# Taiko Audio Extreme Switch Manual

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# The Concept

Housed in a beautiful 22 x 22 x 5 cm / 9 x 9 x 2 inch solid copper chassis, the Extreme Switch is an external network device intended to replace and optimize the direct ethernet interface to the Extreme Music Server. The Extreme Switch reduces noise by cleaning the network and offloading (moving) processing from the Extreme music server. This results in a significant increase in the sound quality of local and streaming music.

The Extreme Switch is designed to work most effectively with the Extreme Music Server, but it can also be used with other manufacturer's servers or streamers. The sound quality can be further elevated by also adding the Extreme Router and/or the Extreme DC Power Distributor.

The Extreme Switch is easy to connect with one SFP+ input module slot and one SFP+ output module slot that both can be fitted with a range of options.

# The difference between a Router and a Switch

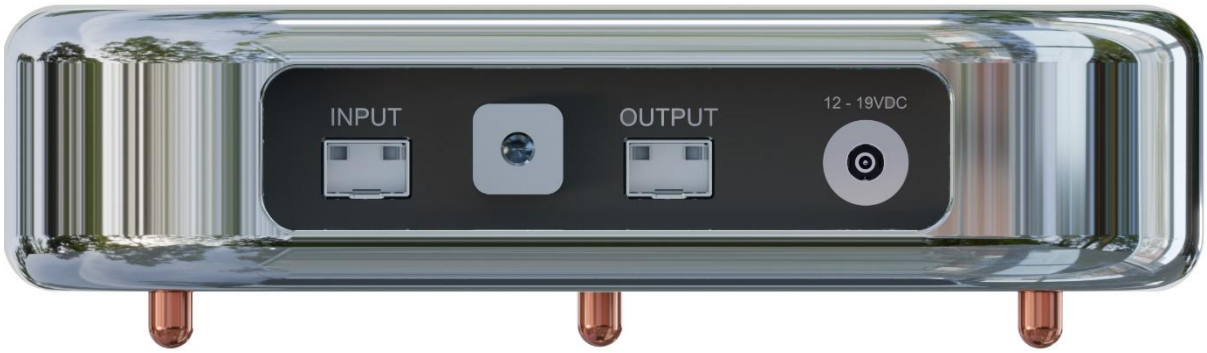
In essence, a Switch is used to connect devices to each other within a network while a Router allows networks to communicate with each other. In general, Routers operate on a software level based on IP addresses while a switch works on a hardware level based on MAC addresses.

A Switch can reduce traffic to a device by learning and storing which MAC address is connected to which port so it can send data to that device specifically addressed to it, while sending data for other devices over its other ports, reducing the amount of traffic on the port your device uses. This does not do anything to reduce broadcast traffic which is sent to all devices on the network.

A Router can control the traffic which is sent and broadcast on your network. Talking in reduction terms, a router can reduce the amount of traffic on the entire network while a Switch can reduce the amount of traffic on a segment of that network. The combination of a Router and a Switch allows the control of traffic on a hardware and software level which can lower traffic to a larger degree than a single Switch, or even multiple daisy-chained Switches, can do.

TAIKO AUDIO

INPUT
OUTPUT




## Ports and connections

There is one SFP+ input module slot and one SFP+ output module slot that both can be fitted with a range of options.

- The SFP port on the left is intended to use as the Switch Input. This slot can be fitted with a DAC (Direct Attach Copper) cable (when connected from the Extreme Router), or alternatively an RJ-45 copper- or Fiber transducer module. Please insert the cable or module with the contacts facing down.
- The SFP port on the right is intended to use as the Switch Output to connect to your server. This slot can be fitted with either an RJ-45 copper- or Fiber transceiver module or a DAC Cable in a variety of lengths ranging from 0,5 – 7m.

  Please insert the transceiver or connector with the internal contacts and pull tab facing down. When oriented correctly, it will go in fully and lock in place. If inserted with the inverse orientation, the transceiver or connector will stick out a little, and will not lock in place.
- DC 12V Power Input. Barrel size: 2.5mm internal / 5.5mm external diameter / 11.3mm length. The Switch has a wide input range of 12V-19V DC (12V is optimal). Power consumption is around 100mA @12V.
- Ground terminal, M6, with hex 4mm screwdriver hole.

