

Dirac Live Bass Control: Filter Design

Filter Design

1. There are three alternatives for Bass Control: "Off", "Bass management" and "Bass Control":
 - a. When Off is selected, the filter design page is presented without Dirac Live Bass Control instruments and standard Dirac Live filters are calculated.
 - b. By selecting Bass control or Bass management the filter design page will be adjusted to accommodate Dirac Live Bass Control instruments.
 - c. By selecting "Bass management", regular bass management filters with Dirac Live filters are designed and each subwoofer gain is scaled by $1/(\text{number of subwoofers})$ to match the target curve. Selecting the "Bass control" the filter design will harmonise the subwoofers and non-subwoofer speakers in the lower frequencies using tailor made phase filters, delays and gains.
2. After selecting "Bass Control" or "Bass management", several magnitude response plots will be shown in the graph. These plots present the average magnitude response of the selected speaker, as well as all subwoofers, and are there to guide the user to choose the best cross-over frequency for the system.
3. Set the cross-over point. Select a cross-over frequency where both the high-range speaker and the subwoofer(s) have energy. The cross-over frequency can be adjusted by dragging the cross-over bar.

The cross-over filters are highlighted when hovering over the cross-over bar. Illustrated above, the lower section (A) of the cross-over filter describes which frequencies are passed down to the subwoofers. Section (B) describes which frequencies that are passed to both the subwoofers and the high-range speaker, and the upper part (C) describes which frequencies that are passed to the high-range speaker.

 - a. Note that each speaker group has their own individual crossover frequency.
4. In Dirac Live Bass Control, just as in Dirac Live, the colour of the sound is set through a target curve. Though it is interacted with in the same way as when only using Dirac Live 2, the target curve when using Dirac Live Bass Control works differently.

In Dirac Live 2 the target curve setting the sound colouration was unique to the speaker group. For Dirac Live Bass Control, however, the lower frequencies are highly correlated between speakers, and a better compensation is achieved by separating the target curve into a low-frequency part common to the system and a higher-frequencies part unique to the speaker group. This new concept of target curve is described below:

 - a. For any selected group, the input target curve consists of the bass-controlled range, which is common to all channel groups, as well as the range of higher frequencies, which is unique to that group. While the bass part of the target curve will be shared, each group can specify their own cross-over point from where the bass control will relinquish control to the requested colouration for the group. Referring to the figure in step 3, above, the lower section (A) describes the colouration of how the subwoofers sum up together, where section (B) shows how the subwoofers and high-range speaker interact over the cross-over region. Section (C) describes the desired colouration for higher frequencies for the chosen speaker.
 - b. The target curve defaults to a flat correction, which is the audio uncoloured and as close to the source sound as possible, which may not be what you prefer. Drag the target-points on the target curve to change to colouration to your preferred taste. You can always add more points by right-clicking on the target curve and select "Add control point to".
 - c. Dragging the curve upward above the 0 dB level on the Y-axis boosts the affected frequencies. Correspondingly, dragging the curve downward under the 0 dB level attenuates them.
5. Increasing the volume of the subwoofers can be achieved by raising the part of the target curve under 100 Hz by a few dB, illustrated below. This is often wanted when watching movies.
6. Press "Calculate" in the lower right corner. The bass control filters will now be calculated.
7. After the Bass Control calculation is done, select the "Corrected" checkbox in the plot options to show the resulting input magnitude response for the selected channel. The corrected curve should conform to the target curve, as illustrated below.
8. Press "Proceed to filter export".
9. Select a suitable slot and give the filter a name and, optionally, a description. If the slot is already occupied, the filter will be overwritten by the new filter.

When the export is completed the filter is deployed on your audio device and is ready to be used. Depending on your system the filter might be activated automatically, or you may have to enable it manually.

Be certain to save your work if you want to adjust it in the future.

Didn't find your solution here? Get technical support on the [Help Desk!](#)