

MIRAND Discrete Preamp V1.0 manual.

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General description

The Preamp V1.0 is made as a companion for the AK4490 USB DAC or as a standalone. The Preamp needs the Mirand OLED Frontpanel to work and a supply like XP power SMPS ECL30UT03.

The module is completely discrete and all stages runs in Class A. The Attenuator is built around a DAC8812 which is an R2R 4Q Multiplying DAC with channel to channel match of 1%.

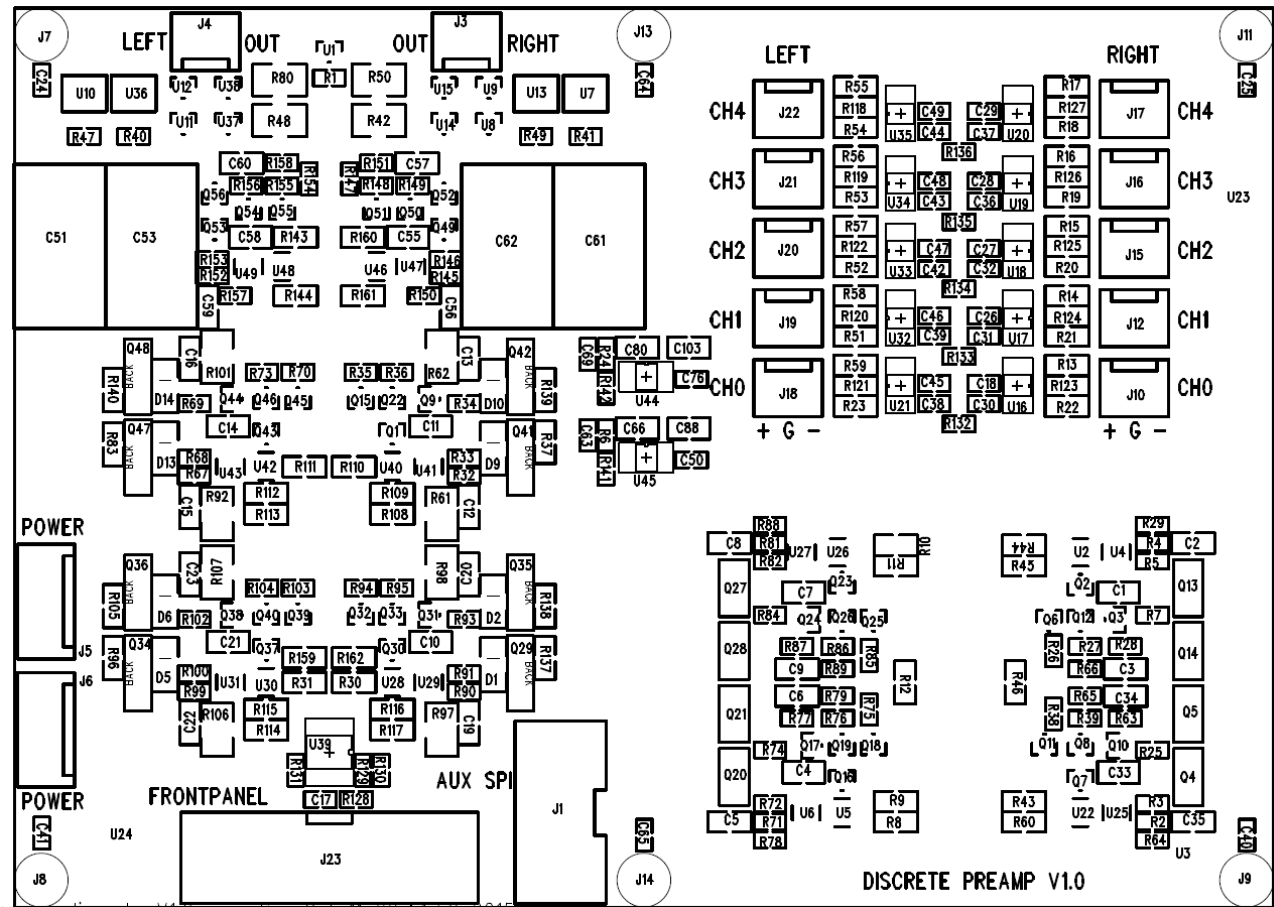
Just some fun facts about the R2R attenuator using the DAC8812: SIM Audio calls it M-eVol2 with phenomenal 530 steps.

