

# **SOLAR 4**

**User Guide English**

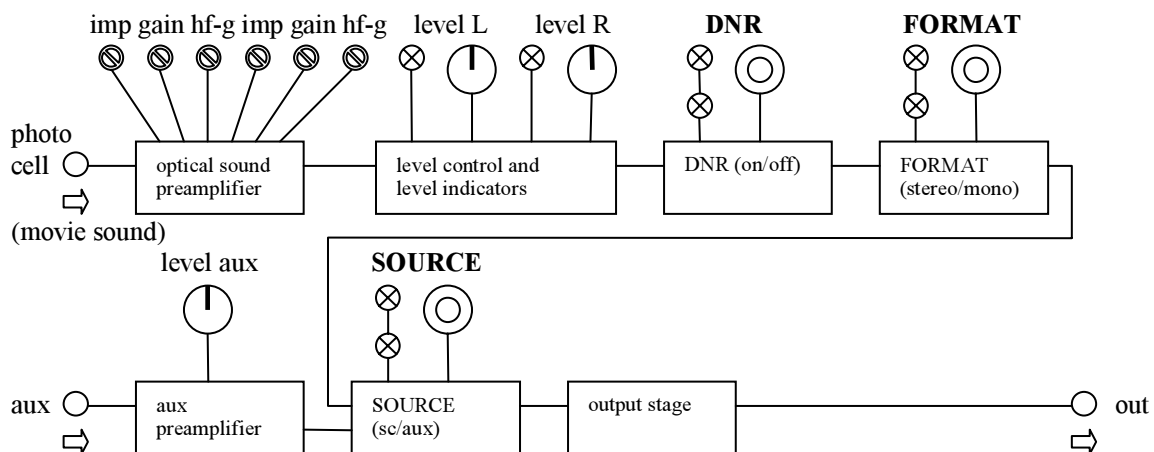


# SOLAR 4

## STEREO SOLAR PREAMPLIFIER

### USER GUIDE

Your new **SOLAR 4** is a preamplifier for optical sound signal reproduction of 16mm and 35mm films. The audio stereo signal delivered by the photoelectric cells ("sc") is processed optimally and – if necessary – denoised by the integrated dynamic noise reduction ("DNR\*" push-button). In the case of movies providing mono tone we recommend selecting "mo" (mono) mode ("FORMAT" push-button) ensuring channel identity and improved signal integrity. Above all a higher degree of noise attenuation is provided in mono mode. With its "aux" connectors the **SOLAR 4** provides an additional stereo input for music and speech messages ("SOURCE" push-button). After the HiFi equipment has been adjusted to the desired movie volume, the "aux" volume level can be adapted using the "level aux" knob on the rear. Therefore it is quite simple to switch from movie sound to music and vice versa without the necessity of correcting the volume level. Furthermore you can store "SOURCE"-, "DNR"- and "FORMAT"-settings that will be restored after every power-up. Please read the entire guide attentively before putting the **SOLAR 4** into operation.



### Getting Started:

- 1.) Connect the 3 pole plug of the power pack to the "power supply" socket of the **SOLAR 4**.
- 2.) Connect the photoelectric cells of the projector to the "solar cell" RCA sockets of the **SOLAR 4** by means of a high-quality RCA cable. As far as you use a mono solar cell, connect the cell to both "sc" RCA sockets. Otherwise the DNR circuit will not work properly.
- 3.) This step is optional: Connect an audio source such as CD player or microphone preamp to the "aux" RCA sockets of the **SOLAR 4** by means of an RCA cable.
- 4.) Connect the "out" RCA sockets of the **SOLAR 4** to the HiFi equipment by

\* DNR is a registered trademark of National Semiconductor Corporation.

means of an RCA cable. (high level input: AUX, CD, TUNER, ...).

