already the predecessor of the new Stereo Vitalizer Jack was awarded the 'Stage Design Award' in 1994 by the 'Artist' magazine for successful use in live applications.



"Stage Design Award" from Artist Magazine for the Vitalizer's "exceptional performance on stage".

Operation safety

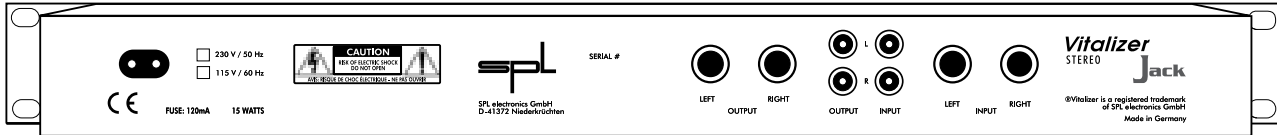


Important security advices

The housing of the Stereo Vitalizer Jack has the standard 19" EIA format and occupies 1U (44 mm) in your rack. When installing the unit in a 19"-rack, the rear side of the unit needs some support, especially in a touring case. The Stereo Vitalizer Jack should not be installed near units which produce strong magnetic fields or extreme heat. Do not install the unit directly above or below power amplifiers or digital processors. If possible, the Stereo Vitalizer Jack should be placed in an "analogue rack" where the majority of (or all) the equipment installed is analogue. This eliminates problems which could result from interfering high-frequency signals such as clock frequencies, MIDI or SMPTE control signals. If, during operation, the sound is interrupted or indicators no longer illuminate, or if abnormal odor or smoke is detected, or if liquids are spilled on the unit, immediately disconnect the power cord plug and contact your dealer.

Only clean your Stereo Vitalizer Jack with a soft, lint-free cloth. Use only standard cleaning agents. Never use alcohol or paint thinner, because they damage the finish. Before connecting the Stereo Vitalizer Jack switch the power off at all connected units.

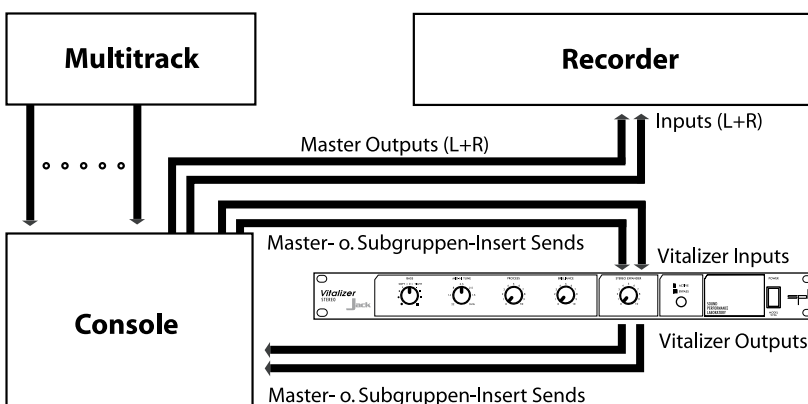
The Stereo Vitalizer Jack is equipped with unbalanced inputs and outputs. The connection can either be made with mono jacks or gold-plated RCA connectors. The output is split to both connectors, so that you can record on two media simultaneously. Make sure to connect only one input signal to either the RCA or the jack connector.



Rear front Stereo Vitalizer Jack, Model 9736

1. In recording studios, connecting the Stereo Vitalizer Jack into the master or subgroup inserts is the most efficient mode of operation. A stereo mix can be treated either during mixdown from multitrack, or while re-recording in a sweetening session, while processing stereo samples or keyboard sounds is another useful application. In particular, drum and string samples benefit from the Vitalizer process. It is essential to listen to a full-range monitor system to evaluate the bass processing. You should also switch between processed and unprocessed signal fairly regularly. "Less is more" is especially true when using the Vitalizer on a full mix. Your hearing adapts quickly to the quality of the Vitalizer sound. A good advice when setting up any processing in a mix is to use a known CD, played over the speakers, to help you keep a sense of perspective.

