

Audial

S5

USER MANUAL

Preview, March 2021

This manual comprises introducing information on the use and performance of this device. For more information, please refer to the Audial website, or send your questions to info@audialonline.com.

IMPORTANT!

1. This manual is a guide only.
2. Do not expose this device to rain or moisture, excessive heat, or mechanical force.
3. Use this device exclusively with specified voltages.
4. Unplug the device from the wall outlet during a lightning storm.

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The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

STARTING WITH S5

Audial S5 is a reference quality, TDA1541A based non-oversampling D/A converter. It is easy to use, and it requires no special maintenance or care. It achieves claimed technical performance (distortion, frequency response, etc) right from the start, however it needs a couple of weeks of burning in to perform its best in subjective terms.

Please note that the TDA1541AD/A converter chip is a classic TTL chip architecture, which dissipates somewhat more power than it is usual for devices of this kind these days. Hence it is not recommended to leave the S5 permanently powered up. On the other hand, that is not needed, either. Once the S5 passes its initial burning in, it is generally enough to have it powered up for about half an hour before critical listening.

Mains cable shipped with S5 is the industry standard grade. It is however generally recommended to use high quality, preferably solid core cables, everywhere in the audio system, and this suggestion applies to the mains cable too.

An RCA to BNC adapter is shipped too, for the customers' convenience, but it is highly recommended to use real 75 Ohm BNC plugs. Regardless of what you might be told from time to time, the RCA can not meet this requirement.

The S5 front plate sports the mains switch and input selector, with the mains power LED indicator in between.

All the connectors, along with the direct input mode switch and S/PDIF PLL mode switch are located on the back plate.

DIGITAL INPUTS AND OUTPUT

The S5 has four inputs: S/PDIF electrical, S/PDIF optical, PCM (I2S) direct, and USB.

The S/PDIF electrical input is the real 75 Ohm BNC, transformer coupled input. The ground of the S/PDIF

line is coupled to the DAC ground by a 0.1 uF capacitor. With both electrical and optical S/PDIF sources, the S5 supports sampling frequencies up to 96 kHz.

S/PDIF receiver uses a PLL to lock to the source, and thus retrieve the sampling clock from it, and it can lock either to the S/PDIF data, or to the preamble. The PLL mode switch is located at the back plate. Please note that, to change the PLL mode, the DAC must be reset. This is achieved by turning it off, and waiting for at least 10 seconds, before powering it up again. Otherwise, the PLL mode change will not take the effect.

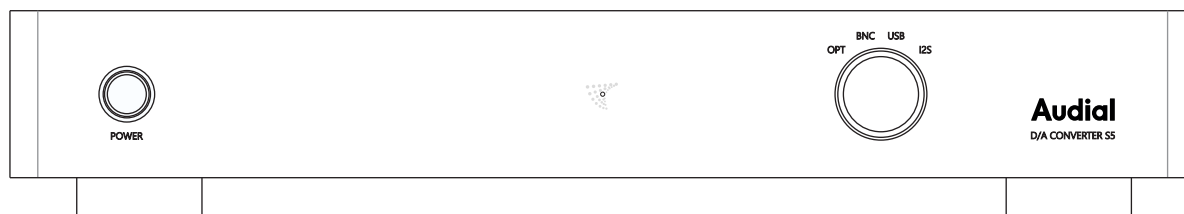
The PCM direct input uses an HDMI connector, but please note that the signals here are carried in their raw form, so they are not coded, and hence not compatible with HDMI protocol. This input can accept either I2S or Philips simultaneous data protocol, as set by the switch at the back plate.

The S5 USB input stage operates as an asynchronous (master) USB device, with its own master clocks for D/A conversion, and two low jitter clocks are included. A 22.5792 MHz works with 44.1/88.2/176.4/352.8 kHz, and 24.576 MHz works with 48/96/192/384 kHz audio sampling frequencies. This way the unit achieves a clean clocking scheme, and all the audio clock signals in the system are generated only by frequency dividing, and not by using PLL synthesizers.

