QUICK START GUIDE D-PRO ™ GUI

BEFORE INSTALLING AMPLIFIER OR CONNECTING POWER CORD, BE SURE INTERNAL JUMPER AND FUSE VALUE ARE SET FOR THE POWER LINE INPUT VOLTAGE THE AMP WILL BE USED WITH OR DAMAGE TO AMP WILL RESULT. The amplifier sample is shipped to operate with 115V power line voltage. The internal jumper and fuse value will need to be changed to operate with 230V power line voltage. (See "Setting amps mains" instruction sheet.)

After the internal jumper and fuse value have been set for the power line voltage (115V or 230V) you will operate the amplifier with, the amplifier can be wired to the speaker drivers and installed into the enclosure. Now you are ready to program the DSP using the D-PRO ™ GUI software. This is a very simple process.

Install the D-PRO ™ GUI software from the location on your computer or from the CD and then start the D-PRO ™ GUI software. DO NOT INSTALL (RUN) THE D-PRO SOFTWARE DIRECTLY FROM THE DIGMODA WEBSITE, it must be downloaded to your computer then installed.

As shown in Fig. 1, select "DSP I/O Board Configuration" from the "Configuration menu" to select I/O board configuration.

Fig. 1

NOTE: for D-Pro I/O menu selections:
DDC552 = DDC1150
DDC550 = DDC1100
DDC520 = DDC1050

To set up the I/O board configuration for the DDC-552 amp, select "DDC552" in "DSP I/O Board Configuration" pop-up menu as shown in fig 2. (This configures the DSP to work with the DDC-552 amp. configuration. If you are working with another amplifier model, select that model from the list.)

Fig. 2

DDC552 or the amp being configured should be shown in the drop down window as shown in figure 3, click "EXIT" to close the window before proceeding.

Fig. 3.

Select "DSP Block Configuration" in the "Configuration" menu as shown in figure 4 to bring up the configuration block window.
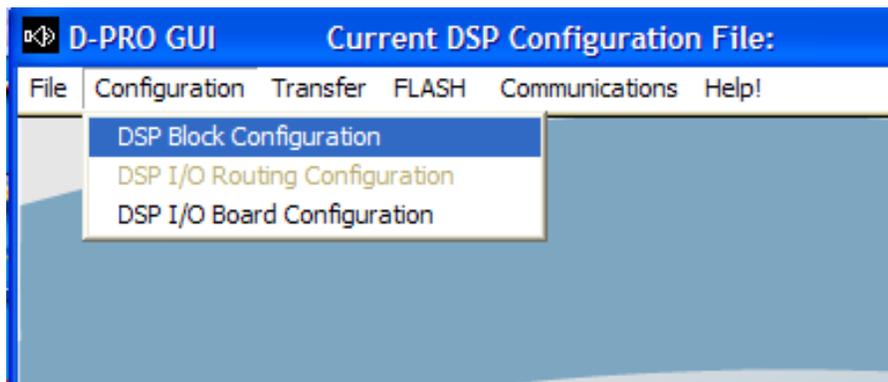
Fig. 4.

Select the "Biquad Filters" block by clicking on the "+" button in channel 1 to open the filter parameters window for channel 1. (Other channel "Biquad Filter" windows can be accessed directly by selecting them if desired. The "Biquad Filter" window will also allow you to change between channels.)

Fig. 5.

