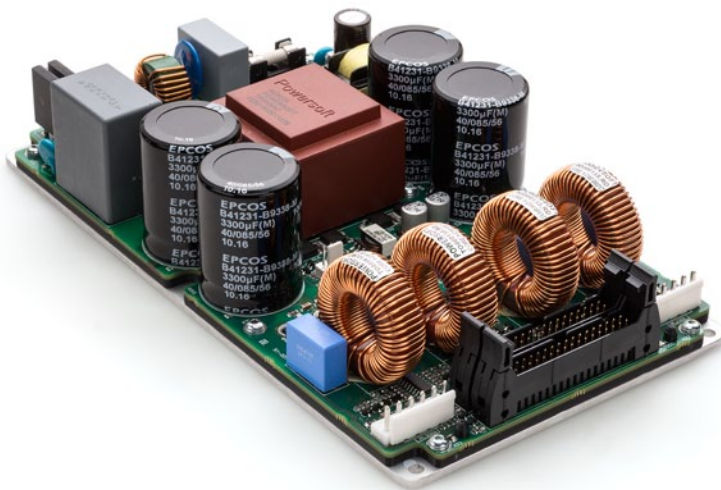


LiteMod4HC + DSP-Lite



Evaluation kit user guide

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1. Introduction	4
1.1 Purpose of this guide	4
1.2 Content of the Kit	4
2 Application Examples	5
2.1 3way line array	5
2.2 2way speaker	5
2.3 Subwoofer	5
2.4 2 channels rack amplifier	5
3. Assembling the evaluation kit	6
3.1 Mechanical	6
3.2 Assembling the DSP-Lite	6
3.3 Electrical	8
3.4 DSP-Lite to LiteMod4HC connection	8
3.5 Amplifier Power Output connection	9
3.6 LiteMod4HC Optional Fan connection	9
4. Testing the kit	9
4.1 Choosing the configuration	9
4.2 Connecting Power Output Cables	10
4.3 DSP-Lite presets structure description	11
4.4 DSP-Lite Standalone Operation	12
4.5 LEDs chart	12
4.6 Power Management (Idle/Standby mode)	13
4.7 DSP-Lite online control via ArmoniaProAudioSuite	13
4.8 Installing the software	13
4.9 Connecting the DSP-Lite to ArmoniaProAudioSuite	13
4.10 Accessing DSP-Lite Processing and Control	14
4.11 General Tab	14
4.12 Some important notes about meters:	14
4.13 Scheme Tab	15
4.14 Input EQ	15
4.15 Output EQs/Xovers	15
4.16 Limiters	16
4.17 Onboard preset selection	16
4.18 Preset export/Onboard storing	16
5. Appendices	17
5.1 LiteMod4HC Pinout	17
5.2 LiteMod4HC PL1000/PL3000 (IDC 34poles) Pinout Description	18
5.3 LiteMod4HC Power Output Cables Diagrams	22
5.4 Fuse Replacement Notes	22



WE RECOMMEND THAT ALL OPERATIONS ARE CARRIED OUT BY A TECHNICIAN IN THE MANNER DESCRIBED IN THIS GUIDE.

IF NOT EXPLICITLY STATED OTHERWISE, DISCONNECT THE AMPLIFIER FROM THE MAINS BEFORE OPERATING THE AMPLIFIER.

WARNING! INTERNAL CAPACITORS BANK COULD BE CHARGED AND HARMFUL: TAKE CARE OF COMPLETELY DISCHARGE INTERNAL CAPACITORS BANK BEFORE HANDLING THE DEVICE

This technical document aims to be a support guide in evaluating the LiteMod 4HC power amplifier modules.

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These documents are confidential and reserved and may not be disclosed, reproduced and shared with third persons or used without the express written permission from Powersoft S.p.A. Data are subject to change without notice.

1. Introduction

1.1 Purpose of this guide

This guide contains instructions and general information necessary to test and evaluate the new LiteMod4HC amplifier platform along with DSP-Lite, our USB-programmable audio processor.

This guide covers the few steps needed to get to evaluate the amplifier performance straight out of the box.

1.2 Content of the Kit

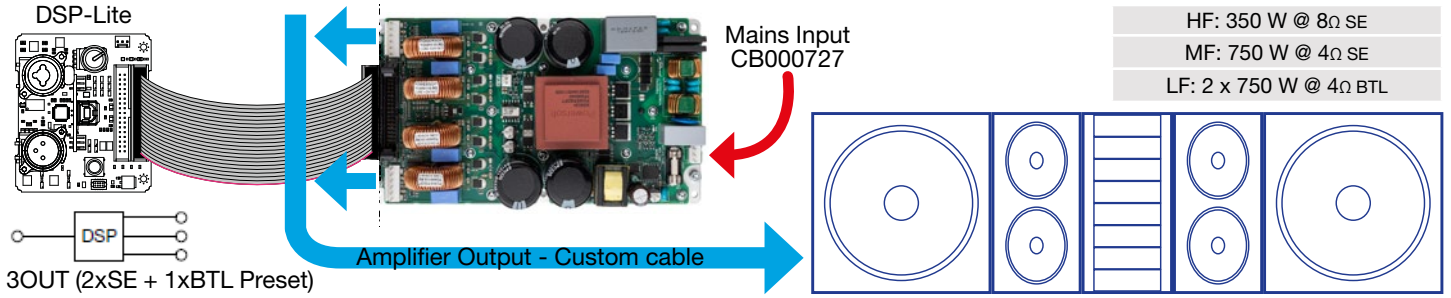
LiteMod4HC evaluation kit is composed by:

- 1x LiteMod4HC sample (PF000349.RD)
- 1x DSP-Lite (preinitialised, ordering code DSPL0001)
- 1x Heatsink Medium (ordering code HS000M01)
- 1x DSP-Lite + Heatsink Medium mounting kit (ordering code KTDSPL01)
- 1x LiteMod4HC Mains Cable sample (CB000727.00)
- 2x LiteMod4HC Single Ended Output NL4 adaptor (CB000731.00)
- 1x LiteMod4HC Bridged Tied Load Output NL4 adaptor (CB000730.00)
- 1x LiteMod4HC Parallel Mode Output NL4 adaptor (CB000733.00)
- 1x LiteMod4HC Parallel/Bridget Tied Load NL4 adaptor (CB0007732.00)

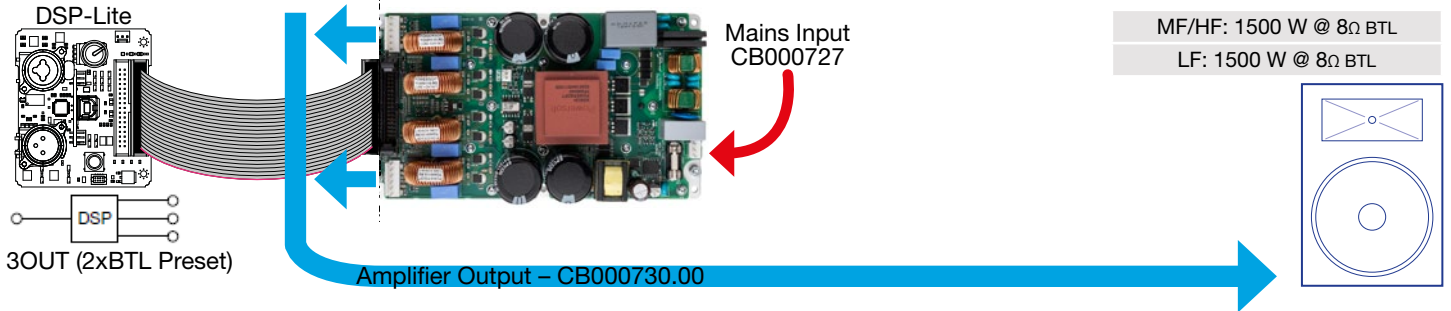
2. Application Examples

Following are some configuration examples, ready to test with this evaluation kit. Examples do not cover all possible applications, please contact us for support selecting the ideal solution for your specific needs. Power ratings could vary depending on acoustic design and speaker specifications.

