

3 INSTALLATION OF CLIO

NOTE: PLEASE REFER TO CHAPTER 4 FOR POTENTIAL PROBLEMS REGARDING THE COMPATIBILITY OF THE CLIO SYSTEM WITH YOUR PC (EITHER HARDWARE OR SOFTWARE).

3.1 PC CONFIGURATION

The CLIO PC board running the system software version 4 **Standard**, **Lite** or **QC** can be fitted in any IBM (or compatible) personal computer with the following minimum system requirements:

- 486 processor (suggested minimum DX-33)
- one free 8-bit or 16-bit half-size ISA slot
- 2 MB RAM
- hard disk
- VGA video board
- MS-DOS Version 3.2 or later

A math co-processor is not required but is highly recommended.

3.2 HARDWARE INSTALLATION

It is possible to configure the I/O address of the CLIO board, by means of the JP2 jumper, in order to avoid conflicts with other boards that are installed in your computer. Refer to Fig.3.1 where you can see the two possible positions of JP2. The I/O space used by CLIO is four bytes wide, and starts at the base address that has been selected (i.e. 300-303 HEX if the 300 HEX choice has been made).

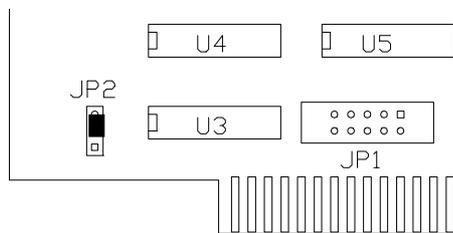


FIGURE 3.1a – I/O address 300 HEX

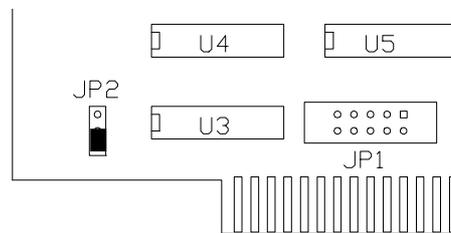


FIGURE 3.1b – I/O address 310 HEX

The situation depicted in Fig.3.1a is the factory default.

For any further problem regarding the jumper settings refer to paragraph 7.3.3. Jumper JP1 has no effect either on the installation or the current software functionality; it has to be left as factory shipped.

To install the CLIO board in your computer you should follow the instructions presented below:

- 1) Disconnect the mains power cable from the PC.
- 2) Open the computer cabinet.
- 3) With the motherboard in front of you, identify a free 8-bit (or 16-bit) slot. Note that it is preferable to install the CLIO board as far away as possible from the video adaptor.
- 4) Insert the CLIO board in the slot and screw it down firmly.

- 5) Close the cabinet.
- 6) Reconnect the mains cable and switch the computer on.

At this point the CLIO board hardware installation is finished. To proceed further, you need an RCA pin-to-pin cable (one of those used in a stereo system) to connect the CLIO channel **A** input and channel **A** output; we **strongly suggest** you to carefully follow paragraph 3.4 in order to verify the correct behavior of your CLIO system.

You should always keep in mind the following electrical specifications of your CLIO system:

MAXIMUM INPUT VOLTAGE:	+30 dBV (89.5 V peak-to-peak)
MAXIMUM OUTPUT VOLTAGE:	+12 dBu (3.1 Vrms) (sine)
INPUT IMPEDANCE:	64 kohm
OUTPUT IMPEDANCE:	100 ohm

3.3 SOFTWARE INSTALLATION

The CLIO software is provided on a 3.5" (1.44 MB) diskette named "PROGRAM DISK".

The software has to be installed on the hard disk of your PC. The installation procedure is carried out by running the INSTALL.BAT batch file that is supplied on the program disk. This will create a CLIOxx directory with two subdirectories, one called DATA and the other called SIGNAL. "xx" denotes the software version number. For this edition the actual version number is 4.0, so a CLIO40 directory will be created.

To install the CLIO software do the following:

- 1) Insert the "PROGRAM DISK" in your PC.
- 2) Type the following command (from **DOS prompt** or **W95/98 Start** button and then **Run** option):

```
{source drive}INSTALL {optional source drive}{optional destination drive}<ENTER>
```

where {drive} is, for example, A: or D: and <ENTER> indicates that you should press the Enter key on your keyboard.

As an example "B: INSTALL B: D:" installs CLIO from drive B: to drive D:; if you only specify "INSTALL" without arguments CLIO will assume A: source drive and C: destination drive.

The DOS PATH should not contain the C:\CLIO40 path; CLIO has not to be run from outside the CLIO40 directory! CLIO requires at least 580K of conventional memory; use the appropriate DOS command to check this requirement before running CLIO.

Now you will run CLIO for the first time; please follow carefully the procedure described in the following chapter: verify that you obtain EXACTLY what is described in the manual and DO NOT proceed to the subsequent step if you were not able to complete the previous successfully.

