TECNARE DPA 28X OWNER'S MANUAL

1. Important safety instructions

Some terminals carry electrical current of sufficient magnitude to constitute a risk of electric shock. Use only high-quality commercially-available speaker cables with ¼" TS plugs pre-installed. All other installation or modification should be performed only by qualified personnel.

This symbol, wherever it appears, alerts you to the presence of ininsulated dangerous voltage inside the enclosure – voltage that may be sufficient to constitute a risk of shock.

This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual

To reduce the risk of electric shock, do not remove the top cover (or the rear section). No user serviceable parts inside. Refer servicing to qualified personnel.

These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operation instructions. Repairs have to be performed by qualified service personnel.

1. READ THESE INSTRUCTIONS
All the safety and operating instructions should be read before the product is operated.

2. KEEP THESE INSTRUCTIONS
The safety and operating instructions should be retained for future reference.

3. HEED ALL WARNINGS
All warnings on the product and in the operating instructions should be adhered to.

4. FOLLOW ALL INSTRUCTIONS

All operating and use of instructions should be followed.

5. DO NOT USE THIS APPARATUS NEAR WATER

Do not use the product near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.

6. CLEAN ONLY WITH DRY CLOTH

Unplug the unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

7. DO NOT BLOCK ANY VENTILATION OPENINGS

Slots and openings in the cabinet back or bottom are provided for ventilation, to ensure reliable operation of the limit and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or similar surface. This product should never be placed near or over a radiator or heat source. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacture's instructions have been adhered to.

8. DO NOT INSTALL NEAR ANY HEAT SOURCES

This Product should be situated away from heat sources such as radiators, stoves, or other products (including amplifiers) that produces heat.

9. DO NOT DEFEAT THE SAFETY PURPOSE OF THE POLARIZED OR GROUNDING-TYPE PLUG

A Polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prongs are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. PROTECT THE POWER CORD FROM BEING WALKED ON OR PINCHED PARTICULARLY AT PLUGS, CONVENIENCE RECEPTACLES, AND THE POINT WHERE THEY EXIT FROM THE APPARATUS.

11. ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER.

12. USE ONLY WITH CART, STAND, TRIPOD, BRACKET, OR TABLE SPECIFIED BY THE MANUFACTURER, OR SOLD WITH THE APPARATUS. WHEN A CART IS USED, USE CAUTION WHEN MOVING THE CART/APPARATUS TO AVOID INJURY FROM TIP-OVER.

Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious injury to someone, and serious damage to the appliance. A unit and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

13. UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.

For added protection for this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.

14. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL. SERVICING IS REQUIRED WHEN THE APPARATUS HAS BEEN DAMAGED IN ANYWAY, SUCH AS WHEN THE POWER SUPPLY CORD OR PLUG IS DAMAGED, LIQUID HAS BEEN SPILLED OR OBJECTS HAVE FALLEN INTO THE APPARATUS, THE APPARATUS HAS BEEN EXPOSED TO RAIN OR MOISTURE, DOES NOT OPERATE NORMALLY, OR HAS BEEN DROPPED.

15. WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

16. APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

TABLE OF CONTENTS:

1 INTRODUCTION

The DPA 28X is a complete 2 input - 8 output digital loudspeaker management system designed for the touring or fixed sound installation markets. The absolute latest in available technology is utilized with 64-bit floating point processors and high performance 24-bit Analogue Converters. The high-bit DSP prevents noise and distortion induced by truncation errors of the commonly used 24-bit fixed-point devices. A complete set of parameters include I/O levels, delay, polarity, 8 bands of parametric EQ per channel, multiple crossover selections, compressor, Limiter, USB and Ethernet port connection. Precise frequency control is achieved with its 1 Hz resolution.

The DPA - 28X can be controlled or configured in real time on the front panel using the previously stored presets or with the intuitive PC software via the USB or Ethernet interface. The Ethernet port allows controlling the device from a long distance using just an Internet connection.

2 SHIPPED CONTENT

- DPA - 28X unit

- User Manual

- Software CD: Tecnare PCC controller Advanced Series.

3 FEATURES

- 2 Input and 8 Outputs.

- 64 Bits floating point DSP

- High performance 24-bit A/D Converters

- 1 Hz Frequency Resolution

- Storage of up to 10 program setups

- Unlimited number of presets via software

- Uploading of 10 collection presets in one step via software

- USB port connection.

- Ethernet port connection

- 30 bands Input graphic equalizer.