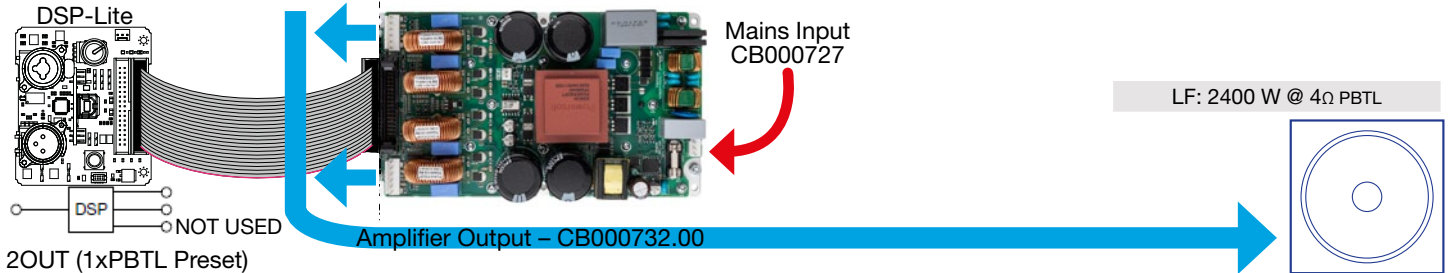
2.1 3way line array



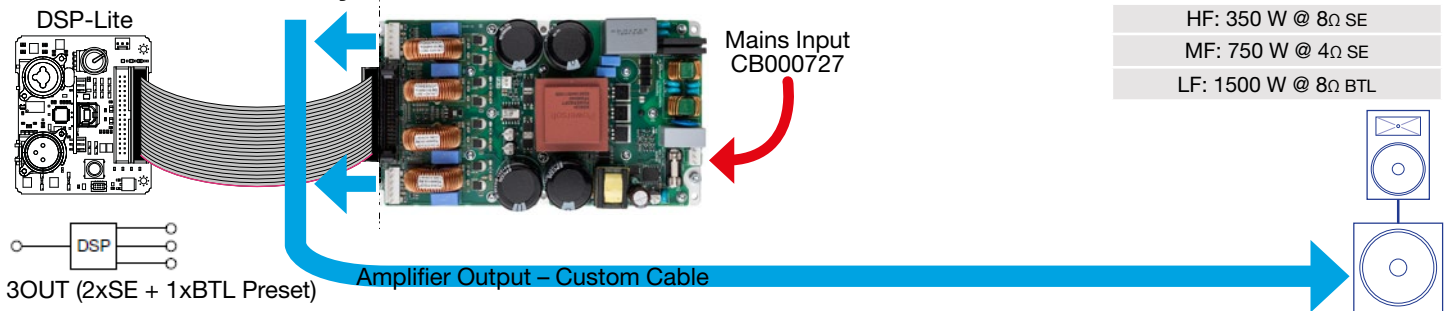
2.2 2way speaker



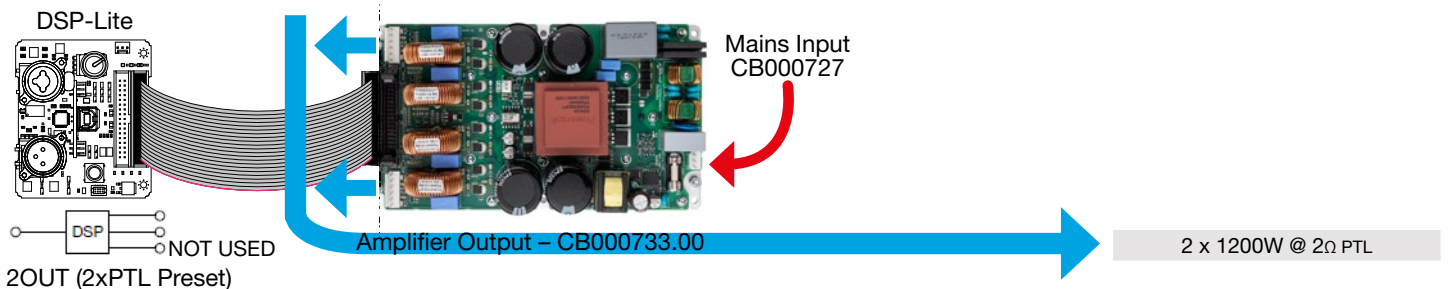
2.3 Subwoofer



2.4 Subwoofer + 2way satellite



2.5 2 channels rack amplifier



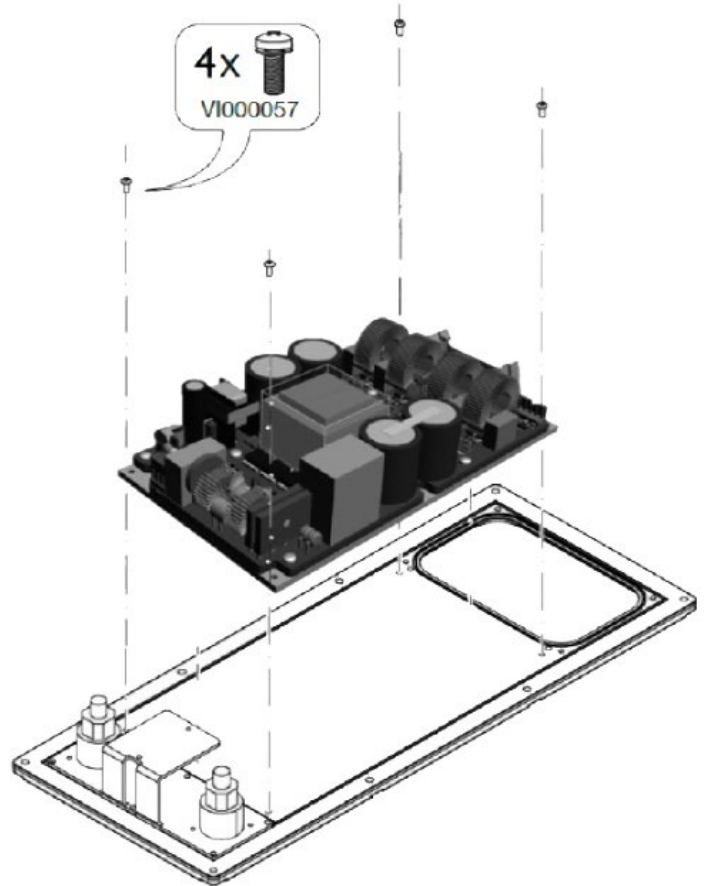
3. Assembling the evaluation kit

Please refer to the following steps to assemble the evaluation kit

3.1 Mechanical

Amplifier + Heatsink

Required tools: Phillips PH0 Screwdriver



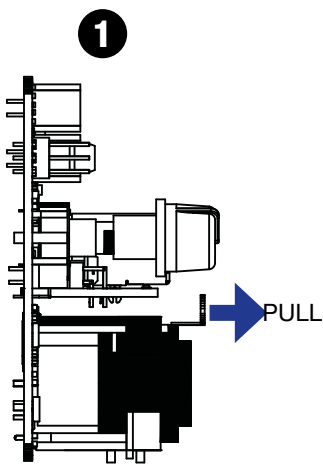
3.2 Assembling the DSP-Lite

Required tools:

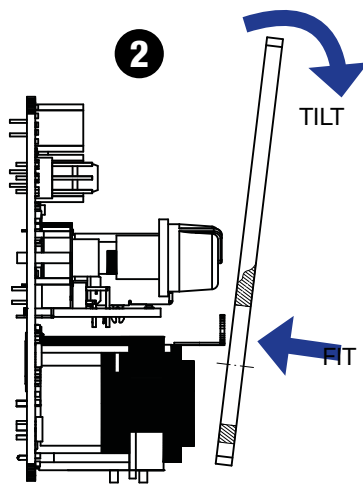
Phillips PH0 Screwdriver

M2 Allen Key

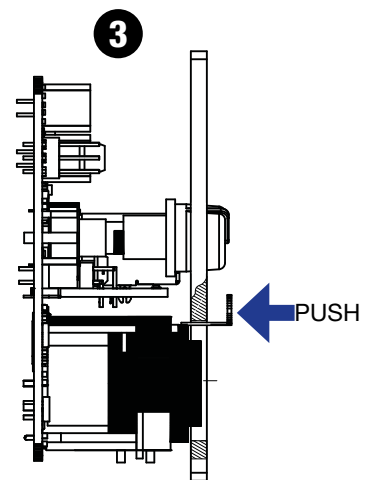
M5 Socket Wrench/Screwdriver



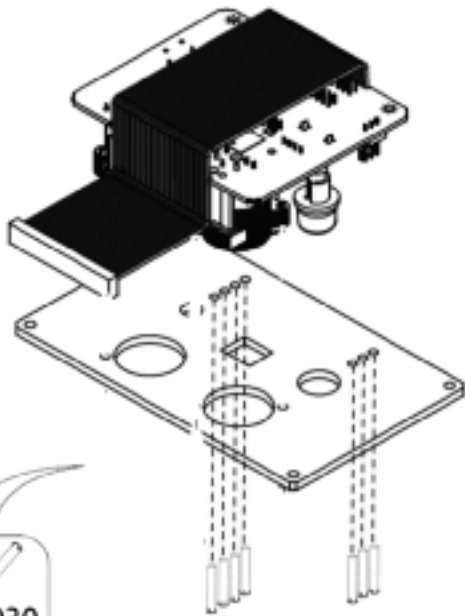
Pull out the locking spline.



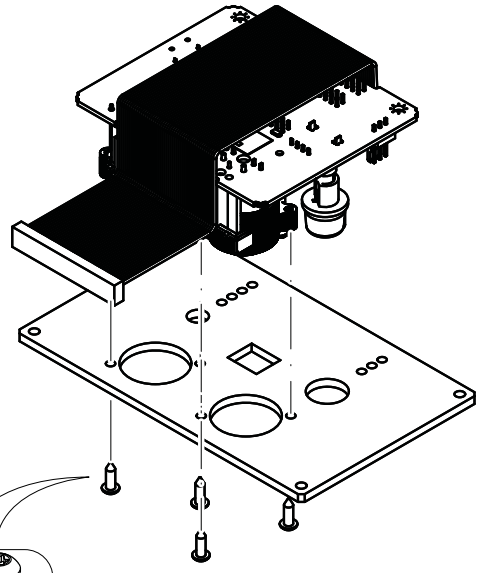
Tilt the mounting plate, pass the locking spline through its hole and fit the plate to the DSP board.