Well..... we have decided 0.5dB steps was just fine, but if anyone thinks it is not enough we would be happy to change it to 0.25dB step... Matter of Firmware upgrade.....

Key specifications

- Supply voltage : +/-15VDC,+5.5VDC
- DC offset: <20mV dc.
- Discrete Servo.
- Single ended and balanced input and output.
- Attenuator -120dB to +6dB
- Attenuator build around DAC8812 with Discrete opamps.
- All 10 opamps are discrete running in class A.
- Input impedance : 10K Ohm
- Output impedance is 10 Ohm
- Discrete SSR for transparent mute circuit.
- CMOS switches for transparent input switching
- Controlled by Mirand Audio frontpanel.
- Size (WxLxH): 140x100x20mm (With molex connector)

Layout:



Discrete Preamp V1.0

Power rerouting connector for AK4490 DAC.

PIN	Function	Description	Type
J5-1	+5.5V	Digital power supply	Input
J5-2	Digital GND	Digital GND for DAC	Input
J5-3	+15V	Analog supply	Input
J5-4	Analog GND	Analog GND for DAC	Input
J5-5	-15V	Analog supply	Input

Table 1: Power input connector Specification

The short jumper cable is to connect between J5 on the discrete output stage and J7 on the DAC mainboard.

Power input for Preamp and for AK4490 DAC

PIN	Function	Description	Type
J5-1	+5.5V	Digital power supply	Input
J5-2	Digital GND	Digital GND for DAC	Input
J5-3	+15V	Analog supply	Input
J5-4	Analog GND	Analog GND for DAC	Input
J5-5	-15V	Analog supply	Input

PIN	Function	Description	Type
J6-1	+5.5V	Digital power supply	Input
J6-2	Digital GND	Digital GND for DAC	Input
J6-3	+15V	Analog supply	Input
J6-4	Analog GND	Analog GND for DAC	Input
J6-5	-15V	Analog supply	Input

Table 2: Power input connector Specification

Frontpanel connector.

PIN	Function	Description	Type
J23-1	CH0	Channel select 0	Input
J23-2	CH1	Channel select 1	Input
J23-3	CH2	Channel select 2	Input
J23-4	CH3	Channel select 3	Input
J23-5	CH4	Channel select 4	Input
J23-6	MUTE_OUT	MUTE_OUT = 0V	Input
J23-7	LDAC	R2R Attenuator control	Input
J23-8	RS	R2R Attenuator control	Input
J23-9	GPIO8	GPIO	Input
J23-10	GPIO9	GPIO	Input
J23-11	GPIO10	GPIO	Input
J23-12	+5.5V	Digital power supply	Input
J23-13	+5.5V	Digital power supply	Input
J23-14	+3V	Digital power supply	Input
J23-15	MISO	-	Input
J23-16	MOSI	-	Input
J23-17	SCK	-	Input
J23-18	CS	-	Input
J23-19	GND	Digital power supply	Input
J23-20	GND	Digital power supply	Input

Table 3: Frontpanel Ribbon cable connector

AUX SPI connector.

PIN	Function	Description	Type
J1-1	+3V	Digital power supply	Input
J1-2	GPIO9	GPIO	Input
J1-3	GPIO10	GPIO	Input
J1-4	GPIO8	GPIO	Input
J1-5	GND	Digital power supply	Input
J1-6	SCK	-	Input
J1-7	GND	Digital power supply	Input
J1-8	MOSI	-	Input
J1-9	GND	Digital power supply	Input
J1-10	MISO	-	Input

Table 4: AUX SPI connector

DIFF Output Right.