The screen changes to show the "biquad filter" window. The DDC-552 filter parameters are pre-loaded for a 3-way loudspeaker (WMT) system as shown in fig 6. The 3 amplifier channel filter parameters may be set for your application requirements, distributing the available amplifier power to the desired driver(s).
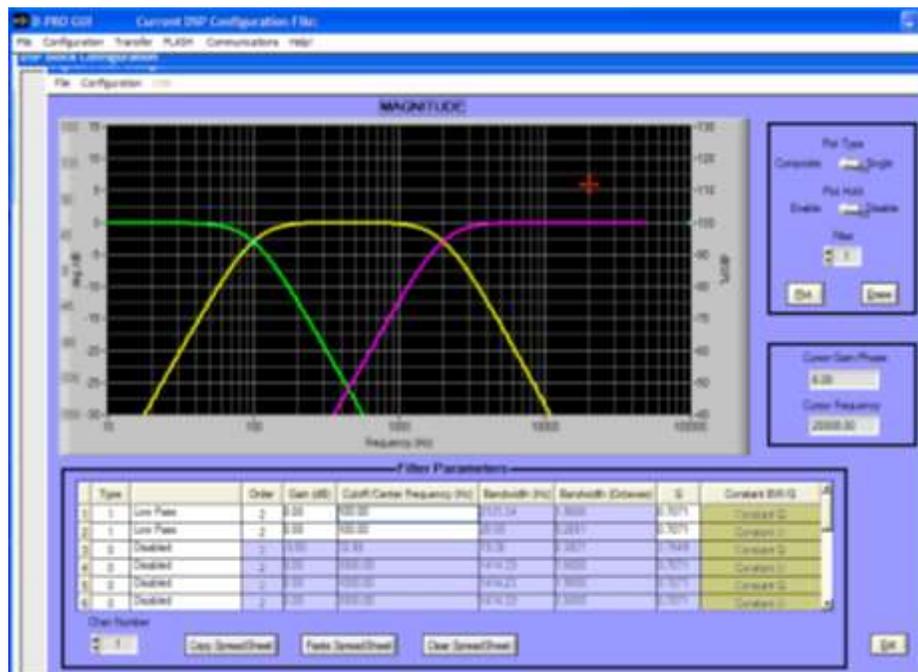
Fig. 6.

Amplifier channel numbers can be changed by selecting the desired channel in the scroll window box located at the lower left corner of the window. Each channel contains 16 filter storage locations, shown are filter locations 1-6, locations for 7-16 can be accessed by scrolling the window down with the scroll bar.

To change the filter Type, click on the field box under the "Type" heading and select the filter type by changing the number 1 – 7, 0 = Disabled. Filter order, gain, frequency and Q can be changed simply by selecting the field box under their heading and typing in the desired value or using the scroll wheel if available.

The DDC-552 amp. channel configuration:

Channel 1 = 500ASP amp. **(amp 1)**

Channel 2 = Side chain processing for Channel 1. (Allows frequency dependent activation of limiter or compressor settings)
Channel 3 N/A

Channel 4 = 500ASP amp. **(amp 2)**

Channel 5 = Side chain processing for Channel 4. (Allows frequency dependent activation of limiter or compressor settings)

Channel 6 = 250A amp. **(amp 3)**

Note: Generally, channels 1 & 4 are used for drivers that can handle 500 watts into 4-ohms and channel 6 for drivers that can handle up to 250 watts into 4-ohms. Channels 2 & 5 provide selectable frequency dependent limiter/compressor protection (side-chain), therefore allowing protection to the driver over specific frequency ranges. Channel 6 limiter protection is provided over the entire frequency range as is channels 1 and 4.

Figure 7 displays the biquad filter parameters set up for a dual woofer 2-way system; crossover point is 1200Hz/2nd order with 20Hz high-pass and 20 kHz low-pass filters added. Filter order can be 1st or 2nd and higher order slopes can be achieved by adding additional filters with filter parameters set equal.
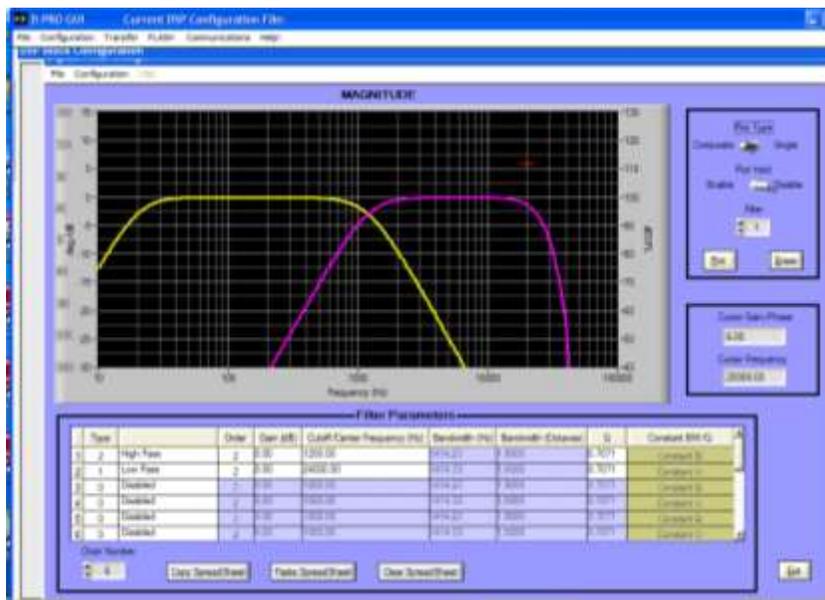
Fig. 7.

