

DAT Software

For C2N-DAP8/RC Digital Audio Processors

Quick Start

These instructions provide a quick reference for using the Crestron® Digital Audio Tools (DAT) software to configure your C2N-DAP8 or C2N-DAP8RC Digital Audio Processors (DAP8/RC) to match the requirements of the listening/viewing area. For detailed instructions, refer to the Operations Guide for the DAP8/RC (Doc. 8186 or 8187) and the help file supplied with the DAT software.

Getting Started

All hardware installation and wiring procedures should be completed before attempting to configure the DAP8/RC unit. The following items are required for room calibration:

- SPL (sound pressure level) meter. Used to measure sound in decibels (dB).
- Tape measure. Used to measure the distance from speakers to primary listening position.

The following items are recommended to optimize the performance of the C2N-DAP8/RC relative to the listening area, speaker arrangement, and the user's preferences:

- Audio spectrum analyzer. Used to “see” a speaker's frequency response in a room. This is used with equalizers to adjust for a proper room response.
- Avia Guide to Home Theater, from Ovation Software (www.ovationsw.com).

OR

Video Essentials, from DVD International (www.videoessentials.com).

NOTE: The DAP8/RC is designed to be used only with a Crestron 2-Series control system.

NOTE: The DAP8/RC requires 21 Watts of Cresnet® power and may require a dedicated Crestron power supply.

Toolbar Icons and Drop-Down Menus

The following is a brief explanation of the DAT software non-standard tool bar buttons and drop-down menu items.

NOTE: When you launch the DAT software, the last project modified is opened. If this is not the file you want to work on, click **New**, or **Open** to work with a different project. Otherwise, you may inadvertently overwrite a valid project.

File

This menu has the usual selections. You can also choose to save your current project as a template (**Save as Template**) and then use it as a starting point for other projects, where additional adjustments can be made and then saved by choosing **Save As**.

Edit

This menu includes **Restore Factory Default Settings**, which will return the unit to its original “out-of-the-box” configuration. Default settings are noted throughout this document.

View

This is standard for all software applications and allows the choice to display the tool bar.

Options

This menu allows the choice of how many equalizers to display in the *Parametric EQ* tab. There is a single EQ view and a view with two EQs.

Tools

This menu allows you to enter Realtime Mode ( on the tool bar). Realtime Mode lets you hear all of the configuration changes immediately as they are made, unless otherwise specified. Once in Realtime Mode, you can choose Source/Noise Steering ( on the tool bar). Selecting the Source/Noise Steering mode allows you to select the built-in *Pink Noise* or *Dolby Noise* noise generators. You can also select an external noise source or other program material for aid in setup of the DAP8/RC. In the “Source/Noise Steering” window, you can specify speakers as active or inactive, thus allowing the adjustment of each speaker independently.

NOTE: When using *any* Source/Noise Steering selection, Bass Management is not active.

Window

This menu allows you to navigate through the tabs.

Mute (*located at the bottom of the screen*)

This is an emergency mute button that will immediately mute the DAP8/RC and all of its outputs. Pressing the button again does not turn mute off. To un-mute the DAP8/RC, you must click the mute icon  on the tool bar or select **Tools | Mute** or press **F8**. (First, make sure the sound level is back to a reasonable level.)

Back / Next

Use these buttons to navigate back and forward through the tabs, one at a time.

Setup Procedures

Communications

The *Communications* tab allows you to define the settings for communication with the C2N-DAP8/RC in order to download existing configuration files and upload new ones. It is important that you set the communication parameters first before doing any of the other setup procedures.

The *Connection Settings* area is where you set the parameters for communication with the C2N-DAP8/RC.

Pass To: Checking this box means that the unit being configured is a Cresnet device and will have its configuration sent to it through a Crestron control processor. If this box is unchecked, then communication with the device is directly through its own RS-232 port. Refer to the DAP8/RC manual for assistance with this communication type.

Device Type: This drop-down menu lets you specify whether the device is a Cresnet device or a card that is inserted into an expansion slot (e.g., C2VEQ-4). The C2N-DAP8/RC is a Cresnet device.

Cresnet ID: Enter in the Cresnet ID of the device. The default ship-with ID for the DAP8/RC is 50.

