SP DSP Quickstart setup and operation.

Rev R 3-24-2010
The value of 0XF9 in the configuration file must read 01 41 24 11 to enable
96Khz operation.

Software Installation and PC Interface Setup

1. **Make sure power is off on amplifier and computer**
2. Plug the interface board into the parallel port of the computer
3. Turn on computer. Enter CMOS setup. The first screen the computer shows while booting frequently tells you which key to press to enter Setup mode.
4. Set the parallel port to EPP mode in CMOS Setup.
5. Save setup and boot to Windows.
6. Download the file DSP Software Complete.zip from www.SpeakerPower.net web site
7. Unzip the files in ALE5.2.zip. Run Setup.exe to install.
8. Unzip the files in DASDCT3.1.zip. Run Setup.exe to install.
9. Unzip the files in softwareupdate.zip into the "DCT3.1" folder. Overwrite any existing files of the same name.
10. Plug the interface cable into the interface board and the SP amplifier.
11. Plug the speaker cable into the back of the SP1 and the loudspeaker. Channel 1 is LF, Channel 2 is MF and Channel 3 is HF. See Speaker Connector and Wiring document for more details. DO NOT ALLOW WIRES TO TOUCH EACH OTHER OR THE CHASSIS. GROUNDS SHOULD NOT BE WIRED TOGETHER.
12. Plug in XLR cable to input from music or test signal source. Make sure signal is OFF.
13. Plug in power cord to SP amp and turn it on.

To Load an Existing Configuration

1. Plug interface cable from PC to amplifier before turning amplifier ON. This ensures it will come up in slave mode and accept commands from the PC.
2. Mute all channels from the faceplate of the SP amplifier.
3. Start DAS DCT 3.1 program
4. Open SpeakerPower.dat file in folder "DCT3.1"
5. After a few seconds you will see the EQ GUI box. Select "Detail GUI A"
6. LOAD your configuration file "_____.cfg". The configuration file SP2-500-250.cfg has a typical 2kHz crossover.
7. You may now unmute the amplifier channels and measure the response.
8. To save the configuration into the amplifier so it is available with the computer removed, select EEPROM on the EQ GUI panel. Select

"EEPROM Write". After several seconds you will see "EEPROM Done" Click OK and close the EEPROM panel.
9. Turn off the SP amplifier. Remove the interface cable. Turn on the SP amplifier.
10. The amplifier will now turn on with your program every time. This process may be repeated with the PGM SEL switch in the other position to load a second configuration. The amplifier power must be cycled when changing programs.

To Create a New Configuration

Generate filters

2. Start ALE 5.2 program
3. DEVICE menu select TAS3100. You have to do this every time you start the program.
4. VIEW menu select Settings. Under Frequency Limits tab set Fs Sampling Frequency to 96000. Press OK.
5. If you created filters before and saved them as a *.EQ310X file, you may reload them from the FILE menu and proceed to modify them as shown in the next steps.
6. EDIT menu select Edit Filter Parameters.
7. If you loaded an *.EQ310X file in step 5 then from the EDIT menu select Add Device Data to Filter Parameters Grid.

EQ filters. Remember when adding eq filters that "bandwidth" in the ALE program is expressed in Hz, not octaves. . If translating from a processor that express bandwidth as Q, BW in Hz = F*1/Q where F is the center frequency of the filter. If translating from a processor that expresses bandwidth in octaves, use the following chart to convert to 1/Q

BW oct	1/Q	BW oct	!/Q	BW oct	1/Q	BW oct	!/Q
		1	0.71	2	1.50	3	2.47
0.1	0.07	1.1	0.78	2.1	1.59	3.5	3.07
0.2	0.14	1.2	0.86	2.2	1.68	4	3.75
0.25	0.17	1.25	0.89	2.25	1.72		
0.3	0.21	1.3	0.93	2.3	1.77		
0.33	0.23	1.33	0.95	2.33	1.80		
0.4	0.28	1.4	1.01	2.4	1.86		
0.5	0.35	1.5	1.09	2.5	1.96		
0.6	0.42	1.6	1.17	2.6	2.06		
0.66	0.46	1.66	1.22	2.66	2.12		

0.75	0.53	1.75	1.29	2.75	2.21		
0.8	0.56	1.8	1.33	2.8	2.26		
0.9	0.63	1.9	1.41	2.9	2.37		

    i.   Linkwitz-Riley Filters. Second order filters may be chosen directly on the Filter Parameters Grid. Fourth order (24dB/oct) versions, also know as "squared Butterworth" filters, are designed by adding two identical Butterworth filters. So for 24 db/oct L-R at 1000Hz make two 1000Hz entries under Butterworth 2-LP.

    ii.   Third order filters. Are not in the Filter Parameters Grid. They may be designed by using the Low Vari Q and High Vari Q tabs. For Butterworth response, one Butterworth-1 filter and one Vari Q filter with a Q of 1.

    iii.   Fourth order Butterworth. Use two Vari Q filters, one with a Q of 1.31 and the other with a Q of 0.541.

    iv.   Eighth order Butterworth. Use four Vari Q filters with Q of 0.51, 0.60, 0.90, and 2.56.

    v.   Eight Order Linkwitz-Riley. Use four Vari Q filters with Q of 0.541, 1.31, 0.541, 1.31.