Do not connect the Stereo Vitalizer Jack between master-outputs and amplifier. The major disadvantage of this connection is the varying input sensitivity with each fader movement.



Applications

Recording studio

Application 1

The Stereo Vitalizer Jack inserted into the master-inserts of the console

Applications

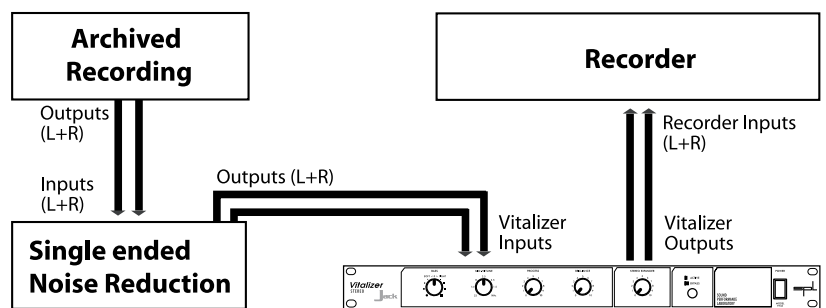
When patching the Stereo Vitalizer Jack into the sub-groups or master-breaks of the console, note if the master breaks are switched »pre« or »post« fader. They should best be switched »pre« fader, so that a variation of the master fader does not affect the input level of the Stereo Vitalizer Jack. The effect level and the treated sound will then remain unchanged.

2. Another popular stereo application is the processing of existing master tapes during post-production such as when reprocessing archive material for CD release.

If a single-ended noise reduction system is used to clean up the original, the Stereo Vitalizer Jack can make a significant contribution in restoring the high end detail that invariably suffers during such treatment. In many cases, the restored master can be made to sound appreciably better than the original.

Application 2

The Stereo Vitalizer Jack inserted between noise-reduction and recorder to improve archived recordings

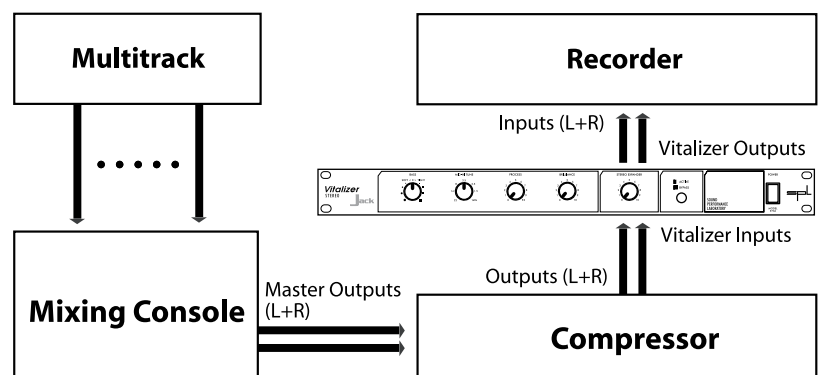


3. When electronic music is produced, the Stereo Vitalizer Jack can be used to add new range and depth to samplers and synthesizers and also to further process existing effects such as delay and reverberation. Even budget instruments and processors with limited audio bandwidths can be made sound full-bodied and detailed.

If you want to use a compressor in the master chain after the console, use your Stereo Vitalizer Jack after the compressor. You can then be sure that the Stereo Vitalizer Jack will receive a level-corrected signal which helps to operate even more precise. If you use the Stereo Vitalizer Jack before the compressor negative side-effects such as pumping could be more audible.

Application 3

The Stereo Vitalizer Jack inserted between compressor and recorder



Applications

Sound reinforcement

In live performance or in club installations, the Stereo Vitalizer Jack is a powerful ally in maintaining speech intelligibility under difficult conditions. It is also of great benefit in systems designed to play recorded music because the illusion of loudness can be maintained at lower absolute SPLs. This could be particularly beneficial with the introduction of new noise level legislation. On the subjective side, the Stereo Vitalizer Jack helps produce a detailed, tight sound, even from indifferent speaker systems giving an improvement in perceived audio quality.