Use the **Viewport Settings** button to display the “Port Settings” window to set the communications parameters required to communicate to the processor or to the unit.

The *Transfer Configuration* area is where you choose to transfer the current configuration to the device (**Send to Device**) or load it from the device (**Retrieve From Device**).

The *Communication Transcript* area contains a window and a **Clear** button. The window shows all of the values sent to or retrieved from the device during communications. It is good to review if there are errors when sending or receiving a configuration. The **Clear** button clears the current information in the window.

Speaker Sizes / Bass Management

The *Speaker Sizes / Bass Management* tab lets you specify the room speaker arrangement, and set the crossover frequency for the subwoofer (bass management).

The *Primary Configuration Mode* drop-down choices are *5.1*, *6.1*, *7.1*, and *Other*. These configurations mean that you have five, six, or seven speakers plus one subwoofer. The *Other* configuration choice lets you define any configuration.

NOTE: It is recommended to be in Realtime Mode to confirm the validity of the configuration. Certain speaker configurations will not be valid and will cause an undesired response.

The available speaker size choices are *Large*, *Small*, and *Not Present*.

A speaker designated as **Large** can efficiently reproduce a frequency range of 20 Hz to 20 kHz.

A speaker designated as **Small** cannot efficiently reproduce the lower frequency ranges (80 Hz and below). With a **Small** speaker, bass management is used to route the lower frequencies to the subwoofer. Bass management uses a crossover to determine what frequencies to route to the subwoofer and what frequencies to route to the speakers. Set the crossover according to what the speaker can efficiently reproduce in the *Crossover Frequency* drop-down.

Not Present means that there is no speaker for that particular location.

NOTE: If a speaker cannot efficiently reproduce frequencies below 50 Hz, it is recommended that you set that speaker to **Small**. Testing this speaker in Realtime Mode will help reveal the best setting.

The *Crossover Frequency* choices are *80 Hz*, *100 Hz*, and *120 Hz*. The crossover is 12 dB per Octave. The crossover is used when bass management is active, i.e., when *Small* speakers are selected in the *Speaker Size* settings.

80 Hz: provides a crossover at 80 Hz. Speakers that cannot efficiently reproduce frequencies 80 Hz and below should use this setting.

100 Hz: provides a crossover at 100 Hz. Speakers that cannot efficiently reproduce frequencies 100 Hz and below should use this setting.

120 Hz: provides a crossover at 120 Hz. Speakers that cannot efficiently reproduce frequencies 120 Hz and below should use this setting.

Delays

Use this tab to enter the distance or timing of the speakers to the primary listening position. This is important so that the sound arrives at the listener's ears at the proper time in reference to the material and the other speakers in the system. (The seat that will be used the most is considered the primary listening position.)

Feet: Using a tape measure, measure the distance from the front of each speaker to the primary seat in the theater. Enter the measured distance in each box for its respective speaker.

Meters: Using a tape measure, measure the distance from the front of each speaker to the primary seat in the theater. Enter the measured distance in each box for its respective speaker.

Milliseconds: Enter the amount of time for the sound from each speaker to reach the primary seat in the theater. There are analyzers equipped to give a millisecond value from the time the sound was produced to the time it reaches the listener's position.

NOTE: Delays are not taken into effect in Realtime Mode until they are sent to the processor using the **Send** button.

NOTE: When you retrieve delay values from a processor, the information is accurately displayed in milliseconds.

NOTE: It is recommended to use distance (feet/meters) calculations for ease of use and a lower chance of error.

Room Calibration

Use this tab to adjust each speaker to the same reference volume level. Use an SPL meter placed at the primary listening location to measure the output of each speaker, using Dolby Noise as your reference. Make sure you are in Realtime Mode for proper adjustment; use Source/Noise Steering to turn on the Noise/External Source, and select the speaker you wish to use as the reference speaker. A level of 75 dB for each speaker is desired.

Master Volume: Use this control to set only the “reference” speaker to 75 dB.

Available Speakers: The setting for all available speakers in the project starts at zero and has a usable trim adjustment of –12 dB to 12 dB. After setting the “reference” speaker level, use Source/Noise Steering to select each other speaker, in turn, and use the trim controls, **not** the Master Volume, to achieve the proper 75 dB level.

