

Gemini

Mastering M/S Processor



Manual



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Gemini

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Version 1.1 – 03/2019

Developer: Bastian Neu

This manual includes a description of the product but no guarantee as for specific characteristics or successful results.

Unless stated otherwise, everything herein corresponds to the technical status at the time of delivery of the product and user manual by SPL electronics GmbH.

The design and circuitry are under continuous development and improvement.

Technical specifications are subject to change.

Package Contents

Gemini Mastering M/S Processor

Power cord

Manual

The Gemini Mastering M/S Processor is available in different colors.

Black: Model 1720

Red: Model 1724

All Black: Model 1723

Do consider keeping the original packaging. It can come in very useful whenever you need to transport your gear. If there is ever the need to send it in for repair, the original packaging guarantees a safe shipment.

Product Registration

Register your device to get useful information concerning the product. On the front page of this manual you will find a QR code, which includes the link to the registration form and automatically fills in the serial number and product name into the form. Alternatively you can also call up the online form with your internet browser via the following link:

<https://spl.audio/register>



The first M/S processor in 120V technology

With **Gemini M/S Mastering Processor** M/S processing enters the SPL Mastering series.

Gemini is an M/S Encoder and Decoder.

Mid signals (voice, snare, bass ...) can clearly be separated from side signals (guitar, spatial sounds, cymbals ...) and can individually be processed. When working on the sum signal, M/S coding often is the best way to specifically get access to individual elements within a mix.

Gemini also provides the possibility to work on the stereo panorama.

With the Balance control you can position the mid signal within the stereo panorama. With the Trim control, you can adjust the level of the mid signal in relation to the side signal. In connection with the Stereo Width control, the mixing ratio of both channels can be adjusted.

An Elliptical Filter, which can cut low frequency ratios of the side band is also provided.

The SPL Gemini Mastering M/S Processor was developed and manufactured in Germany.

Technical Aspects

120 Volt Technology

SPL's goal was to push analog signal processing to the limits. That's why we combined the best possible components with a high-grade optimized circuit design.

We have been using the in-house developed 120 Volt technology - the highest-ever operating voltage used for audio applications - in all our products from the Mastering series for years. Some of the most highly respected Mastering studios today revolve around SPL consoles and signal processors from our Mastering series (Bob Ludwigs Gateway Mastering & DVD in the USA, Simon Heyworth's Super Audio Mastering in the UK, Galaxy Studios in Belgium, and the legendary Wisseloord in the Netherlands, for instance).

The 120 Volt technology is based on op-amps developed internally by SPL's co-founder and Chief Developer Wolfgang Neumann. The Hermes Mastering Router features the most advanced generation of these op-amps. They boast with even better tech specs thanks to the thermal behavior optimization they underwent under the hands of Bastian Neu.

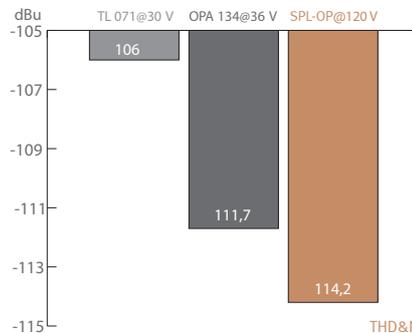
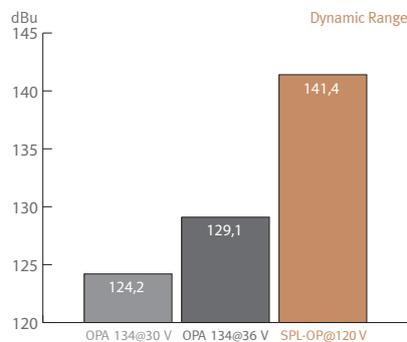
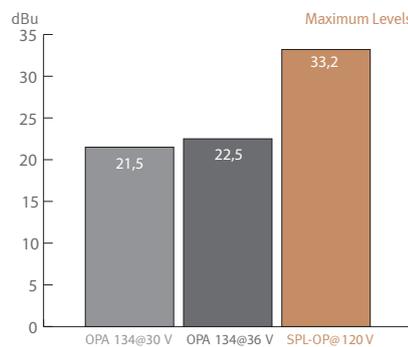
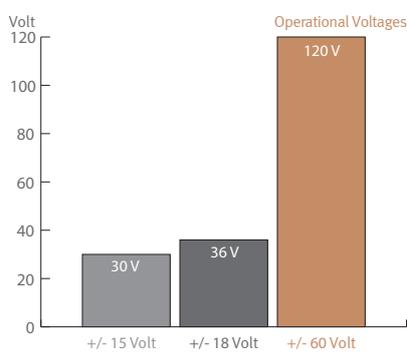
Ultimately, the supply voltage is key for the overall dynamic response of a processor. Voltage is to an electrical circuit what cylinder capacity is to an internal combustion engine:

You can't replace cylinder capacity with anything else, except more cylinder capacity.