As an example NEVER PERFORM A CALIBRATION if you were not able to play a sinusoid: THERE IS A PROBLEM THAT HAS TO BE SOLVED !

When contacting technical support report what has happened and where your verification procedure stopped.

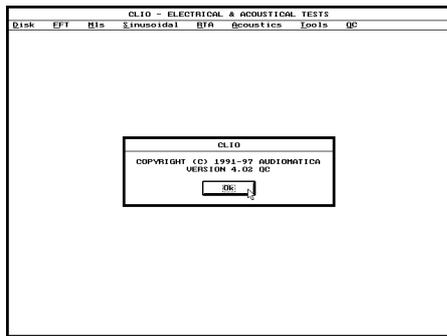


FIGURE 3.2

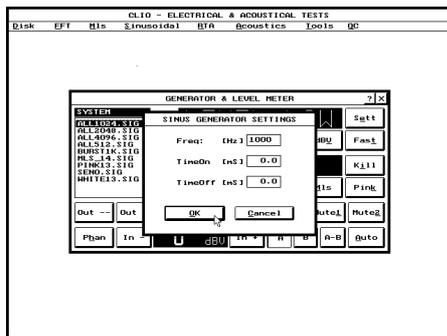


FIGURE 3.3

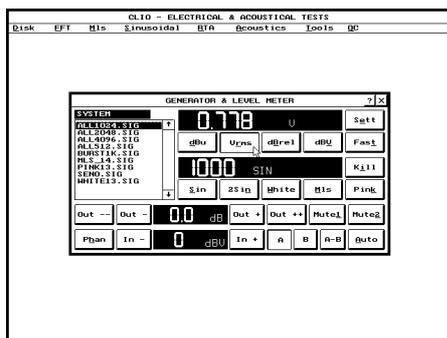


FIGURE 3.4

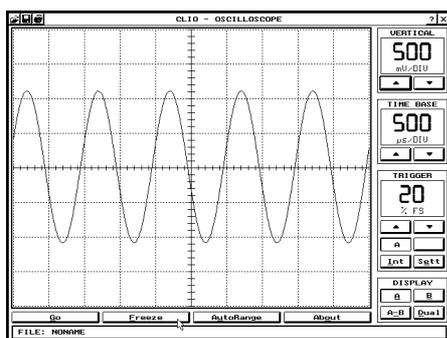


FIGURE 3.5

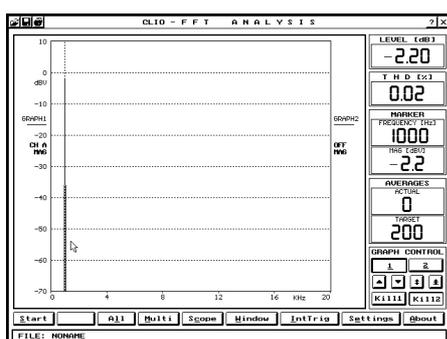


FIGURE 3.6

3.4 RUNNING CLIO FOR THE FIRST TIME

If you have completed the preceding installation procedure, you are ready to run CLIO!

The steps hereafter described will guide you through a complete verification of the system performance and operation.

To run the software just type CLIO (be sure to start from within the CLIO system directory) and <ENTER>. You should see CLIO's main window (Fig. 3.2). After having answered the initial prompt you are ready to make your first measurement.

Should there be any problem with the installation the program will display a warning message. In the event that a warning message does occur, please refer to Chapter 7 to properly setup your board.

The board has to be connected as depicted in Fig. 3.14 (with input A and output A short-circuited); **do not change** this connection throughout all the tests described in this section.

Let's now start with a simple level measurement of a 1000 Hz sinusoid generated by CLIO: press F4 to recall the Generator and Level Meter control panel and then "S" or click on the Sin button to start the definition of a sinusoidal signal; type in 1000 in the Freq field (leave the other fields at 0) and press Enter or click on the Ok button (as shown in Fig. 3.3); the generator display will show "1000 SIN" and the level meter will measure about "0.77 V" which is the default output level of a sinusoidal signal (as shown in Fig. 3.4).

Now you are ready to view the signal with the Oscilloscope; press Esc or click on the "X" title bar button to exit the Generator control panel and then press "T" and "S" for the Tools Scope option; once in the Oscilloscope control panel you may press "G" to start the interactive oscilloscope; using the UP-ARROW and DOWN-ARROW keys you can freely change the vertical amplification of the acquired waveform and pressing "F" you are able to freeze it and view a stable screen (Fig. 3.5). Press Esc to exit the oscilloscope.