LFE: This trim adjustment is for the **Low Frequency Effects** channel. The usable adjustment is 0 to –10 dB, and attenuates the LFE portion of the signal while leaving the bass information from the other channels at their original levels. Adjust this setting to suit your personal preference and the requirements of your equipment.

NOTE: The zero button to the left of the Front Left trim control resets all speaker trim controls and the LFE trim control to 0.00 dB; the Master Volume setting is not affected.

Input Settings

Use this tab to select the type of incoming signal and the decoding type for each source. Any analog input also has an adjustment available for its input level; digital inputs have no adjustment. If so desired, setup of the source and the decoding type for each signal can be left at their default settings and the user will not have to make any selections.

Input Source: The drop down menu allows for the selection of each input. Clicking the button to the right allows each input to be renamed.

Input Level Gain: This allows the adjustment of the selected analog input's incoming signal level. Use this to adjust each analog input so that as a switch from source to source is made, the level of each source is consistent.

Signal Type: This lists the types of signals that could be supplied from the particular source.

Decoding Mode: This lists the default decoding mode for each possible input signal type. The pull-down at the right of each decoding mode lists any available alternate decoding modes that can be selected. User selection can be made for any of the available modes while operating the unit. Please refer to the help file for the specifics of each decoding mode.

NOTE: Some decoding modes are not available in all speaker configurations. In such cases, the affected mode listing will be dimmed.

The following is a brief description of each signal type and decoding mode available. Note that the first decoding mode listed is the default mode. Any available alternate modes are listed below the default.

2-Channel: This signal type would be a stereo source from a CD player, cable box, etc. It is the only available signal type for all analog inputs, and provides only a (front) left and right signal.

Decoding Modes Available: *Stereo (default)*
 Dolby Pro Logic II Movie
 Dolby Pro Logic II Music
 Dolby Pro Logic II Matrix
 Dolby Pro Logic
 DTS Neo6: Cinema
 DTS Neo6: Music
 User-Controlled

Dolby Digital 5.1: This is a digital input signal and provides 5.1 channels of discrete surround sound (left, center, right, surround left, surround right, and LFE).

Decoding Modes Available: *Dolby Digital 5.1 (default)*
 Dolby Digital EX
 User-Controlled

Dolby Digital 2/0: This is a digital input signal that provides only two channels of discrete sound (left and right). It is different from 2-Channel in that this signal is digital and used in Dolby encoding and decoding.

Decoding Modes Available: *Stereo (default)*
 Dolby Pro Logic II Movie
 Dolby Pro Logic II Music
 Dolby Pro Logic II Matrix
 Dolby Pro Logic
 User-Controlled

Dolby Digital 2/0 Pro Logic: This is a digital input signal that provides two channels of sound with a Pro Logic Flag (left, right, surround left, surround right).

Decoding Modes Available: *Stereo (default)*
 Dolby Pro Logic II Movie
 Dolby Pro Logic II Music
 Dolby Pro Logic II Matrix

*Dolby Pro Logic
User-Controlled*

Dolby Digital EX: This is a digital input signal that provides 5.1 discrete channels of surround sound and 2 matrix rear speakers. It uses Dolby Surround EX to do all of the decoding.

Decoding Modes Available: *Dolby Digital EX*

DTS Digital Surround: This is a digital input signal that provides 5.1 discrete channels of surround sound (left, center, right, surround left, surround right, LFE).

Decoding Modes Available: *DTS 5.1 (default)
User-Controlled*

DTS ES Matrix 6.1: This is a digital input signal that provides 5.1 discrete channels of surround sound and one matrix rear center (left, center, right, surround left, surround right, rear center, LFE).

Decoding Modes Available: *DTS ES Matrix (default)*

DTS ES Discreet 6.1: This is a digital input signal that provides 6.1 discrete channels of surround sound (left, center, right, surround left, surround right, rear center, LFE).

Decoding Modes Available: *DTS ES Discreet (default)*

Output Settings

Use this tab to customize the level of all speakers in use to your personal preference. This differs from the *Room Calibration* tab in that the levels you set are decoding mode specific. For example, if you would like to hear more *Center* when listening to *DTS Neo6: Cinema*, you would make the adjustment here, so it only affects this decoding mode.

Decoding Mode: The drop down menu lists all available decoding modes. Select the mode you wish to adjust.