120 Volt Technology - Diagrams

These diagrams clearly show the advantages of our 120-volt technology in comparison to other circuits with a lower operating voltage. The direct relation between operating level and maximum level is fundamental for the classification: the higher the operating level, the higher the maximum level a circuit can handle. And since virtually all essential acoustic and musical parameters depend on this relation, a higher operating voltage also has a positive impact on the dynamic range, distortion limit and signal-to-noise ratio. The result is a clearly more laid-back and natural sound with less unpleasant coloring.

Do bear in mind that dB scales do not represent linear but rather exponential increases. A 3 dB increase corresponds to doubling the acoustic power, +6 dB correspond to twice the sound pressure level, and +10 dB correspond to twice the perceived loudness.



When it comes to volume, the 120-volt technology exhibits a performance that is twice that of common components and circuits, in regard to maximum level and dynamic range, with values that are approximately 10 dB higher. THD measurements of the SPL op-amps show a difference of more than 3 dB compared to the OPA134 at 36 V — in terms of sound pressure level, that corresponds to an improvement of more than 50%.

The operating level most commonly used for audio equipment is 30 volts.

Installation

Voltage Selection

Before connecting the Gemini Mastering M/S Processor to the mains, make sure that the voltage selection corresponds to the values of your local power grid (230 or 115 volts). Inside the power connector, to the right, next to the on/off switch, there is an opening that displays the voltage selected. If the voltage indicated does not correspond to the one required, change it by following this procedure:

Open the power connector lid with a small screwdriver (use the tiny slots on the right hand side). Use the screwdriver to lever the red fuse holder from above until you can grab it. Take the fuse holder out and replace the fuse with one corresponding to the local power grid specifications. You can find the adequate values on the rear of the unit or on page 16 of this user's manual. Turn the fuse holder around 180 degrees and place it back again. When you close the lid again, you should see the correct voltage displayed in the opening.

On the product site on our website (<https://gemini.spl.audio>) you will find a video concerning the topic "Changing the mains voltage". If you ever have to exchange a fuse, we recommend the video "Exchange defective fuses".

First Steps

Before turning on the Gemini Mastering M/S Processor you must first connect the included 3-pin power cord to the 3-pin IEC socket. The transformer, power cord and IEC socket all comply to the VDE, UL and CSA regulations.

The Gemini Mastering M/S Processor should not be installed in close proximity to equipment that emits magnetic fields or emanates heat. Avoid exposure to heat, moisture, dust, and vibrations. Do not install the Gemini Mastering M/S Processor close to any power amps or digital processors. Instead, install it in a fully "analog rack" where any interferences can be avoided (Word Clock, SMPTE, MIDI etc.).

The unit should be powered off before connecting or disconnecting any cables or equipment to it.

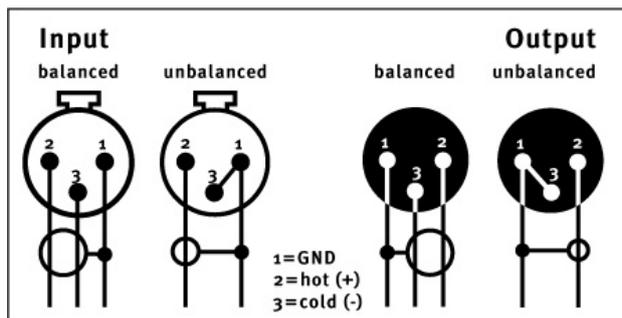
Use the On/Off switch on the rear panel to turn the unit on or off. The illuminated red LED in the middle of the front panel indicates the unit's operating status. The On/Off switch was placed on the rear panel to avoid any emissions due to voltage-carrying conductors running across the unit and affecting sound. When powering on or off, there's no need to observe a specific sequence regarding the connected devices. However, like with any audio signal chain, power amplifiers should always be powered on last and powered off first. The Gemini Mastering M/S Processor can be powered on and off with the use of a circuit breaker, as long as the total load does not exceed the rating of the latter.

