Datasheet DAC2 ADC Pro

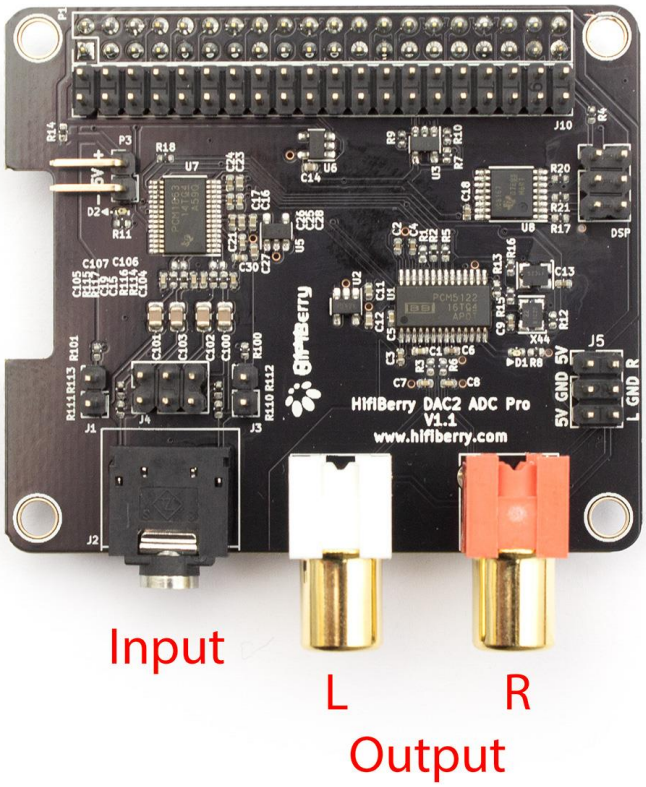
Overview

The HiFiBerry DAC2 ADC Pro is a high-resolution digital-to-analogue and analogue-to-digital converter for the Raspberry Pi (newer models with 40 pin GPIO connector). This is a special sound card for the Raspberry Pi, optimised for one specific use case: the best audio playback and recording quality. It is specifically designed for applications that do not only need playback, but also recording functionalities.

Facts

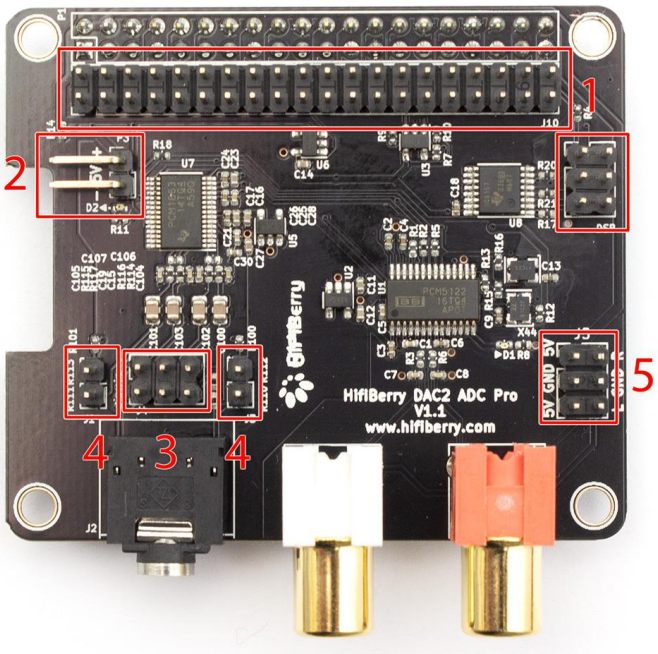
- Stereo input and output
- Dedicated 192kHz/24bit high-quality Burr-Brown DAC
- Dedicated 192kHz/24bit high-quality Burr-Brown ADC
- Hardware volume control for DAC and ADC. You can control the input and output parameters using “alsamixer” or any application that supports ALSA mixer controls.
- Support for the HiFiBerry DSP add-on
- Connects directly to the Raspberry Pi, no additional cables needed
- No soldering, comes as a pre-fabricated kit. You just plug it onto the Raspberry Pi, it is conform to the Raspberry Pi hardware-attached-on-top (HAT) specification.
- Compatible with all Raspberry Pi models with a 40-pin GPIO connector
- Directly powered from the Raspberry Pi, no additional power supply
- Three ultra-low-noise linear voltage regulators for optimal audio performance
- Low-jitter dual-domain clock for optimised clock decoupling from the Raspberry Pi
- Mic bias voltage for the use with electret microphones
- No anti-aliasing filter in the input path for best recording bandwidth
- HAT compliant, EEPROM for automatic configuration
- Gold plated RCA output connectors
- Comes with all components required to mount it. We include 4 M2.5x12mm spacers to fix the board onto the Raspberry Pi