*Dolby Digital 5.1(Default)
Dolby Digital EX
Dolby Pro Logic
Dolby Pro Logic II Movie
Dolby Pro Logic II Music
Dolby Pro Logic II Matrix
DTS 5.1
DTS ES Matrix
DTS ES Discrete
DTS Neo6: Cinema
DTS Neo6: Music
Stereo*

Decoding Mode Volume: This slider adjusts the overall volume of the decoding mode so that it matches that of the other decoding modes. This helps to make a smooth transition from one decoding mode to another without an audible difference in volume.

Speaker Adjustments: All available speakers in the project start at 0 dB and have a usable adjustment of -30 dB to +12 dB. Adjust each speaker for the preferred level per decoding mode.

LFE: This adjustment is for the **L**ow **F**requency **E**ffects channel. The usable adjustment is -15 dB to 0. Adjust to the preferred level per decoding mode.

NOTE: The level adjustments done here are in addition to the values set in the *Room Calibration* tab. The total gain or attenuation is represented at the bottom of each slider.

Options: These are available for adjustment for music decoding modes only. The following describes which options apply to which modes and what changes they cause to the mode.

Panorama, Center Width, and Dimension apply to *Dolby Pro Logic II Music*.

Panorama: Extends the front stereo image to include the surround speakers for a wraparound effect with sidewall imaging.

Center Width: Allows variable adjustment of the center image so it may be heard only from the center speaker, only from the left/right speakers as a “phantom” center image, or various combinations of all three front speakers. Adjust for your listening preference. Valid entries are 0 through 7.

Dimension: Allows an adjustment of the sound field either towards the front or towards the rear. Adjust for your listening preference. Valid entries are 0 through 3.

Center Gain applies to *DTS Neo6: Music*:

Center Gain: Allows variable adjustment of the center image so it may be heard only from the center speaker, only from the left/right speakers as a “phantom” center image, or combinations of all three front speakers. Useable adjustment is 0 to 0.5.

Graphic EQ

Use this tab to select the amount of Graphic/ Parametric EQ's to be used for each channel. You can also make adjustments for all speakers among 10 presets. The adjustments made here will affect all active speakers.

EQ Mode: This describes the current Graphic/ Parametric configuration of the EQ's and allows the selection of different configurations. The default is 5 Graphic EQ's/ 1 Parametric EQ. When choosing to make a change to the default settings, you are prompted to let you know the effect this will have on the processor. The options available are as follows:

0 Graphic EQ's/ 6 Parametric EQ's:

There are no graphic EQ frequencies available.

3 Graphic EQ's/ 3 Parametric EQ's:

The graphic EQ frequencies available for adjustment are:

250 Hz.
1000 Hz.
4000 Hz.

5 Graphic EQ's/ 1 Parametric EQ:

The graphic EQ frequencies available for adjustment are:

63 Hz.
250 Hz.
1000 Hz.
4000 Hz.
10000 Hz.

EQ Trim Preset: Use this drop-down to select the preset you would like to adjust. There are up to 10 presets available for the graphic EQ's. All presets affect all active speakers in the system.

Adjustments: Use the slider controls at the bottom area of the screen to adjust the frequencies available for the current configuration. The usable adjustment range for each available frequency is -10 dB to 5 dB, with the default at 0 dB. You may use the slider or enter a numeric value for adjustment. Clicking on the 0 button to the left of the first slider will set all sliders to zero.

Parametric EQ

Use this tab to make all the fine adjustments for the speakers and the way they interact with the room. Realtime Mode will have to be activated in order to hear the changes in real time and to use any internal or external noise source for adjustment. The use of a parametric EQ allows a much finer adjustment across the entire range of frequencies. This screen is designed to aid an experienced audio specialist who knows how to use and adjust parametric EQ's to balance a room. If this is your first time, please consult the help file and/ or the latest version of the Crestron Surround Sound Primer (Doc. 6122) for information on the parametric EQ, its uses and adjustments.

NOTE: It is recommended to use a **Real Time Analyzer (RTA)** when tuning a room. It is especially important to use such a device when using parametric EQ's, to obtain the best results for the room.

NOTE: If you would like to view two equalizers on one screen, click on **Options | Number of Equalizers**, and check **2**. This will make copying speakers and filters much easier.