XLR inputs and outputs

We used exclusively Switchcraft/Neutrik XLR input and output plugs to guarantee perfect connectivity in the studio. They provide an optimal connection thanks to their electromechanical design and large contact surface.

The image shows the XLR connectors pinout. They are balanced and have three conductors or wires. Conductor 2 (Pin 2) corresponds to the (+) or hot Signal.

In case an unbalanced connection is necessary, the correct polarity of the conductors needs to be observed.

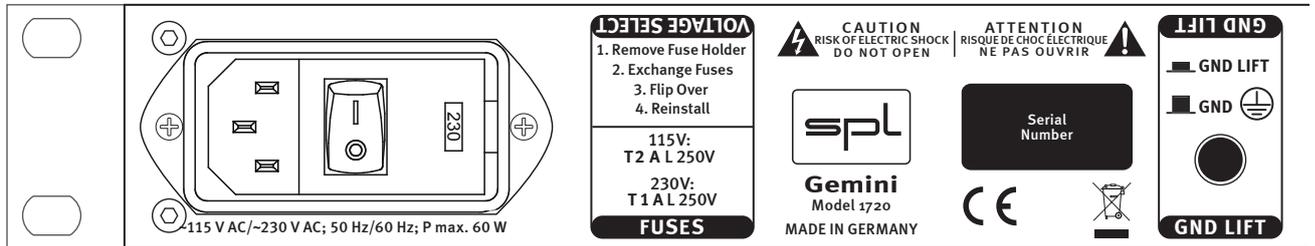


Ground Lift switch to avoid ground loops

On the rear panel of the Gemini Mastering M/S Processor (see page 8) is also a „GND LIFT“ (Ground Lift) switch to avoid any ground loops. Ground loops take place when gear connected in the same network have different potentials

The GND LIFT switch disconnects the equipment ground from the service ground to avoid such problems. The Ground Lift function is activated (= equipment ground disconnected) when the switch is depressed.

Cabling: Rear Side



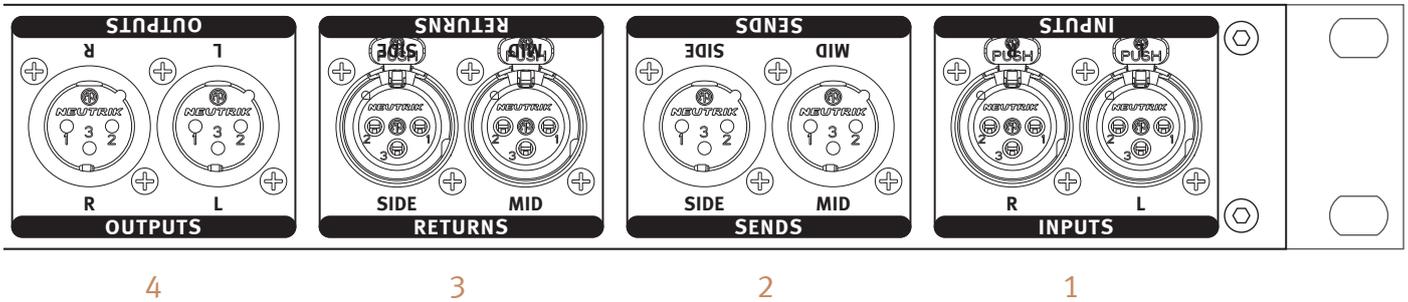
- 1 Inputs
- 2 Sends
- 3 Returns
- 4 Outputs
- 5 Ground-Lift (see details on page 7)
- 6 Voltage (see details on page 6)

1 Inputs

Gemini provides two balanced inputs labeled as Inputs. These are female XLR jacks. Connect the stereo signal, which is supposed to be processed with the Gemini, to these inputs. Connect the left channel to INPUL L and the right channel to INPUT R.

2 Sends

Through both unbalanced output jacks, XLR male, Gemini sends the signal to a device or a collection of devices, with whom the signal can be processed. Connect the left channel to SEND MID and the right channel to SEND SIDE.