- 8 bands Output Parametric equalizer per output channel

- 4 ways configurable Crossover

- Main Delay

- Input and output Compressor and Limiter

- Configurable Clock

- Noise Generator

- Sound Analyzer

- Phase inverter per band

- Mute

- Via adjustable delay

4 FRONT PANEL FUNCTIONS
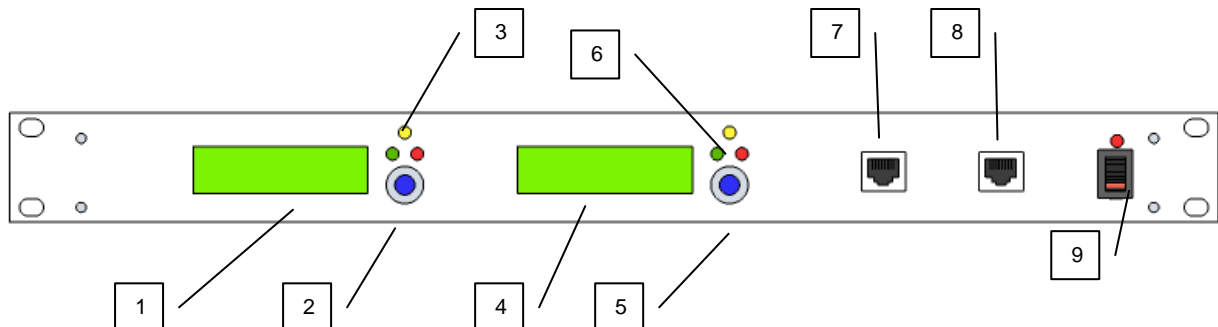
**1.- LCD Screen CH-A:** Show all the necessary information to control de unit
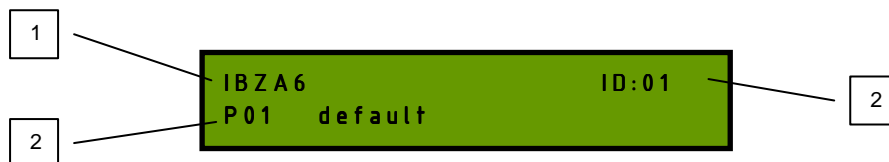
1.- Unit name

2.- Shows the preset number and identification.

3.- ID of the Unit.

2.- Rotary thumb wheel CH-A: Controls the presets. To select the desire preset, press the wheel.

3.- On / SIGNAL / CLIP led CH-A: When On indicate the unit is On, Signal at the input and the input level is above the device´s maximum headroom respectively.

4.- LCD Screen CH-A: Show all the necessary information to control de unit

5.- Rotary thumb wheel CH-A: Allows you to switch between presets. To select the desire preset, press the wheel.

6.- On / SIGNAL / CLIP led CH-A: When On indicates the unit is On, Signal at the input and the input level is above the device´s maximum headroom respectively.

7, 8.- Ethernet connector: Standard RJ-45 female socket.

9.- Power switch: Controls power On/Off.

5 REAR PANEL FUNCTIONS
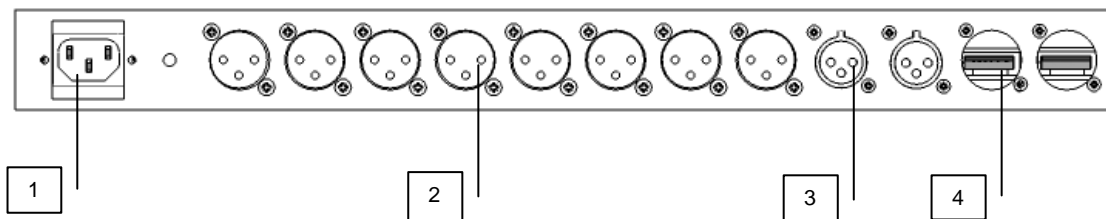
1.- Main Power: Connects via a standard IEC socket. A compatible power cord is supplied with the unit. The voltage input is either 115VAC or 230VAC and is clearly specified on the unit. Voltage requirement has to be stated upon ordering.

2, 3.- XLR input and outputs: Separate 3-pin XLR connectors are provided for each audio input and output. The device's output stage employs the balanced impedance topology. All I/O connectors have pin 1 as ground (shield), pin 2 as + and pin 3 as –

4.- USB connectos: USB connector per channel for PC connection.

TECNARE PCC CONTROLLER ADVANCED SERIES USER MANUAL

1.- INSTALLATION

1.1.- SOFTWARE INSTALLATION.

1.- Click on Pcc12G_Setup.exe icon

2.- Follow the wizard instruction (for default installation you can press NEXT until the end)

* The estimated time required for first installation is about 1 minute.

* If asked by the wizard, restart the computer

1.2.- SETUP THE PC COMMUNICATION

1.- Connect the unit to the PC using the provided USB cable.

2.- USING THE PCC CONTROLLER ADVANCED SERIES

2.1 Overview

The Tecnare PCC Controller advanced series software application provides real-time control and configuration editing for the DPA-28X using a laptop or other PC-compatible computer.