PIN	Function	Description	Type
J3-1	Right output+	Right output positive	Output
J3-2	Signal GND	DIFF Signal GND	Output
J3-3	Right output-	Right output negative	Output

Table 5: DIFF output right

DIFF Output Left.

PIN	Function	Description	Type
J4-1	Left output+	Left output positive	Output
J4-2	Signal GND	DIFF Signal GND	Output
J4-3	Left output-	Left output negative	Output

Table 6: DIFF output left

CHO Input.

PIN	Function	Description	Type
J10-1	IN+	RIGHT	Input
J10-2	GND	RIGHT	Input
J10-3	IN-	RIGHT	Input
J18-1	IN+	LEFT	Input
J18-2	GND	LEFT	Input
J18-3	IN-	LEFT	Input

CH1 Input.

PIN	Function	Description	Type
J12-1	IN+	RIGHT	Input
J12-2	GND	RIGHT	Input
J12-3	IN-	RIGHT	Input
J19-1	IN+	LEFT	Input
J19-2	GND	LEFT	Input
J19-3	IN-	LEFT	Input

CH2 Input.

PIN	Function	Description	Type
J15-1	IN+	RIGHT	Input
J15-2	GND	RIGHT	Input
J15-3	IN-	RIGHT	Input
J20-1	IN+	LEFT	Input
J20-2	GND	LEFT	Input
J20-3	IN-	LEFT	Input

CH3 Input.

PIN	Function	Description	Type
J16-1	IN+	RIGHT	Input
J16-2	GND	RIGHT	Input
J16-3	IN-	RIGHT	Input
J21-1	IN+	LEFT	Input
J21-2	GND	LEFT	Input
J21-3	IN-	LEFT	Input

CH4 Input.

PIN	Function	Description	Type
J17-1	IN+	RIGHT	Input
J17-2	GND	RIGHT	Input
J17-3	IN-	RIGHT	Input
J12-1	IN+	LEFT	Input
J12-2	GND	LEFT	Input
J12-3	IN-	LEFT	Input

Cabling notes.

