

VQLPN

VideoQ Loudness Profiler & Normalizer

VideoQ Productivity Tools

A suite of software modules
for advanced video processing workflow

<http://www.videoq.com/vgpt.html>

Training Presentation

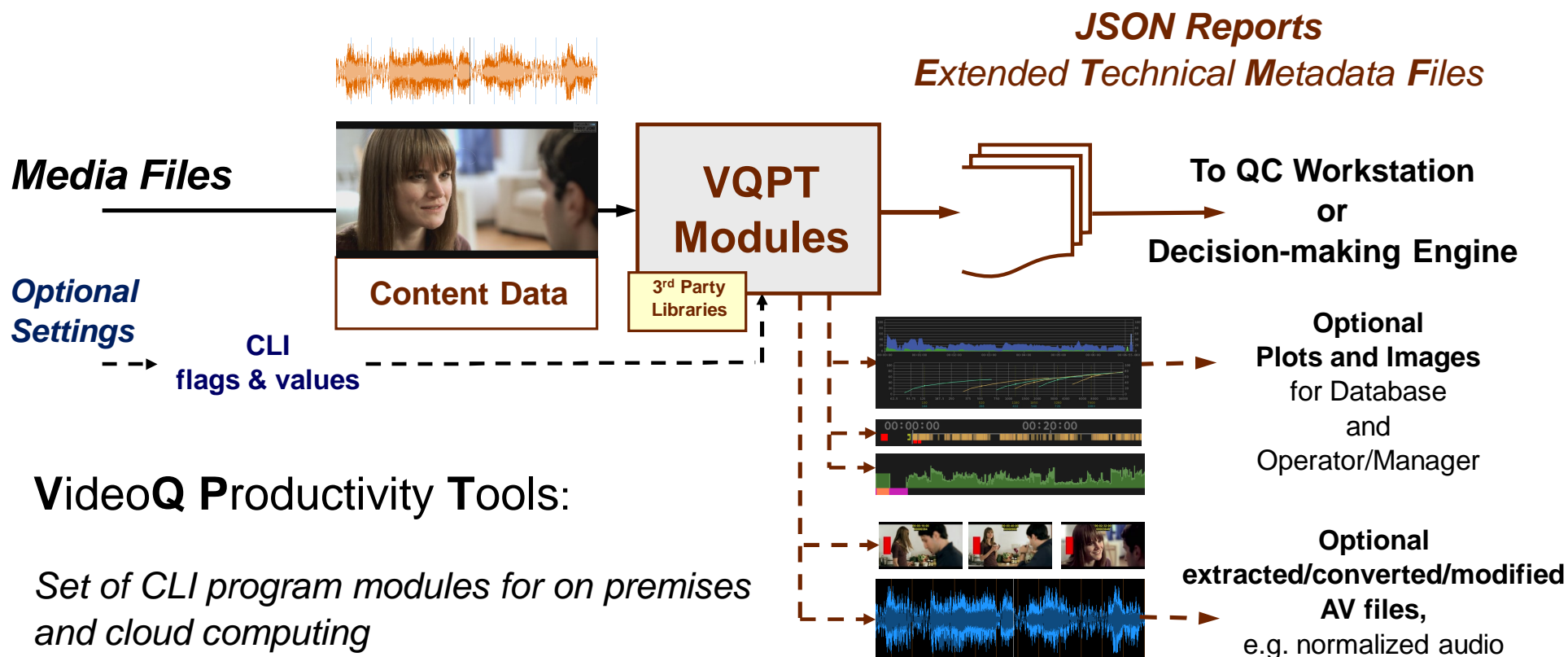
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www.videoq.com

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Top Level VQPT Automated Workflow Diagram



VideoQ Productivity Tools:

Set of CLI program modules for on premises and cloud computing

Features

- VQLPN reads WAV, W64, AAC, AC3, EAC3, MP4, MOV, MXF, etc. media file, containing audio stream(s)
 - VQLPN supports various audio stream formats:
 - any duration and bit depth,
 - high sampling rates (e.g. 192 kbps)
 - multi-channel formats: **2.0, 5.1, 7.1**
- It measures the audio stream loudness parameters in accordance with Recommendation ITU-R **BS.1770-3** (*USA ATSC RP A85, EBU R128*).
- Editable **VQLPN.INI** file stores test **configuration** and **target** parameters.
- VQLPN sorts audio segments by types (**regular audio, test tone, mute**)
- Finally, VQLPN creates Report in JSON format
- VQLPN Report also includes **Momentary Loudness Profile** data array at 100 ms step interval
- Optional outputs:
 - **Normalized** OGG/WAV/W64 audio file of **desired Integrated Loudness**
 - PNG file showing Momentary Loudness time-line profile with special segments highlighted, as well as **loudness statistics BarGraph**