We also provide a Screenshot video manual on the product page on our website:
<https://gemini.spl.audio>

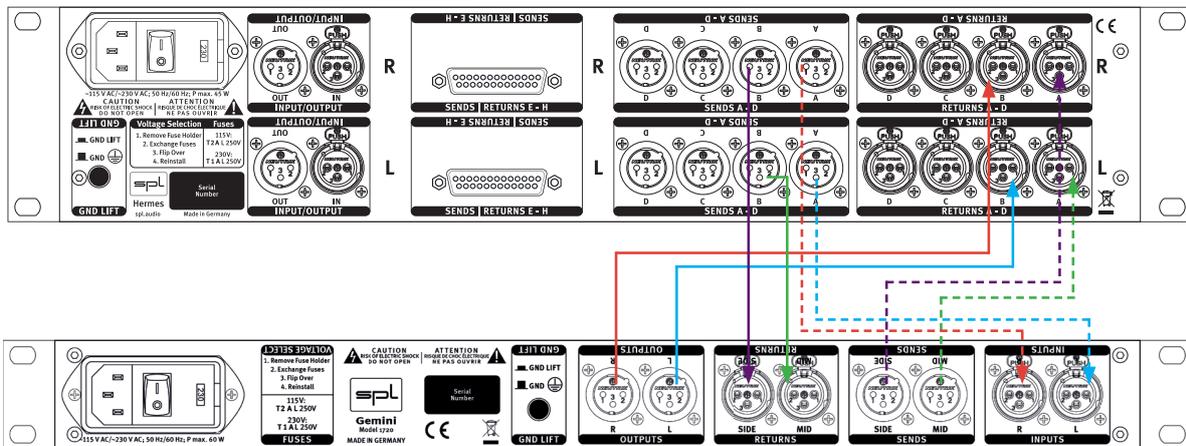
3 Returns

Additionally, Gemini provides two balanced input jacks, XLR female, labeled as Returns. Connect the left channel to RETURN MID and the right channel to RETURN SIDE. Send and Return together make up the insert of Gemini Mastering M/S Processor. With this insert, external processors for further signal processing can be used. The signal is sent through the Send to an external processor and sent back through the Return.

4 Outputs

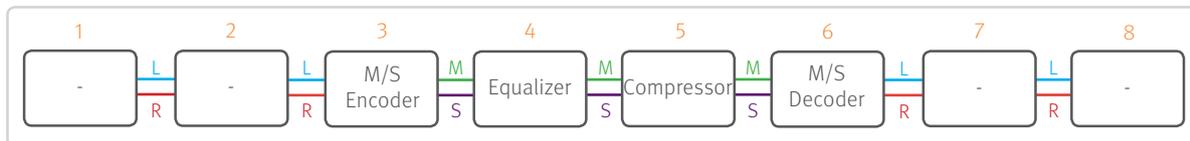
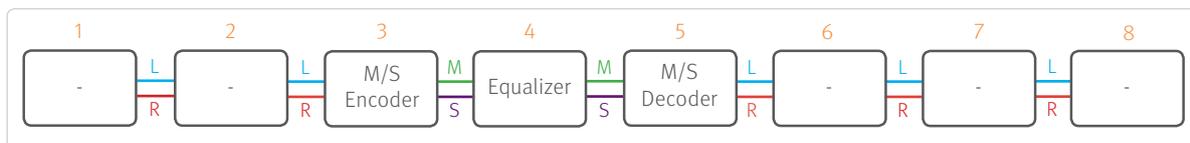
With both balanced outputs, XLR male, labeled as Outputs, the signal, which is processed with Gemini is sent back to the original signal path. Connect the left channel to Output L and the right channel to Output R.

Pairing Gemini and Hermes

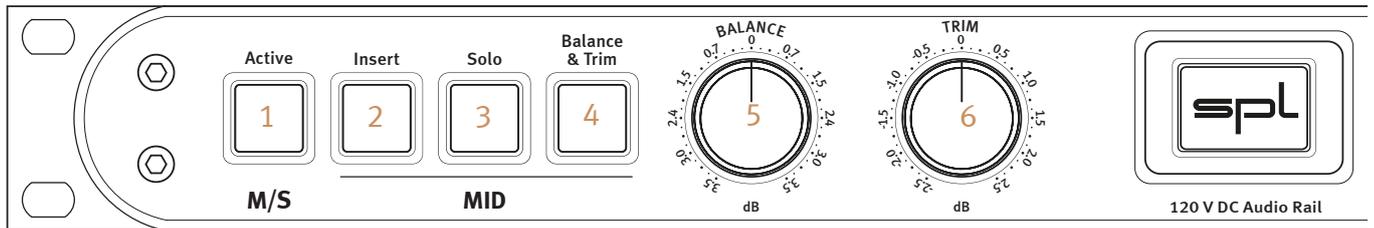


Hermes and Gemini Mastering M/S Processor operate in their complete range of functions as stand-alone devices. A pairing of Hermes and Gemini enables lots of further possibilities.