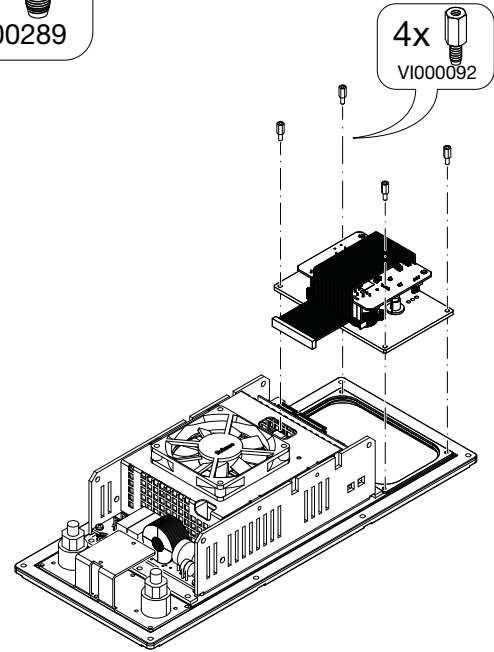
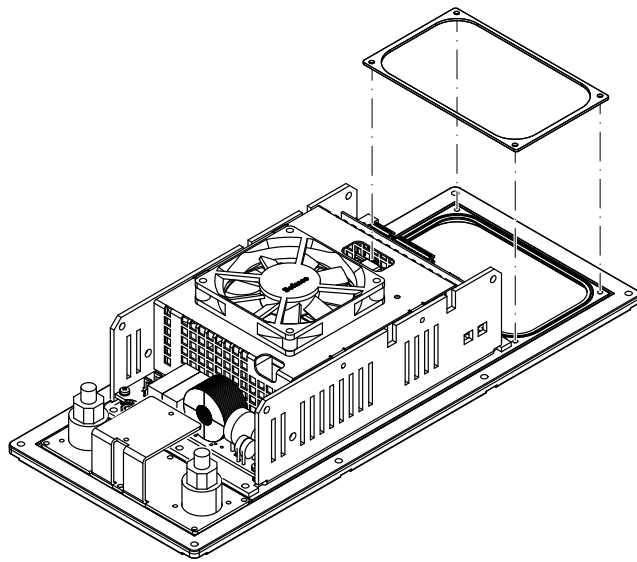
Push the locking spline in its normal position and attach the plate to the DSP board.




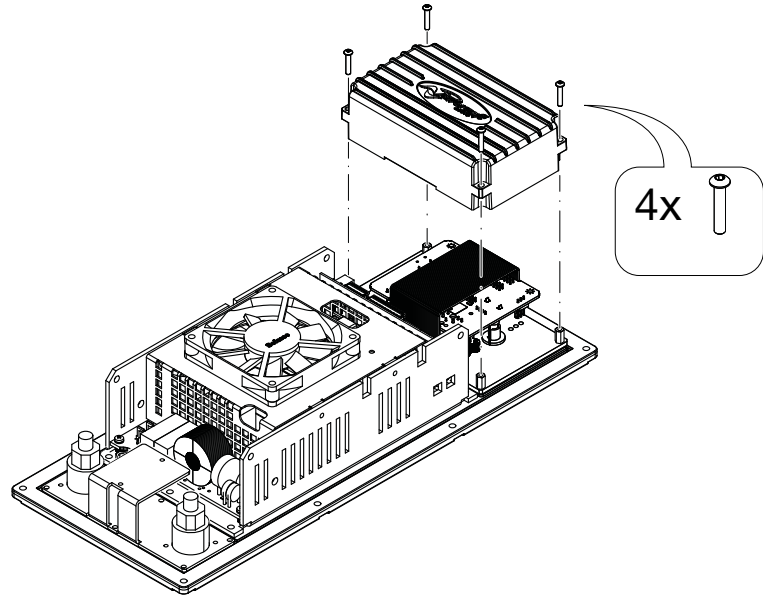
7 X 
ME001030




4x 
VI000289



4x 
VI000092



4x 

3.3 Electrical

Mains Cable Connection

Required tools:

Phillips PH0 Screwdriver

M7 Socket Wrench/Screwdriver

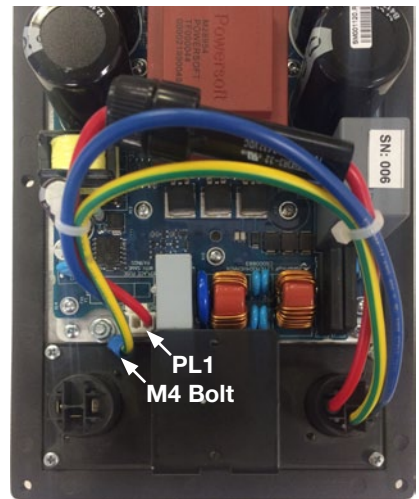
Disconnect the female "blue" PowerCon connector and unscrew it from the Heatsink



Replace the female PowerCon connector with LiteMod4HC Mains Cable (CB000727) and screw it to the Heatsink.

Once CB000727 is in place, connect it to PL1 on LiteMod4HC.

Fasten the Earth cable to the LiteMod4HC Grounding screw with the M4 bolt included.



INDEX

3.4 DSP-Lite to LiteMod4HC connection

2x 34poles IDC ribbon cables (included) shall be used for DSP-Lite to LiteMod4HC connection, as shown in the following table:

DSP-Lite connector ref.	Connected to	LiteMod4HC connector ref.
PL2	→	PL1000
PL3	→	PL3000

DSP-Lite to LiteMod4HC connection should look like in the picture.



3.5 Amplifier Power Output connection

LiteMod4HC outputs can be configured for different operating modes such as Single Ended(SE) /Bridge Tied Load(BTL) /Parallel Tied Load(PTL) /PBTL(Parallel+Bridge Tied Load).

Different operating modes are obtained by feeding the correct audio input channel and also connecting the transducers to specific pins on the amplifier output sockets PL1001/PL3001.

(Mating Housing: JST VHR-6N Mating Terminals: JST SVH-41T-P1.1)

NOTE! A set of pre-assembled JST-NL4 adaptors is included in the kit.

Please refer to paragraph 3 for more details about cables and configurations available for testing within the evaluation kit provided.

Should you want to use your own DSP/Processor for testing, please refer to paragraph 4.2 “LiteMod4HC Power Output Cables Diagrams”

NOTE! Parallel Mode operation is selected by shorting pin 5 and 6 on either PL1001/PL3001. (Output cables included in this kit for parallel mode test does already include this shorting jumper!)

IMPORTANT! Always switch off the amplifier when changing operating mode (SE /BTL /PTL /PBTL). That is, always connect the Power Output Cables prior to switch on the Amplifier. Also, make sure the amplifier is OFF before unplugging the Power Output cables.

3.6 LiteMod4HC Optional Fan connection

LiteMod4HC support an external DC Fan (12Vdc, 200mA max) connected to PL2. The Fan is automatically switched on when temperature/output power rise above a set threshold.

4. Testing the kit

4.1 Choosing the configuration

LiteMod4HC is a powerful, versatile, four channel amplifier platform configurable for Parallel/Standard mode operation.

This evaluation kit including DSP-Lite allows you to test the following configurations:

1IN, 2xSE + 1xBTL OUT

1IN, 2x BTL OUT

1IN, 2x PTL OUT

1IN, 1x PBTL OUT

NOTE! The DSP-Lite sample included in this evaluation kit is preconfigured and support the above operating modes only, please consider it a “beta release”. Full DSP-Lite support for LiteMod4HC is under development.

IMPORTANT! DO NOT try to initialise the DSP with Armonia ProManager, as DSP-Lite + LiteMod4HC init parameters are not available for ProManager yet.