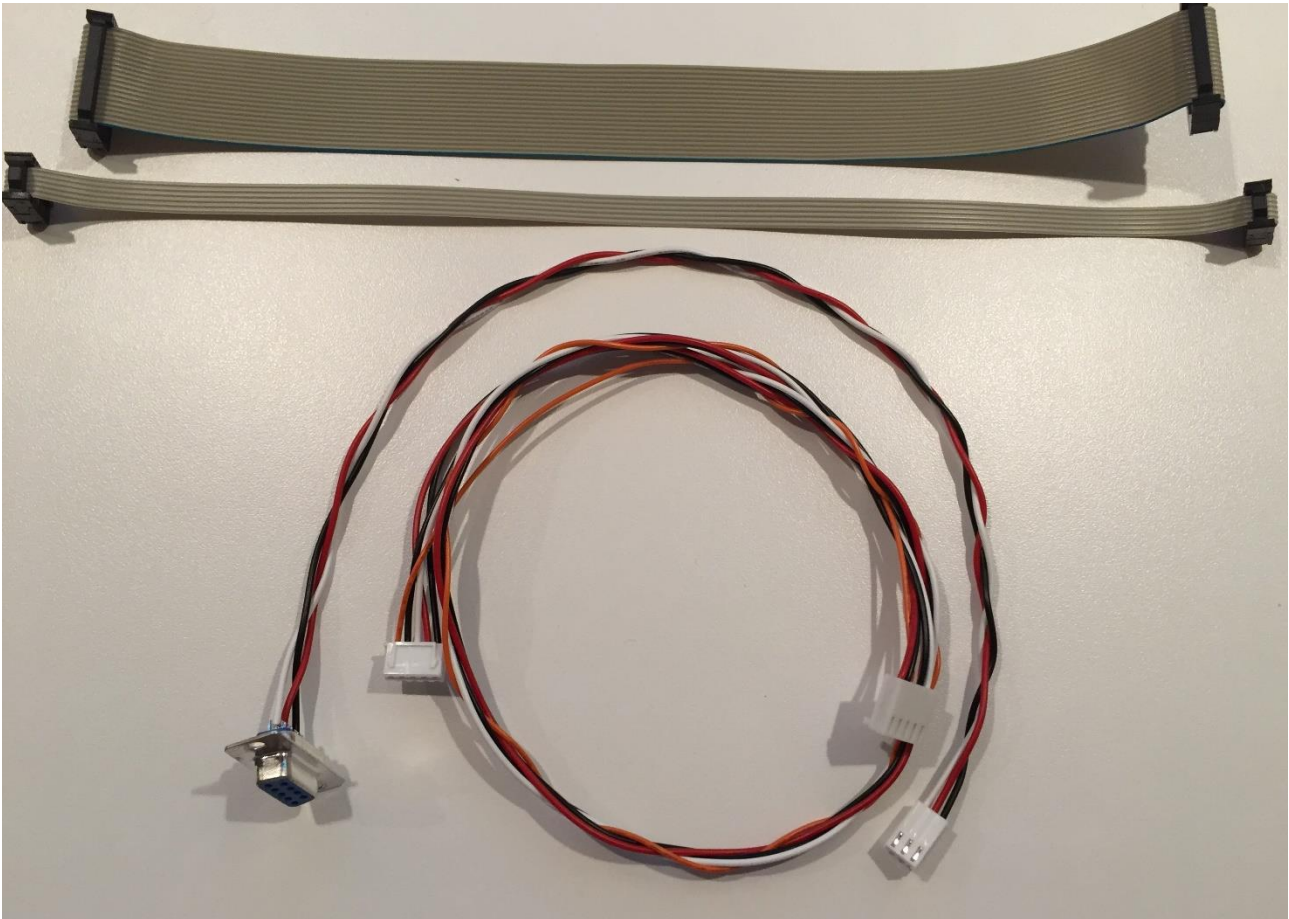
Always use shielded or at least twist the cables to reduce coupling as much as possible between the wires.
Use up to 22AWG wire

Remember pin 1 on connector is the square pad on the PCB.