In addition, the application provides control over each individual input channel: Gain, Graphic EQ, Compressor, main delay, and over each individual output channel: Crossover, 8 bands parametric EQ, phase inverter, mute, and delay.

In addition, the application provides a powerful real time analyzer with pink noise generator capability.

Changes made in the PC software are immediately executed in the DPA-28X.

To start the application click on the PCC Icon on your desktop

It will appear a screen as is in the following image:
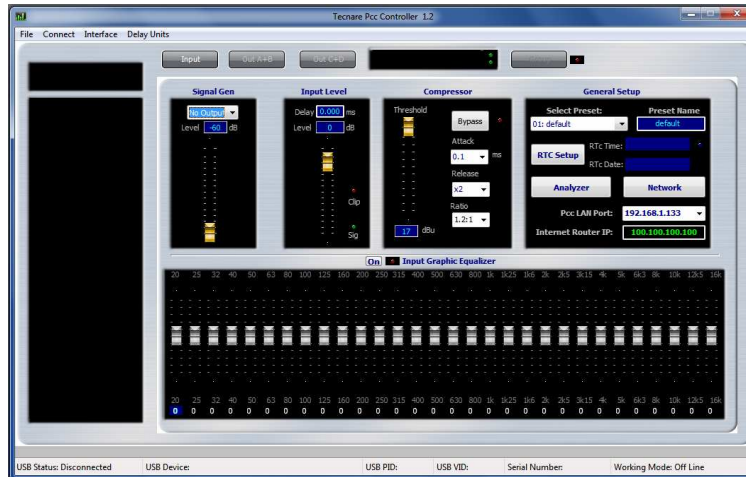
Open the Connect dropdown list and select On Line, this will connect your unit to your PC.

The user interface is divided into 4 sections:

- Menu Bar

- Network window

- Input section

- Output section

2.2 MENU BAR

The following menus are available in the Menu Bar at the top of the screen

FILE

- Load Preset: Click this option to Load an existing preset from your computer

- Save Preset: Save the current preset to a file

- Load Set: Click this option to Load a Set of 10 preset from your computer

- Save Set: Save the current set of 10 presets to a file.

- Exit: Exit the application

CONNECT
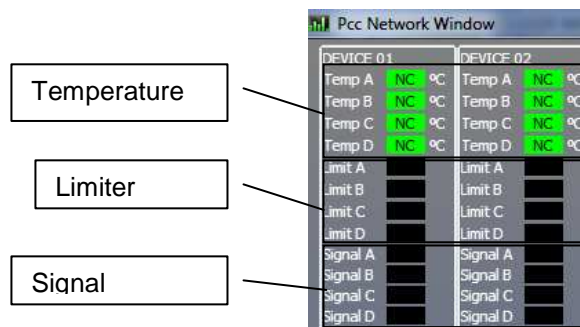
- On line: Connects the computer to the unit.

DELAY UNITS

- ms

- meter

- feet

2.3 NETWORK WINDOW

When the PC is connected to the unit, the following information is shown at the upper left corner of the screen.

Temperature: It shows the temperature of each output channel.

Limiter: The limiter light show up when the audio limiter is acting.

Signal Inidicator: When lighting a input signal is present.
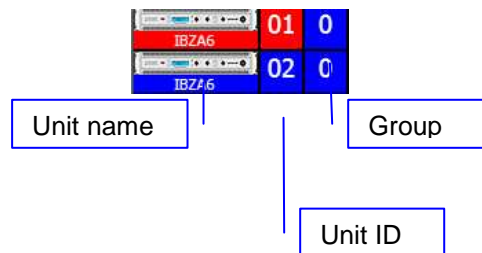
2.4 INPUT SECTION
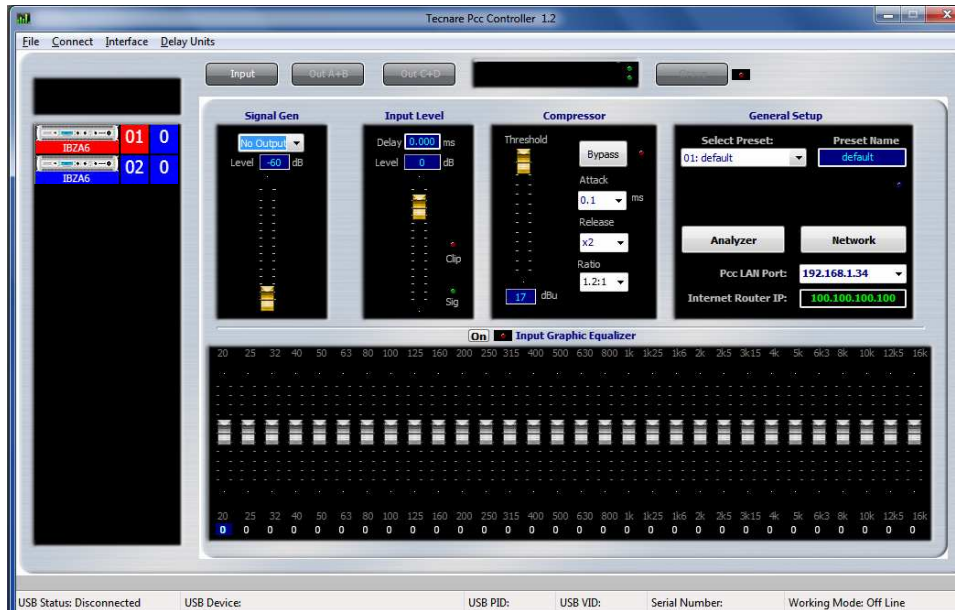
This section contains the following modules:

- Unit ID and grouping.
- Signal Generator
- Input Level
- Input Compressor
- General Setup
- 30 bands Graphic equalizer

UNIT ID AND GROUPING

It shows the units information connected to the PC, the active one is the one on Red. Double click to activate the unit.

By clicking on the group ID box, the user will be able to assign each unit to a group.

SIGNAL GENERATOR

By selecting active in the dropdown list, a pink noise signal is generated by the 8 output channels.

The output level is controlled by the fader control.

INPUT LEVEL

Main delay in ms, meters or feet can be adjusted in this section. The input level is adjusted by the fader control, it provides signal and clipping indicators.

INPUT COMPRESSOR
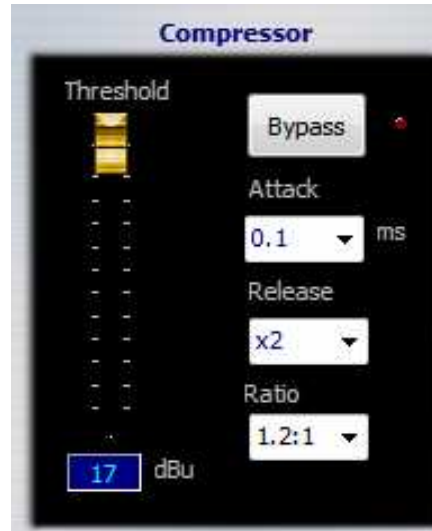
The input compressor has four controls: Attack, Release, Threshold and Ratio. Click on the dropdown list to adjust each parameter. Click the Bypass button to turn it off.

About Compression: A compressor is used to reduce or limit transient peaks in a signal. As the input level to the compressor increases, the output level increases linearly until the threshold point is reached. After that point, the output level no longer increases linearly, but increases at a reduced rate that is determined by the ratio setting.

• Threshold: This control determines the level at which the compressor begins to act on the incoming signal. It is calibrated in decibels, with a range from –-40.0 dBu to 17 dBu.

• Attack: This determines how fast the compressor reacts once the threshold has been exceeded. It is calibrated in milliseconds, with a range from 1 ms to 90 ms.

• Release: This determines how fast the compressor turns off once the signal falls below the threshold. It is calibrated in milliseconds, with a range from 10 ms to 2500 ms (2.5 seconds).

* Ratio: This determines the change in output level as a function of the change in input level, once the threshold has been exceeded. It is calibrated in decibels, with a range from 1.2:1 (off) to 30:1.

GENERAL SETUP
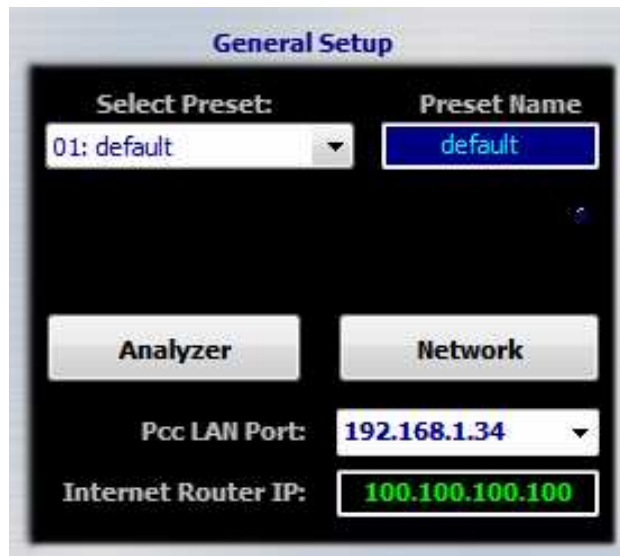
The following controls are available in the general Setup module:

-         Presets
-         RTC Setup
-         Analyzer
-         Network
-         Pcc LAN Port
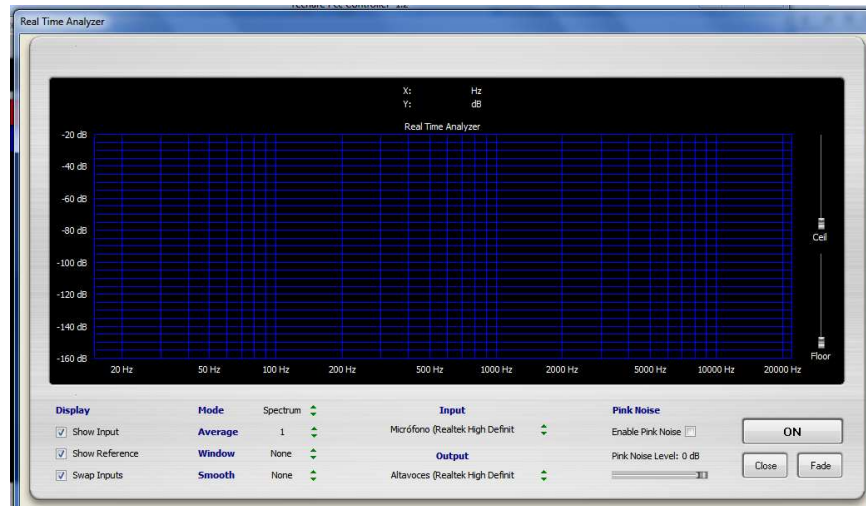-   Internet Router IP

PRESETS

By pulling down the Select Preset dropdown list, 10 different preset saved in the unit can be selected.

Changes made in the PC software are immediately executed in the DPA-28X, and stored in the selected preset.
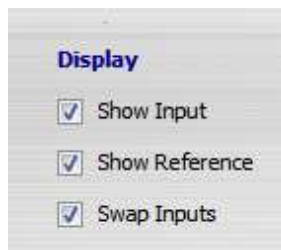
A Preset name can also be stored.

ANALYZER

This toggles the audio Analyzer window open and closed.

The following information is available in this window:

- <u>Display</u>: Allows the user to show/hide the input and reference signals.


- <u>Parameters</u>:

- <u>Mode</u>: The audio analyzer allows the user to work on four different modes:
  - o Spectrum Analyzer
  - o Transfer Function
  - o Phase Response
  - o Impulse Response

- <u>Average:</u> Eight different time average can be selected: 1, 5, 10, 20, 30, 50, 80 and 120.
- <u>Window</u>: Signal Windowing by None, Hamming, Triangular, Hanning and Blackman
- <u>Smooth</u>: Is the frequency average. None, 1/3, 1/6, 1/12, 1/24 Octave.
- <u>Input and Output</u>: Allows the user to choose the PC input and output device.
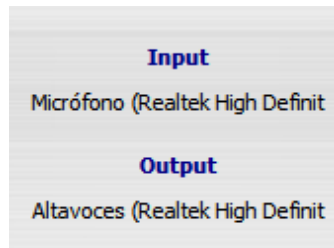
- <u>Pink noise</u>: Enable the pink noise generator. Note that the Pink noise can only be enabled when the analyzer is turned Off.
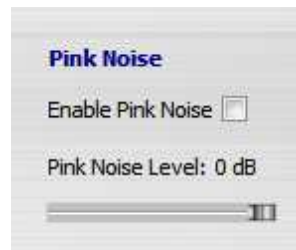

- <u>Buttons:</u>
  o On: Turn on and off the analyzer
  o Close: Close the analyzer window
  o Fade: It makes the window analyzer 50% transparent, so the user can see the window behind.

