DSP-8C Owner's Manual

Applies to: firmware 1.7 and later

Revision 3

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This manual provides details and usage instructions for the CoLinear Acoustics DSP-8C. It covers what is in the box, what the front and rear panels do, how to get the unit set up for the first time, and what to check if something is not behaving as you would expect.

Configuration of the DSP-8C (crossovers, filters, delays and so on) is done from a computer using DSPconfig, our free cross-platform control software. DSPconfig usage is covered separately via the Getting Started with DSPconfig guide and the DSPconfig Reference.

What is in the box

- The DSP-8C
- 1 x infrared remote control
- 1 x 22.5W universal AC adapter
- 1 x 2m braided USB-A to USB-B cable

The front panel

Figure 1: The DSP-8C front panel: the display to the left of centre, and the rotary encoder at the right

To the left is the monochrome OLED display and to the right is the rotary encoder. The small round window adjacent to the rotary encoder is the infrared receiver window for the remote control.

The rotary encoder has three functions:

Action	On the home screen	On any other screen
Rotation	Changes the volume	Moves through the options
Short press	Opens the menu	Selects the highlighted option
Long press	Enters standby	Enters standby

Note that if the display has timed out and switched itself off, the first press will only wake the display and not select anything.

The home screen

Figure 2: The home screen: the volume across the top, and the active profile and input below it

The home screen shows the active profile, the active audio input and the master volume. Profiles are shown by the name you give them in DSPconfig, or as Profile 1 to Profile 4 if they have not been renamed. Names that are too long for the display are shortened with an ellipsis.

Depending on how you have configured your unit, the volume section may display one of the following alternatives:

Shown	Meaning
Mute	You have muted the unit
Digital Out	The active profile sends its audio to the S/PDIF output rather than to the analogue outputs
Fixed	The unit is in fixed volume mode

Fixed volume mode holds the DAC at full scale and disables the volume controls, and is useful when something downstream is handling volume, such as an integrated amplifier. This option can be set using DSPconfig.

The home screen can optionally be configured to display just the volume, allowing it to use a much larger font. See the Overview setting below.

Figure 3: The home screen in volume-only mode: the volume alone, in a large font

The menu

Figure 4: The menu: Select Profile, Select Input, Settings and Back

Press the rotary encoder on the home screen to open the menu, which lists the following items:

Item	Function
Select Profile	Choose between the four profiles, listed by name
Select Input	Choose between S/PDIF Coaxial, S/PDIF Optical and USB Audio
Settings	See below
Back	Return to the home screen

Figure 5: The Select Profile screen, browsing Profile 1 of the four

Figure 6: The Select Input screen, with USB Audio highlighted

Settings

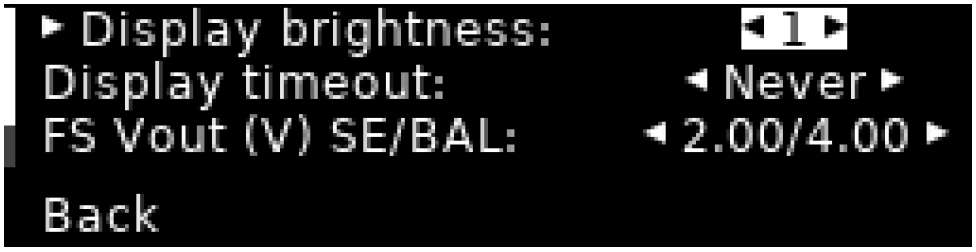

Figure 7: The Settings screen: Display brightness, Display timeout and FS Vout, with Back below and a scrollbar to the left

Setting	Function
Display brightness	Adjust the brightness of the display, in six steps
Display timeout	Set the automatic display timeout to one of: Never, 30 seconds, 60 seconds or 120 seconds
FS Vout (V) SE/BAL	The full-scale output voltage, in eleven steps from 2.00 V to 2.50 V single-ended, i.e. 4.0 V to 5.0 V balanced
Overview	Normal, the standard home screen, or Volume, which shows just the volume in a large font

To change a setting, turn the rotary encoder to move the cursor to it, press to start editing, then turn to change the value. The full-scale output voltage is a setting of the unit rather than of a profile, so it applies whichever profile is loaded.

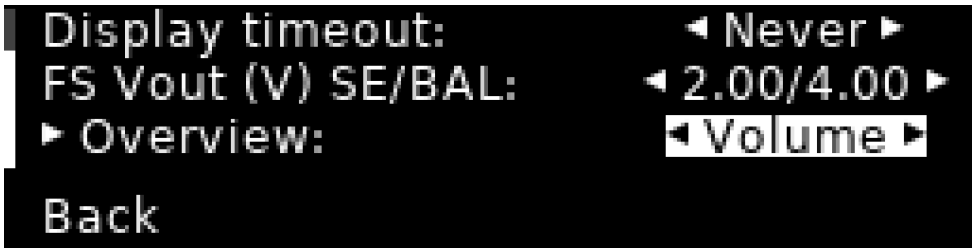

Figure 8: The Settings screen scrolled down to the Overview row, set to Volume

The display timeout does not apply whilst the logo is shown during start-up, or during a firmware update.