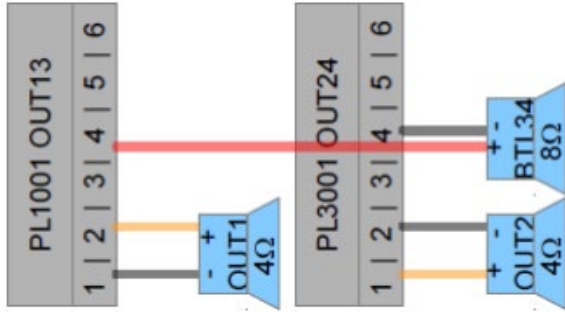
To help you set up the right configuration to test, please find a compatibility chart, relating DSP-Lite preset to amplifier configuration, needed Power Output Cable and power ratings

Configuration	I/O Channel Count	DSP-Lite Onboard Preset Slot	Power Output Cable Code	Power Ratings
1IN, 2x SE+1x BTL OUT	1IN – 3OUT	1- (2xSE+1xBTL_or_2xBTL)	Not Included (Custom Cable, see diagram below)	2x 750W@4Ω SE 1x 1500W@8Ω BTL
1IN, 2x BTL OUT	1IN – 2OUT	1- (2xSE+1xBTL_or_2xBTL)	CB000730	2x 1500W@8Ω BTL
1IN, 2x PTL OUT	1IN – 2OUT	2- (2xPTL_or_1xPBTL)	CB000733	2x 1200W@2Ω PTL
1IN, 1x PBTL OUT	1IN – 1OUT	2- (2xPTL_or_1xPBTL)	CB000732	1x 2400W@4Ω PBTL

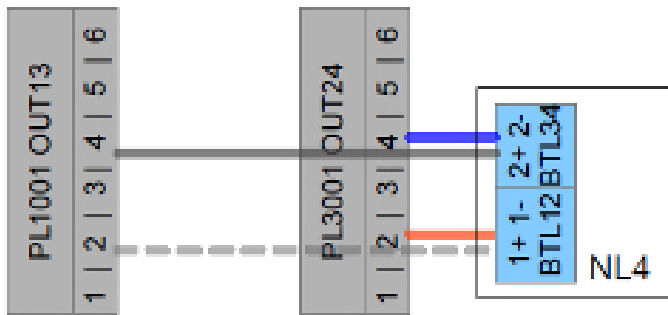
4.2 Connecting Power Output Cables

Please refer to the following diagrams to properly connect the Power Output cables for the chosen configuration

1IN, 2xSE + 1xBTL OUT (Custom Cable Diagram)



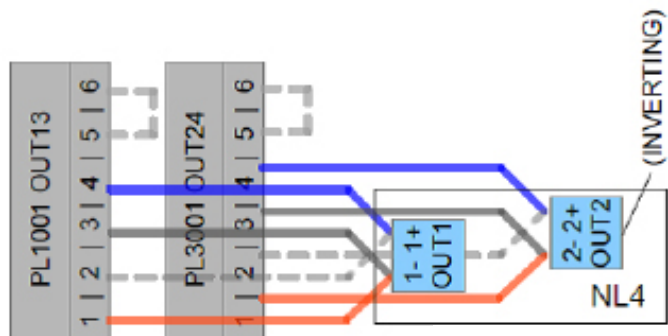
1IN, 2xBTL OUT (CB000730)



Warning: Connect header with white/grey wires to PL1001 to maintain the correct polarity of the Speakon contacts.

----- White

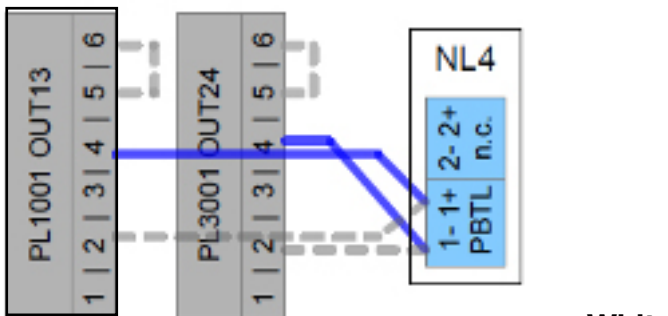
1IN. 2xPTL OUT (CB000733)



Warning: Speakon pair going to PL3001 (OUT2) has reversed polarity: negative on 2+ and positive on 2-.
Please pay attention to connect 2+/2- to PL3001 (OUT2)

----- White

1IN, 1xPBTL OUT (CB000732)



Warning: Header connected to Speakon 1+ must be plugged to PL1001, header connected to speakon 1- must be plugged to PL3001.

----- White

INDEX

4.3 DSP-Lite presets structure description

Please find here the DSP-Lite processing structure for each amplifier configuration.

1IN – 3OUT

Preset Slot 1, used for 2xSE+1xBTL (Custom Cable needed)

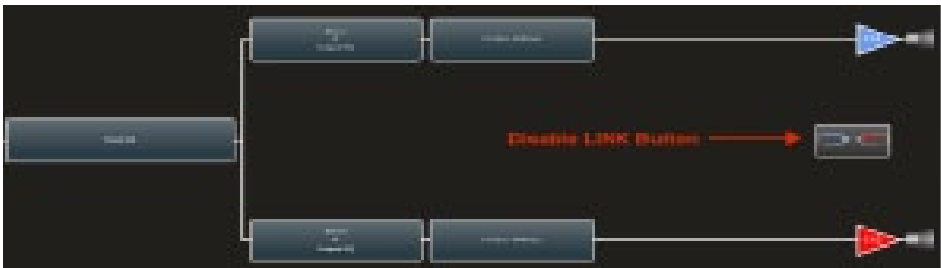


Preset Slot 1, used for 2xBTL OUT (along with CB000730)



1IN – 2OUT

Preset Slot2, used for 2xPTL OUT (along with CB000733)



1IN – 2OUT

Preset Slot 2, used for 1xBPBL OUT (along with CB000732)



4.4 DSP-Lite Standalone Operation

When DSP-Lite is used for standalone operation (i.e. not controlled via Armonia ProAudioSuite), basic commands are available via the interface panel: Onboard Preset selection via pushbutton (four slots) and input Gain adj via pot.

Onboard preset selection

The DSP-Lite sample included in this kit comes pre-initialised, with presets stored onboard as follow:




Slot	Preset Name	Corresponding Amplifier Configuration	Notes
1	3OUT(2xSE+1xBTL_or_2xBTL)-DEMO	3 Channel Mode (2xSE+1xBTL) or 2Channel Mode (2xBTL)	Locked (preset cannot be overwritten)
2	2OUT(2xPTL_or_1xPBTL)-DEMO	2 Channel Mode (2xPTL) or 1 Channel Mode (1xPBTL)	Locked (preset cannot be overwritten)
3	3OUT(2xSE+1xBTL_or_2xBTL)-DEMO	3 Channel Mode (2xSE+1xBTL) or 2Channel Mode (2xBTL)	Can be overwritten (via Armonia)
4	2OUT(2xPTL_or_1xPBTL)-DEMO	2 Channel Mode (2xPTL) or 1 Channel Mode (1xPBTL)	Can be overwritten (via Armonia)

Simply press the pushbutton to toggle between the stored presets.




4.5 LEDs chart

DSP-Lite interface LEDs behaviour is described by the following tables



Status LED

Color	Solid ON
OFF	System down
 GREEN	System ready to play, auto standby mode disabled
 CYAN	System ready to play, auto standby mode enabled
 BLUE	System in standby mode: no signal detected in the latest 15 minutes

Signal LED

Color	Solid ON
OFF	No input signal
 GREEN	Signal presence, output level in the linear range
 YELLOW	Input signal strong enough to engage one of the output limiters (peak or RMS)
 RED	Input signal too high: less than 4 dB margin to cause the input stage to hard clip the signal (i.e. high THD)

Clip/Temp LED

Color	Solid ON
OFF	System temperature OK, no signal clipping
 YELLOW	High system temperature. The DSP will lower the clipping voltage level (soft clip limiter) to reduce the output power and limit the increase of temperature.
 RED	Output signal clipping

4.6 Power Management (Idle/Standby mode)

DSP-Lite can trigger both Idle and Standby amplifier operating modes.

Please refer to page 16 on DSP-Lite User guide for more details <http://www.powersoft-audio.com/docman/1008-dsp-lite-user-guide/file>

4.7 DSP-Lite online control via ArmoniaProAudioSuite

DSP-Lite full processing capabilities can be accessed via our software ArmoniaProAudioSuite. Please find instructions for DSP-Lite control via Armonia within the next paragraphs

4.8 Installing the software

Please download and install the latest version of our software ArmoniaProAudioSuite at this link:

<http://armonia.powersoft.it/download-armonia/>

Installing the plug-in

Please download and install the addition Armonia Plugin at the following link. This is necessary to control DSP-Lite.

Please make sure you Armonia is NOT running before launching this installer.