SPECTRUM ANALYZER

This feature allows the user to visualize the spectral components either of the input signal (given by a microphone connected to the PC) or the reference signal (output) it is also possible to visualize both signal simultaneously.
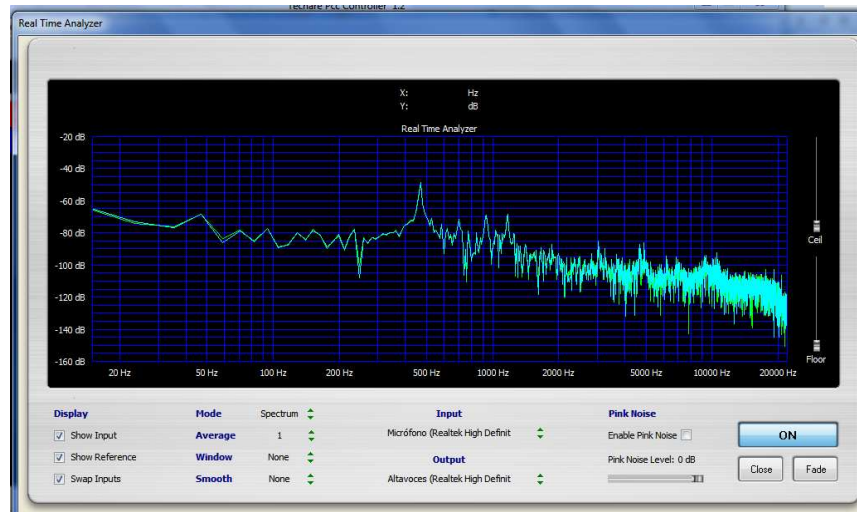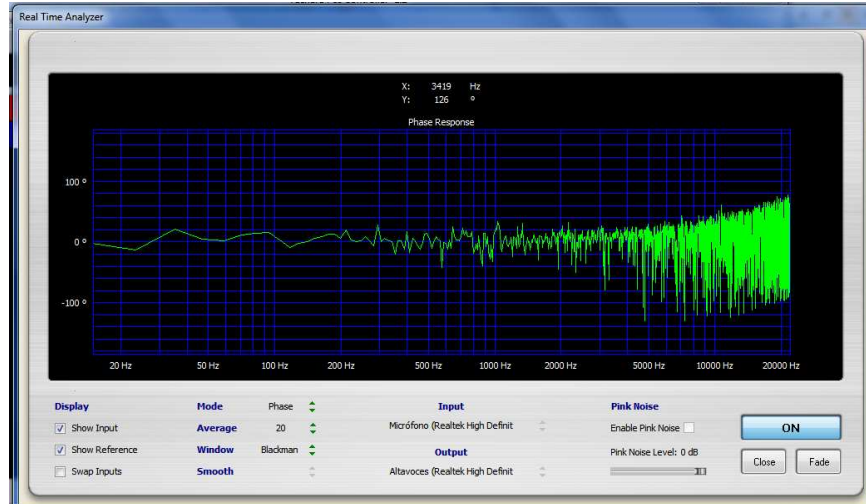

TRANSFER FUNCTION

It shows the systems transfer function, meaning the difference between the signal from the output of the DPA-28X to the microphone input signal.
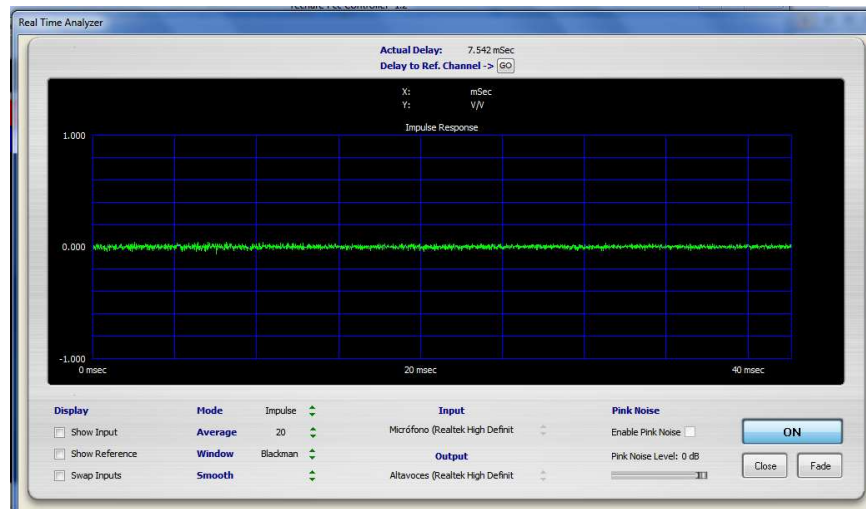
PHASE RESPONSE

It allows the user to analyze the phase response of an installation

IMPULSE RESPONSE

This tool provide the spectrum impulse response of a certain room.

NETWORK

This button toggles the network window open and closed. (Refer to 2.3 for more information)
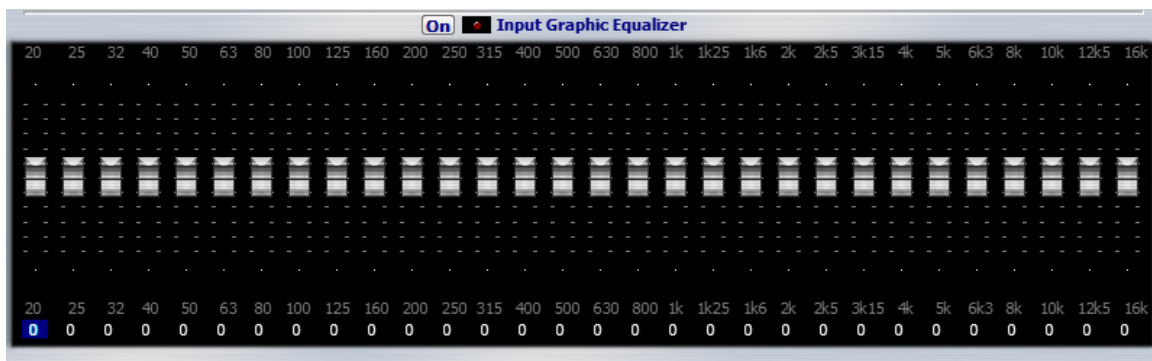
PCC LAN PORT AND INTERNET ROUTER ID

When the unit is connected to Ethernet cable, the user is able to control all the unit parameters from another location remotely.