If the M/S Encoder and Decoder stages of Gemini are each paired with an insert of Hermes, it is possible to freely choose a position for the M/S Encoder and Decoder within the processing chain. This way, it is possible (see image below) to place the M/S Encoder on the third position, an equal-izer on the fourth to use it for separate processing of the mid and side signal and then use the M/S Decoder stage of the Gemini on the fifth position to generate an L/R stereo signal. If you now like to additionally use a compressor, as a further device for M/S processing, you can place it on position 5 and the M/S Decoder stage would thus move to position 6.



Control Elements



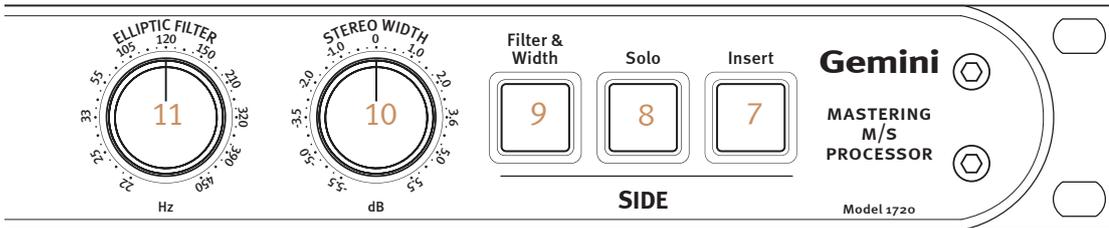
- 1 Active
- 2 Insert (MID)
- 3 Solo (MID)
- 4 Balance & Trim
- 5 Balance
- 6 Trim

1 Active

With this button, you activate the M/S Matrix of Gemini. If the button lights up, the M/S Matrix is active. Before the insert Send in Gemini an M/S encoding takes place and after the insert Return an M/S decoding. All further buttons and controls of Gemini are also functioning. If the M/S Matrix is not activated with this button, an M/S encoding and M/S decoding does not take place. Devices connected to the insert are fed with the regular L/R stereo signal. All further buttons and controls of Gemini have no effect on the audio signal in this case.

2 Insert (MID)

If the INSERT button in the MID section is activated, the device connected to the insert MID is inserted into the signal path (Insert Send: MID Send, Insert Return: MID Return). With this device, you can only process the mid part of the M/S signal. The mid signal (MID) is the sum of the left and the right channel of the stereo signal (L+R), hence the “in-phase part” of the stereo signal. The insert is located after the BALANCE control, though before the TRIM control. Therefore, the mix balance can be corrected before the inserts and level differences can be balanced after the inserts.



- 7 Insert (SIDE)
- 8 Solo (SIDE)
- 9 Filter & Width
- 10 Stereo Width
- 11 Elliptical Filter

We also provide a Screenshot video manual on the product page on our website:
<https://gemini.spl.audio>

3 Solo (MID)

If the SOLO button of the MID section is activated, you can only hear the mid part of the M/S signal. If the SOLO button of the SIDE section is activated, the MID Solo function is automatically deactivated. This gives you the opportunity to comfortably switch between the monitoring of the M/S mid signal and M/S side signal.

4 Balance & Trim

With this button, you can activate the functions BALANCE and TRIM. If the button is activated, functions BALANCE and TRIM with their corresponding controls are in the signal path of the processor.

Control Elements

5 Balance

With the BALANCE control, you can perfectly place the mid part of the stereo signal in the center of the stereo. The BALANCE control features a very high-resolving radius of +/- 3.5dB. When hard left, the mid signal is shifted to the left by 3.5dB within the stereo signal. When hard right accordingly to the right side.

6 Trim

With the TRIM control, you can adjust the level of the mid signal. The TRIM control has a resolution of +/- 2.5dB. When hard left, the mid signal is reduced by 2.5dB and when hard right it is increased by 2.5dB.

7 Insert (SIDE)

If the INSERT button in the SIDE section is activated, the device connected to the insert SIDE is inserted to the insert (Insert Send: SIDE Send, Insert Return: SIDE Return). With this device, you can only process the side part of the M/S signal. The side signal (SIDE) is the difference of the left and the right channel of the stereo signal (L+R), hence the “out-phase part” of the stereo signal. The insert is located before the ELLIPTICAL FILTER and the STEREO WIDTH control.

8 Solo (SIDE)

If the SOLO button of the SIDE section is activated, you can only hear the side part of the M/S signal. Only one of both SOLO buttons in the MID and SIDE section can be active at the same time. This gives you the opportunity to comfortably switch between the monitoring of the M/S side signal and M/S mid signal.

