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## CLIO 10 NEW FEATURES NOT AVAILABLE IN CLIO 8

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### INTRODUCTION

This document gives a synthetic description of CLIO 10 new features not available in CLIO 8 systems.

*The following applies to the new software CLIO10.3 for the FW-01 audio interface; note that CLIO10 will not be available for the USB system (SC-02+PB-4281).*

### LIST OF NEW FEATURES

1. **Up to 24-bits 192kHz sampling.** Measurements with a bandwidth of up to 90kHz.
2. **Balanced input and output connection.** XLR combo input; +18 dBu (6.2 Vrms) max output level.
3. **SPDIF digital output.**
4. **Hardware input channel protection.** To avoid faults caused by misuse of the instrument.
5. **Fully portable instrument.** No need for wall outlet AC supply.
6. **ASIO operation.** To avoid any instability caused by computer latencies.
7. **Windows Vista and 7 100% compatible.**
8. **Interactive User Manual translation.** Available in English, Spanish, Portuguese and Italian languages.
9. **QCBox Model 5 new functions exploit.** Output current limit to protect speakers, MIC supply from 2V to 24V, Output DC voltage, Laser DC input. 6 IN/OUT TTL signals control via USB.
10. **ANSI/CEA 2010 interactive FFT test.** Possibility of measuring maximum acoustical output of loudspeakers, particularly subwoofers.
11. **New signal generation.** Sinusoidal bursts with tapered amplitude (hanning window).
12. **Default output level of the generator.** It is now 1Vrms i.e. 0dBV; compare this to the former value of 0.775V (0dBu).
13. **512Ksamples MLS & Log Chirp size.**
14. **New measurement units: displacement (meter), velocity (m/s), acceleration (m/s<sup>2</sup>).** The new CLIO Options>Units Conversion tab has been enhanced to enter the sensitivity values for these units. MLS, Sinusoidal, FFT, Multimeter and Leq are able to use these new units.
15. **QC test triggered by speaker cables connection.** Inside CLIO Options>QC you may find the "QC Script Input Start Signal" definitions. Use "QCBox5 DevCon" to sense the connection of the speaker under test. Also added the possibility of using the input bits of the QCBox Model.
16. **New file load behaviour.** Saved files are loaded with the same scale

settings as they have been saved; if you want to "Maintain User Scales on Graph" select it under CLIO Options>General.

17. **File load by dragging file.** Simply drag the measurement file on to CLIO desktop to open it.
18. **Stereo measurements now possible.** CLIO10 is able to take simultaneous stereo measurements; it is possible to measure loudspeaker frequency response and impedance together (using a QCBox Model5). See CLIO Options>Graphics for definitions of the "Main Curve B".
19. **New common measurement graph displays.**
20. **Two main curves management.** Execute a stereo measurement with sinusoidal (select CH A&B); the Main Curve B will be activated on screen. It is possible to Display/Hide/Select one of the two curves; when selected the curve can be stored in an Overlay; scale controls (buttons and Autoscale) work on selected curve; marker A reads Curve A, marker B reads Curve B (when no overlay is selected).
21. **Overlays can be selected.** Each overlay can be displayed (check box only grayed), hidden or selected (check box is black).
22. **Marker B can read an overlay.** When an overlays is displayed it can be read by Marker B if it is also selected.
23. **Markers A and B can read together.** Activate both markers, then hold down the Shift key when moving the mouse; the two cursors will collapse into a single one; it is possible to read two different curves (like response and impedance or phase) at the same frequencies.
24. **Change scale by direct input.** Click on the top or bottom value of right or left Y scales; it is possible to input the desired values.
25. **Change zoom factor by direct input.** Click on the lower or upper frequency value of frequency scale; it is possible to input the desired values.
26. **Third Curve display under QC.** It is possible to display a third measurement curve (like Rub&Buzz or THD) under a single QC test together frequency response and impedance (done with a stereo sinusoidal measurement). See CLIO Options>Graphics for definitions of the "QC Curve C", "QC upper limit C" and "QC lower limit C".
27. **New Sinusoidal Menu.**
28. **Stereo measurement.** Selecting CH A&B you measure channel A and B simultaneously (with same Y scale). Selecting also "Ohm Right Scale", within sinusoidal settings, you measure impedance on channel B.
29. **A/B tests.**
30. **THD plus Harmonics up to 10<sup>th</sup>.** Select "THD Enabled" under Sinusoidal>Distortion settings. Display with THD button and harmonics drop-down.
31. **Fast-Track™ Rub&Buzz measurement.** Select "R&B Enabled" under Sinusoidal>Distortion settings. Display with R&B button.
32. **Fast sweep measurement speed.** Sweep optimized for fastest R&B