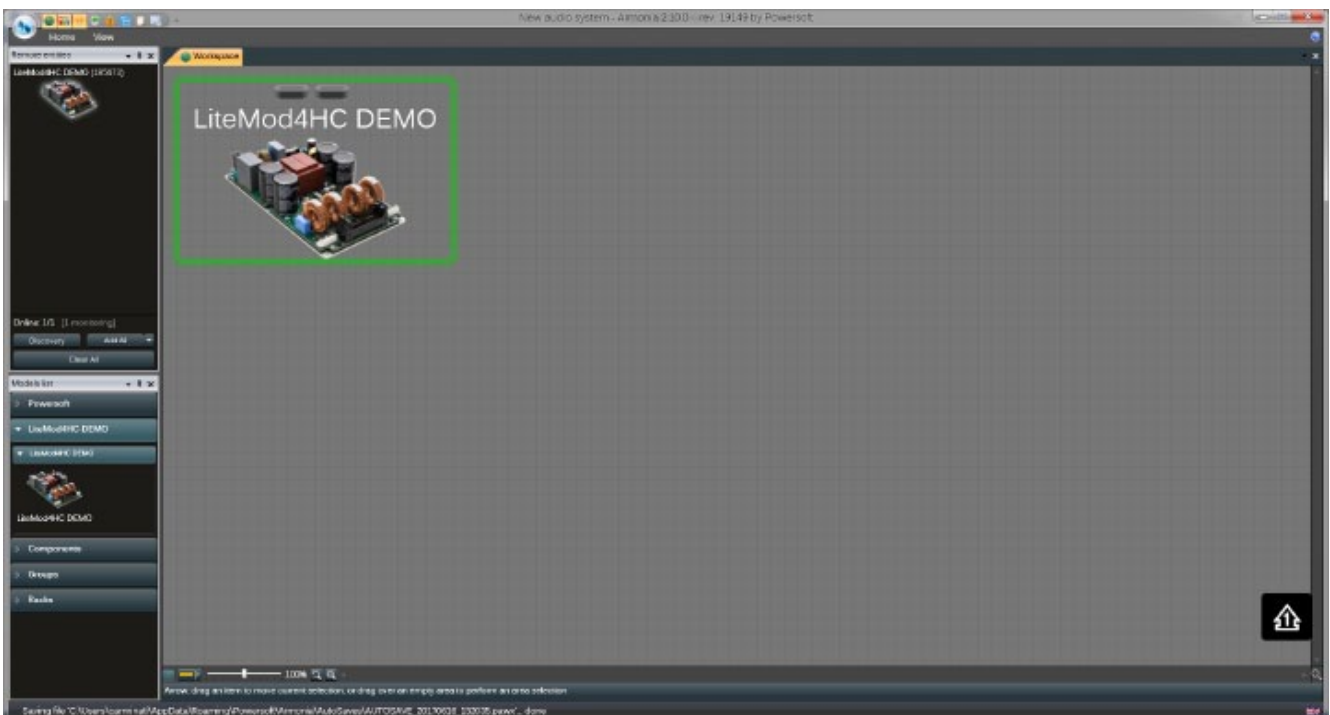
https://www.dropbox.com/s/ajjdzbjr2ksciuy/LiteMod4HC-DEMO_Armonia-Plugin_Installer_v1.1.exe.zip?dl=0

Should the above link be unavailable, please contact us at: support@powersoft.it

4.9 Connecting the DSP-Lite to ArmoniaProAudioSuite

NOTE! USB A/B extension cable is needed (not included)

- Power on the amplifier and connect the USB cable to the DSP-Lite
- Wait for the USB-UART bridge drivers to be automatically installed (if this shouldn't happen, please refer to this page to download drivers download
- <http://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>)
- Start ArmoniaProAudioSuite
- Click on top left corner (light blue Armonia logo) and select "Option"
- Options menu show up -> select "Communication Manager"
- Select and activate the relevant serial port
- Press "OK"
- Open the "Remote Entities" menu (View->remote Entities)
- Press Discovery
- give it a few seconds, device will show up
- double click to add device to Workspace



4.10 Accessing DSP-Lite Processing and Control

To access the DSP processing and control tabs, simply double click on it in the Workspace

4.11 General Tab

General tab display amplifier output peak Voltage and Current readout for Channel 1 and Channel 2 (3OUT preset shown below)

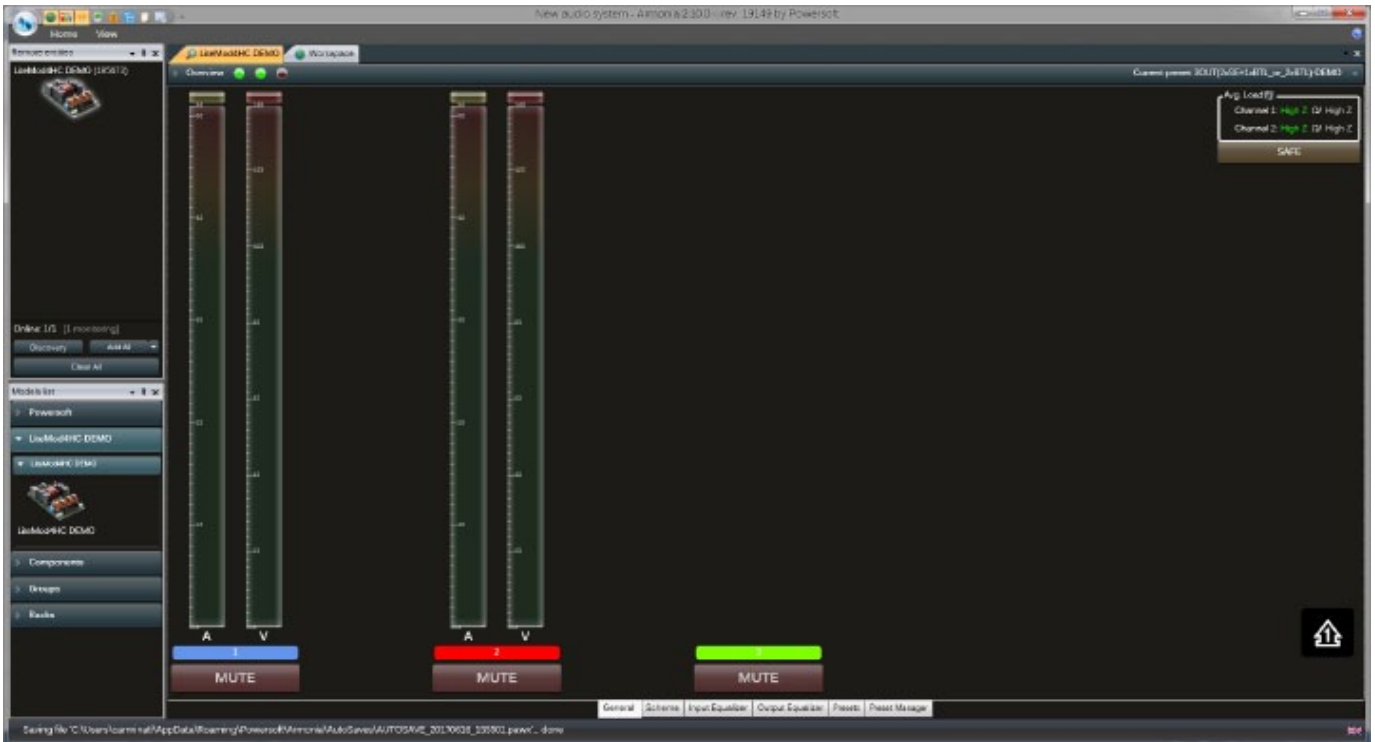
Please note that VUs full scale values are much higher than the real amplifier peak Voltage/Current capabilities. (will be corrected in final DSP-Lite+LiteMod4HC preset release)

4.12 Some important notes about meters

When 2xBTL configuration is used, bridged channels 1+2 meters display total current and half the total peak voltage each. To get a value for peak voltage applied to the load, simply sum output 1 or 2 peak voltage by 2

When used in 2xPTL configuration, channel 1 and 2 Current meters display half the total current flowing in the transducers. To get the total current simply multiply the single channel readout by 2

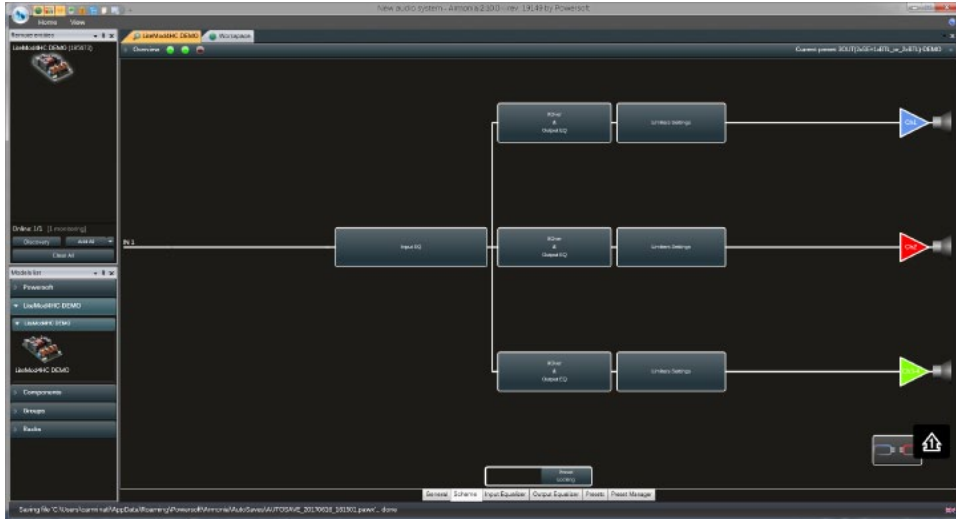
When 1xPBTL configuration is used, bridged channels VUs display half the voltage and half the current applied to the transducer. Please multiply both current and voltage readouts by 2 to get the real amplifier peak values



INDEX

4.13 Scheme Tab

Scheme tab display the DSP processing diagram. It does also provide quick access to the processing blocks by simply click on the block of interest.