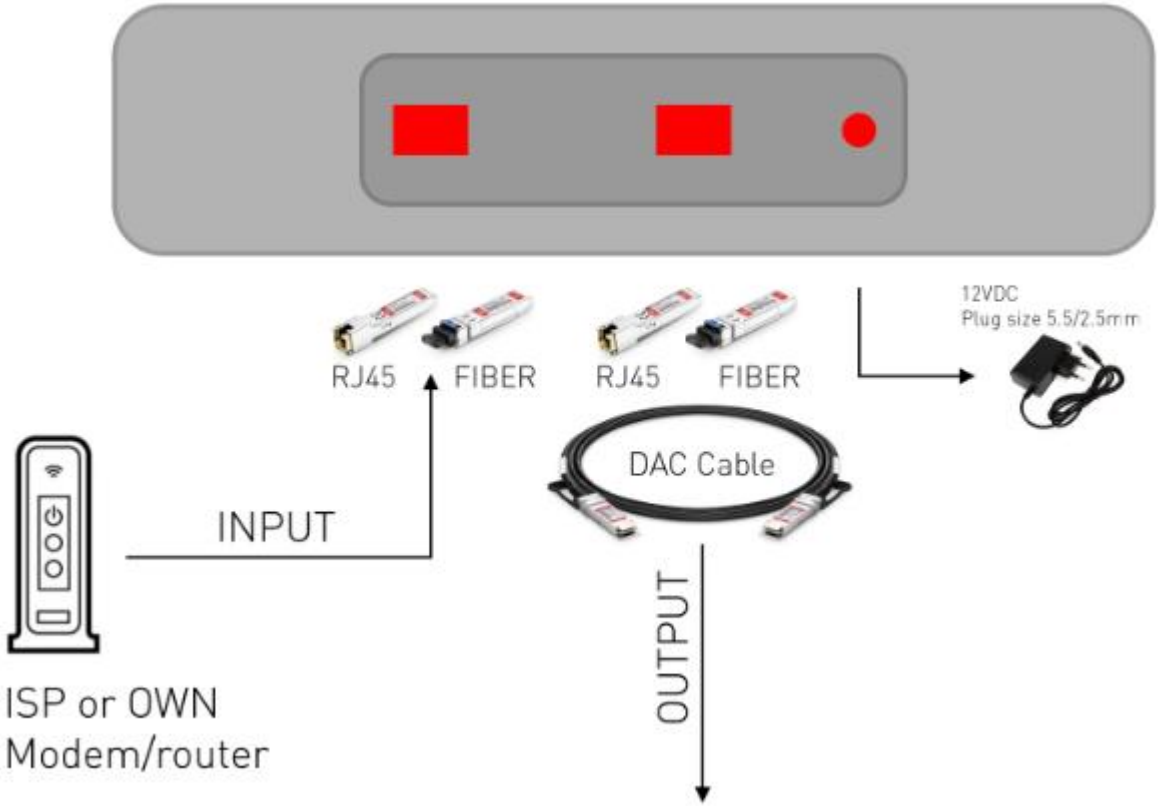
Please note that SFP ports only works with 1Gb connections. The Switch will not work with 100mbit connections.

# Connection

A basic setup would be to connect the Extreme Music Server, or another Music Server or Streamer, to a generic router directly or via a generic network switch.

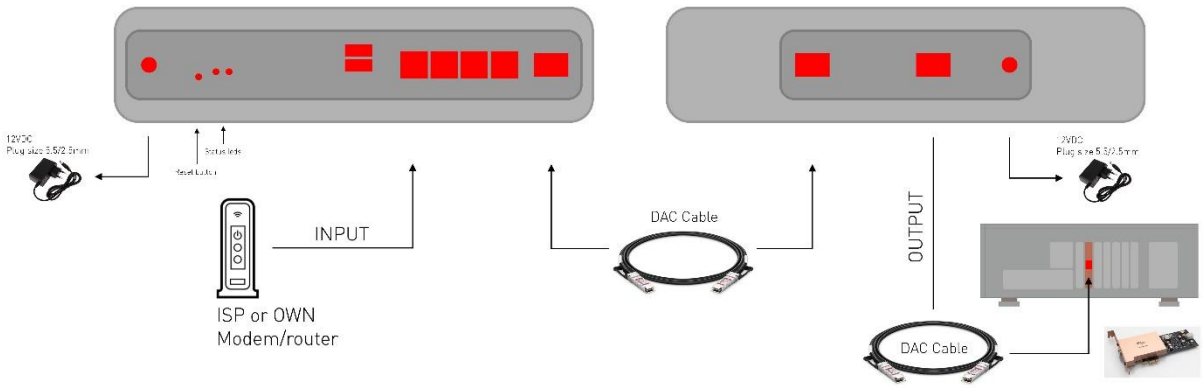
This basic setup can be upgraded by adding the Extreme Network Switch to achieve a significant improvement in Sound Quality. For older Extreme Music Servers, the Extreme Network Card can be retrofitted.