For this purpose, the remote user must input the PCC Lan Port and Internet Router ID of the local DPA 28X unit.
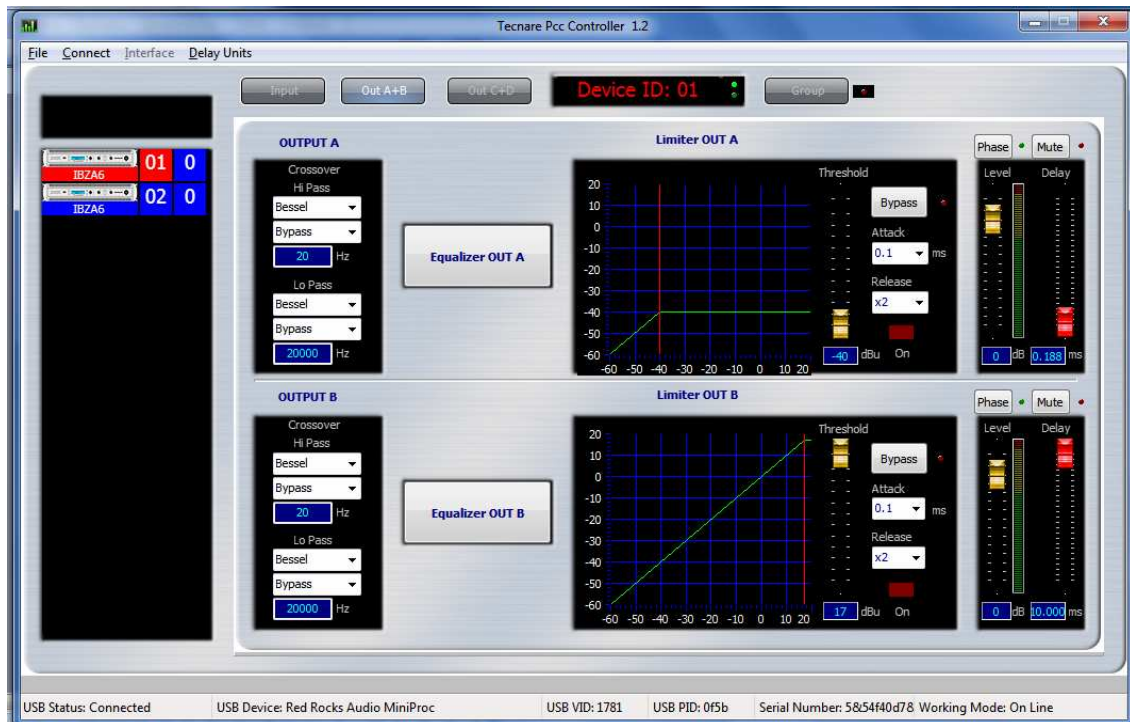

GRAPHIC EQUALIZER

Click the ON button to turn the Graphic EQ on and off

Click and drag on the slider fader to adjust the equalization from -15dB to +15dB.

2.5 OUTPUT SECTION

The user can manage the output section by clicking on Out A-B and Out C-D buttons.
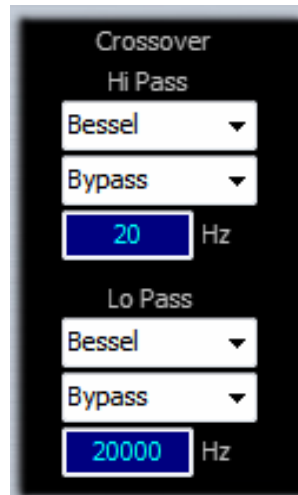
This section contains the following modules:

-        Crossover

-        Graphic EQ

-        Limiter

-        Level

-        Delay

-        Phase inverter

-        Mute

CROSSOVER

This section contains two crossover filters per output.

Three different kinds of filters can be selected:

- Bessel

- Butterworth

- L-R

The order of the filter can be selecting by pulling down the Bypass dropdown list, Second Order filter (12dB/Octave) and Fourth Order filter (24dB/Octave) are available.

