

Multi-TAP

TAP – Multi-Enclosure Systems

OEM/DIY Overview

Through the rabbit hole we go.....This document will not apply to most TAP systems but for some applications spreading the TAP Modules among different enclosures will make sense. Some of the Bent Audio products use this flexibility but this document is written specifically for OEM/DIY builders looking to optimize their products and projects. Please get familiar with the TAP-X User Manual, the TAP Modular Pre-amp User Manual, and the TAP DIY/OEM document before reading further. Without a basic handle on the TAP system none of this document will make any sense at all!

There are two general reasons for placing modules in more than one enclosure:

1- Signal Path Considerations:

Although using multiple enclosures is not a 'simpler' system overall it can be used to get the TAP attenuators right where they should be. This keeps the all important audio signal path cleaner and shorter than it otherwise would be – at the expense of some additional non-audio connections in the system. This can be a worthwhile trade off – since the additional connections needed are not part of the audio system as such and do not affect sound quality in any way. The most obvious example would be moving the attenuation modules in a resistor passive pre-amp right to the inputs of the amplifier (or even inside it) where they really need to be to optimize a resistor passive system. This is an OEM/DIY document so an example of moving the TAP Resistor Attenuator boards right inside dual monoblock amp chassis will be given later on.

2- For Fun:

Splitting the control circuits and the audio circuits can allow for some very unique controller enclosures to be designed. Since you no longer have to fit the audio connections in the controller enclosure you are free to make it any shape and size you'd like to. Several standard enclosure options are available for your DIY projects or alternately we can work with you to design a custom controller system. Please note that to do that kind of custom system we need to do a batch of 100 units to get the cost per unit down low enough to fit most product cost structures – maybe fine for OEM designs but not for DIY designs.....

Basic Information

The most common 'split' from one box to another is to use one enclosure for the User Interface and then place the Audio Signal Path boards (Attenuators and your circuits typically) in another enclosure.

The enclosures then connect from one to the other via a fiber optic cable. We use standard Toslink cables that are easy to obtain and not too expensive. Note that this Toslink cable is only used for sending a packet of control information that travels from the System Controller down the fiber cable to the audio electronics enclosures – it is NOT used to transmit the audio signal in any way. This is the same packet of information that is transmitted across the internal 10 pin ribbon cable in a single chassis TAP system. Fiber Optic cables also completely break the electrical connection from controller to the chassis – no ground or power connections are needed from chassis to chassis.

Finished Controller Options From Bent Audio



TRIK Controller

MicroTAP Controller

Both the TRIK and the MicroTAP Controller will run all functions in a TAP system. No Audio signals run to these controllers – Only power and then the fiber optic connections to the 'audio' enclosures with TAP modules and PCBs inside.



TAP Controller

This TAP Controller can be used to run the TAP system via fiber optic cables just as the above two controllers and it can perform source selection for a six input system– plug your sources into this TAP Main Unit and then it will route the currently selected source to the output jacks to the main amp chassis. A tape output is also included. An example of using this controller is shown lower down in this

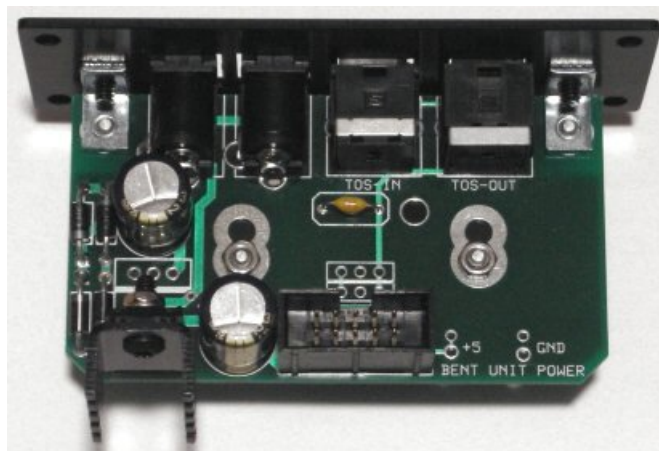
document.