The rear panel

Figure 9: The DSP-8C rear panel: eight numbered output channels on the left, the digital and USB connections in the centre, and power at the right

Working from left to right:

Section	Description
Analogue outputs	Eight channels, numbered 1 to 8 from left to right, each with a balanced XLR on the upper row and a single-ended RCA below it. Each channel can be individually configured to output over either XLR or RCA
USB	A USB-B socket, which carries both the USB audio input and the connection that DSPconfig uses
Digital	Input and output coaxial and optical S/PDIF connectors
Power	A physical on/off switch and the DC input, which takes the supplied 15V adapter
Serial number	The round sticker located above the DC input is a QR-encoded serial number

All audio inputs support up to 192kHz / 24-bit PCM audio.

First setup

1. Connect the outputs you intend to use, and the input you intend to play from.
2. If you are going to use USB audio, or to configure the unit with DSPconfig, connect the supplied USB cable between the unit and your computer.
3. Connect the supplied adapter to the DC input and set the rear panel switch to ON.

You will hear a click from the unit when it starts up. This is normal and represents the relays being tested.

The logo appears immediately, and the home screen replaces it once the DSP has started and the active profile has loaded. Choose your input from the menu or with the remote.

A new unit has none of the output channels mapped to the input channels, so no audio will play until you have created your first profile configuration using DSPconfig.

Profiles and the remote

The unit holds four profiles. Each profile represents a complete configuration for your system, including filters and crossovers, delays and gains, whether each output uses its RCA or XLR socket, and whether the profile's audio goes to the analogue outputs or to S/PDIF.

You can switch between saved profiles freely, which can be useful for A/B testing different configurations.

The remote

Figure 10: The supplied remote control: power and mute at the top, the five-way pad with OK in the middle, a row of three small keys, and the volume rocker below them

The supplied remote control uses the infrared Philips RC-5 protocol. Point it directly at the unit's front panel for maximum range.

The keys are marked with symbols rather than words. Working down the handset from the top:

Key	**Function**
Power symbol	Standby and wake
Bell with a cross through it	Mute and unmute
Five-way pad, with OK in the middle	Move through the current screen and select the highlighted option
Home	Return to the home screen
Menu	Open the menu
Back	Go back one screen
+ and -	Volume up and down

There are two built-in short cuts when the unit is displaying the home screen:

Keys	**Short cut**
Left and Right	Quick profile selection: opens the profile chooser at the previous or next profile
Up and Down	Quick input selection: opens the input chooser at the previous or next input

Universal remotes and control systems

If you want to drive the unit from a universal remote or an installed control system, it responds to Philips RC-5 on device address 0x1A. The commands sent by the keys on the supplied handset are:

Command	Key
0x01	Standby
0x02	Mute
0x03	Up
0x04	Left
0x05	OK
0x06	Right
0x07	Down
0x08	Home
0x09	Menu
0x0A	Back
0x0B	Volume up
0x0C	Volume down

The firmware also implements a set of extended commands that are not on the supplied handset. These let a control system go straight to a profile, an input or a screen rather than walking through the menu:

Command	Function
0x0D to 0x10	Select Profile 1 to 4 directly
0x11	Open the Select Profile screen
0x12	Open the Select Input screen
0x13	Open the Settings screen
0x14	Select the S/PDIF coaxial input directly
0x15	Select the S/PDIF optical input directly
0x16	Select the USB input directly
0x17	Display brightness up one step
0x18	Display brightness down one step

Note that in standby the unit only responds to the Standby command; every other command is ignored until the unit is awake.

Standby

Press and hold the rotary encoder, or press the power button on the remote, to enter the low-power standby mode. The display is turned off and audio output is stopped.

To wake the unit from standby, press the rotary encoder button or the power button on the remote control.

Connecting to DSPconfig

DSPconfig runs on Windows, macOS and Linux, and is a free download from the Downloads page. Once installed, it will automatically detect any DSPs connected via the supplied USB cable.

Getting Started with DSPconfig walks through designing a profile and sending it to the unit, and there is also the DSPconfig Reference.

Updating firmware

Firmware updates are delivered through DSPconfig, from the Device > Firmware menu. DSPconfig will tell you when the connected unit has an update available.

Whilst the update runs the unit shows:

```
Upgrading firmware...
Do not power off your device
```

The unit will restart itself as soon as the update has been completed.

DSPconfig will only update firmware over a high speed USB connection. If it reports a slower connection, try a different cable or USB port, and connect the unit directly rather than through a hub.

If an update is interrupted, for example by closing DSPconfig or unplugging the cable, the unit keeps running its previous firmware and shows:

```
Upgrade interrupted
Retry from PC, do not power off
```

Leave the unit powered and reconnect it to DSPconfig, which will offer to retry. Until an update completes, the overview screen shows "Upgrade needed". Interrupted updates are handled this way from firmware 1.9.

