K&K Audio

RAKK dac
Mark II

Raleigh Audio

USB to SPDIF Converter

Installation Manual

Version 1.0

Kit version

Use this manual with RAKK USB – SPDIF v 1.0, which is marked on the board.

Required Tools and Supplies

35 to 50 Watt soldering iron
Diagonal cutting pliers
Long-nose pliers
Wire stripper
Solder

Warnings and Cautions

Caution – Use only solder that is intended for electrical circuits. Do not use acid or corrosive flux of any kind.

Support

RAKK dac and its associated components are produced through the joint cooperation of K&K Audio and Raleigh Audio. You may contact us with questions on constructing this kit by sending an e-mail message to david@raleighaudio.com or kevin@kandkaudio.com

Table of Contents

Introduction

The USB to SPDIF converter is intended to be used in conjunction with the RAKK dac digital board or other DAC that has an SPDIF input. It uses an isolated 12V power input so it may be powered from the same power supply as the RAKK dac without impeding the performance of the RAKK dac.

For the best performance possible, the USB interface must be isolated from the circuitry in the DAC that it is attached to. We have chosen to provide a digital pulse transformer on the output of the USB to SPDIF converter for this purpose. If you are interfacing to a DAC, like the RAKK dac, that has an input transformer, then the output transformer on the USB to SPDIF converter is not needed. You may use both transformers, but it won't help or hurt.

Assembly Instructions

The majority of the circuitry of the USB to SPDIF converter digital board is in surface mount components that are already installed on the board. You will personalize the board by either mounting an output transformer, or bypassing the transformer output with jumpers.

If you are using an output transformer, depending on our stock availability, either a Lundahl LL1572 or an equivalent Newava S22160 transformer will be provided.

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1. If you have a transformer, insert it in location T1.

   Solder the leads.
   You are done with the assembly.
   Proceed to the installation instructions.

If you do not have a transformer, you will insert two jumpers to bypass the transformer in location T1.

Notice that there are two outlines for transformer T1, oriented at right angles to each other. The outer outline has pads numbered 1, 3, 4 and 6: these numbers are oriented to the side of the board. The inner outline has pads numbered 1, 2, 3 and 4: these numbers are oriented to the end of the board. The inner pads are physically larger than the outer pads. The jumpers will be installed in the pads in the inner outline.

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2. If you do not have a transformer, install a jumper wire between inner pads 2 and 4. Solder the leads.

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3. If you do not have a transformer, install a jumper wire between inner pads 1 and 3. Solder the leads.

Installation Instructions

The board is light enough such that it may be mounted with L-brackets over a hole in the back panel, with the USB connector protruding through the hole.

Another option would be to mount the board inside the enclosure and run a short USB cable to a USB A/B connector on the back panel.

1. Mount the board in its location and secure it in place.

2. Install the internal USB cable, if used.

3. Install a twisted pair of wires from the SPDIF pads on the USB to SPDIF board to the SPDIF input on your DAC. Observe polarity.

4. Install a twisted pair of wires from the +/- 12V pads on the USB board to the 12V power supply. Observe polarity.

Document version history

Version	Description
1.0	Original document