- 5.) Connect the power plug of the power pack to mains.
- 6.) Adjust "level L" and "level R" knobs to middle position (line mark up).
- 7.) Select "sc" mode („SOURCE" push-button). Play back the test film attached (Dolby\* CAT 69T: Dolby Tone). Alternately – if your projector is unable to play back a film loop – you can use a film instead, the volume level of which is representative of common film soundtrack levels (a feature film with "usual" level for example).
- 8.) The **SOLAR 4** provides three trimmers per channel labelled imp, gain, hf-g to adjust input impedance (imp), signal gain (gain), and high frequency gain (hf-g). The effects of the trimmers (impedance, gain, hf gain) are increased by clockwise rotation and decreased by counter-clockwise rotation. The trimmers need about 26 rotations to be turned from one end to the other. In the condition as delivered the **SOLAR 4**'s precalibration is as follows: "imp" in middle position, "gain" in minimum position, "hf-g" in middle position. Starting from this precalibration you should adjust the trimmers with the trimmer key attached according to the following scheme:

#### **gain + imp trimmers:**

adjustment with the help of the test film attached (highly recommended):

**output level too high** ("level L" resp. "level R" level indicator is shining continuously). Remedy: Turn trimmer "imp" counter-clockwise until the level indicator is only just shining.

**output level too low** ("level L" resp. "level R" level indicator is off). Remedy: Turn trimmer "gain" clockwise until the level indicator is only just shining. In case this measure is insufficient additionally turn trimmer "imp" clockwise.

adjustment with the help of another film (stopgap):

**output level too high** ("level L" resp. "level R" level indicator is flashing often or shining continuously). Remedy: Turn trimmer "imp" counter-clockwise until the level indicator is only flashing occasionally during periods of increased signal level.

**output level too low** ("level L" resp. "level R" level indicator is flashing seldom or never). Remedy: Turn trimmer "gain" clockwise until the level indicator is only flashing occasionally during periods of increased signal level. In case this measure is insufficient additionally turn trimmer "imp" clockwise.

#### **hf-g trimmers:**

**hf level too high** (sound is shrill and sharp). Remedy: Turn trimmer "hf-g" counter-clockwise until sound is pleasing and natural.

**hf level too low** (sound is dull and muffled). Remedy: Turn trimmer "hf-g" clockwise until sound is pleasing and natural.

Adjust the sound by means of an external equalizer if necessary.

- 9.) This step is optional: As far as you have a pink noise film loop (Dolby CAT 69P: Pink Noise), you can adjust the appliance to an even frequency response with the help of the hf-g trimmers and an external frequency analyzer.
- 10.) Play back a film and adjust volume of the HiFi equipment to your preferred volume level.
- 11.) If you have connected an audio source to the "aux" stereo input according to

\* Dolby is a registered trademark of Dolby Licensing Corporation.

- 3.), switch to “aux” (“SOURCE” push-button). Apply a signal to the “aux” stereo input (start CD playback e.g.) and adjust the volume level via “level aux” (rear) without altering the volume setting of the HiFi equipment thus providing an appropriate volume level ratio of movie sound (“sc”) and “aux” sound.
- 12.) If you want to store “SOURCE”-, “DNR”-, and “FORMAT”-settings to define a startup condition first perform the “SOURCE”- and “DNR”-settings and then the “FORMAT”-setting. To store the current settings keep the “FORMAT” push-button pressed (about 2 sec.) until the “level L” and “level R” indicators are flashing alternately. The installation is now complete.

### **Concluding Remarks:**

To prevent inductive or capacitive caused hum and noise interfering with audio signals ensure the distance between supply cables and signal cables is as large as possible. Do not lay supply cables and signal cables in parallel! Possibly it is necessary to connect the ground line (shielding) of the solar cell cable to earth potential at **one** point.

Please notice that the options “DNR” (dynamic noise reduction) and “FORMAT” (stereo/mono) are available for “sc” (photoelectric cell) mode only and not for “aux”. Nevertheless you can preset the desired modes for the next film playback while “aux” mode is still selected. In particular we recommend to preset the “DNR” setting (on/off) with “aux” mode selected because of audible switching noise of the integrated DNR circuitry.