Specifications

Digital inputs	1 x USB audio (UAC2), 1 x S/PDIF coaxial, 1 x S/PDIF optical (all up to 192kHz / 24-bit)
Analogue outputs	8 x RCA single-ended, 8 x XLR balanced
Digital outputs	1 x S/PDIF coaxial, 1 x S/PDIF optical (both up to 192kHz / 24-bit)
Full-scale output	2.00 V to 2.50 V single-ended, 4.0 V to 5.0 V balanced, in eleven increments
Processing rate	96kHz or 192kHz (configurable per profile)
Profiles	4
Dimensions	330 x 180 x 70 mm (W x D x H)
Weight	1.55 kg net, 2.2 kg gross
Power	15 V DC, from the supplied external 22.5 W universal AC adapter
Control	DSPconfig for Windows, macOS and Linux; infrared remote
Compliance	CE, UKCA, FCC Part 15 Class B

The number of filters and the amount of delay a profile can hold depend on the sampling rate and can be found in the Capacities section of the DSPconfig Reference.

Troubleshooting

The unit clicks when I switch it on

Normal behaviour - every output relay is pulsed and settled at each start-up.

No sound at all, and the Mute key does nothing

The unit holds itself muted, and ignores the Mute key, if the loaded profile could not be read.

This may happen if the USB cable is removed whilst a profile was being uploaded. Re-saving the profile from DSPconfig recovers it.

No sound from one channel, or from the RCA sockets but not the XLRs
Each analogue output channel is individually configurable to output over either RCA or XLR; not both. Check that channel's output setting in DSPconfig is configured correctly for your system, and that the correct profile is selected on the unit once it has been saved.

No sound from the analogue outputs, and the display shows Digital Out
The loaded profile sends its audio to the S/PDIF output. Change profile, or change that profile's output in DSPconfig.

The volume control does nothing, and the display shows Fixed
The unit is in fixed volume mode, which holds the DAC at full scale and disables the volume controls. This setting can be changed in DSPconfig.

The rotary encoder only seems to work every other press
When the display has timed out, the first press wakes it and does nothing else.

The display goes dark on its own
That is the display timeout, in Settings. Set it to Never if you would rather it stayed on.

The remote does nothing whilst the unit is in standby
In standby, the unit only responds to the power key on the remote or a press of the rotary encoder.

The display shows DSP Boot Failed
The DSP did not start for some reason - connect the unit to DSPconfig for more information and contact us.

The display shows Upgrade interrupted, or Upgrade needed
A firmware update did not finish. Leave the unit powered, connect it to DSPconfig and retry the update when offered.

The display shows Recovery Mode
The unit was switched on with the rotary encoder held down, which puts it into a mode for recovering from a failed update. No profile is loaded and no audio is processed, but DSPconfig can reach the unit and write firmware to it.

Still not right
If none of the above matches what you are seeing, get in touch and tell us the model, the firmware version (shown in DSPconfig's Device menu), what you did and what happened.

Warranty and support

Every unit is guaranteed for 24 months from the date of delivery. If it fails in that time through a defect in materials or workmanship, we will repair or replace it and pay the carriage both ways. If repair or replacement is not possible, we will refund your order.

The guarantee stays with the unit rather than the original buyer. If you bought your DSP-8C second-hand, you have whatever is left of its 24 months, and you do not need the original receipt to claim.

The guarantee is in addition to your legal rights.

The full terms, including what the guarantee does not cover and how cancellations and refunds work, are published at colinear-acoustics.co.uk/terms-of-use.

If something is wrong

Please read Troubleshooting first.

If you are still stuck or require further assistance, please email support@colinear-acoustics.co.uk with:

- The model (DSP-8C) and the serial number, which can be found on the round QR sticker on the rear panel beside the power switch
- The firmware version, from DSPconfig's Device menu
- What the unit is doing, and what you were doing when it started

Most issues can be answered remotely via email, but, in the rare case that you need to return the unit to us, we will provide you full instructions for how to carry out the RMA process.

Safety and compliance

The DSP-8C runs off extra-low voltage (15V), with the mains supply handled by the included external AC adapter. The AC adapter carries its own approvals for the region it is shipped to.

Please use the adapter supplied with the unit. If you ever need a replacement, contact us rather than substituting one, so that the unit stays within the conditions it was tested under.

Our hardware carries the CE mark for the European Economic Area and the UKCA mark for Great Britain. Either mark is now accepted in the UK, as recognition of CE marking for the EMC and low voltage regimes was extended indefinitely in October 2024.

For the United States, the product is declared under FCC Part 15, Subpart B, as a Class B digital device. It contains no radio transmitter. The supplied remote control is infrared, which is outside the scope of radio equipment regulation everywhere we ship.

A Declaration of Conformity listing the directives and standards applied is available on request.

Disposal

Electrical and electronic equipment should not be put in with general household waste at the end of its life. Please take it to a local collection point for waste electrical and electronic equipment, or contact us and we will arrange to take it back and dispose of it properly.

The remote control contains a battery. Remove it before disposing of the remote and take it to a battery collection point; most supermarkets and hardware shops have one.