

1 INTRODUCTION

This User's Manual explains the CLIO system hardware and software.

All software versions - **Standard**, **Lite** and **QC** - are covered; we remind you that the Standard and **QC** software are **hardware protected** and work in **demo mode** if the proper PC board (the one with the correct serial number) is not installed or found .



If the software does not recognize the correct serial number works in demo mode!

The CLIO software is year 2000 compliant.

1.1 GENERAL CONDITIONS AND WARRANTY

THANKS

Thankyou for purchasing your CLIO system. We hope that your experiences using CLIO will be both productive and satisfying.

CUSTOMER SUPPORT

Audiomatica is committed to supporting the use of the CLIO system, and to that end, offers direct support to end users. Our users all around the world can contact us directly regarding technical problems, bug reports, or suggestions for future software enhancements. You can call, fax or write to us at:

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AUDIOMATICA ON-LINE

For any inquiry and to know the latest news about CLIO and other Audiomatica's products we are on the Internet to help you:

E-MAIL: audiomatica@mclink.it
WWW: <http://www.mclink.it/com/audiomatica>

AUDIOMATICA'S WARRANTY

Audiomatica warrants the CLIO system against physical defects for a period of one year following the original retail purchase of this product. In the first instance, please contact your local dealer in case of service needs. You can also contact us directly as outlined above, or refer to other qualified personnel.

WARNINGS AND LIMITATIONS OF LIABILITY

Audiomatica will not assume liability for damage or injury due to user servicing or misuse of our product. Audiomatica will not extend warranty coverage for damage of the CLIO system caused by misuse or physical damage. Audiomatica will not assume liability for the recovery of lost programs or data. The user must assume responsibility for the quality, performance and the fitness of Audiomatica software and hardware for use in professional production activities.

The CLIO SYSTEM and AUDIOMATICA are registered trademarks of Audiomatica SRL.

REGISTRATION CARD

<p><i>AUDIOMATICA REGISTRATION CARD (MAIL OR FAX TO US)</i></p> <p>CLIO SERIAL NUMBER: _____</p> <p>SOFTWARE VERSION: _____</p> <p>PURCHASE DATE: _____</p> <p>NAME: _____</p> <p>JOB TITLE: _____</p> <p>COMPANY: _____</p> <p>ADDRESS: _____</p> <p>ZIP OR POST CODE: _____</p> <p>PHONE NUMBER: _____</p> <p>FAX NUMBER: _____</p> <p>E-MAIL: _____</p>

1.2 THE HARDWARE OF CLIO

CLIO, housed on a standard IBM-PC board, works as a precision A/D D/A audio front-end for your PC; once fitted in a laptop providing an ISA slot, gives you the power of a lightweight portable instruments for on-field acoustical measurements; it is capable of generating any pre-defined stimuli like already defined signals: sine, two-tone, burst, white and pink noise, MLS (maximum length sequence) and all the others in its libraries saved on disk; on the other hand it is capable of analyzing the signal present at its inputs both in frequency and time domains; the wide range of programmable output attenuation (resolution of 0.1 dB) and input gain allows an easy interface to the outer world; the software controls the two input channels separately or as a single balanced one. Dual DMA handling permits both generation and acquisition to be performed in background giving maximum flexibility and ease of operation. The CLIO board can be directly connected to a microphone without the need for an external preamplifier; the proposed line of the two **MIC-01 and MIC-02 microphones** perfectly match the requirements of a professional measurement system. The optional, battery-operated, **PRE-01 microphone preamplifier** satisfies the needs of laboratory measurements, performs A,B,C-weight filtering and drives long cables to the PC. The new **CLIOQC power amplifier and switch-box** permits frequency response and impedance tests with no change in the wiring connection of the loudspeaker under test and also to switch between two measurement microphones. All internal functions are TTL controlled.

1.3 THREE SOFTWARE VERSIONS

You can enter the CLIO world in three different ways. If you execute, for the first time, electro-acoustic measurements and only need a limited, but still powerful, version of CLIO then choose **CLIO Lite** and its unbeatable price! If you need the full power of our professional package choose **CLIO Standard**. And if you need the extra flexibility required for testing and controlling a production line then add the **Quality Control Plug-in**.

1.4 THE CLIO SYSTEM MEASUREMENT TECHNIQUES

1.4.1 MLS ANALYSIS

CLIO takes great advantage of the well established MLS analysis technique: the system is stimulated with a pseudo-casual noise and then its **impulse response** is reconstructed, by means of sophisticated algorithms; it is the de-facto standard for accurate anechoic analysis and for room acoustics.