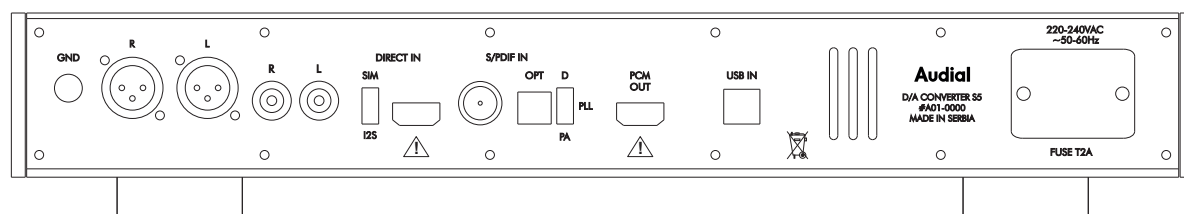
The USB stage also provides galvanic decoupling between the USB and D/A stage, thus also separating PC from audio circuits.

In addition, the USB stage supports four channel operation. The first two channels are always converted by the S5 D/A stage, and are available as analog outputs, while the third and fourth channels are available as digital signals, decoded and output as serial PCM i.e. Philips simultaneous data protocol, at the HDMI output connector. Consequently, two S5 DACs, with an HDMI cable connecting this output to the other S5 DAC PCM direct input, can make a four channel USB DAC.

The pinout and voltage specifications for this PCM output and PCM (I2S) direct input are provided separately.



S5 front plate



S5 back plate

From left to right:

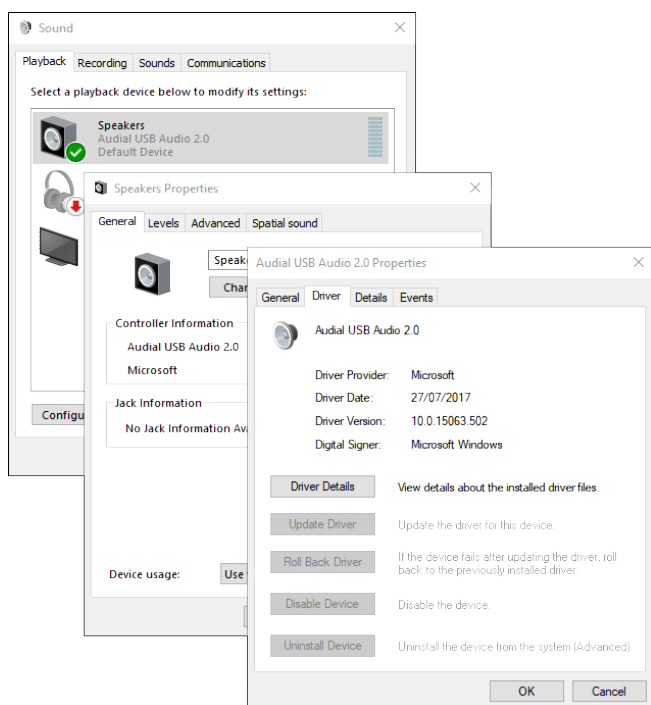
GND terminal, optional transformers coupled XLR outputs (can be also transformers coupled RCA), RCA outputs (capacitors coupled), PCM / I2S direct input with mode selector, S/PDIF electrical (BNC) and S/PDIF optical (Toslink) inputs with PLL mode switch, digital PCM output from USB input, USB input connector, mains connector.

USB AUDIO CLASS 2.0

Audial S5 USB stage employs USB Audio Class 2.0 definitions.

Mac OS X and Linux are natively USB Audio Class 2.0 compliant for many years now, and this device hence does not require a special driver when used with Mac OS X or Linux.

Since September 2017, Windows 10 (1703) also supports USB Audio Class 2.0 definitions, so the S5 acts as a plug-and-play device with recent Windows 10 versions. Once it is connected to a PC running Windows 10, a small window will pop up in the bottom right corner of the screen, reporting the initial connection routine. Once this process is finished, the DAC can be found as a playback audio device, available in the system.

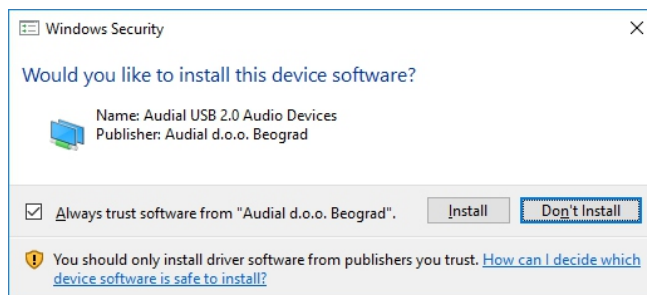


DEDICATED WINDOWS DRIVER

In addition, Audial provides dedicated Windows driver for this device, which is still necessary with earlier Windows versions. This driver also provides additional functionality such as ASIO interface, buffer length control, or firmware update, and it can be generally preferred soundwise.