Hardware



Note that the actual board might look a bit different. Layout and components might change without further notice. We do not guarantee a specific PCB layout or specific components.

Connectors and Jumpers



1	DSP header
2	5V from the Pi
3	Balanced/unbalanced input connector
4	Microphone bias jumper (you need to close both jumpers to provide a microphone bias voltage)
5	Analog output

Balanced/un-balanced input connector J4

This 6-pin connector can be used to connect a balanced input (e.g. XLR or 6.5mm jacks). Pin 1 is on the left bottom corner.

in R-	1	2	in R+
GND	3	4	GND
in L+	5	6	in L-

Output connector J5

This connector can be used to connect to external components, e.g. an amplifier. The output is connected in parallel to the RCA jacks. Pin 1 is on the top left.

+5V	1	2	R
GND	3	4	GND
+5V	5	6	L

Specifications

Maximum input voltage	2.1Vrms	4.2Vrms for balanced input
Maximum output voltage	2.1Vrms	
ADC signal-to-noise ratio	110db	typical
DAC signal-to-noise ratio	112db	typical
ADC THD+N	-90db	typical
DAC THD+N	-93db	typical
Frequency response	10Hz-70kHz	(-3dB)
Input gain	-12db to 32dB	

Power consumption	<0.3W	
Sample rates	44.1-192kHz	

Configuration

Overlay for config.txt:
dtoverlay=hifiberry-dacplusadcpro

Mixer controls

Name	Function	Comments
ADC Left Input	Selects the input for the left channel	For on-board (unbalanced) input use VINL1[SE] for balanced input use {VIN1P, VIN1M}[DIFF]
ADC Right Input	Selects the input for the right channel	For on-board (unbalanced) input use VINR1[SE] for balanced input use {VIN2P, VIN2M}[DIFF]
ADC Mic Bias	Enables/disables microphone bias voltage	Default: 'Mic Bias off', only set to 'Mic Bias on' if your microphone requires a bias voltage.
ADC	Configures the input gain of the analogue input	Use low gains for line-level sources like CD players or similar and high gains for inputs like microphones
Digital	Main output volume control	This will control the volume of the analogue output

Example: Configure input for balanced input and maximum input gain (e.g. to connect a dynamic microphone)
amixer sset "ADC Mic Bias" "Mic Bias off"
amixer sset "ADC Left Input" "{VIN1P, VIN1M}[DIFF]"
amixer sset "ADC Right Input" "{VIN2P, VIN2M}[DIFF]"
amixer sset ADC 40db

Example: Configure input for onboard input with low gain (e.g. to connect a CD player or similar)
amixer sset "ADC Mic Bias" "Mic Bias off"
amixer sset "ADC Left Input" "VINL1[SE]"
amixer sset "ADC Right Input" "VINL1[SE]"
amixer sset ADC 40db

While there are lots of other ALSA mixer control, most of these access internals of the DAC and ADC chips on the board and should not be changed.