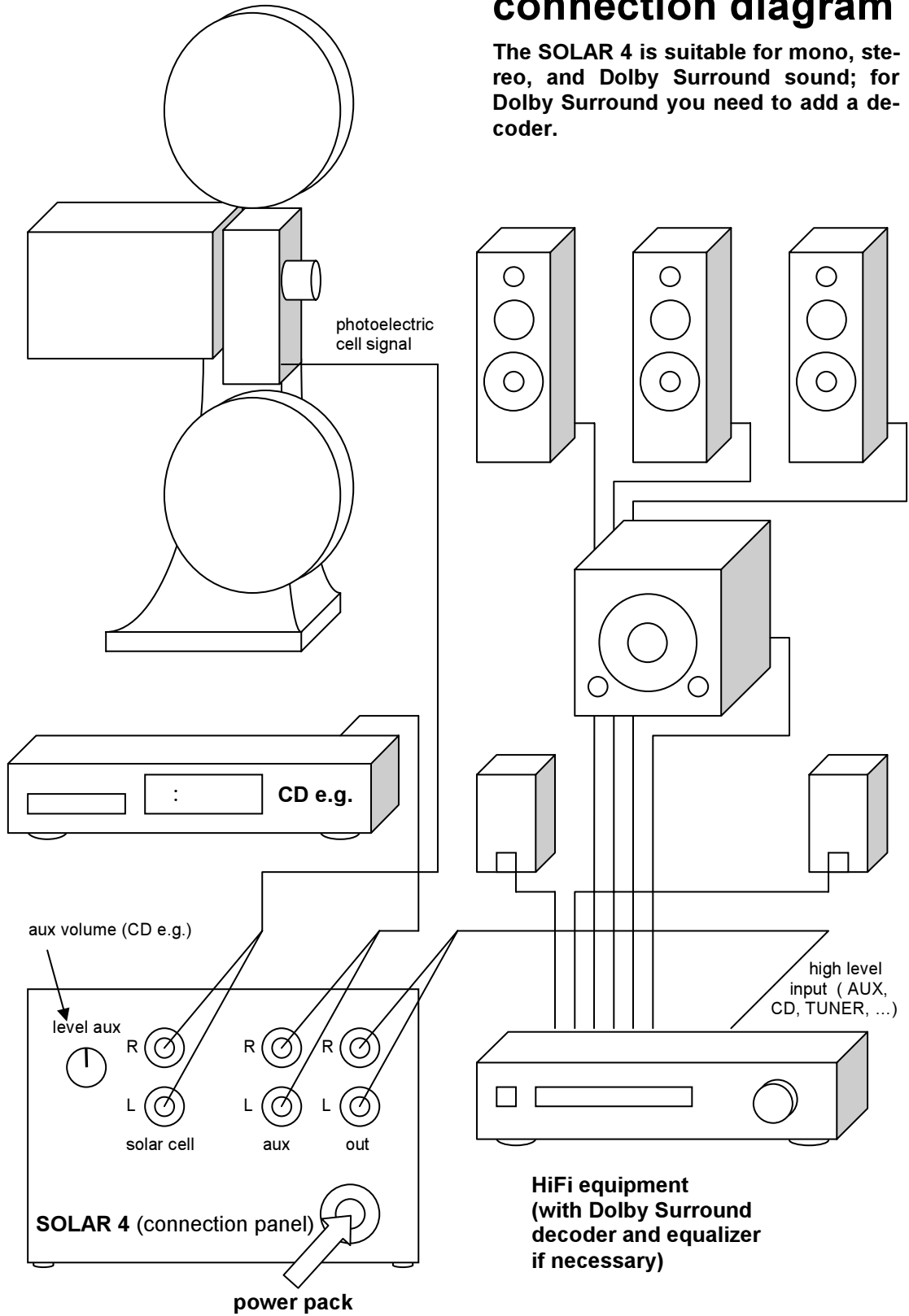
The *effective signal level* routed internally to the DNR circuit may vary within a certain range, but should not be above or below this range. If a film soundtrack provides an exceptionally high or exceptionally low nominal signal level, we recommend readjusting the “level L” and “level R” settings, so that the level indicators flash occasionally during periods of increased signal level. **This is a necessary sign to show that the DNR circuit is working with a suitable signal level to achieve an optimal result in noise attenuation.**