Applications

- VQLPN is a portable Windows/Linux CLI program for on premises and cloud computing. Portable here means that VQLPN does not require installation of any additional software.
- Supported input media file formats (extensions) are:
 - TS, MP4, MKV video files containing at least one audio stream
 - OGG, MKA, WAV, W64, AAC, AC3, EAC3, MP3 audio files
- Supported audio channel numbers are: 1 (1.0), 2 (2.0), 6 (5.1), 8 (7.1).
- Multi-track input files with the specified layout are auto-merged to 2.0, 5.1 or 7.1 format.
- If audio file export is enabled in VQPLN.INI, then the audio output file path is auto-generated as `inFilePath.VQLPN.AudioFileExt`,
e.g.: for `c:\test\test.mp4` input the output audio file is `c:\test\test.mp4.VQLPN.wav`.
- If the duration of the resulting WAV file and the number of audio channels in it require the output file size greater than 4 GB, then VQLPN automatically switches the output format and extension to `.W64`.

Usage Info Helper

Launching VQLPN executable without any parameters brings up the following help message:

Usage (see more in VQLPN_ReadMe.TXT):

```
vqlpn -i inFileFullPath [-o [outFileFullPath]]
```

Other user controls and parameters are stored in VQLPN.INI file co-sited with the vqlpn executable

If the VQLPN.INI file is not found, then it will be auto-created with the default control values

Order of flags and parameters is mandatory and cannot be changed

`[-o outFileFullPath]` option specifies full Path\FileName.Ext

If `[-o]` is present but `outFileFullPath` omitted, `outFileFullPath = inFileFullPath.vqlpn.json`

If `[-o]` is omitted, Short Report will be sent to console (no JSON/PNG files created)

If Path\FileName contains spaces or special characters use double quotes

Optional `AudioOutFileFullPath` is auto-generated as `inFileFullPath.vqlpn.AudioFileExt`

Optional `PlotFileFullPath` always follows `outFileFullPath` (*.png matching *.json)

File names, Report and Log contents are in multi-lingual UTF-8 encoding format

VQLPN.INI File Example

```
;VideoQ VQLPN.INI file created 2022-05-16T15:00:53.322Z  
;User can edit or replace this file as needed, add your note here:  
;  
[ConfiguredBy]  
ConfiguredBy=Victor Steinberg  
[AudioStreamIndex]  
AudioStreamIndex=0  
[TargetLoudness_LUFS]  
TargetLoudness_LUFS=-23  
[LoudnessTolerance_LU]  
LoudnessTolerance_LU=1  
[MuteDurationThreshold_s]  
MuteDurationThreshold_s=1  
[AudioFileOut]  
AudioFileOut=YES  
[AudioFileExtension]  
AudioFileExtension=WAV  
[OutFileNormalization]  
OutFileNormalization=YES  
[TimelineProfile]  
TimelineProfile=YES  
[PlotFileOut]  
PlotFileOut=YES
```

VQLPN.INI Usage Details

- "VQLPN.INI" file name is reserved and cannot be changed.
- ConfiguredBy= value is optional, empty string value "ConfiguredBy=" allowed.
However, it is recommended to fill it with the real person name, this is especially important for large data bases.
In case of manual editing it is also recommended to amend the ISO formatted UTC timestamp of INI file creation.
- AudioStreamIndex= option specifies the Audio Stream Index (0, 1, etc.)
If AudioStreamIndex=-1, multi-track file audio streams will be auto-merged to the appropriate 2.0, 5.1 or 7.1 format
- TargetLoudness_LUFS= and LoudnessTolerance_LU= parameters are very important:
 - Default (EBU R128) values: TargetLoudness_LUFS=-23, LoudnessTolerance_LU=1 (it means +/- 1 LU)
 - Other standards and custom applications values are also supported.
E.g. for ATSC A/85 standard specify VQLPN.INI TargetLoudness_LUFS=-24 and LoudnessTolerance_LU=2 (it means +/- 2 LU).
- MuteDurationThreshold_S= option specifies the Mute Duration Threshold, i.e. min value in integer seconds; default = 1 s
- AudioFileOut=YES enables audio file export.
 - Audio output parameters: 48kHz, 24bit, input language tag and channels layout metadata preserved
 - AudioFileExtension= option specifies the Audio File **Extension** and **Codec**, e.g.: =OGG means **.OGG** file and **FLAC** codec
 - Supported extensions are: MKA, MKV, OGG(flac), WAV(pcm24), EAC3, MP4, TS(eac3), AC3, M4A(ac3), AAC(aac), default = OGG(flac)
 - Audio Out File Path is auto-generated as inFilePth.vqlpn.AudioFileExt
- OutFileNormalization=NO option enables audio file output with the original (input file) loudness parameters.
- OutFileNormalization=YES enables normalized audio file output with the specified Integrated Loudness target value.
- TimelineProfile=NO option disables Timeline Profile section within JSON Report file (reducing Report file size).
- PlotFileOut=NO option disables Loudness Timeline Profile Plot PNG File output.