Making Connections

As mentioned above a Fiber Optic cable used to connect controllers to the other enclosures in the system. Think of this as being like an 'extension cord' for the 10 pin BentBus ribbon cable used in single box TAP systems. There are currently two options for the circuit board used to make this fiber optic connection:

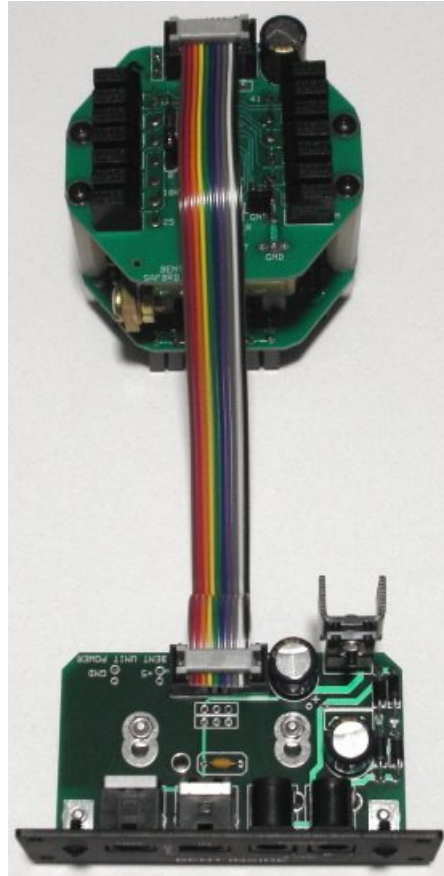
Option 1- The Bent Inside Board

This board combines the power supply for the TAP modules with a fiber optic sender and receiver module. This board would be used in the audio circuit enclosure. Because the back panel cutout is rather specific and tricky (especially for DIY builders) we have a blank plate that can be mounted in a simple rectangular cutout. If designing your own back panel please contact us for a drawing of the required cutout.



The In/Out Toslink connectors allow for daisy chaining the fiber optic cable from one enclosure to another. Any number of enclosures can be connected in this way. This is the same circuit board used in our Bent Unit Resistor Attenuator Modules.

Example of Bent Inside connected to a Slagleformer Module

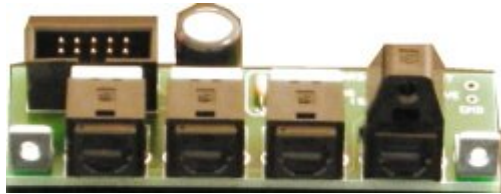


Once the fiber optic cable is connected between a TAP system controller and the audio circuit enclosure then the Slagleformer module - along with any other TAP boards inside that enclosure - will run exactly as it would if all parts were located in one chassis. All functions like volume, mute and right/left balance still function the same.

Making Connections - Continued

Option 2 – Toslink Only Board

Most systems would use the combined power/fiber board above. For applications where the chassis already uses one of the other TAP Power Supply boards (usually the case inside a TAP System controller) then this fiber optic only module can be used. This is the same Fiber Optic Board used in the TAP-X system when the expansion module option is used.



This board has 1 fiber optic receiver and 3 fiber optic transmitters. Connection to the TAP BentBus is via the 10 pin header on the PCB – just like all TAP modules and boards. Contact us for a drawing of the required cutout.

Dual Monoblock Amplifier Example

In this example we'll use the MicroTAP Controller to run a TAP resistor attenuator module mounted inside each mono amplifier enclosure. Any other TAP controller option – either a finished TAP controller or a DIY enclosure of your own – can be selected and will function the same. This is a good system to use if you want a nice looking control unit positioned anywhere in the room to run dual monoblock amplifiers located behind each speaker. This makes them equivalent to each having their own built in level control but now you get a high quality stepped attenuator circuit with full remote control of volume, right/left balance, and mute.