The adjustment window(s) provide a graphic representation of the filters and allow adjustment of the selected filters by using a mouse. The selected filter will appear in *green* and will create a *green* curve. This *green* curve applies to the effect of each individual filter. The *yellow* curve will represent the overall effect of all the filters for the given speaker. Movement of a filter left or right will change the frequency this filter affects. Movement up and down will adjust the gain on the filter. Selecting either end of the line and adjusting it in and out will adjust the bandwidth of the filter. The viewable range on this interface is 25 Hz to 20 KHz and -12 dB to 12 dB.

NOTE: Right clicking in the adjustment window gives you the option to copy a filter, copy a speaker, paste a filter, paste a speaker, and copy all filters from preset (#). This can be used to help simplify a system setup by permitting you to copy and paste values from one speaker, filter, or preset to another.

Preset: Use this drop-down to select up to five available presets per speaker. When a particular preset is chosen, all EQ settings will be used that were saved to that preset for all active speakers. Clicking the button to the right will allow the preset to be renamed.

Speaker: Use this drop-down to choose the speaker to be adjusted with the parametric EQ. Only the speakers activated in the *Speaker Sizes/ Bass Management* tab will be available.

Filter: Use this drop-down to choose which filter to adjust. A filter can also be chosen by clicking on it in the adjustment window. A filter that is selected will appear in *green*. A filter that is not selected will appear in *yellow*. When a filter is selected to be adjusted, the *Filter* drop-down list shows the number of the filter being adjusted. If there are no filters available in the window, click the **Add Filter** button at the bottom. If the desired amount of filters is not available, check your settings in the *Graphic EQ* tab. If a filter is selected but does not appear, refer to *Show Filters*, which follows.

Show Filters: Checking this box shows all the filters currently applied to the selected speaker. Un-checking this box will show the curve that was created for the speaker using the filters.

Frequency: The usable range for frequency is 25 Hz to 20 KHz. This window shows any current value for the filter and allows a new frequency to be entered for the selected filter.

Gain: The usable range for gain is -12 dB to 12 dB. This window shows any current value for the filter and allows a new gain value to be entered for the selected filter.

Bandwidth: The usable range for bandwidth adjustment is 0.02 Octaves to 2 Octaves. This shows any current value for the filter and allows a new bandwidth value to be entered for the selected filter.

Filter Type: This drop down menu allows the selection of one of five different filter types for adjustment of the selected filter. Refer to the help file for more information and examples of each of the filters listed. The five filters and how they affect the speaker is explained below.

Low Pass: A low-pass filter passes all frequencies below the specified frequency, while attenuating all frequencies above this specified frequency.

High Pass: A high-pass filter passes all frequencies above the specified frequency, while attenuating all frequencies lower than its specified frequency.

EQ Filter: This filter is also known as a Peak/ Notch filter. Equalization (EQ) filters permit a precise amplitude adjustment of a selectable range of frequencies. The range can vary from a small slice of the frequency spectrum (0.02 Octave) to a 2 Octave area. EQ filters allow a fine adjustment to compensate for room acoustics, noise, and speaker limitations.

Notch filters (also called band-reject filters) are EQ filters used to remove unwanted frequencies from a signal while affecting all other frequencies as little as possible.

Bass Shelf: A bass shelf filter uniformly affects all low frequencies while not affecting high frequencies. The bass shelf filter can also be used to uniformly decrease the bass frequencies to eliminate a booming bass sound.

Treble Shelf: A treble shelf filter affects all high frequencies in a uniform manner while not affecting all low frequencies. The treble shelf filter can increase the proportion of treble to bass, enabling the smaller speakers to produce a clearer sound.

Add Filter: This button allows you to add filters when pressed. If there are no additional filters available, this button will be dimmed.

Remove Filter: This button will remove the selected filter when pressed. If no filter is selected or available, this button will be dimmed.

Clear All Filters: This button will set all filter gains back to zero while keeping the current frequency and type of filter at the last setting.

Saving the Configuration

Once you are satisfied with the results of the configuration settings, save the file. If you have not been working in Realtime Mode, upload the project to the DAP8/RC as specified in “Communications” on page 2. You may also wish to save the project as a template to be used as a model for other projects.