If you're running a Lite software version, please skip the following lines and go directly to the description of system calibration. Now we are ready for a frequency measurement: press "F" to invoke the FFT analyzer; pressing "S" begins the FFT analysis; as in the oscilloscope case the measurement is continuously refreshing and pressing "T" stops the acquisition: the single line that you see is the spectral content of the generated sinusoid (Fig. 3.6); using the LEFT-ARROW and RIGHT-ARROW keys or moving the marker with the mouse

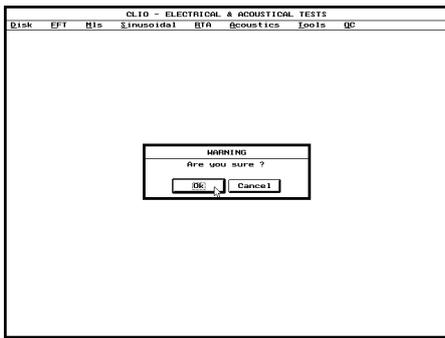


FIGURE 3.7

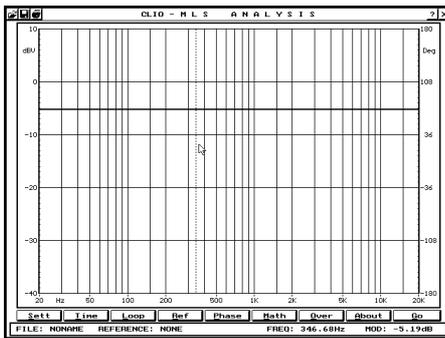


FIGURE 3.8

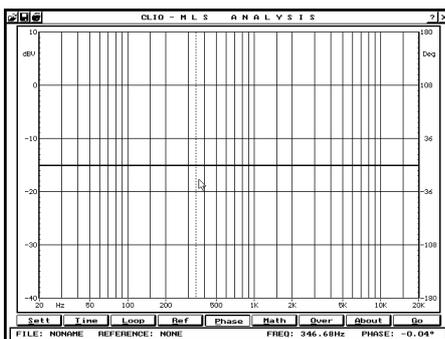


FIGURE 3.9

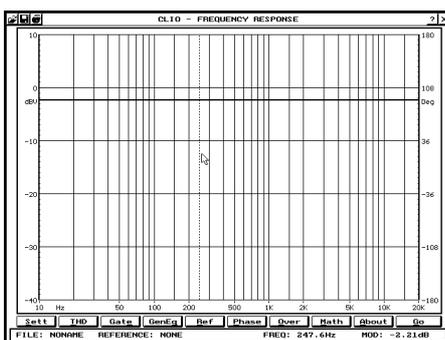


FIGURE 3.10

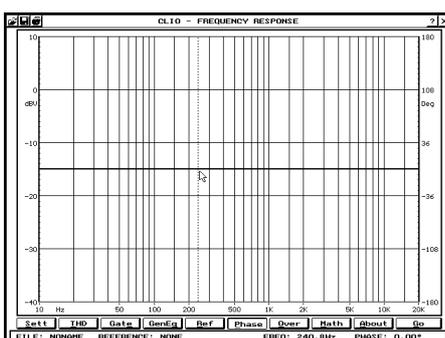


FIGURE 3.11

you can inspect the amplitude of each single frequency bin, if it is positioned as in figure the marker will read the level at 1 kHz of -2.2 dBV. Press Esc to exit the FFT control panel and go back to CLIO’s main menu.

We will now undertake the **system calibration** procedure: press “D” to enter the Disk menu and “C” to start the system calibration (Fig. 3.7); press Enter to start the procedure; **please be patient as this procedure will take some minutes**; you will see several progress indicators that will accompany each calibration performed; as the procedure ends you will have control of the system again and are ready for an MLS check.

Press “M” and then “A” to invoke the MLS Analysis control panel; now press “G” to run your first MLS measurement, after some seconds the computer will play a short beep and you should see, on your screen, a straight line as in Fig.3.8; this means that your system is correctly calibrated with respect to the amplitude of the MLS frequency response; press now “P” to get the phase plot and you should obtain another straight line as in Fig.3.9; this means that your system is correctly calibrated with respect to the phase of the MLS frequency response.

NOTE: the average amplitude reading of the marker is -5.1 dBV (the default output level of the MLS signal file).

Press Esc to exit the MLS control panel and go back to the main menu. Press “S” and then “F” to invoke the Sinusoidal Frequency Response control panel; now press “G” to run your first Sinusoidal measurement, for several seconds the computer will play a sinusoidal sweep from 10 Hz to 20 kHz; you will see the frequency played on the status line in the bottom of the screen; at the end of the process you should see a straight line as in Fig.3.10; this means that your system is correctly calibrated with respect to the amplitude of the Sinusoidal frequency response; press now “P” to get the phase plot and you should obtain another straight line as in Fig.3.11; this means that your system is correctly calibrated with respect to the phase of the Sinusoidal frequency response. NOTE: the average amplitude reading of the marker is -2.2 dBV (the default output level of a sinusoidal signal, as seen before).

If you completed successfully this hard job your system should perform correctly and you are ready to get the most satisfactory results from your CLIO.

To start working with CLIO you may want to familiarize yourself with the user interface and the many hot keys. Read carefully chapters “5-Clio’s User Interface”, “6-Disk Menu and Files management” and “7-Configuring and Calibrating Clio” after this chapter before proceeding further.