The Stereo Vitalizer Jack can be of great value when mixing under time-pressure. You can almost leave the onboard EQs flat and create the FOH sound with the Stereo Vitalizer Jack in the master inserts.

As in other areas, the Stereo Vitalizer Jack can be used to sharpen and enrich dialogue, even when the microphone placement is less than optimum as is often the case when filming due to the need to keep the mic out of shot. Music soundtracks benefit in the ways already described for audio-only applications and the fact that the Stereo Vitalizer Jack is so quick to set up can save a lot of wasted time spent tuning multi-band equalisers.

Time-compressed audio can also be treated to restore the lack of timbre so often caused by such intensive processing. This is particularly valid in the case of vocal narratives as even a relatively small amount of time-compression or expansion can dramatically compromise the sound quality.

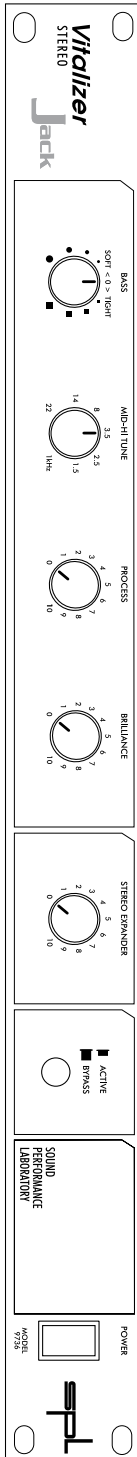
On the post production work on Spike Lee's "Malcom X" movie the voice of Denzel Washington playing Malcolm X was treated with the Vitalizer for dramatical reasons:

"We wanted to make sure that there was a dramatic quality difference between the voice-over and the sync dialog," Fleischman adds, offering a mixer's view. "You try to find a balance between two center mics then balance that with whatever you're using from left-right pair. We then treated it with the SPL VITALIZER, a psychoacoustic equalizer. It brings a lot more presence to the upper end of the spectrum and a very deep low end so that the voice sounds full."

Mix Magazine

First steps

Starting positions



When setting up the Stereo Vitalizer Jack for the first time, it is wise to approach the controls in a specific order to avoid confusion and to achieve positive results right from the start. Use a CD as source.

- Bass to zero (center position)
- Mid-Hi Tune to 3,5 kHz (center position)
- Process to zero (counter clockwise)
- Brilliance to min (counter clockwise)
- Stereo Expander to zero (counter clockwise)

1. Press the Active switch. You will yet hear no audible change in the sound.

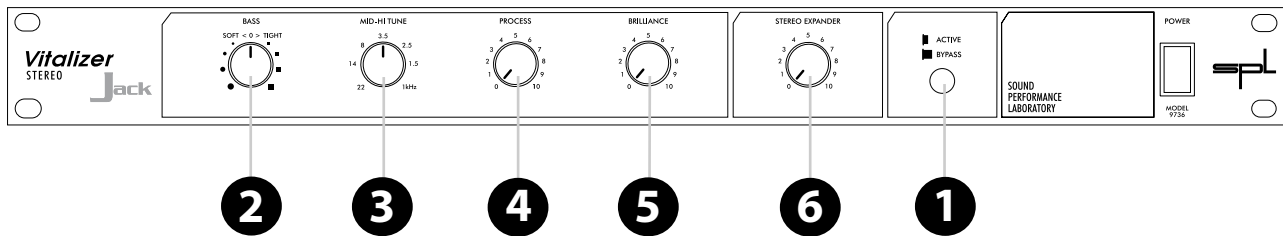
2. Slowly move the Process control in from the extreme left. You will find that starting from the 10 o'clock position all frequencies above 3.5 kHz (initial setting Mid-Hi Tune) are becoming more intense. Frequencies below this point are diminished. First set the Process control at 2 o'clock.