To do this we'll need the following:

- 1- MicroTAP Controller
- 2- Two Bent Inside modules
- 3- Two Hybrid attenuator Boards

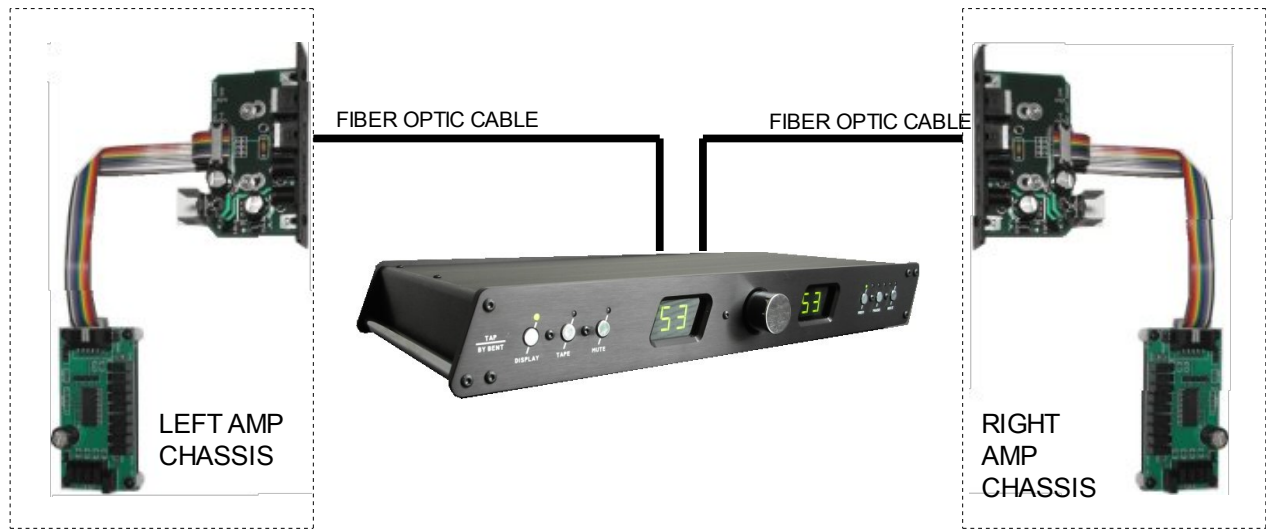
Other parts needed (supplied by Bent Audio) will be two Toslink fiber optic cables and 3 power supplies – or only 1 wall supply for the MicroTAP Controller if you can steal some DC voltage inside each monoblock to power the Bent Inside modules.



For Information on the Attenuator PCB wiring please see the TAP OEM Wiring Manual. Note that the TRIK controller can also be used in exactly the same way. Any other TAP Attenuator options can be used inside the amp chassis – like the Goldpoint BSA-1 or the Slagleformer Modules.

TAP Main Unit as a Controller

Here is an example using the TAP Main Controller as the system controller. This has the advantage of allowing sources to be selected at the main controller and then the selected source is fed on to the amp chassis. The Main Controller does the 'housekeeping' and the attenuation happens right in the amp – keeping the attenuator to amp wire length very short the way it should be.



Final Thoughts

This modular system can be used to form endless system configurations. Among them would be:

- Build a pre-amp using the TRIK or MicroTAP Controller as a system control unit and hide away the audio circuits inside your own enclosure. This enclosure can then be located in the system rack to keep cables short without regard for access to the front panel, etc.
- Build an Integrated Stereo Amp using the TRIK or MicroTAP Controller or even a custom OEM controller design. Then use the TAP modules inside the AMP chassis to keep the signal path really short in the system. This can include both attenuation modules and the source select PCB inside the integrated amp. Then you have a fully integrated amp that can be tucked away in your rack to keep interconnect cables short. The TAP system controller can be located anywhere in your listening room. Think of it as a front panel separate from the integrated amp (or pre-amp) amp chassis.

Keep in mind when planning these systems that there is no limit to the length of the fiber optic cables – allowing right/left chassis or the controller to be located anywhere in the listening room.

Before designing a Multi Enclosure TAP system first ask yourself if you need multiple boxes in your system. Most of the time the answer will be no – one box will work fine. Common examples of times that it does make sense are:

- To move resistor attenuator boards downstream to the inside of an amplifier chassis - Where they should be.
- If your pre-amp project suits using one of the finished TAP controller options – allowing you to spend your project time on the electronics enclosure and hide that away in the rack while still having a nice looking controller easily accessible and located anywhere in the listening room.
- If as an OEM designer you want to have a unique system controller separate from the audio electronics enclosure.