3.5 CLIO CONNECTIONS

The CLIO board has four RCA plugs that are used to connect it with the outside world (Fig. 3.12). The lower ones, J1 and J2, are the two outputs, while J3 and J4 are the inputs. The board is stereo and can simultaneously process two I/O channels which are named channel **A** and **B**. The output of channel **B** is normally driven in parallel with channel **A** output but can be separately muted.

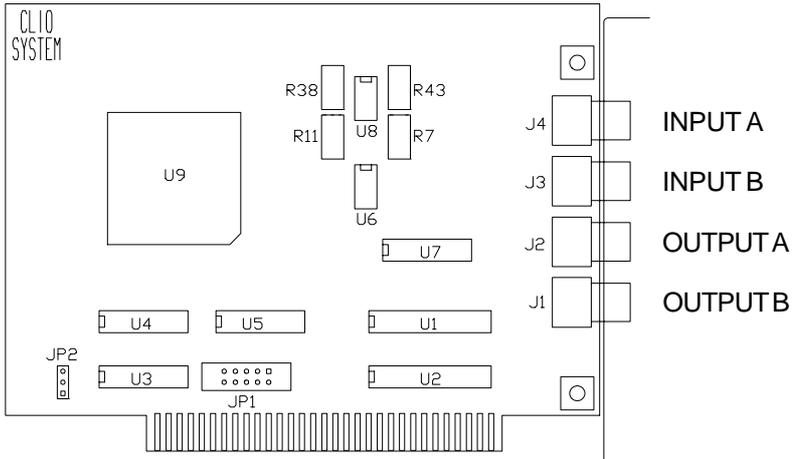


FIGURE 3.12 – The CLIO PC board

The software is able to analyze either the signal present at channel **A** or channel **B** input in an unbalanced configuration or the combined **A-B** signal thus realizing a **balanced** input configuration (Fig. 3.13); in the first case the input connection can be realized with one simple RCA cable while in the latter case it is mandatory to realize a balanced probe that will connect channel **A** input (used as the positive or “hot”) to the first measuring point, channel **B** input (used as the negative or “cold”) to the second

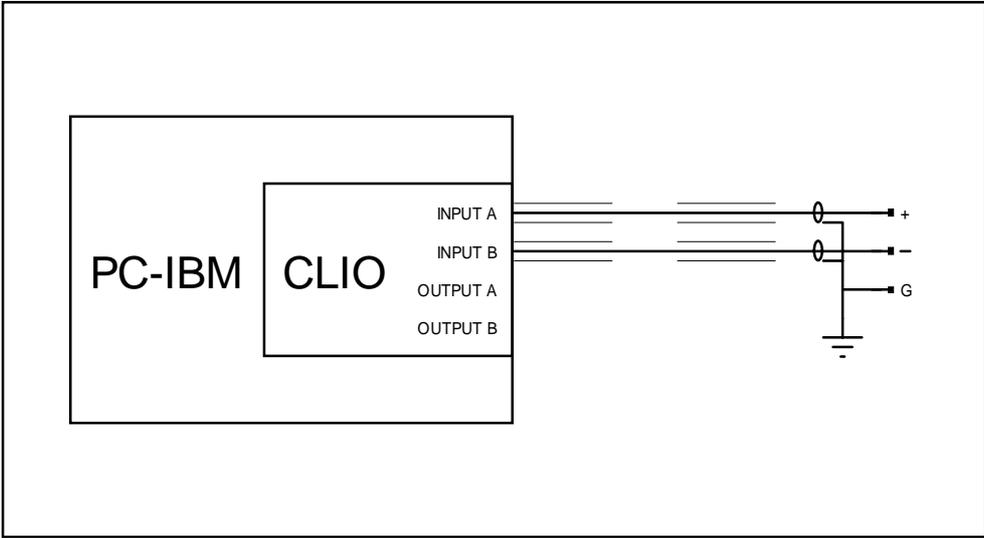


FIGURE 3.13 – Input connection for balanced measurements

measuring point and ground. Use Shift-F1 to recall the global/local settings dialog box and select the input channel desired; refer to chapter 7 for any further detail about it.

WARNING: Both CLIO inputs and outputs are referred to a **common measuring ground**. When you are making measurements in the normal configuration (channel **A** or **B** unbalanced), one of the two measuring points **MUST** be at ground potential! Problems may arise if one tries to use amplifiers with floating outputs; the connection with CLIO could cause damage to such an amplifier. Use the channel **A-B** balanced connection in such cases.

Unless you are executing impedance measurements with the Internal Mode selected (see Chapter 11), one of CLIO outputs will usually be connected to an external power amplifier that will drive the loudspeaker, electronic apparatus, or other system under test.

The output of the system under test will be connected to one of the CLIO inputs. For acoustical measurements, it will be the microphone (optionally followed by a preamplifier) that is connected to the input channel.

When using the microphone directly connected to CLIO, always remember to switch the phantom voltage on. It is good practice to wait a few minutes before starting measurements.