8. Close the Filter parameters table and select the Wand icon to Draw Filters.
9. Go back to Edit Filter parameters until you have added all the filters you need for one channel of the amplifier.
10. EDIT menu select Generate Device Data.
11. FILE menu select Save As Device Program Data. Name and save the file to the folder "DCT 3.1"
12. Repeat steps 2 – 8 for each channel of the amplifier.

Generate limits

Setting limits is complicated and it is suggested you contact the factory for help. Here is the procedure for creating and loading a typical "hard" limit for driver protection.

1. Set Threshold 1 to –182dB.
2. Set Threshold 2 to the level you wish to limit at. 1W output limit = -95.5. For instance to limit at 100W you would set the Threshold 2 to -75.5.
3. Set Regions 0, 1, and 2 to Compression. Set Slopes for Regions 0 and 1 = 1. Set Slope for Region 2 = 30.
4. Press Apply.
5. FILE menu select Save As DRC310X file. Navigate to the DCT3.1 folder and save under a unique name. As an alternative to this procedure, you may use one of the files already created in the distribution zip file.
6. In the DCT program, load your configuration, then press Page 2.
7. Select any one of the DRC boxes.

8. Select CH1,2 or CH3 depending on your channel configuration
9. Under DRC Curve Parameters, select your file and press Apply
10. Under Alpha Calculator, replace 48000 with 96000 and press enter. Enter your time constant and press Enter. For low frequencies use 5ms and 0.5ms for high frequencies.
11. Press each of the three Alpha buttons next to Energy, Attack, and Decay to copy the value up.
12. Make sure that the signal is routed to the DRC box AFTER the volume control. For configurations using only channel 1 or channel 2, make sure the unused channel is not feeding the DRC detector. The detector responds to whichever channel is higher.
13. Press OK and Save your configuration
14. For dual thresholds, make sure you put in an offset to keep the gain below threshold the same. The upper threshold then has to be moved up by an amount approximately equal to the off set to keep it the same. Then the offset has be adjusted etc.
15. To fine tune the threshold level, you can change the level of the signal feeding the detector.

Operate DSP

1. Plug interface cable from PC to amplifier before turning amplifier ON. This ensures it will come up in slave mode and accept commands from the PC.
2. Mute all channels from the faceplate of the SP amplifier.
3. Start DAS DCT 3.1 program
4. Open SpeakerPower.dat file in folder "DCT3.1"
5. After a few seconds you will see the EQ GUI box. Select "Detail GUI A"
6. LOAD your *.cfg file. For SP1 and SP2 load "allflat_2way.cfg". For SP3 load file "allflat_3way.cfg"
7. Select "BQ12" on the flow chart. The file names in the drop down boxes are NOT the files that are already loaded. They are the ones that are available in your hard disk.
8. Pull down Ch1 drop down menu, select wipe.EQ310X and press ENTER. You must always wipe out previous settings before loading an EQ310X file. Now select your LF.EQ310 file and press the ENTER button. Repeat for channels 2 and 3 using the filters appropriate for the channel.
9. Default Channel assignments in the DSP architecture are:

	LF	MF	HF
SP1	Ch3	na	na
SP2	Ch3		Ch1
SP3	Ch3	Ch2	Ch1

There are many other possible configurations. For more details see the Speaker Connector and Wiring document.

IMPORTANT NOTE: In a many configurations, the front panel mute switches and the speaker connector, channels 1 and 3 are reversed from the DSP internal labeling. 1 is 3 and 3 is 1. Or to put it another way, To the outside world ch1 is LF and Ch3 is HF. This is so the limiter tied to channels 1 and 2 will move the mid highs together.

10. Select 'PAGE 2"
11. Select "Vol". Set the volume offset between channels using the sliders. Close the dialog box.
12. Select "Delay3" button. Add desired delay to channels. Each increment is 10.4uS. Close dialog box.
13. Select "SAVE" Enter a new unique file name for this configuration.
14. You may now unmute the amplifier and measure the response. Volume, delay and filters may be readjusted with the mute removed, but configurations should be loaded with mute on in order to avoid sending pops and clicks through the system.
15. When the program is complete, select EEPROM on the EQ GUI panel. Select "EEPROM Write". After several seconds you will see "EEPROM Done" Click OK and close the EEPROM panel. Change the position of the Program Select switch on the faceplate and load the same or another configuration into the other position.
16. Turn off the SP amplifier. Remove the interface cable. Turn on the SP amplifier.
17. The amplifier will now turn on with your program every time.