Figure 8 illustrates channel 1 set-up as a 4th order low-pass at 1200Hz, Q of 0.707 and a 4th order high-pass set at 20Hz with a Q of 0.707. Channel 4 is set the same. The result of all filter types used can be plotted by selecting the "Composite" switch or if desired a single filter type can be displayed by selecting the "Single" switch and clicking on filters rows 1 – 16 to display.
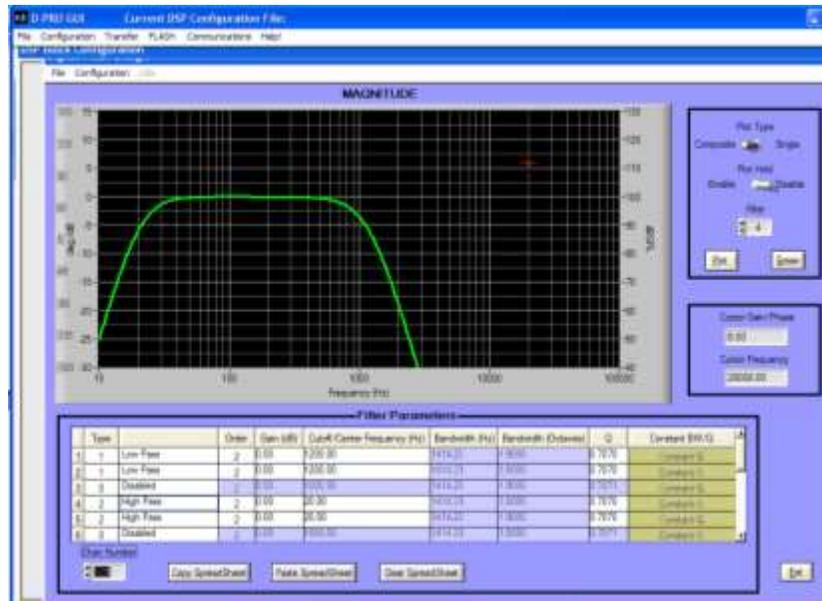
Fig. 8.

After all amplifier channels have been initially set with the appropriate crossover parameters and roll-off frequency for each driver, other filter types such as parametric can be added in anyone of the unused set of 16 filter slots to achieve the desired driver EQ and system response curve. The mouse pointer can be used to change the filter parameters by selecting the filter row to display the filter and then grabbing the filter handles with the mouse pointer to change frequency, Q or Gain.

D-PRO ™ also has a frequency response simulator tool which allows for actual driver frequency and phase response data measured in the actual enclosure to be brought in so frequency response simulations can quickly be computed and viewed. As with all simulation software tools, actual results should be verified with actual measured test data. (More info is available in the help menu.)

Once the desired filter type and curve shape has been setup for each amp channel, the side-chain processing and limiter can be set to provide driver protection.

The first step is to copy the main channel biquad filters to its side chain channel counter part. This is achieved by selecting the channel to copy (i.e. Channel 1) and clicking the "Copy Spreadsheet" button and then selecting the channel to copy to (i.e. Channel 2) and clicking on the "Paste Spreadsheet" button to paste the data into this channel. Repeat for the other channels (i.e. Channels 4 & 5). Now that the side chain channels have the same base filters as the main channels they will protect, additional filters can be added to protect the desired frequency range. This is accomplished by selecting the filter type in the side chain channel and setting the frequency and other parameters.

An example of setting the limiter/compressor to protect a driver from excessive low-frequency energy is as follows: select an open biquad filter slot and set filter type to parametric, set Q to 6 and set the gain level to +6dB. The side chain parametric filter works as a detailed sensitivity setting thus more gain is added to engage the compressor limiter sooner. After the side chain biquad filters are set-up the overall sensitivity of the limiter and compressors as well as other parameters are set up by selecting the "ganged limiter/compressor" block located on the DSP block configuration window shown in figure 9, this opens the "Limiter/Compressor" window displayed in figure 10.