If the measuring point is far from the PC, always lengthen the connection between the preamplifier and CLIO. Make sure that you never use microphone cable that is longer than the one that has been supplied.

In the following set of figures one will find four possible measuring conditions and the relative connections.

In Fig. 3.14 we see the connection to be used for the calibration procedures. It is necessary to short circuit the input and output of channel **A** with a pin-to-pin cable.

In Fig. 3.15 we see the typical test setup for performing acoustical measurements of a loudspeaker. Please note this schematic diagram, drawn in the assumption of using one Audiomatica microphone MIC-01 or 02 directly connected to CLIO input, where the output of the power amplifier is connected to the loudspeaker with an inversion in cables polarity; this compensates the fact that Audiomatica microphones are phase inverting as almost the vast majority of measuring microphones found in the market; when making polarity measurements always cure the measuring chain in this respect considering that the CLIO board itself is **NON-INVERTING** and that all calibrations are usually made under this assumption: any external device like amplifiers, microphones, accelerometers, preamplifiers etc. has to be carefully checked.

In Fig. 3.16 we see the connection that is used to make impedance measurements or to measure the Thiele-Small parameters of a loudspeaker driver. When using the Internal Mode the connection is normally realized using the supplied adaptor cables (pin to alligators). Refer to Chapter 11 for any further detail on impedance measurements.

A case of particular interest is when the CLIOQC Amplifier & Switch Box is used (Fig. 3.17 and 3.18 where the Model 3 unit is showed).