To raise the bar even further, you also add the Extreme Router and connect it ahead of the Extreme Switch to create an audio exclusive (isolated) network unimpaired by typical home network processes and traffic. Please see the separate Extreme Router Manual for more information on this topic.



# Power

The Switch is powered by any normal 12-19V DC power supply. A standard wall-wart power supply is included. Please see the following image for reference.

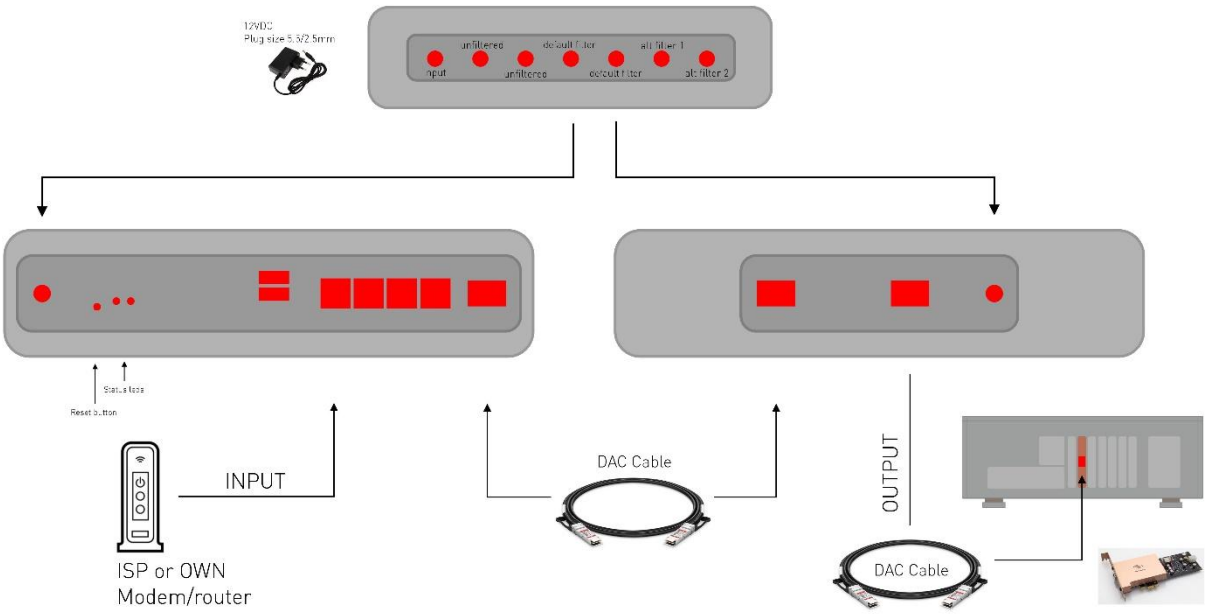



The power supply may be the supplied Wall-Wart Power Adapter or an audiophile switched or linear power supply. A better power supply does provide even better sound quality.

Optionally, the Router and Switch may also be powered by our new to be released Taiko Audio BPS (Battery Power Supply).

The ultimate current solution would be to add the Extreme DC Power Distributor. This allows you to power both the Extreme Switch and Router from a single power supply while offering improved performance over 2 separate power supplies, especially when using a DAC cable to connect the Extreme Router to the Extreme Switch.

Please see the following image for reference for how to connect the Router and Switch via the DC Power Distributor.



# Installation

The Taiko Audio Extreme Network Switch can be used in tandem with the Taiko Audio Extreme Network Card, or on its own. When the Extreme Network Card is also installed, please refer to the additional information in the separate Extreme Switch Installation documentation which also involves a script to be installed. Please get in touch with us via support@taikoaudio.com to obtain the latest software.