Fig 9.
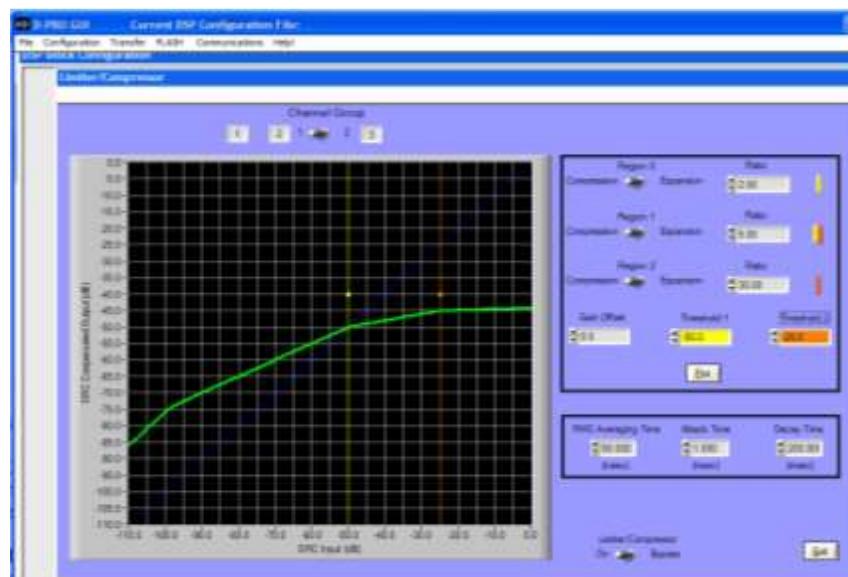
Fig. 10

To activate Limiter/compressor select "Limiter/Compressor" switch to "On" position.

"Gain offset" should always be set to "0" for most applications. "Gain Offset" box controls amount of compression or expansion. "Region 0, 1, 2" switch positions determine if Compression or Expansion is active. "Threshold 1" and "Threshold 2"

operation depend on "Ratio" settings of "Region 0, 1 and 2 boxes". If "Ratio" box is set to "1" limiter/compressor are not active (1:1). Value in "Ratio" box determines amount of compression or expansion and control slope. (i.e. if set to 30 then 30:1)

Threshold 1 should always be less than **Threshold 2**. **Threshold 2** controls the overall sensitivity of the limiter/compressor. To engage the limiter/compressor sooner set **"threshold 2"** value to a lower value (more negative**). "Threshold 1"** works with **"Region 1" "Ratio"** and **"Threshold 2"** works with **"Region 2" "Ratio"** both adjust the amount of compression and determine the range the compressor begins to work over in terms of signal level, thus providing the capability to do a **"soft-knee"** turn on of the compressor/limiter.

Channel group switches determine which amplifier channels the limiter/compressor settings control. All the settings are displayed on the graph and can be controlled with the mouse by selecting the **"Threshold 1"** or **"Threshold 2"** plot lines. Colors bars to the right of the **"Ratio"** boxes relate to color bars displayed on graph display to show areas controlled. Area to left of "yellow" line is **"Region 0".** Area between yellow/orange bars is **"Region 2"** and areas above "orange" line is **"Region 2".**

"RMS averaging time" sets the start frequency of the compressor/limiter. t = 1/f, if the desired start frequency is 10 Hz and above. (1/10 = 100 ms), type in 100 ms.
"Attack time" set how fast the compressor/limiter reacts,
"Decay time" sets how fast the compressor/limiter releases.

Channel delay and channel polarity can also be changed by selecting these blocks in the DSP block configuration window.

After you complete the setup of the bi-quad filters, and compressor SAVE your configuration file to disk by selecting the "File" menu and 'Save current DSP configuration".