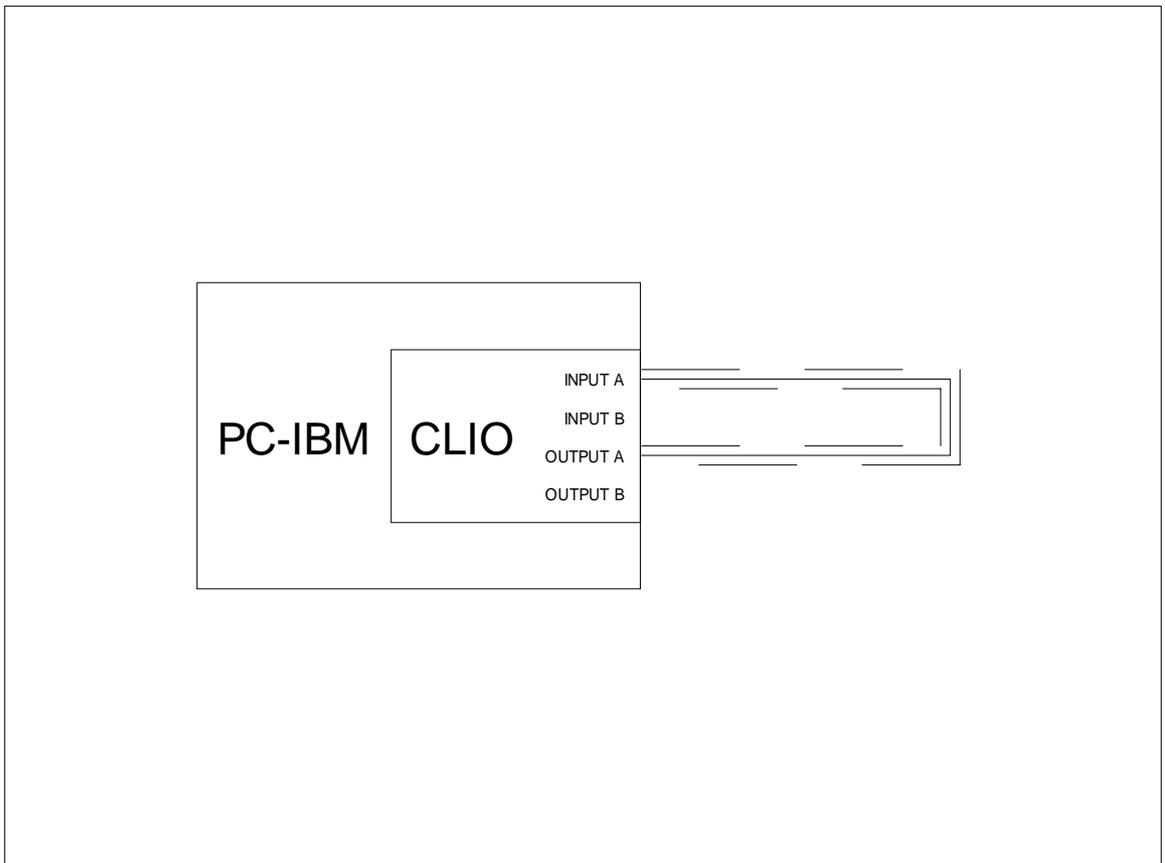


FIGURE 3.14 – Connection for calibration

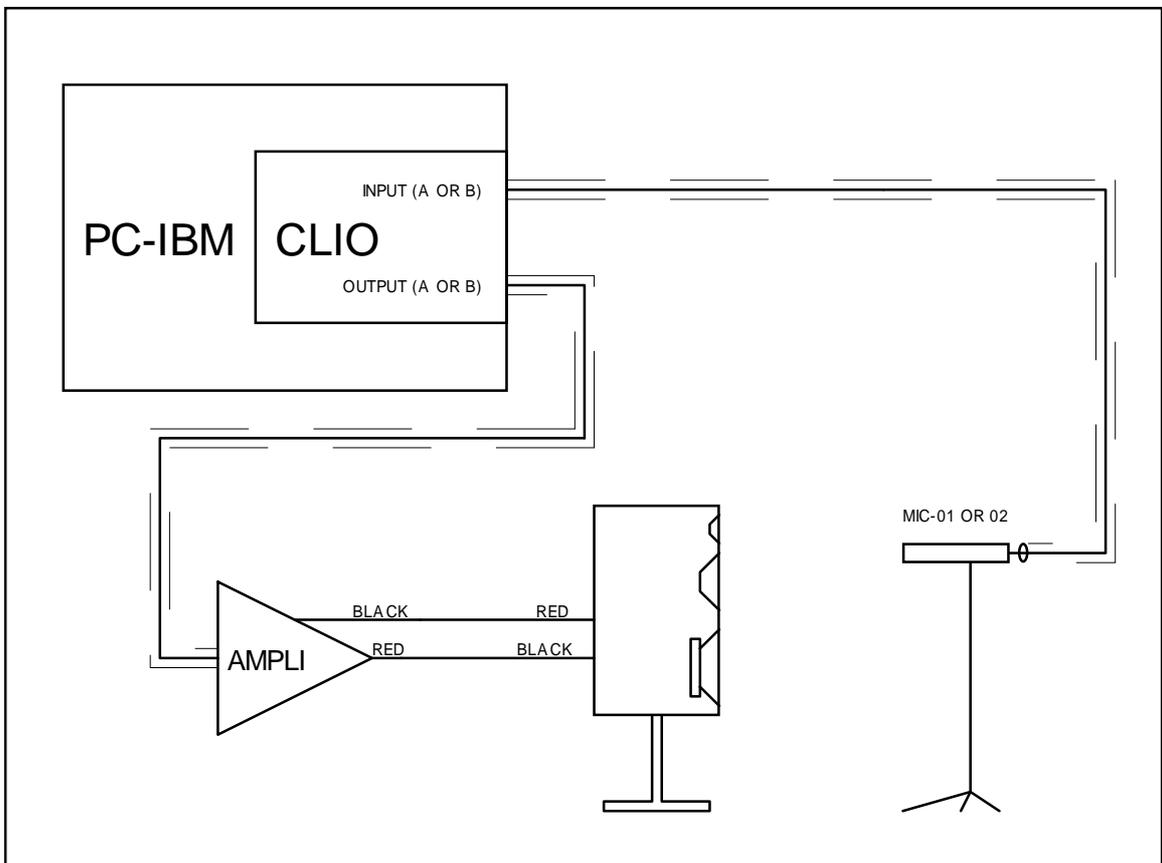


FIGURE 3.15 – Connection for loudspeaker sound pressure measurements (see text)

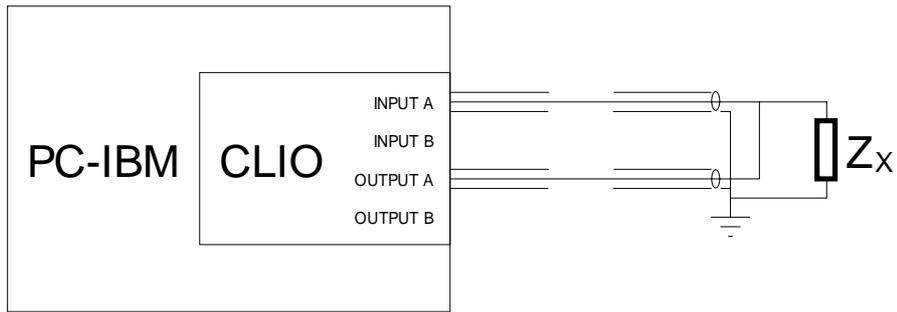


FIGURE 3.16a – Impedance measurements in "Internal Mode"

