

If an acoustic timing reference is used REW will generate a timing signal on the output that has been selected to act as the reference before it generates measurement sweeps on the channels being measured. The level of the timing reference is set relative to the measurement level using the [Ref level trim](#) control, it may need to be higher or lower depending on whether the speaker used as the timing reference is further away or closer than the speaker being measured. The timing signal is a high frequency sweep to allow accurate timing, a subwoofer cannot be used as the reference channel. Measurements will have a time delay that corresponds to the difference in their distance from the microphone compared to the distance of the reference speaker - if the reference speaker is further away the delay would be negative. The delay can be shifted using the **Timing offset**. When an acoustic timing reference is used individual measurements **taken from the same mic position** will have the same relative timing, allowing trace arithmetic to be carried out on the traces in the [All_SPL](#) graph. **Note that multiple sweeps cannot be used when using an acoustic timing reference.**

If using a timing reference REW can calculate the delay through the system being measured relative to the reference and show it in the measurement Info panel as **System Delay** in milliseconds, with the equivalent distance in feet and metres shown in brackets. Any **Timing offset** is shown below the **System Delay**. For speakers the delay estimate is based on the location of the peak of the impulse response. Subwoofers have a broad peak and a delayed response due to their limited bandwidth so the delay is instead measured relative to the start of the impulse response. The start of the impulse response cannot be located as precisely as the peak, however, so delay values are less accurate for subwoofer measurements.