When the Extreme Switch is added standalone (without the Taiko Extreme Network Card) there is no requirement for any software install and the document that you are currently reading is all you need. Please follow the steps below to install the Switch.

1. Connect the Switch with the Wall-Wart power adapter.
2. Insert the RJ45 (or Fiber-) adapter in the SFP input slot (left-hand side). Please note that the module only fits in one orientation, with their contacts facing down. Push the module all the way in and move the yellow handle up to secure the module in the slot (Move the handle down to remove it).
3. If ordered, insert the second RJ45 adapter in the SFP output slot (right-hand side). Please note that the module only fits in one orientation, with their contacts facing down. Push the module all the way in and move the yellow handle up to secure the module in the slot (Move the handle down to remove it).
4. Connect the Switch input (left-hand connector) with the output from your regular Router or Switch.
5. Connect the Switch output (right-hand connector) to the input of your Server.

# SFP Adapter Modules

Please refer to the below photo of a Fiber SFP Module (left) and a Copper SFP RJ45 Module (right)

# What is a DAC cable?

A Direct Attach Copper cable or a “DAC cable” is a twinax copper cable terminated with SFP connectors that connects directly the SFP ports (or line cards) within active equipment, such as switches, routers, servers or data storage devices, in a data network.

*Above is an example of a DAC SFP Cable, or in other words, a DAC cable terminated with SFP connectors*

# DAC Cable Length

The length of a DAC Cable is not critical, simply use the length you need. Longer cable lengths require a larger wire gauge to compensate for the increased signal loss. There are some marginal differences between different lengths but not really a qualitative difference, more along the lines of slightly thinner/faster for shorter lengths, slightly fuller/slower for longer lengths, but again, really minor, at Taiko, we use any length without caring about these differences.

# 1Gbit Network Requirement

SFP modules and -ports are designed for a single speed and do not exist in a dual-speed configuration. The SFP modules and ports that we use in our Taiko Audio products are specified to work only at 1Gb.

As a result, the following Taiko Audio products's SFP ports will not work with 100mb connections, only with 1Gb connections:

- Extreme Switch
- Extreme Network Card (as mounted in the Extreme Server)
- Olympus Network Card (as mounted in Olympus Server or I/O)

Conversely, RJ45 ports can work in 100Mb and 1Gb mode. As a result, products that have both SFP and RJ45 ports will be partially compatible with 100Mb and 1Gb connections:

- Extreme Router RJ45 ports: 100Mb and 1Gb
- Extreme Router SFP/DAC port: 1Gb only

# In Practice

Any network interfaces upstream (ahead) of the Taiko Audio Extreme Switch or Network Card, such as generic routers or switches, must be 1 Gb. For the Taiko Audio Extreme Router, the same holds true when it concerns devices connected to its SFP/DAC port.

For the upstream network that feeds the Extreme Router via RJ45, there is no 1Gb requirement, and that network may be 100Mb or 1Gb. This is also true for a MESH router with a (lower than 1Gb-) Wi-Fi source.

Please note that some Ethernet cables are restricted to 100Mbit (as opposed to Gigabit), and as a result, these are also be incompatible.

The Gigabit requirement only pertains to your local network's maximum rated speed, not to your internet subscription. The actual speed of the data does not need to be 1Gb. Nevertheless, faster internet connections do tend to work more reliably, especially with Roon.

# Specifications

The Switch is powered by any normal 12-19V DC power supply. A standard wall-wart switched power supply is included which will provide superb sonic results.

However, a higher-end power supply will provide further improvements. The ultimate current solution would be to add the Extreme DC Power Distributor. This allows you to power both the Extreme Switch and Router from the same power supply while offering improved performance over 2 separate power supplies.

Power input: 12-19V DC. (12V is optimal)

Standard DC barrel polarity (middle pin positive +)

Current draw at 12V: 100mA natively. Note that the total current draw depends on the supplied voltage.

Earth Screw: M6 with 4mm hex screwdriver hole (use screw length and or washers as needed)

Product Dimensions: 21 x 21 x 6 cm / 8.27 x 8.27 x 2.36 inch (with feet)

Power Connector Dimensions: 2.5 inner / 5.5 outer / 11.3mm length (14mm recommended)

Weight: 14.8 Kg / 32.6 lbs