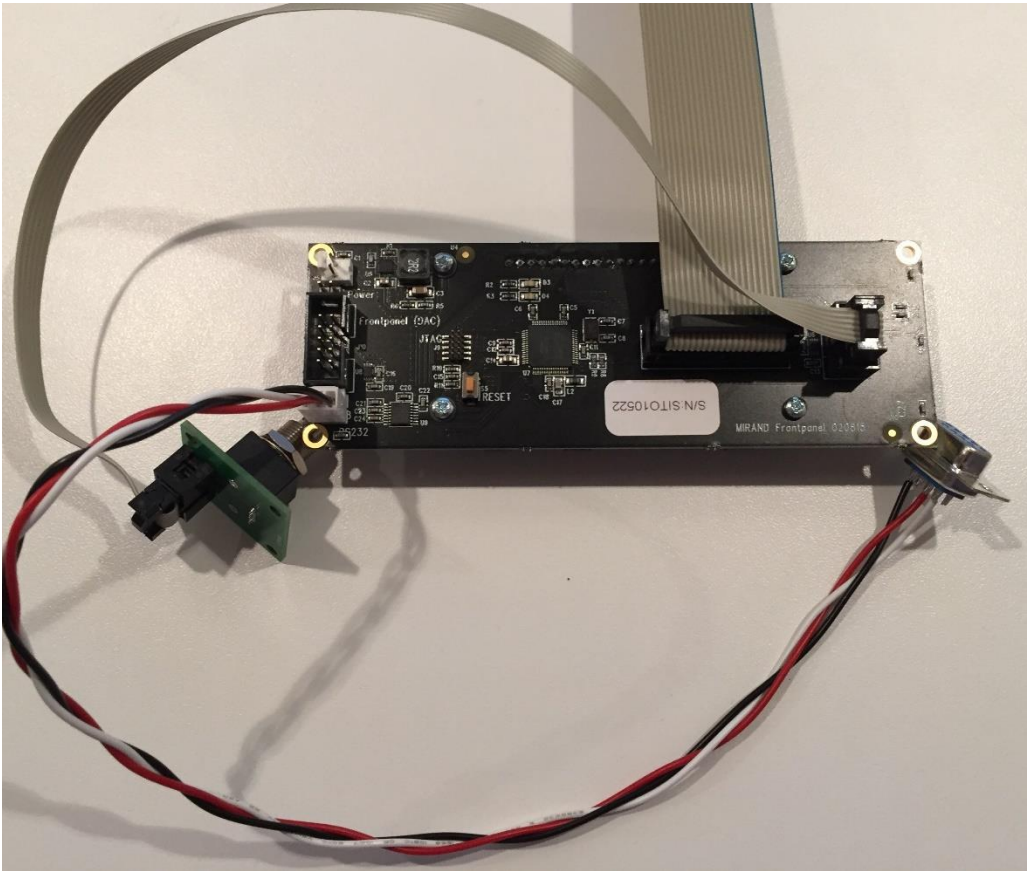
Basic cable set to get the preamp.

The cable kit shown below is part of the kit. It consist of:

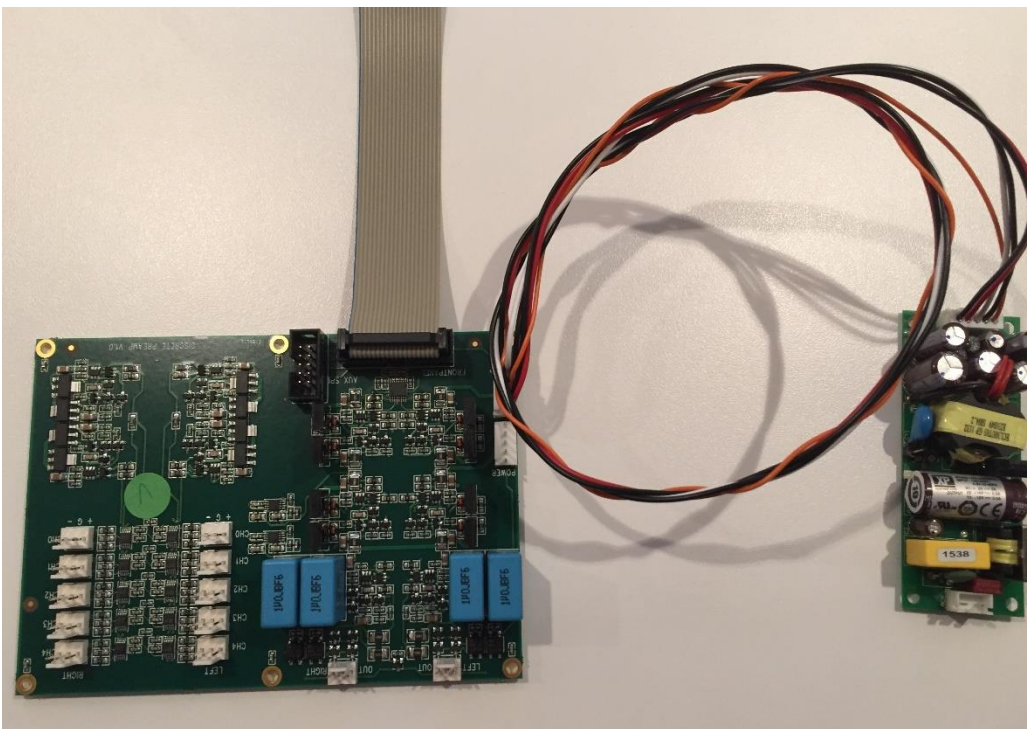
- 20 pol ribbon cable for Preamp to frontpanel GPIO connector
- 6 pol ribbon cable for frontpanel encoder connector to encoder
- RS232 cable for firmware upgrade
- Power cable to connect to J5 or J6 on Preamp board. The shown cable fits the ECL30UT03 powersupply from XP power.