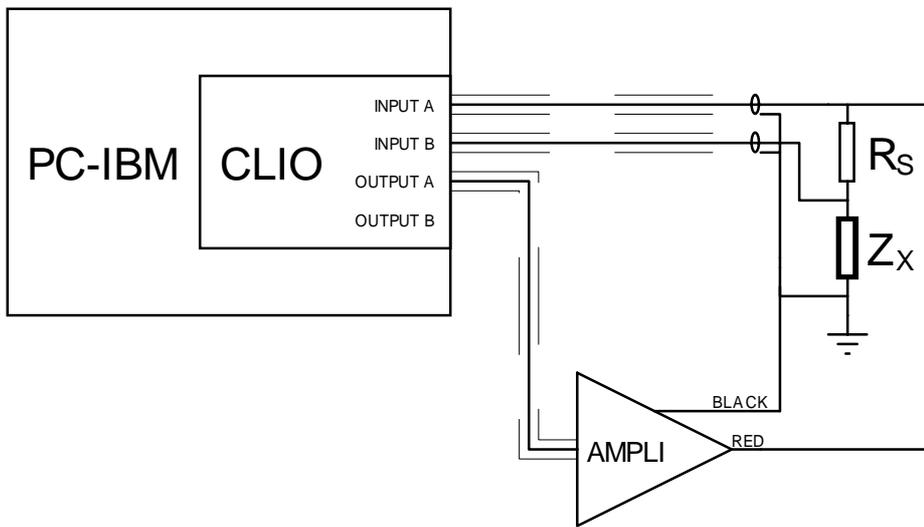


FIGURE 3.16b – Impedance measurements with an external sensing resistor R_s in "Constant Current Mode"

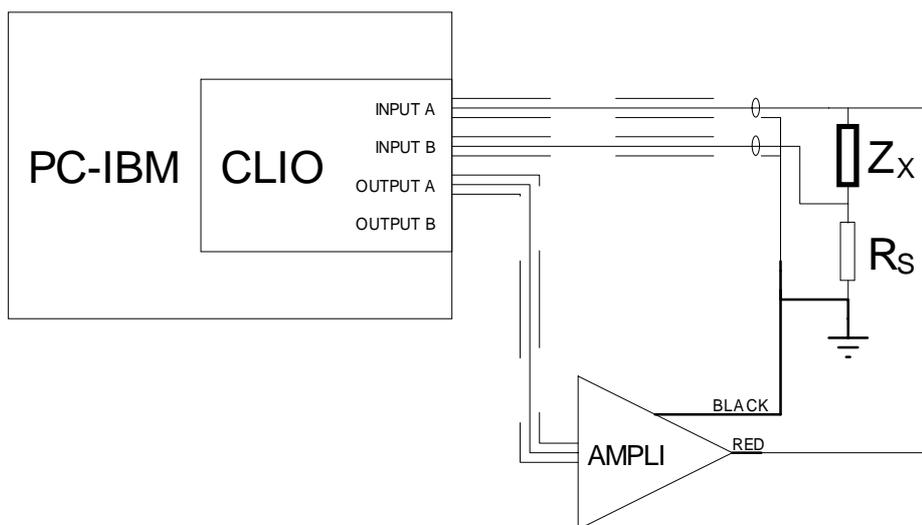


FIGURE 3.16c – Impedance measurements with an external sensing resistor R_s in "Constant Voltage Mode"