3. The next step is to shift the Bass control from the zero position to both sides. Turn to the right: The bass sounds tight and dry. Turn to the left: The bass sounds soft and round. Decide on a bass sound of the desired amplitude.

4. Now start varying Mid-Hi Tune. The original setting is 3.5 kHz. Turn to the right: The programme material sounds brighter and gets more mids from about 1.5 kHz. The Mid-Hi Tune control sets a starting frequency above which all frequencies are processed. If this starting frequency is lowered, the frequency spectrum included in processing increases. The programme material then sounds brighter and clearer. Turning the control to the left shifts the starting frequency from 3.5 kHz to higher frequencies. The programme material then sounds increasingly dull, because fewer and fewer frequencies are being included in the process, the higher the frequencies become. The setting you choose is a matter of personal taste.

5. The Brilliance control helps you to give voices or other instruments in improved presence. Set the Brilliance control in to around 12 o'clock. This makes the processed signal more natural with a soft, silky-sounding top-end.

6. Finally, turn in the Stereo Expander control to the 12h-position. Note the spreading stereo image.



The Active function switches the Stereo Vitalizer Jack on or off. It is a relay-hard-bypass function that works on both RCA and Jack connections. In the event of a power failure the Stereo Vitalizer Jack is automatically switched to hard-bypass (power failure safety). To increase the operational safety of the monitor loudspeakers you should not switch the Stereo Vitalizer Jack on or off at high monitor volume. At high amplitudes inside the filter, there may be residual charges on the switching contacts which may be discharged when you switch over. These may become apparent as audible click sounds. If applicable, reduce or mute the monitor loudspeakers before switching on or off.

1 Active

The Active switch switches a relay hard-bypass circuitry for XLR and jack operation.

The Bass control is responsible for the “colour” of the bass sound your signal is to have. If you move the Bass control to the right, you get a drier, percussive bass sound, known as *Tight*. As a result of this, on the right-hand side of the scaling points, there are squares which increase in size, in line with increased intensity. They symbolize the contoured bass sound. If the Bass control is moved from the center position (0) to the left, the bass sound becomes very deep, soft and warm. This sound is known as *Soft*. This is symbolized with round scaling points which also increase in size as the intensity increases. The further the Bass control is shifted to the right or left of the center position, the more intensive the bass sound in question. However, Process (see 4) must be positioned around 12 o’clock or higher for the bass to be audible. You can always hear the original (dry) bass if the Bass control is in the center position.

2 Bass

Selecting a soft or a tight bass sound

The Process control determines the processing ratio between the set bass sound colour and the original signal. This results in varying bass sound structures: if you combine high bass amplification on the Bass control with a lower Process value, you get a different bass structure than with a lower bass amplification combined with a higher Process value. Choosing the best solution is a matter of personal taste and also depends on the type of original signal involved.

Control Elements

Mid-Hi Tune **3**

Setting the starting frequency for the shelving filter to adapt the frequency range to the hearing sensation.

No comb-filtering effect as with graphic EQs.

The Mid-Hi Tune control is used to set the starting frequency of a broad-band shelving filter. In line with the setting of Process control, all frequencies above this value right through to the end of the audio range are processed.

The control range of the Mid-Hi Tune control is between 1 kHz (extreme right) and 20 kHz (extreme left). In practice, common settings vary between 3.5 kHz and 8 kHz (12h to 10h positions).

As the human ear perceives the range between 1 kHz and 3 kHz particularly clearly, at all volumes between 0 and 120 phon it makes sense to adapt this frequency range. You might feel inclined to say "Yes, but I do that with my graphic EQ as well". The main difference is that the graphic EQ really reduces the effective loudness of the frequency, i.e. cuts out the appropriate frequencies, thus changing the spectral content of the original signal. The Stereo Vitalizer Jack, however, relies on a more musical method of amplitude-depending phase shifting. This does not involve altering the spectral composition of the signal but it does maintain the subjective impression of loudness. Moreover, graphic equalizers produce comb-filter effects because of the interaction between adjacent filters, when broad-band frequencies are raised. The Mid-Hi Tune filter can raise the broad-band spectrum with a very linear frequency response, without colouring the signal.