After playback of a film with an exceptionally high or exceptionally low nominal signal level you should readjust the “level L”- and “level R” knobs to middle position (line marks up). If you do not adapt the system manually to *extreme* signal levels, it may affect the sound quality. An effective signal level that is too high may reduce the effectiveness of the noise reduction, an effective signal level that is too low may result in a total attenuation of low sound sequences.

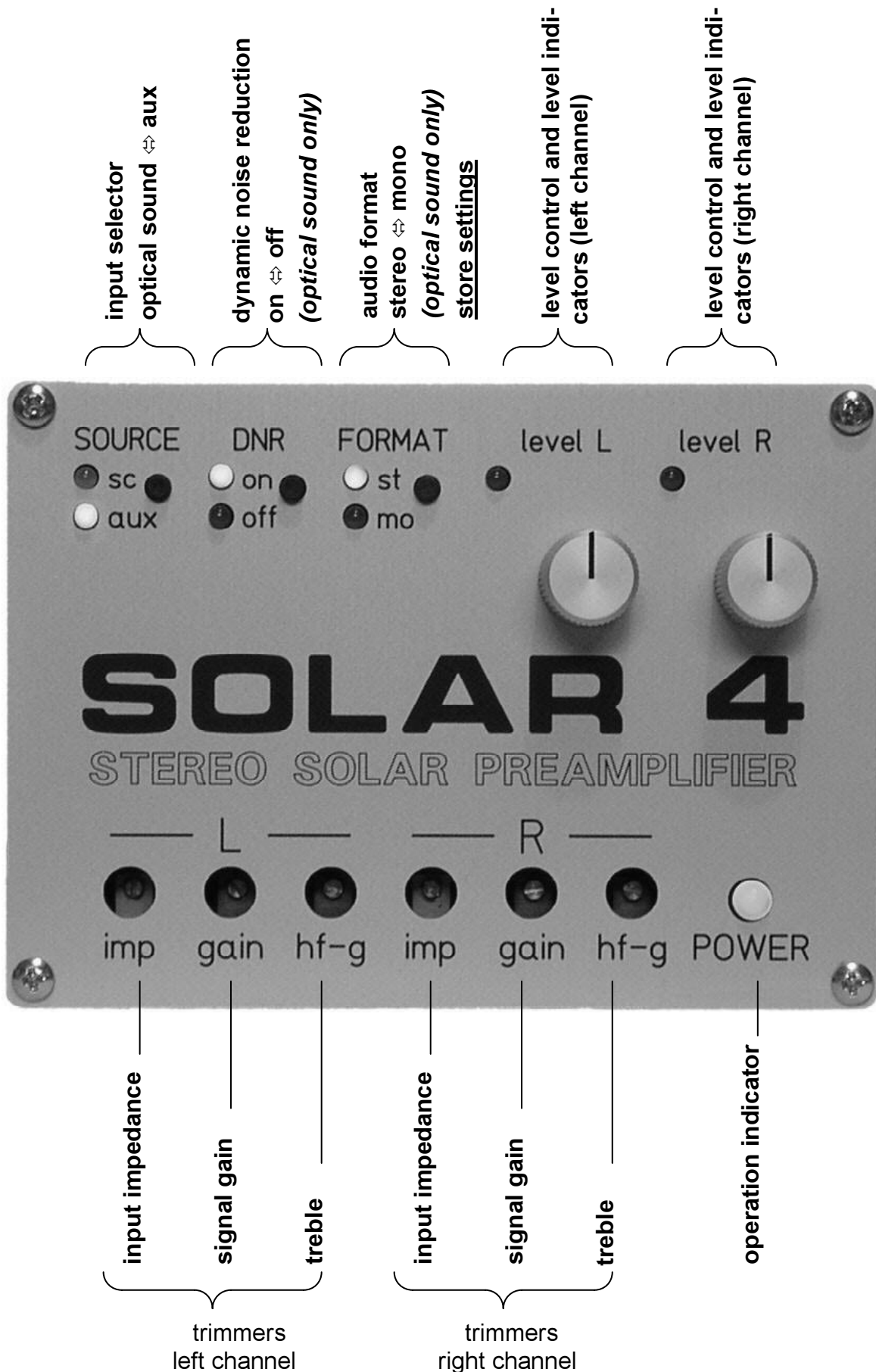
With the **SOLAR 4** being adjusted correctly in every way, the optical sound reproduction reaches a high degree of naturalness and clarity.