- tests.
33. **Slow sweep measurement speed.** Sweep optimized for maximum accuracy.
  34. **New Multimeter measurements.** Displacement, Velocity, Acceleration, THD+Noise and Power measurements.
  35. **FFT internal trigger.** Enhanced internal trigger for synchronous measurements.
  36. **New Thiele&Small parameters with Laser.** It is possible to execute a single pass T&S evaluation from a stereo sinusoidal measurement laser displacement in one channel, impedance in the second.
  37. **Large signal T&S parameters.** Fulfilling IEC 62458 standard.
  38. **Acoustical parameters from wav impulse response.** Possibility to record and measure acoustics starting from balloon pops, pistol or spark gaps.
  39. **New 3D Balloons Analysis.** A dedicated application note is going to cover this topic thoroughly.
    - **3D Balloon calculation and display.**
    - **Color Balloons.**
    - **Real-time mouse-driven rendering.**
    - **Full export to EASE .xhn & CLF .tab ASCII files.** No need for external software like CLIOtoEASE.
    - **Mass export of Impulse Responses to .txt ASCII files.** High resolution format to be imported with EASE SpeakerLab.
    - **Note.** 3D balloons analysis and 3D turntables controls are only available in CLIO10 QC version.
  40. **Laser measurements.**
  41. **New Loudness Rating meter.** RLR, SRL, STMR calculator from MLS or Sinusoidal frequency responses.

## NEW QC FUNCTIONS

42. **Complete loudspeaker QC test with a single fast measurement.**

Using the new sinusoidal features it is possible to program a loudspeaker test that can measure the following quantities in a single pass: response, sensitivity, impedance, polarity, Rub&Buzz, THD and harmonics up to 10<sup>th</sup>, T&S parameters; three curves are displayed on screen: response, impedance and one to be selected among the others calculated. Choosing proper sinusoidal settings (resolution, frequency span and speed) it is possible to achieve best tradeoffs between speed and accuracy; we experimented 1 second production line cycle times with good results; less stringent setups give comfortable cycle times within 1 to 2 seconds.
43. **Relative limits with frequency jittering.** Use:  
[RELATIVE]  
FREQJITTER=0.3 *fractions of octave*
44. **Relative limits with percentage masks.** Use:

- [RELATIVE]  
PERCENT=1
45. **Equalized sinusoidal tests.** Use:  
EQREFERENCE=*file*
46. **Loudness rating under QC.** Inside limits file activate with:  
[LR]  
RLRUPPER=*value*  
RLRLOWER=*value*
47. **QC for stereo measurements.** Use:  
REFERENCE=*stereo file*  
LIMITS=*limits file for both channels*  
*or*  
LIMITSA=*limits file for channel A*  
LIMITSB=*limits file for channel B*  
See CLIO Options>Graphics for definitions of the "QC upper limit B" and "QC lower limit B".
48. **QC with Fast-Track R&B.** Inside limits file activate with:  
[RUB+BUZZ UPPER LIMIT DATA]
49. **QC for A/B tests.** Inside limits file activate with:  
[A/B UPPER LIMIT DATA]
50. **Third curve display under QC.** Inside limits file activate with:  
[RUB+BUZZ DISPLAY].  
See CLIO Options>Graphics for definitions of the "QC upper limit C" and "QC lower limit C".
51. **Test triggering with loudspeaker connection.** The QC test can be started by the connection of the speaker to QCBox terminals.
52. **Sweep sync TTL signal generation.** It is possible to generate the desired TTL signal right after sweep completion instead of waiting calculations and end of test; in this way ultra-fast tests are optimised.  
Example:  
[SIN]  
..  
..  
QCBOXOUTBIT0=1  
*instead of*  
[PERFORM]  
QCBOXOUTBIT0=1
53. **REPEATONBAD.** To repeat the last executed measurement in case of noise disturbances.
54. **Full USB Speaker, USB Microphone and Bluetooth Audio Device testing capability.** Control over any device exposing a WDM Windows compatible audio interface.