Audial S5 users can download this driver at Audial web site, <https://www.audialonline.com/s5>. Driver version 1.26 works with Windows XP, Vista, 7, 8, 8.1 and 10. Later driver version 2.10 however improves on compatibility with later PC systems, and can be installed to Windows 7, 8, 8.1 and 10, however it supports only a stereo operation. All driver versions are compatible with both 32 and 64-bit Windows.

To install the driver, please unzip the provided file, and run setup.exe. The installation window will pop up, and at one stage you will be asked to connect the device. Also, during this process, and according to your Windows security settings, you might be asked a couple of times to allow the installation, and please do so. These windows will look like this.



Once the installation is complete, you can configure your settings by using the control panel, available in Windows Start Menu -> Audial.

ANALOG AUDIO OUTPUTS

Audial S5 DAC regularly has one pair of capacitively coupled RCA outputs. Optionally, another pair of transformer coupled outputs can be added, and this can be either RCA or XLR.

Please note that the capacitive coupling, which implies the grounds of two devices tied together, and transformer coupling, which keeps two grounds separate, require different approaches to the system earth grounding. Typically, transformers need the grounds connected to the earth at both its sides, whereas more than one earth in the system that uses capacitive coupling may cause ground loops, and increase the noise.

At its back plate, the S5 also includes the connection to its chassis/earth ground. This connector can help proper system grounding and/or earthing, or it can be used to connect the shield of the interconnect cable (similarly to XLR pin 1).

WARRANTY

Audial claims proper working of this product for two years. Audial is obliged to correct any malfunction within this period, at no charge, either by competent repair service, or by swapping the sold unit with the new one.

For the units sold directly by Audial, the invoice is also a guarantee certificate. Since Audial maintains its own database of directly sold units, the original buyers in most cases won't need it. Warranty is still fully transferrable from the original to the subsequent owner(s), however in this case we will probably ask for the invoice.

SPECIFICATIONS

INPUTS:

- USB 2.0, supports 2.0 Class Definitions for Audio Devices, asynchronous operation; Fs max 384 kHz;
4-channel operation is possible, with 3rd & 4th channel available as PCM digital output at HDMI connector *
- S/PDIF electrical, 75 Ohm BNC; Fs max 96 kHz
- S/PDIF optical («Toslink»); Fs max 96 kHz
- Direct in, supports I2S up to Fs 96 kHz, and Philips simultaneous data protocol up to Fs 384 kHz; HDMI connector *

OUTPUTS:

Unbalanced RCA, capacitors coupled, 2.1 V RMS

Optional transformer coupled balanced XLR, or transformer coupled RCA, 2.1 V RMS

OUTPUT IMPEDANCE:

Capacitors coupled outputs: 3.5 Ohm @ 20 kHz, 10 Ohm @ 1 kHz (23.5 uF)

Transformers coupled outputs: 30 Ohm, 20Hz-20kHz

FREQUENCY RESPONSE:

Sin(x)/x equivalent:

@ fS=44.1kHz: -3.2dB @ 20kHz

@ fS=88.2kHz: -0.8dB @ 20kHz

@ fS=192kHz: -0.2dB @ 20kHz

@ fS=384kHz: -0.05dB @ 20kHz

TRANSIENT RESPONSE:

Clean with no overshoot or ringing

ABSOLUTE PHASE:

Correct

HARMONIC DISTORTION (@ 1kHz):

0.003% @ -6dBFS (I/V dominated)

0.9% @ -60dBFS (D/A dominated)

INTERMODULATION DISTORTION (CCIR):

0.006%

MAINS VOLTAGE:

220-240VAC/50-60Hz, or 110-120VAC/50-60Hz, or 100 VAC/50-60Hz

DIMENSIONS (W x D x H):

426 x 280 x 75 mm, including feet, but excluding knob and connectors

WEIGHT:

Approx. 7Kg

For performance graphs, please visit <https://www.audialonline.com/s5>.

* - HDMI output and input connectors pinout and voltage specifications are provided separately.