# connection diagram

The SOLAR 4 is suitable for mono, stereo, and Dolby Surround sound; for Dolby Surround you need to add a decoder.



# SOLAR 4 front panel:



| <b>Specifications:</b>   |                                       |
|--|---------------------------------------|
| - Input Sensitivity Optical Sound „sc”<br>(„gain” trimmer)<br><b>Configuration „Normal“:</b>                   | typ. 250 nA ... 25 $\mu$ A <b>RMS</b> |
| - Input Sensitivity Optical Sound „sc”<br>(„gain” trimmer)<br><b>Configuration „Laser“:</b>                    | typ. 500 nA ... 40 $\mu$ A <b>RMS</b> |
| <i>(depending on “gain” and “imp” settings; values relating to middle position of „level L” and „level R”)</i> |                                       |
| - Signal gain „aux”:   | typ. -60 ... +12 dB                   |
| <i>(adjustable with „level aux”)</i>   |                                       |
| - Output Signal Voltage:   | typ. 1V <b>RMS</b>                    |
| - Input Impedance optical sound („imp” trimmer):   | typ. 200 $\Omega$ ... 2.2 k $\Omega$  |
| - Input Impedance „aux”:   | typ. 47 k $\Omega$                    |
| - Output Impedance:  | typ. 100 m $\Omega$                   |
| - THD optical sound (DNR „off”):   | typ. 0.04 %                           |
| - Dynamic Range (Clipping to Noise Floor):   | typ. 91 dB                            |
| - Channel Separation optical sound (DNR „on”):   | typ. 64 dB                            |
| - Effective Noise Attenuation (DNR „on”):  | up to 24 dB                           |
| <i>Power Supply:</i>   |                                       |
| - Supply Voltage Device:   | 18...24 V ~ , 50...60 Hz              |
| - Power Consumption Device:  | typ. 3,2 W                            |
| - Power Consumption Power Pack and Device:   | typ. 5,5 W                            |

The power pack attached to the **SOLAR 4** is designed for operation at 230Vac/50Hz (USA: 100-240Vac/50...60Hz). Do not use any other power pack! Do not expose the device to moisture or to dirt. Operation in dry rooms and under supervision only! Disconnect the power pack from mains when the **SOLAR 4** is not in use. Typical values of this leaflet apply to the expected performance. Real values may vary due to the tolerance of components' values. Keep device and power pack away from children. **Do not open the case!** Do not try to repair a defective device; send it to your dealer and refer servicing to qualified personnel. In the course of further development changes of technical data may occur.

As far as problems arise when putting the **SOLAR 4** in operation or if you have questions or suggestions, please contact us.

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The information of this leaflet about SOLAR 4 device, power pack, peripheral components, accessories, the use of all these and the interconnection was made up with a maximum of care and is considered to be accurate und reliable. Nevertheless no responsibility for its use is taken. Liability is limited to damages to the SOLAR 4 device and to the original power pack caused by provable manufacturing faults. SOLAR 4 device and power pack must not be operated in any different way than described in this user guide. Any operation differing from the user guide's instructions as well as opening the case results in the warranty expiring immediately. Please notice that damages and consequential damages caused by inadequate use are beyond our sphere of influence. Wittner Kinotechnik reserve the right to make changes to devices and to documentations without announcement or notification.