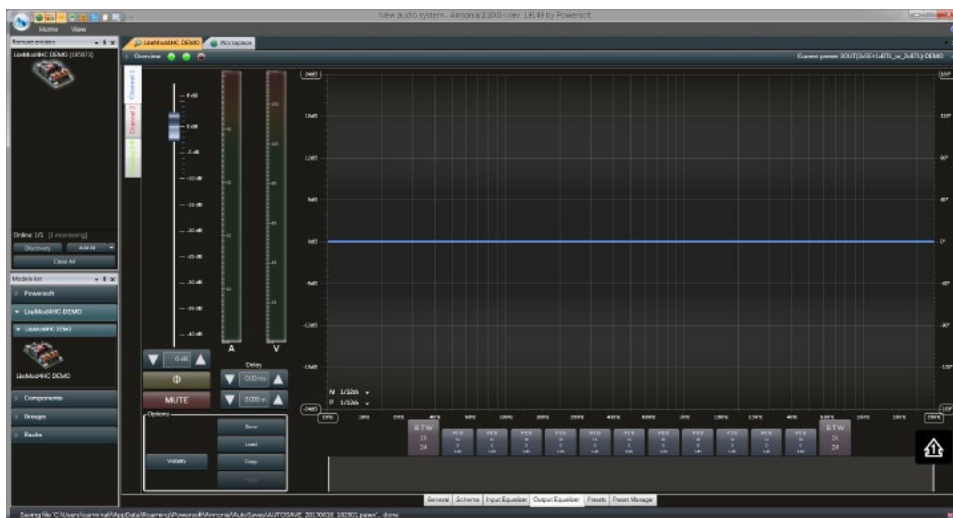
4.14 Input EQ

Access Input EQ/Volume/Delay and Polarity control within Input EQ tab



4.15 Output EQs/Xovers

Access Output EQ/Xovers/Volume/Delay and Polarity control within Output EQ Tab. Scroll between outputs with the side buttons



INDEX

4.16 Limiters

Output limiters access is blocked.

This is because full support for DSP-Lite+LiteMod4HC is not ready yet and threshold values displayed within Armonia aren't correct and Limiters use might be misleading.

In fact, Power Limiter Threshold differ of a by 4 factor from the real one (i.e. set Armonia Power Limiter Threshold x4 the target), while Peak Limiter Threshold differ by a factor 2 (i.e. set Armonia Peak Limiter Threshold x2 the target one).

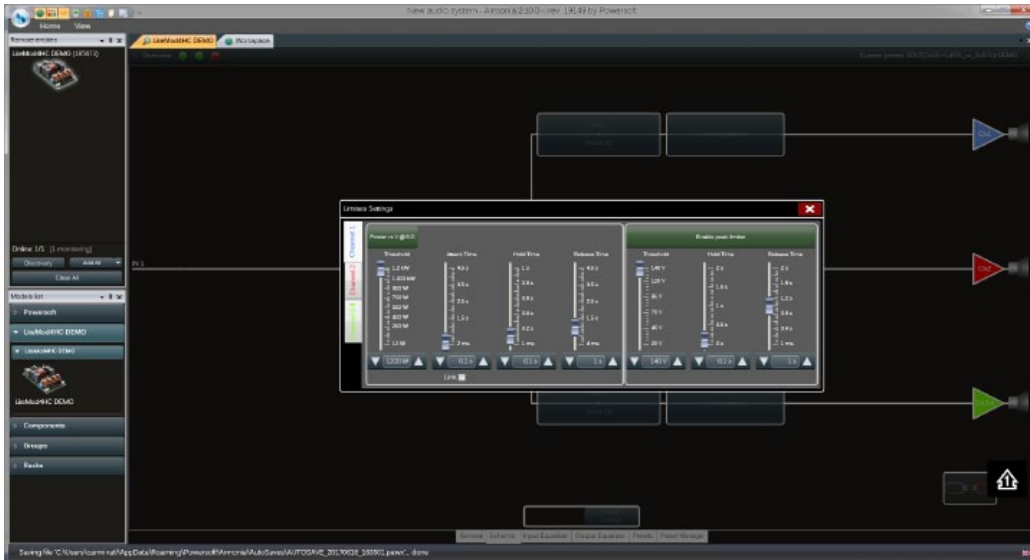
Now that you know the trick, here is how to access Limiters:

Open "Scheme Tab"

Click on "Preset Locking"

Type "password"

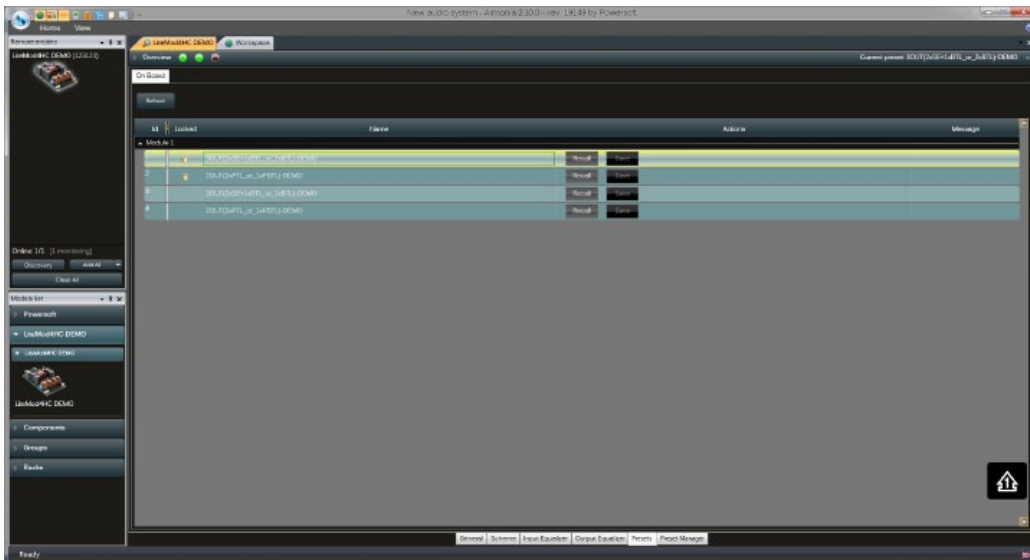
Unlock RMS and Peak limiters on each output channel



4.17 Onboard preset selection

When connected to Armonia, interface bushbutton is deactivated.

Access "Preset Tab" to load/store onboard presets



4.18 Preset export/Onboard storing

To export the current configuration of the DSP-Lite, right click on the device in Workspace->Preset->Export

Please note that first two slots of the DSP are LOCKED and cannot be overwritten. To store a custom preset, please load slot 3 or 4 first.

5. Appendices

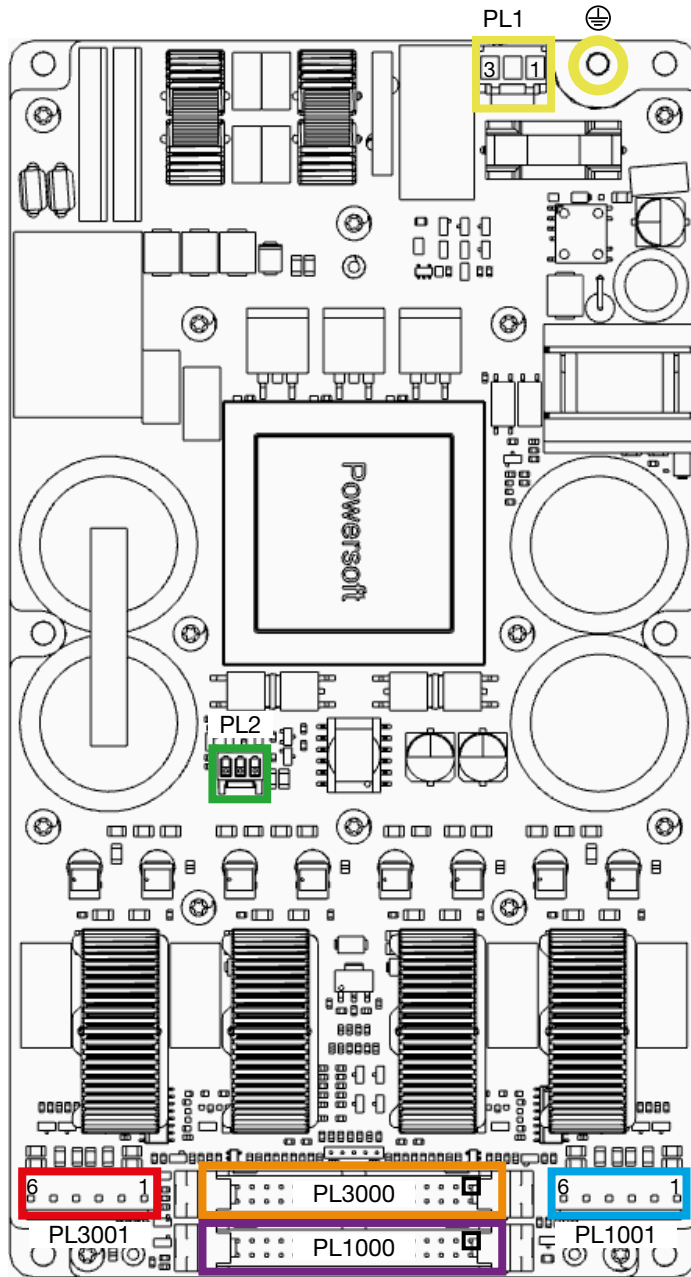
5.1 LiteMod4HC Pinout

PL1 - AC Mains Connector

PIN 1	AC MAINS L
PIN 2	not connected
PIN 3	AC MAINS N
	GROUND

PL1000

PIN 1	SDPWS
PIN 2	READY 1
PIN 3	MODEL ID
PIN 4	+5VDC OUT
PIN 5	GND
PIN 6	IN 1+
PIN 7	IN 1-
PIN 8	GND
PIN 9	VOUT1MON
PIN 10	PROTECT 1
PIN 11	IOUT1MON
PIN 12	TEMPMON 12
PIN 13	+12VDC OUT
PIN 14	-12VDC OUT
PIN 15	MUTE 1
PIN 16	+VCCMON
PIN 17	-VCCMON
PIN 18	-VCCMON
PIN 19	+VCCMON
PIN 20	MUTE 2
PIN 21	-12VDC OUT
PIN 22	+12VDC OUT
PIN 23	TEMPMON 12
PIN 24	IOUT2MON
PIN 25	PROTECT 2
PIN 26	VOUT2MON
PIN 27	GND
PIN 28	IN 2-
PIN 29	IN 2+
PIN 30	GND
PIN 31	+5VDC OUT
PIN 32	MODEL ID
PIN 33	READY 2
PIN 34	SDPWS