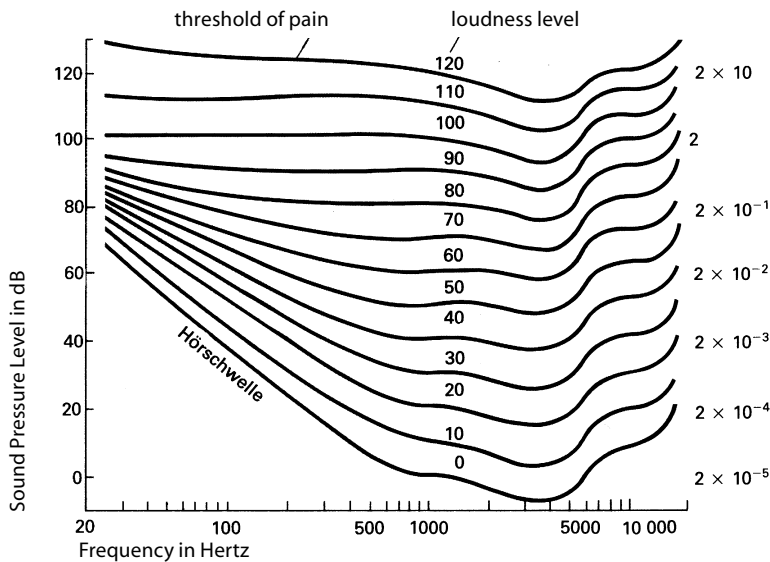
Above the Mid-Hi Tune value set, the Stereo Vitalizer Jack filters create a linear increase, i.e. one that is adapted to the human ear. This compensates any inability of our hearing as regards perceiving frequencies ranging between 5 kHz and 10 kHz. The Mid-Hi Tune filter works with a wide bandwidth and always sounds musical, never »bell-like«. Gradually go down from 20 kHz (extreme left) to lower frequencies. The further down you go, the brighter the sound image becomes, as an increasing number of frequencies are included in the process.

The Mid-Hi Tune control can also be used to tone down excessively sharp-sounding material, by setting frequencies of 10 kHz or higher, and setting the Process control on Max. Seeing as the Process control is also responsible for deleting dominant mid frequencies, all frequencies are gradually reduced down to the application frequency, in conjunction with high starting frequencies of the Mid-Hi Tune control.

Process **4**

The Process control determines the ratio between Bass and Mid-Hi Tune to the original signal. The Process control also determines the damping intensity of dominant mid frequencies. This allows rapid adaptation to the loudness curves (Fletcher-Munson curves, "curves of equal loudness"). The human ear perceives the audio frequency spectrum at varying sound pressure levels very differently. Perception is by no means "linear". The Stereo Vitalizer Jack alters the frequency spectrum in such a way that the balance is maintained between all frequency ranges even at varying monitor volumes.

For the human ear, the sound is more pleasant and easier to perceive than the original. In other words, increasing the Process value also increases the intensity of the Mid-Hi Tune filter and the Bass filter, whilst dominant mid frequencies are damped by amplitude-controlled phase shiftings. This improves the perception of loudness, clarity and the bass punch, i.e. the strength and fullness of the audio signal.



The Fletcher-Munson curves ("curves of equal loudness").

The Stereo Vitalizer Jack works with coil filters and controlled changes of the phase relationships of the high frequencies and harmonics.

We consciously did without the generator principle of "Exciters". The Stereo Vitalizer Jack's Brilliance circuitry does not add any distortions to the original signal, unlike with the generator principle. It extracts all the information it needs from the original signal. This significantly reduces the hearing fatigue effect on the listener. By influencing the phase relationship in an intelligent fashion, the filtering emphasizes the perception of high and harmonical frequencies. The effect significantly improves the speech intelligibility and the transparency. Old archived recordings sound fresh and silky again. The brilliance of any audio signal can be improved without it sounding sharp.

