

Loudness Standards Disambiguation

Currently, a large number of different standards and recommendation for loudness measurement are available. Since they show very little or no difference, this has unfortunately led to some confusion. This document is an attempt to clarify this situation. It goes without saying that the merging product Final Check and MXFix are compatible with all the standards mentioned here.

<i>Program-compliance standard</i>	EBU-R128	ATSC A/85
<i>Underlying Meter-compliance standard</i>	ITU-R BS 1770-2	ITU-R BS 1770-1
<i>Gate /Anchor - settings</i>	Gate always enabled. Threshold -10 LU.	Anchor when available, gate otherwise. Threshold to be defined by individual broadcasters.
<i>Countries where typically used.</i>	European Union	USA, Canada

1. **Meter-compliance**

A first category of standards define the compliance of a loudness-meter. They are likely to mostly affect people who manufacture loudness-meters, by telling them what information should be displayed and what setup must be available.

The most relevant of these standards is ITU-R BS 1770, which defines the common ground to all loudness measurements. There have been two slightly different versions of this recommendation, namely ITU-R BS 1770-1 and ITU-R BS 1770-2. Version 2 is meant to replace version 1, but unfortunately, version 1 is still very common, mostly in Northern America, because the CALM Act refers to it.

The difference between the two lies in the specification of gating (aka g8). Revision 1 does not include a gating function. Revision 2 describes measurements with and without a gate, the gating threshold being defined as -10LU.

2. **Program-compliance**

A second category of standards define the compliance of audio programs. Such recommendations typically affect broadcasters and sound engineers, by telling them to use a meter with given settings, and then to change the volume of their programs to meet a given target. This obviously assumes the use of a meter that is compliant to one of the standards from the first category.

The most relevant standards today are EBU-R128 and ATSC A/85.

2.1. **EBU-R128** is typically used in Europe. EBU-R128 recommends to use meters with a gate of -10 LU, and never to bypass the gate. Note that previous (now obsolete) versions of the EBU-R128 used to recommend a gate of -8 LU, hence the name "g8". Additionally, EBU-R128 recommends that the programs have an integrated-loudness (aka INT, aka average-loudness) of -23 LUFS (aka LKFS)

2.2. **ATSC A/85** is typically used in Northern America, since U.S. broadcasters are legally bound to do so by CALM Act.

ATSC A/85 focuses on the concept of anchor element (aka anchor signal) of the program. Typical anchors would be dialogs in a movie, lead vocal in pop-music, etc.

When such an anchor is available, loudness should be measured either only on the anchor, or only on the parts of the program where the anchor signal is present. When no anchor signal is available, then ATSC A/85 the use of a gate is recommended, though there is no real consensus on the value of its threshold.