PL2 - FAN Connector

PIN 1	GND
PIN 2	+12VDC, 200 mA max
PIN 3	GND

PL3000

PIN 1	SDPWS
PIN 2	READY 3
PIN 3	MODEL ID
PIN 4	+5VDC OUT
PIN 5	GND
PIN 6	IN 3+
PIN 7	IN 3-
PIN 8	GND
PIN 9	VOUT3MON
PIN 10	PROTECT 3
PIN 11	IOUT3MON
PIN 12	TEMPMON 34
PIN 13	+12VDC OUT
PIN 14	-12VDC OUT
PIN 15	MUTE 3
PIN 16	+VCCMON
PIN 17	-VCCMON
PIN 18	-VCCMON
PIN 19	+VCCMON
PIN 20	MUTE 4
PIN 21	-12VDC OUT
PIN 22	+12VDC OUT
PIN 23	TEMPMON 34
PIN 24	IOUT4MON
PIN 25	PROTECT 4
PIN 26	VOUT4MON
PIN 27	GND
PIN 28	IN 4-
PIN 29	IN 4+
PIN 30	GND
PIN 31	+5VDC OUT
PIN 32	MODEL ID
PIN 33	READY 4
PIN 34	SDPWS

PL3001

PIN 1	GND
PIN 2	OUT 2 (inverting)
PIN 3	GND
PIN 4	OUT 4 (inverting)
PIN 5	GND
PIN 6	PARALLEL

PL1001

PIN 1	GND
PIN 2	OUT 1 (non inverting)
PIN 3	GND
PIN 4	OUT 3 (non inverting)
PIN 5	GND
PIN 6	PARALLEL

5.2 LiteMod4HC PL1000/PL3000 (IDC 34poles) Pinout Description

LiteMod4HC - PL1000 (IDC34p)

Pin#	Name	Type	Description
1	SDPWS	IN	Power supply shut down. Active High. Enable energy save mode (consumption <1W). Same as pin 34. Same as pin 1 and
2	READY 1	OUT	Channel 1 PWM state. High when output 1 PWM generation is enabled
3	MODEL ID	OUT	Amplifier model ID resistor. 33KΩ connected between pin 3 and GND (NOT MOUNTED ON MAY/2017 SAMPLES)
4	+5VDC OUT	POWER	Regulated +5VDC supply output (+/-5%). Same as pin 31. Same as pin 4 and 31 on PL3000
5	GND	POWER	
6	IN 1+	IN	Channel 1 balanced input (non-inverting) Channel 1 unbalanced input (non-inverting, when shorting pin 7 to GND)
7	IN 1-	IN	Channel 1 balanced input (inverting) Channel 1 unbalanced input (inverting, when shorting pin 6 to GND)
8	GND	POWER	
9	VOUT1MON	OUT	Channel 1 output voltage monitor
10	PROTECT 1	OUT	Channel 1 output stage protection monitor. Low when output is in protect state
11	IOUT1MON	OUT	Channel 1 output current monitor
12	TEMPMON 12	OUT	Output stages 1&2 temperature monitor. Highest temperature between channel 1 and 2 is considered. Same as pin 23
13	+12VDC OUT	POWER	Regulated +12VDC (+/-10%) supply output (for audio circuits). Same as pin 22. Same as pin 13 and 22 on PL3000
14	-12VDC OUT	POWER	Regulated -12VDC (+/-10%) supply output (for audio circuits). Same as pin 21. Same as pin 14 and 21 on PL3000.
15	MUTE 1	IN	Channel 1 hardware mute. Active low. Disable output stage PWM generator
16	+VCCMON	OUT	Positive rail bus monitor
17	-VCCMON	OUT	Negative rail bus monitor
18	-VCCMON	OUT	Negative rail bus monitor
19	+VCCMON	OUT	Positive rail bus monitor
20	MUTE 2	IN	Channel 2 hardware mute. Active low. Disable output stage PWM generator
21	-12VDC OUT	POWER	Regulated -12VDC (+/-10%) supply output (for audio circuits) Same as pin 14. Same as pin 14 and 21 on PL3000
22	+12VDC OUT	POWER	Regulated +12VDC (+/-10%) supply output (for audio circuits) Same as pin 13. Same as pin 13 and 22 on PL3000
23	TEMPMON 12	OUT	Output stages 1&2 temperature monitor. Highest temperature between channel 1 and 2 is considered. Same as pin 12
24	IOUT2MON	OUT	Channel 2 output current monitor
25	PROTECT 2	OUT	Channel 2 output stage protection monitor. Low when output is in protect state
26	VOUT2MON	OUT	Channel 2 output voltage monitor
27	GND	POWER	
28	IN 2-	IN	Channel 2 balanced input (inverting) Channel 2 unbalanced input (inverting, when shorting pin 29 to GND)
29	IN 2+	IN	Channel 2 balanced input (non-inverting) Channel 2 unbalanced input (non-inverting, when shorting pin 28 to GND)
30	GND	POWER	
31	+5VDC OUT	POWER	Regulated +5VDC (+/-5%) supply output. Same as pin 31. Same as pin 4 and 31 on PL3000
32	MODEL ID	OUT	Amplifier model ID resistor. 0Ω connected between pin 32 and GND (NOT MOUNTED ON MAY/2017 SAMPLES)
33	READY 2	OUT	Channel 2 PWM state. High when output 2 PWM generation is enabled
34	SDPWS	IN	Power supply shut down. Active High. Enable energy save mode (consumption <1W). Same as pin 1. Same as pin 1 and

	Range	Scale Factor	Impedance
d 34 on PL3000	3,3VDC < VIH < 12VDC	\	4,7KΩ
	VOH= 5VDC / VOL= 1VDC	\	100KΩ
	\	\	33KΩ
	Max current available= 100mA	\	\
		\	Differential= 3KΩ / Common mode= 3,5KΩ (bal)
	3VRMS input for full output Absolute MAX input= 8VRMS	\	3,5KΩ (unbal)
		\	Differential= 3KΩ / Common mode= 0,95KΩ (bal)
		\	1,5KΩ (unbal)
	0-4,5VDC	20V/V	4,5KΩ
	11VDC < VOH < 13VDC / 0VDC < VOL < 1VDC	\	Open Collector - 100KΩ Pullup
	0-4VDC	8,35A/V	2,7KΩ
	0-5VDC	TEMPMON12(V)= 3,5-0,035*T[°C]	10KΩ
	Max current available= 1A	\	\
	Max current available= 0,3A	\	\
	VIL (max)=0,2VDC	\	47KΩ Internal pull-up to +5VDC
	+4,5VDC MAX	20V/V	4,5KΩ
	-4,5VDC MAX	20V/V	4,5KΩ
	-4,5VDC MAX	20V/V	4,5KΩ
	+4,5VDC MAX	20V/V	4,5KΩ
	VIL (max)=0,2VDC	\	47KΩ Internal pull-up to +5VDC
	Max current available= 0,3A	\	\
	Max current available= 1A	\	\
	0-5VDC	TEMPMON12(V)= 3,5-0,035*T[°C]	10KΩ
	0-4VDC	8,35A/V	2,7KΩ
	11VDC < VOH < 13VDC / 0VDC < VOL < 1VDC	\	Open Collector - 100KΩ Pullup
	0-4,5VDC	20V/V	4,5KΩ
		\	Differential= 3KΩ / Common mode= 0,95KΩ (bal)
	3VRMS input for full output Absolute MAX input= 8VRMS	\	1,5KΩ (unbal)
		\	Differential= 3KΩ / Common mode= 3,5KΩ (bal)
		\	3,5KΩ (unbal)
	Max current available= 100mA	\	\
	\	\	0Ω
	VOH= 5VDC / VOL= 1VDC	\	100KΩ
34 on PL3000	3,3VDC < VIH < 12VDC	\	4,7KΩ

LiteMod4HC - PL3000 (IDC34p)