Filter cut-off Frequency ranges from 20 to 20,000Hz in 1Hz steps

PARAMETRIC EQ

Eight bands parametric EQ can be opened by clicking on the Equalizer Out X button.
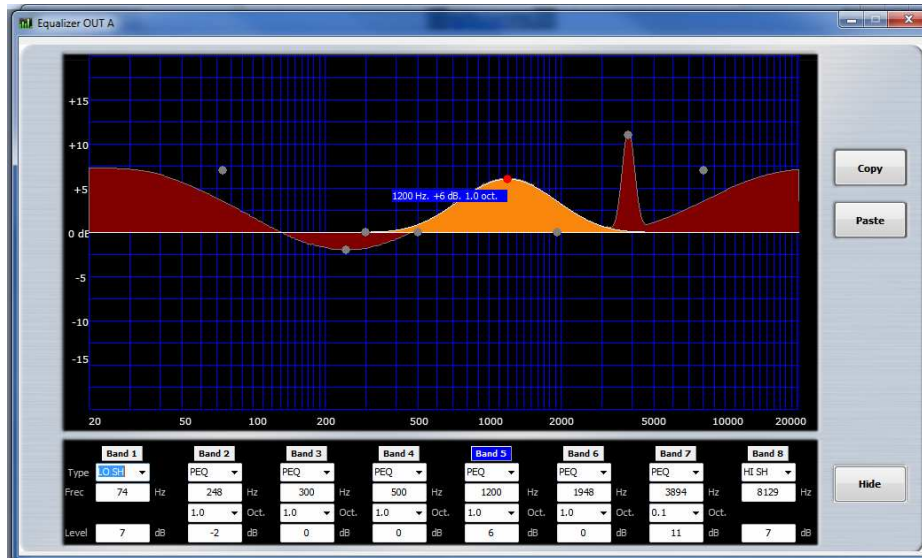
Four different settings can be adjusted by the user per band.

- Type: The user can select Hi Pass, Low Pass or band filter

- Frequency: Ranges from 20 to 20,000Hz in 1Hz steps

- Bandwidth: Ranges from 0.1 to 2 Octaves

- Level: Ranges from -25dB to 25dB

The user can also modify the equalization (Frequency and level) by clicking and dragging the grey points on the screen, the selected band will turn from red to orange.
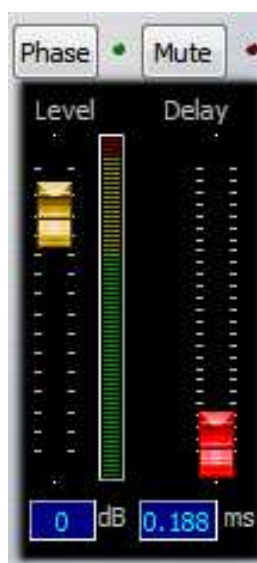
To copy the desire equalization to other output just click on Copy button, go to the desire output parametric EQ and click on the paste button.

LIMITER
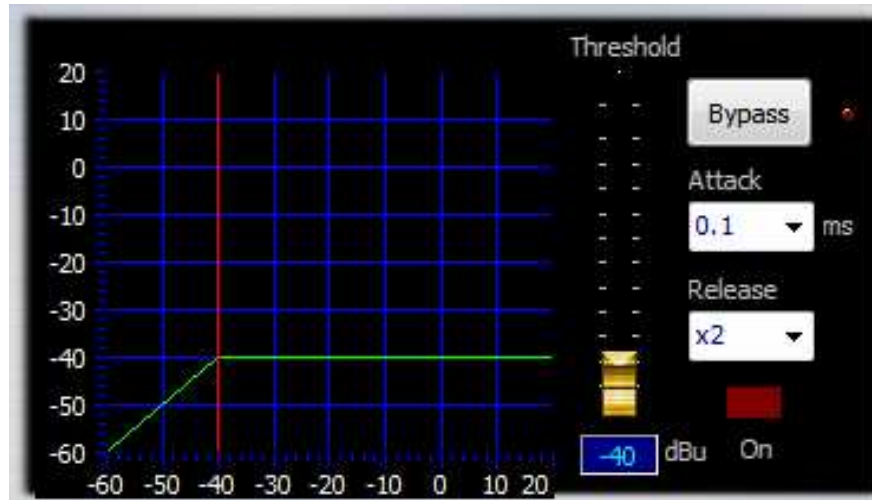
- Threshold: The THRESHOLD controls are continuously adjustable from -40dBu (maximum limiting) to 17dBu

- Bypass: Turn the module in bypass mode.

- Attack: Ranges from 0.1 to 90ms

- Release: Ranges from 2x to 32x

LEVEL/DELAY

- Level: The output level can be adjusted from -60dB to 12dB, unit gain is at the 0dB position.

- Delay: Ranges from 0 to 10 ms

- Phase inverter.

- Mute.