JSON Report Example – Part 1

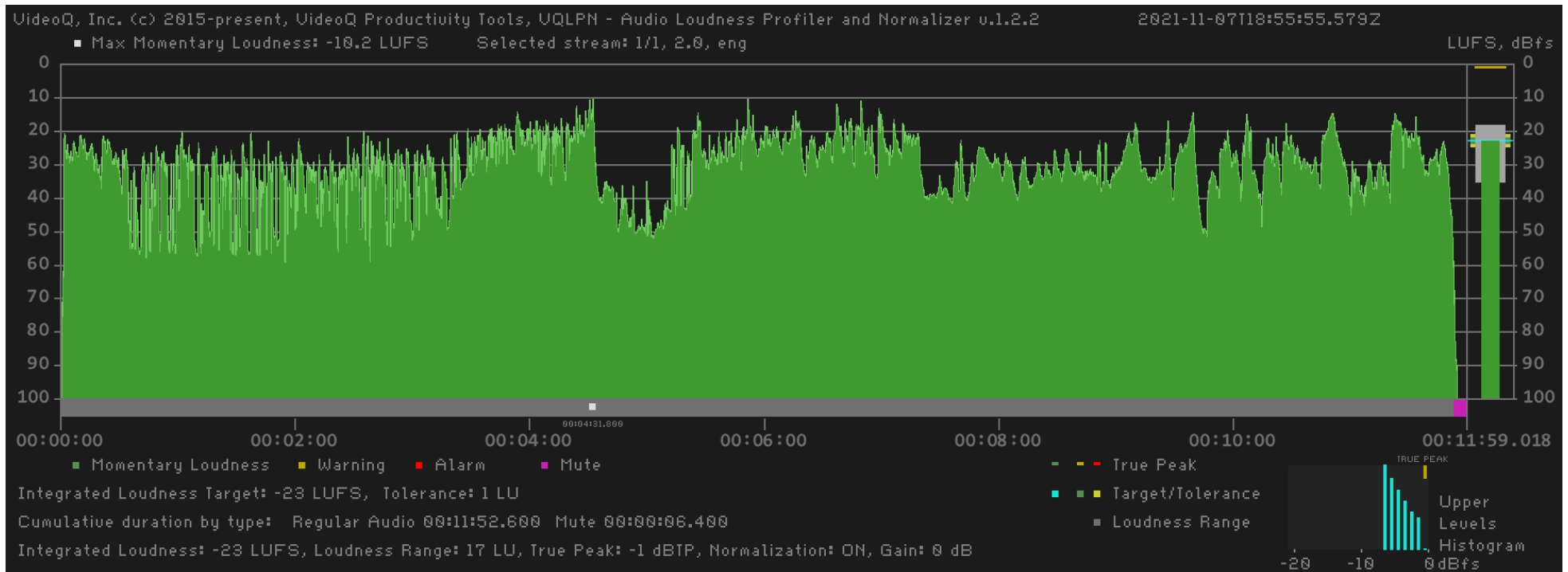
<ul style="list-style-type: none"> ▼ (0) "header": {} (16) > (0) "generalInputFileInfo": {} (9) > (0) "audioStreams": {} (2) > (0) "testConditions": {} (8) > (0) "generalLoudness": {} (14) > (0) "audioSegments": {} (2) > (0) "timeLineProfile": {} (3) 	<ul style="list-style-type: none"> 1."programShortName" "VQLPN" 1."programName" "Audio Loudness Profiler and Normalizer" 1."version" "1.2.2" 1."copyright" "VideoQ, Inc. (c) 2015-present" 1."license" "Trial Demo version, expires 2022-07-01" 1."configuredBy" "Victor Steinberg" 1."reportDateTimeUTC" "2022-05-17T19:07:23.480Z" 1."reportDateTimeLocal" "2022-05-17T20:07:23.479" 1."localTimeZone" "UTC+00:00, BST" 1."elapsedTime_ms" "12021" 1."elapsedTime_TC1000" "00:00:12.021" 1."inputFileName" "/mnt/l/Mexicana.mp4" 1."reportFileNameMode" "Specified in command line" 1."reportFileName" "/mnt/l/Mexicana.mp4.vqlpn.json" 1."plotFileName" "/mnt/l/Mexicana.mp4.vqlpn.png" 1."normalizedFileName" "/mnt/l/Mexicana.mp4.vqlpn.wav" 	<ul style="list-style-type: none"> ▼ (0) "audioStreams": {} (2) 1."count" "1" ▼ (1) "1": {} (16) 2."audioStreamIndex" "0" 2."title" "0" 2."streamID" "2" 2."languageISO639Alpha2" "en" 2."languageISO639Alpha3" "eng" 2."channelsNumber" "2" 2."channelLayout" "L R" 2."duration_ms" "415123" 2."samplesCount" "19925904" 2."streamDuration_TC1000" "05:32:05.904" 2."samplingRate" "48000" 2."bitsPerComponent" "128000" 2."bitRate_bps" "128000" 2."bitRateMode" "CBR" 2."streamSize_byte" "6642006" 2."encodingFormat" "AAC" ▼ (0) "testConditions": {} (8) 1."selectedAudioStreamIndex" "0" 1."multiTrackMergeMode" "No" 1."multiTrackLayout" "0" 1."targetLoudness_LUFS" "-23" 1."loudnessTolerance_LU" "1" 1."muteDetectionThreshold_s" "1" 1."normalizedAudioFileName" "/mnt/l/Mexicana.mp4.vqlpn.wav" 1."normalizedAudioChannelsNumber" "2"
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JSON Report Example – Part 2