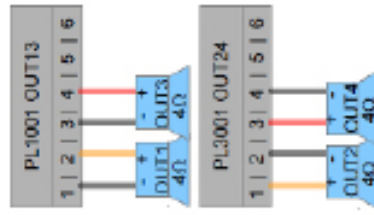
Pin#	Name	Type	Description
1	SDPWS	IN	Power supply shut down. Active High. Enable energy save mode (consumption <1W). Same as pin 34. Same as pin 1 and 3
2	READY 3	OUT	Channel 3 PWM state. High when output 3 PWM generation is enabled
3	MODEL ID	OUT	Amplifier model ID resistor. 33K Ω connected between pin 3 and GND (NOT MOUNTED ON MAY/2017 SAMPLES)
4	+5VDC OUT	POWER	Regulated +5VDC (+/-5%) supply output. Same as pin 31. Same as pin 4 and 31 on PL1000
5	GND	POWER	
6	IN 3+	IN	Channel 3 balanced input (non-inverting) Channel 3 unbalanced input (non-inverting, when shorting pin 7 to GND)
7	IN 3-	IN	Channel 3 balanced input (inverting) Channel 3 unbalanced input (inverting, when shorting pin 6 to GND)
8	GND	POWER	
9	VOUT3MON	OUT	Channel 3 output voltage monitor
10	PROTECT 3	OUT	Channel 3 output stage protection monitor. Low when output is in protect state.
11	IOUT3MON	OUT	Channel 3 output current monitor
12	TEMPMON 34	OUT	Output stages 3&4 temperature monitor. Highest temperature between channel 3 and 4 is considered. Same as pin 23
13	+12VDC OUT	POWER	Regulated +12VDC (+/-10%) supply output (for audio circuits). Same as pin 22. Same as pin 13 and 22 on PL1000
14	-12VDC OUT	POWER	Regulated -12VDC (+/-10%) supply output (for audio circuits). Same as pin 21. Same as pin 14 and 21 on PL1000.
15	MUTE 3	IN	Channel 3 hardware mute. Active low. Disable output stage PWM generator
16	+VCCMON	OUT	Positive rail bus monitor
17	-VCCMON	OUT	Negative rail bus monitor
18	-VCCMON	OUT	Negative rail bus monitor
19	+VCCMON	OUT	Positive rail bus monitor
20	MUTE 4	IN	Channel 4 hardware mute. Active low. Disable output stage PWM generator
21	-12VDC OUT	POWER	Regulated -12VDC (+/-10%) supply output (for audio circuits) Same as pin 14. Same as pin 14 and 21 on PL1000
22	+12VDC OUT	POWER	Regulated +12VDC (+/-10%) supply output (for audio circuits) Same as pin 13. Same as pin 13 and 22 on PL1000
23	TEMPMON 34	OUT	Output stages 3&4 temperature monitor. Highest temperature between channel 3 and 4 is considered. Same as pin 12
24	IOUT4MON	OUT	Channel 4 output current monitor
25	PROTECT 4	OUT	Channel 4 output stage protection monitor. Low when output is in protect state
26	VOUT4MON	OUT	Channel 4 output voltage monitor
27	GND	POWER	
28	IN 4-	IN	Channel 4 balanced input (inverting) Channel 4 unbalanced input (inverting, when shorting pin 29 to GND)
29	IN 4+	IN	Channel 4 balanced input (non-inverting) Channel 4 unbalanced input (non-inverting, when shorting pin 28 to GND)
30	GND	POWER	
31	+5VDC OUT	POWER	Regulated +5VDC (+/-5%) supply output. Same as pin 4. Same as pin 4 and 31 on PL1000
32	MODEL ID	OUT	Amplifier model ID resistor. 0 Ω connected between pin 32 and GND (NOT MOUNTED ON MAY/2017 SAMPLES)
33	READY 4	OUT	Channel 4 PWM state. High when output 1&2 PWM generation is enabled
34	SDPWS	IN	Power supply shut down. Active High. Enable energy save mode (consumption <1W). Same as pin 1. Same as pin 1 and 34

	Range	Scale Factor	Impedance
34 on PL1000	3,3VDC < VIH < 12VDC	\	4,7KΩ
	VOH= 5VDC / VOL= 1VDC	\	100KΩ
	\	\	33KΩ
	Max current available= 100mA	\	\
		\	Differential= 3KΩ / Common mode= 3.5KΩ (bal)
	3VRMS input for full output Absolute MAX input= 8VRMS	\	3,5KΩ (unbal)
		\	Differential= 3KΩ / Common mode= 0,95KΩ (bal)
		\	1,5KΩ (unbal)
	0-4,5VDC	20V/V	4,5KΩ
	11VDC < VOH < 13VDC / 0VDC < VOL < 1VDC	\	Open Collector - 100KΩ Pullup
	0-4VDC	8,35A/V	2,7KΩ
	0-5VDC	TEMPMON34(V)= 3,5-0,035*T[°C]	10KΩ
	Max current available= 1A	\	\
	Max current available= 0,3A	\	\
	VIL (max)=0,2VDC	\	47KΩ Internal pull-up to +5VDC
	+4,5VDC MAX	20V/V	4,5KΩ
	-4,5VDC MAX	20V/V	4,5KΩ
	-4,5VDC MAX	20V/V	4,5KΩ
	+4,5VDC MAX	20V/V	4,5KΩ
	VIL (max)=0,2VDC	\	47KΩ Internal pull-up to +5VDC
	Max current available= 0,3A	\	\
	Max current available= 1A	\	\
	0-5VDC	TEMPMON34(V)= 3,5-0,035*T[°C]	10KΩ
	0-4VDC	8,35A/V	2,7KΩ
	11VDC < VOH < 13VDC / 0VDC < VOL < 1VDC	\	Open Collector - 100KΩ Pullup
	0-4,5VDC	20V/V	4,5KΩ
		\	Differential= 3KΩ / Common mode= 0,95KΩ (bal)
	3VRMS input for full output Absolute MAX input= 8VRMS	\	1,5KΩ (unbal)
		\	Differential= 3KΩ / Common mode= 3.5KΩ (bal)
		\	3,5KΩ (unbal)
	Max current available= 100mA	\	\
	\	\	0Ω
	VOH= 5VDC / VOL= 1VDC	\	100KΩ
4 on PL1000	3,3VDC < VIH < 12VDC	\	4,7KΩ

5.3 LiteMod4HC Power Output Cables Diagrams

4 CHANNEL MODE

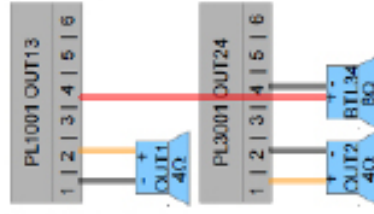
PL1000 feeds CH1 and CH2 Inputs
 PL3000 feeds CH3 and CH4 Inputs



— Negative
 — Positive

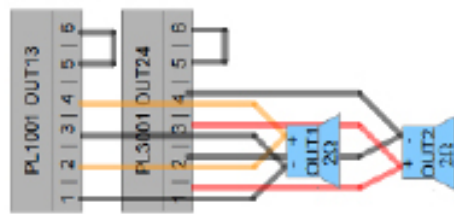
3 CHANNEL MODE

PL1000 feeds CH1 and CH2 Inputs
 PL3000 feeds CH3 and CH4 Inputs
 IN4+ must be the same as IN3+
 IN4- must be the same as IN3-



2 CHANNEL MODE (2Ω)

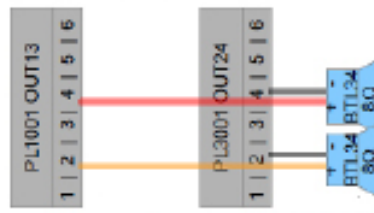
PL1000 feeds CH1 and CH2 Inputs
 PL3000 not used



2 CHANNEL MODE (8Ω)

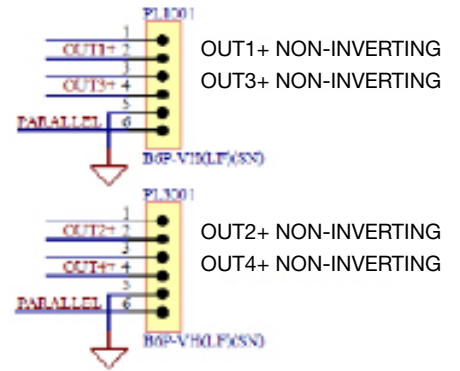
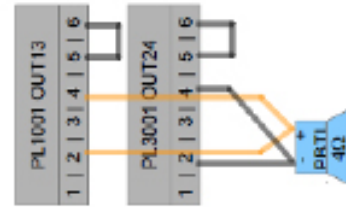
PL1000 feeds CH1 and CH2 Inputs
 IN2+ must be the same as IN1+
 IN2- must be the same as IN1-

PL3000 feeds CH3 and CH4 Inputs
 IN4+ must be the same as IN3+
 IN4- must be the same as IN3-



1 CHANNEL MODE (PBTL)

PL1000 feeds CH1 and CH2 Inputs
 IN2+ must be the same as IN1+
 IN2- must be the same as IN1-
 PL3000 not used



INDEX

5.4 Fuse Replacement Notes

Always replace blown fuses with same ratings fuses: LITTELFUSE 326 15AT.

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