FIGURE 3.16 – Connection for impedance measurements

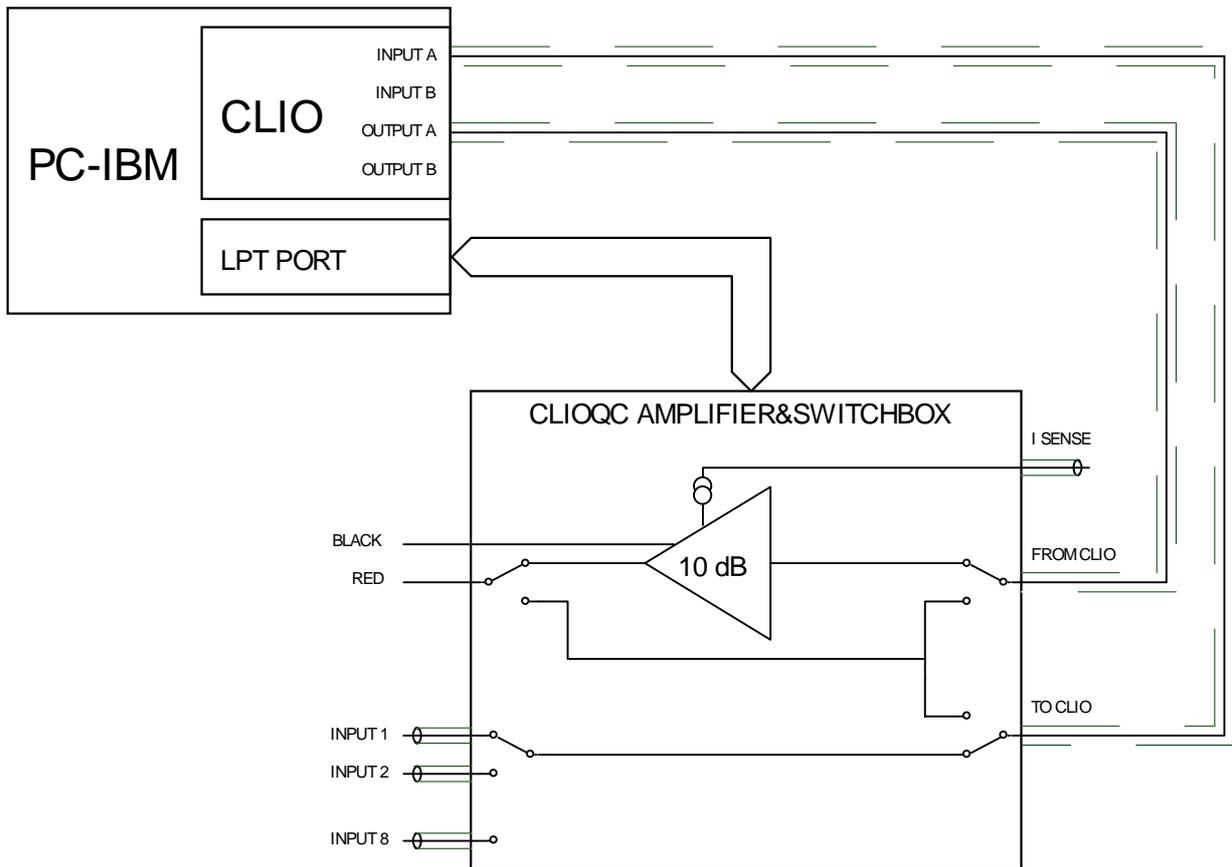


FIGURE 3.17 – ClioQC Ampli&SwitchBox with internal connection for response measurements

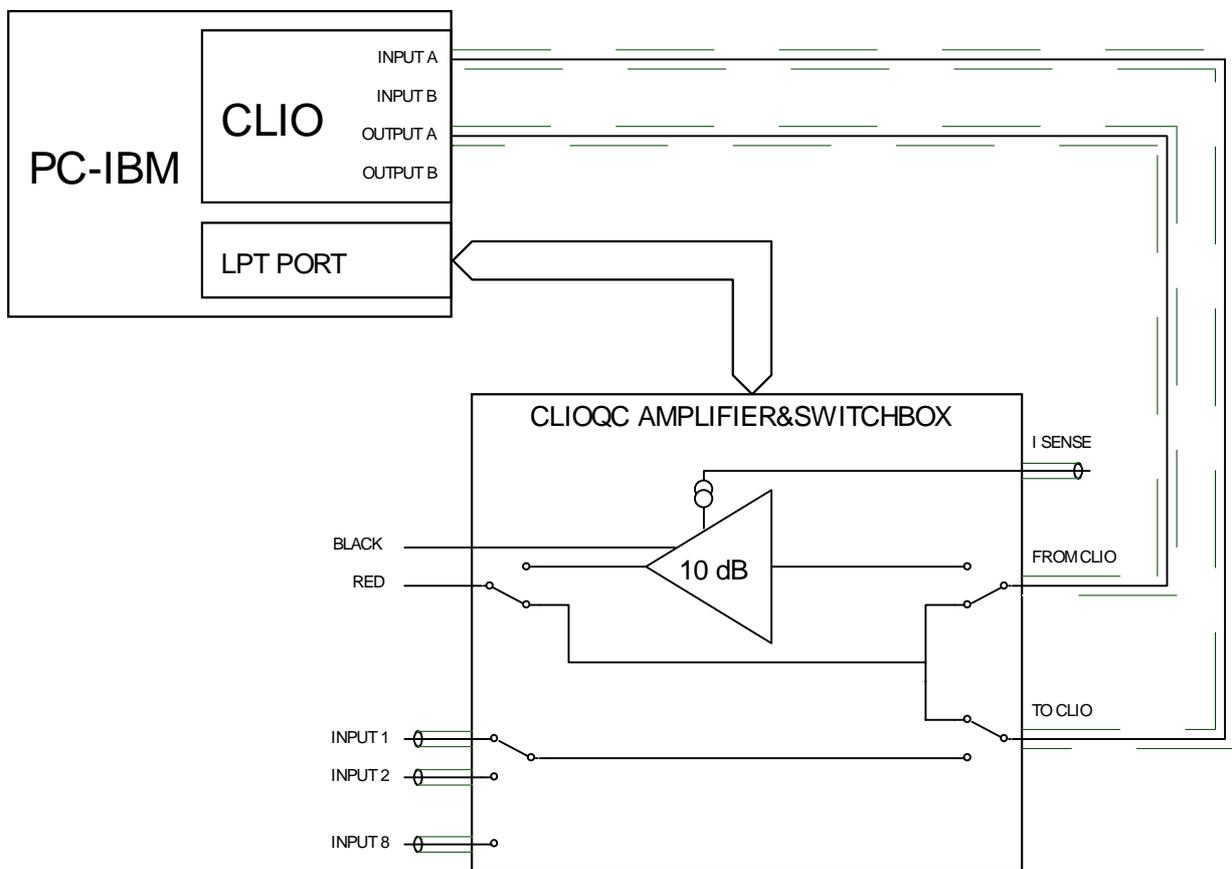


FIGURE 3.18 – ClioQC Ampli&SwitchBox with internal connection for impedance measurements