9 Filter & Width

With FILTER & WIDTH button, the functions ELLIPTIC FILTER and STEREO WIDTH (including associated controls) can be routed into the signal path. If this button is not active, the controls ELLIPTICAL FILTER and STEREO WIDTH have no assigned function. To exclusively remove the ELLIPTICAL FILTER function from the signal path, push the FILTER & WIDTH button for about two seconds. As soon as the button starts blinking, the button only turns on or off the STEREO WIDTH function. The ELLIPTICAL FILTER is always deactivated! If you push the FILTER & WIDTH button again for about two seconds, you return to the regular button mode.

10 Stereo Width

With the STEREO WIDTH control, you can increase or attenuate the level of the side signal by 5.5dB. This way, you can change the perception of the stereo width.

11 Elliptical Filter

The ELLIPTICAL FILTER (Cauer Filter) removes signal components below a predefined frequency from the side signal. You can then hear these signal component through the M/S decoding in the mid signal component. The ELLIPTICAL FILTER has an extremely steep slope. The cut-off frequency can be adjusted from 22Hz up to 450Hz.

Specifications

Measurements

Inputs

Max. Input Level + 32.5 dBu
Input Impedance 20 kOhms (bal.)

Outputs

Max. Output Level + 32.5 dBu
Output Impedance < 100 Ohms (bal.)

Noise (A-weighted, Insert, Balance & Trim, Filter & Width = active) - 98.2 dBu

THD & N (at +20dBu) > -110 dBu

Common-Mode-Rejection (at 0 dBu) > -79 dB

Transmission Bandwidth: 10 Hz-150 kHz

Power Consumption: 0.11 Amp, 230V/50Hz, 24 Watt, 32 VA
0.22 Amp, 115V/60Hz, 24 Watt, 32 VA

Fuses 230 V/50 Hz: 0.5 Amp
115 V/60 Hz: 1 Amp

Dimensions

Standard EIA 19 Inch Housing/1U 482 x 44 x 300 mm / ca. 19" x 1.73" x 11.8"
(front panel excl.)

Weight 5 kg / 11 lb



Connections

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

Water and humidity

Do not use this device anywhere near water (for example in a bath room, a damp cellar, near swimming pools, or similar environments). Otherwise you are dealing with an extremely high risk of fatal electrical shocks!

Insertion of objects or fluids

Be careful to not insert any object into any of the chassis openings. You can otherwise easily come into contact with dangerous voltage or cause a damaging short circuit. Never allow any fluids to be spilled or sprayed on the device. Such actions can lead to dangerous electrical shocks or fire!

Ventilation

The vent openings on the unit are meant to avoid the Gemini from overheating. You should never cover nor block these openings.

Power Supply

Power the unit exclusively with the voltage rating specified on the unit. In case of doubt, contact your local dealer or electric provider. Disconnect the unit from the electric power grid if you are not going to use it for a long period of time. Unplug the power chord from the mains to cut power supply to the unit. Always make sure that the mains plug is easily accessible.

Opening the unit

Simply put: DON'T, if you are not a certified SPL technician or engineer. Really: Do not open the device housing, as there is great risk you will damage the device, or – even after being disconnected – you may receive a dangerous electrical shock!

Cord protection

Make sure that your power and audio signal cords are 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 the cords. Power connection overloads: Avoid any kind of overload in connections to wall sockets, extension or splitter power cords, or signal inputs. Always keep manufacturer warnings and instructions in mind. Overloads create fire hazards and risk of dangerous shocks!

Lightning

Before thunderstorms or other severe weather, disconnect the device from wall power; do not do this during a storm in order to avoid life threatening lightning strikes. Similarly, before any severe weather, disconnect all the power connections of other devices and antenna and phone/network cables which may be interconnected so that no lightning damage or overload results from such secondary connections.

Security Advices

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 unit from all power and signal connections and immediately contact a qualified technician when you think repairs are needed – or when moisture or foreign objects may accidentally have reached inside the housing, or in cases when the device may have fallen and shows any sign of having been damaged. This also applies to any situation in which the unit 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 supply and cord, 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 device is in all respects up to factory standards.

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 device from your power source before cleaning

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 reused in accordance with their markings. Through reuse, 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: 973 349 88.

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Declaration of CE Conformity

The construction of this unit is in compliance with the standards and regulations of the European Community.

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Album: _____ Track(s)/Groups: _____

Title: _____ Date: _____