<ul style="list-style-type: none"> ▼ (0) "generalLoudness": {} (14) <ul style="list-style-type: none"> 1."integratedLoudness_LUFS" "-12.9" 1."targetLoudness_LUFS" "-23" 1."normalizationGain_dB" "-10.1" 1."truePeak_dBTP" "-1.7" 1."clippingDistortionsLevel" "Nil" 1."maxMomentaryLoudness_LUFS" "-5.9" 1."maxMomentaryLoudness_ms" "232500" 1."maxMomentaryLoudness_TC1000" "00:03:52.500" 1."loudnessRange_LU" "7.3" 1."loudnessRangeMin_LUFS" "-18.8" 1."loudnessRangeMax_LUFS" "-11.5" 1."dualMono" "Yes" 1."stereoPhaseInversion" "No" ▼ (1) "upperLevelsHistogram": {} (2) <ul style="list-style-type: none"> 2."binsCount" "4" ▼ (2) "values": [] (4) <ul style="list-style-type: none"> ▼ (3) 0: {} (1) <ul style="list-style-type: none"> 4."0dBfs" "0" ▼ (3) 1: {} (1) <ul style="list-style-type: none"> 4."-1dBfs" "338" ▼ (3) 2: {} (1) <ul style="list-style-type: none"> 4."-2dBfs" "14140" ▼ (3) 3: {} (1) <ul style="list-style-type: none"> 4."-3dBfs" "33922" 	<ul style="list-style-type: none"> ▼ (0) "audioSegments": {} (2) <ul style="list-style-type: none"> ▼ (1) "segmentsByType": {} (6) <ul style="list-style-type: none"> 2."totalSegmentsCount" "1" ▼ (2) "RegularAudio": {} (3) <ul style="list-style-type: none"> 3."count" "1" 3."duration_ms" "415123" 3."duration_TC1000" "00:06:55.123" > (2) "Mute": {} (3) > (2) "TestTone": {} (3) > (2) "VQAUD1": {} (3) > (2) "VQAUD2": {} (3) ▼ (1) "segmentsByNumber": {} (1) <ul style="list-style-type: none"> ▼ (2) "1": {} (7) <ul style="list-style-type: none"> 3."type" "RegularAudio" 3."duration_ms" "415123" 3."duration_TC1000" "00:06:55.123" 3."start_ms" "0" 3."end_ms" "415123" 3."start_TC1000" "00:00:00.000" 3."end_TC1000" "00:06:55.123" ▼ (0) "timeLineProfile": {} (3) <ul style="list-style-type: none"> 1."meterMode" "EBU_R128_MomentaryLoudness" 1."timeStep_ms" "100" ▼ (1) "momentaryLoudnessLUFS_x10": <ul style="list-style-type: none"> 2.0 -1000 2.1 -1000 2.2 -1000 2.3 -420 2.4 -389
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Plot Example 1