If you close the Process control (extreme left), the Bass and Mid-Hi Tune controls do not function any more. You can then listen to the Brilliance circuitry control separately.

The Mid-Hi Tune and the Brilliance circuitry complement each other in an ideal fashion. While the Mid-Hi Tune sets the frequency above which the programme material is lifted and below which the damping takes place, the Brilliance circuitry comes in place to extract certain frequencies from this process. This is very helpful, when you are processing material with lead vocals: Using the Mid-Hi Tune will generally damp some speech frequencies and the voice moves into the mix losing a bit of its presence. Use the Brilliance circuitry to bring it back up front.

5 Brilliance

Improved high and harmonic frequencies result in a silky top-end with better separation and intelligibility.

Control Elements

Stereo Expander

6

The Stereo Expander potentiometer controls the width of the stereo image. Working on established inter-channel phase principles, the Stereo Expander control is used to increase the subjective soundstage width of any stereo source. The off-center signals of the stereo source are detected and fed back to the opposite channel phase inverted.

This effect can be applied to overall mixes as well as to single instruments. Very interesting is the spreading of the stereo image of overhead mics of drum-sets or choruses or horn sections.

In case you want to monitor the Stereo Expander in isolation, switch Active on and set the Process and Brilliance controls fully counter clockwise.

Input & output stages

Instrumentation amplifier, transformerless

Connectors Jack and RCA

Nominal input level 0 dB

Input impedance 20 kOhms

Output impedance 75 Ohms

Max. input level +24 dBu

Minimum load ohms 600 Ohms

Hard bypass switch yes

Measurements

Overall Frequency Response 10 Hz-100 kHz
(100 kHz = -3 dB)

EQ Frequency Response 20 Hz-22 kHz

THD & N 0,002% @1 kHz

S/N CCIR 468-2 -87 dBu

Power Supply

Transformer 2,4 VA

Fuse 200 mA (230 V/50 Hz)
... 400 mA (115 V/60 Hz)

Dimensions

Housing Standard EIA 19"/1U
... 482 x 44 x 200 mm

Weight 3 kg

Subject to change without notice.

Warranty

SPL electronics GmbH (hereafter called SPL) products are warranted only in the country where purchased, through the authorized SPL distributor in that country, against defects in material or workmanship. The specific period of this limited warranty shall be that which is described to the original retail purchaser by the authorized SPL dealer or distributor at the time of purchase.

SPL does not warrant its products against any and all defects:

1) arising out of materials or workmanship not provided or furnished by SPL, or 2) resulting from abnormal use of the product or use in violation of instructions, or 3) in products repaired or serviced by other than authorized SPL repair facilities, or 4) in products with removed or defaced serial numbers, or 5) in components or parts or products expressly warranted by another manufacturer.

SPL agrees, through the applicable authorized distributor, to repair or replace defects covered by this limited warranty with parts or products of original or improved design, at its option in each respect, if the defective product is shipped prior to the end of the warranty period to the designated authorized SPL warranty repair facility in the country where purchased, or to the SPL factory in Germany, in the original packaging or a replacement supplied by SPL, with all transportation costs and full insurance paid each way by the purchaser or owner.

All remedies and the measure of damages are limited to the above services. It is possible that economic loss or injury to person or property may result from the failure of the product; however, even if SPL has been advised of this possibility, this limited warranty does not cover any such consequential or incidental damages. Some states or countries do not allow the limitations or exclusion of incidental or consequential damages, so the above limitation may not apply to you.

Any and all warranties, express or implied, arising by law, course of dealing, course of performance, usage of trade, or otherwise, including but not limited to implied warranties of merchantability and fitness for particular, are limited to a period of 1 (one) year from either the date of manufacture. Some states or countries do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state, country to country.

SPL electronics GmbH

41372 Niederkrüchten, Germany