The measurement is highly accurate and extremely fast to execute; the data recorded by the computer, can be instantly analyzed or stored for later post-processing. From the impulse response it is possible to obtain:

- Frequency response
- Phase response, minimum phase, phase with group delay removed.
- Step response
- Energy-Time curve (ETC)
- Cumulative spectral decay (Waterfall)
- Reverberation time (RT60)

The actual software release 4 permits, among other features, the following:

- Input signal autorange for optimum signal to noise ratio.
- Selectable analysis window
- Manual or continuous programmable time average
- Loop function with continuous measurement refresh
- Mathematical operations on data in memory
- Automatic merge function between near and far field
- Selectable smoothing factor (from 1/2 to 1/12 of octave)

1.4.2 SINUSOIDAL ANALYSIS

CLIO executes sinusoidal analysis with a sophisticated digital filtering of input signal to achieve the highest noise-immunity; in this way you add the power of the PC to the most traditional frequency analysis.

The sinusoidal technique is oriented to:

- Frequency and phase response
- Gating system for quasi-anechoic measurements
- File driven shaped amplitude generation
- Second and third harmonic plot vs. frequency
- Harmonic and intermodulation distortion vs. level (SMPTE, CCIF, DIN)
- Polar plots with hardware control of a turntable
- Impedance measurements
- Automatic evaluation of the Thiele-Small parameters
- Real-time interactive measurement of capacitors and inductors

The frequency resolution can be as high as 1/48th of octave; the input signal autorange yields a very high dynamic range; the impedance measurements can be done with a direct connection or with an external amplifier and a sensing resistor both in constant current or constant voltage configurations; the procedure for the evaluation of speaker parameters uses the added-mass or known-volume methods and minimum square error routines.

1.4.3 THIRD OF OCTAVE ANALYSIS

This classical measurement is implemented with the possibility of using, as stimulus, a pseudo-random pink-noise thus minimizing the number of averages needed; for Car Stereo installers it is also possible to calculate the IASCA score (not available in Lite version).

1.4.4 EQUIVALENT LEVEL MEASUREMENT

CLIO executes the real-time calculation (integration of the input signal) of the equivalent level Leq ; the value is displayed together with the time history of the signal; this is useful for environmental noise monitoring and as a classical paper recorder.

1.4.5 FFT ANALYSIS AND OSCILLOSCOPE

These measurements are implemented with interactive control panels that easily permit to switch back and forth between time and frequency domains.

The main features are:

- Two channels measurement and display (time and frequency)
- Internal trigger with programmable delay (time and frequency)
- Real-time THD calculator
- FFT up to 4096 points
- Transfer function between input channels

Modulus, real and imaginary parts display

- Linear or logarithmic frequency axis
- Linear or dB amplitude scale
- Alltone signals for real-time transfer function
- Multitone signals generation

With FFT it is possible to easily execute bursted distortion measurements delivering, for a definable short period of time, very high power to the load.

1.4.6 SIGNAL GENERATOR AND MILLIVOLTMETER

This extremely useful control panel is the control centre of the whole instrument and is recallable from any other measurement menu; it permits the generation of all pre defined stimuli, the output amplitude control, the input channel selection and input gain control; the input level may be viewed as V_{rms} , dBu, dBV, dBSPL or dB relative.

1.4.7 THE RELEASE 4 USER INTERFACE

The actual CLIO system software release 4 uses an intuitive “Windows-Like” user interface; the various control panels, result of Audiomatica’s decennial experience in programming and audio measurements, give you the impression of facing a real instrument. The software displays multiple curves giving you powerful editing capabilities together import and export facilities as a link to simulation programs. The context-sensitive Help On-Line simplifies, even the first time, CLIO’s use.

1.5 THE QC (QUALITY CONTROL) MEASUREMENT MENU PLUG-IN

The QC software represents Audiomatica's "on-field developed" solution for any production facility; it is a **plug-in** software that enhances CLIO 4 giving the possibility of no-compromise testing of production lines. The QC plug-in is functionally "inside" the main system software giving the developing engineer all the functionality of the standard software; during production tests it may present simple "go-no go" masks in order to be run by inexperienced operators.

The QC software is file-driven and permits the following measurements:

- Definable sinusoidal continuous sweeps for classical "ear-driven" tests

- FFT with totally definable masks and signals to allow ultra-fast tests of:

- THD
- Frequency response
- IMD
- Noise

- Level with bargraph display.

- Impedance with sinusoidal stimulus. Featuring:

- Definable limits
- Thiele/Small parameters QC test.

- Frequency response with MLS analysis. Featuring:

- Absolute or relative response check
- Global level check with definable tolerance and visual shift compensation
- Definable offset to check devices with different sensitivity
- Standard deviation within the batch

- Polarity

The check masks may be easily viewed to self-explain the executed QC test.

Data files can be autosaved for off-line post processing and reporting.

The QC software can also interact with the outer world by means of I/O TTL signals in order to realise a fully automated testing environment; custom controls have been tailored for the CLIOQC Amplifier & SwitchBox.