Connecting the Front panel cables are very simple. There is not cable position that does not fit correctly. On the picture below it can be seen how to connect the cables to the front panel.



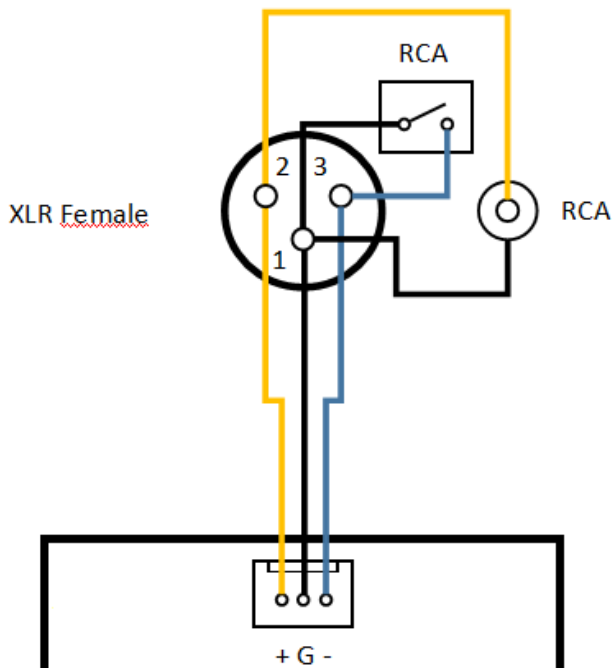
The Preamp board is just as easy as to connect the front panel:



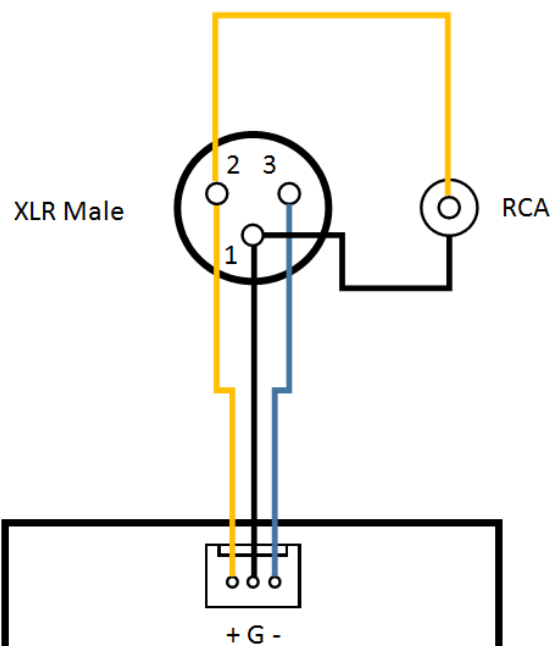
Cabling the inputs and outputs.

Connecting the inputs does need a little wiring. In general it is good to use a cable with an shield and two wires for carrying the + and – signal. And good alternative to this is twist/weave the 3 wires.

The picture below shows how to connect a female XLR connector and an RCA connector in parallel making Single ended and balanced input possible:



In the case of the outputs it is very similar. The XLR connector is a Male and the RCA switch is removed.



Ordering information

Part number: Mirand Discrete Preamp V1.0

Contact information

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