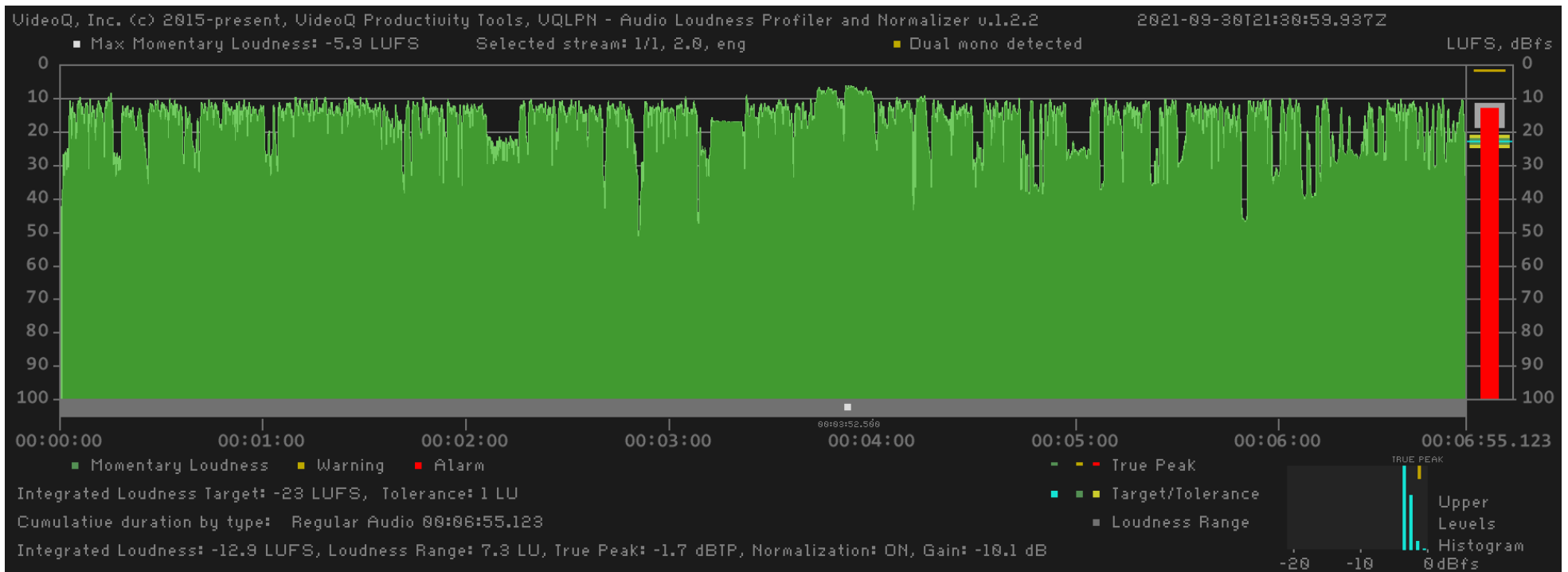
Professional clip with 6 seconds long Mute Fragment at the end
Normalized audio stream – **Integrated Loudness** is exactly equal to **-23 LUFS** target value
True Peak value is **quite high**



Plot Example 2

Legacy content:

Integrated Loudness is much higher than -23 LUFS target value, and True Peak value is quite high



About VideoQ



Company History

- Founded in 2005
- Formed by an Engineering Awards winning team sharing between them decades of global video technology.
- VideoQ is a renown player in calibration and benchmarking of Video Processors, Transcoders and Displays, providing tools and technologies instantly revealing artifacts, problems and deficiencies, thus raising the bar in productivity and video quality experience.
- VideoQ products and services cover all aspects of video processing and quality assurance - from visual picture quality estimation and quality control to fully automated processing, utilizing advanced VideoQ algorithms and robotic video quality analyzers, including latest UHD and HDR developments.

Operations

- Headquarters in CA, USA
- Software developers in Silicon Valley and worldwide
- Distributors and partners in several countries
- Sales & support offices in USA, UK