The next step is to flash the biquad filters into the DSP. Connect a USB cable from your computer to the USB port on the back of the amplifier plate. See figure 11.
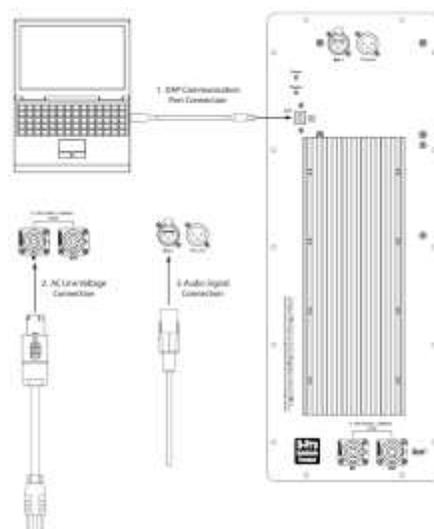
Fig. 11

Check communication status by selecting the "communications" menu and select "Select com port".   As shown in figure 12.
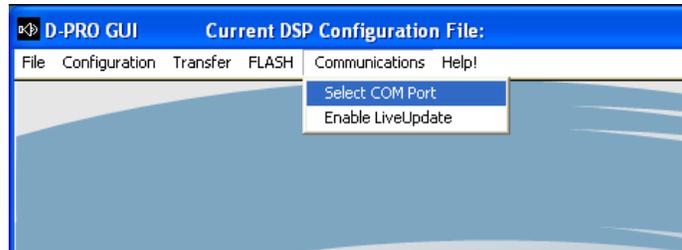
Fig. 12

This brings up a port finder box shown in figure 13. Click "scan" to scan for an open port.

Fig 13.

When the word "successful" appears in the "scan/ping status" box the port has been found. Note: (the port may need to be manually selected using the "Com port" field box. Click "ping" if no port is found using the "scan" port feature or connect and re-connect the USB cable to establish port communication and re-ping to check port status.

Fig. 13.

Bi-quad filter setting can now be flashed to the DSP by selecting "Flash" menu and then "Flash current DSP configuration into DSP" as shown in figure 14.
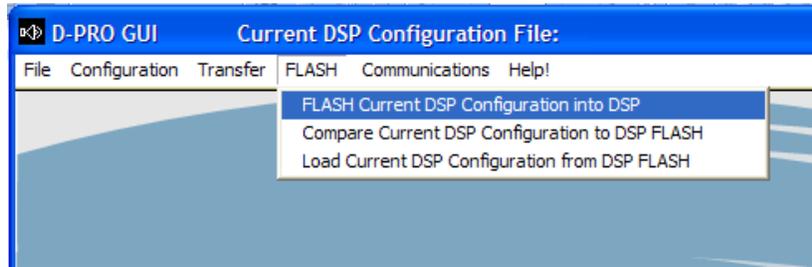
Fig. 14

This brings up a dialog box shown in figure 15.
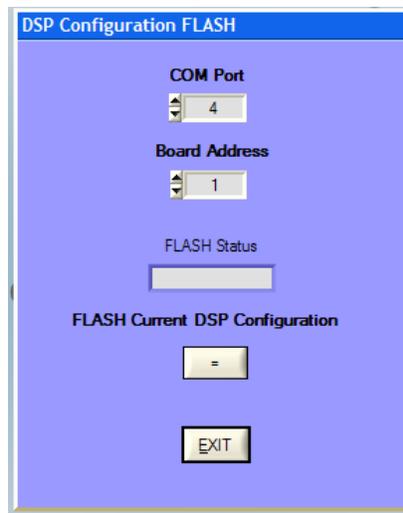
Fig. 15

 Click the "=" button to flash the biquad filters and other parameters into the DSP. When "successful" appears in the "Flash status" box programming is complete.
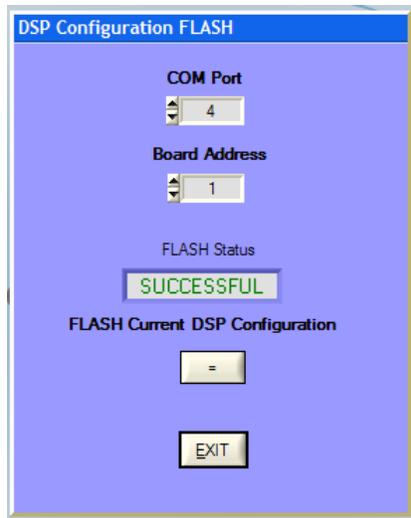
More detailed info regarding other features can be found in the D-PRO ™ user's manual located in the programs help menu.

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