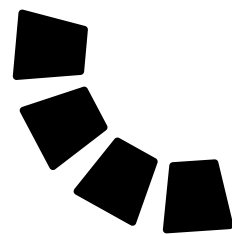


# *PLM 6800*



## POWERED CONTROLLER

manuale utente | user's manual

italiano | english

**Montarbo**  
Made in Italy





The lighting flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to humans.



The exclamation point within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions.

## IMPORTANT ! SAFETY INSTRUCTIONS

### WARNING

**In order to protect your own and others' safety and to avoid invalidation of the warranty of this product, please read this section carefully before operating this product.**

- This product has been designed and manufactured for being operated as a power amplifier for loudspeaker systems in the applications typical of a sound reinforcement system. Operation for purposes and in applications other than these has not been covered by the manufacturer in the design of the product, and is therefore to be undertaken at end user's and/or installer's sole risk and responsibility.
- This unit conforms to Class I insulation, and for safe use it is required that the protective earth contact is connected to a grounded (earthed) outlet.

### TO AVOID THE RISK OF FIRE AND/OR ELECTRIC SHOCK:

- Never expose this product to rain or moisture, never use it in proximity of water or on a wet surface. Avoid dripping water or water sprays, moreover never place objects full of liquid, such as vases, on top of it. Never let any liquid, as well as any object, enter the product. In case, immediately disconnect it from the mains supply and refer to servicing before operating it again. Never place burning candles or other sources of open flame on top of the device. Keep clean and free from dust the ventilation grids on front and rear panels.
- Before connecting this product to the mains supply, always make sure that the voltage on the mains outlet corresponds to that stated on the product.
- This product must be connected only to a grounded mains outlet complying to the safety regulations in force via a power cable of adequate copper section terminated with a plug or a connector complying with all safety regulation applicable. Refer to page 46 for detailed instructions about mains connector's wiring.
- This device is connected to the power line even when the mains switch is off. As long as it is plugged in there are dangerous electrical potentials inside the device, so, before undertaking any sort of maintenance work etc., always make sure it has been unplugged from the mains socket.
- Never place any object on the power cable. Never lay the power cable on a walkway where one could trip over it. Never press or pinch it.
- Never install the product without providing adequate airflow to cool it. Never obstruct the air intake openings on it. When installing in a rack cabinet, leave enough room to get to the mains power socket and the mains connector on the back panel.
- Always make sure the Power is switched off before doing any operation on the connections of the product.
- Before attempting to move the product after it has been installed, remove all the connections.
- To disconnect the power cable of this product from the mains supply never pull the cable directly. Hold the body of the plug firmly and pull it gently from the mains supply outlet.

### CAUTION!

**This product does not contain user serviceable parts.**

**To prevent fire and/or electrical shock, never disassemble it or remove the panels. For maintenance and servicing always refer to the official Montarbo Distributor in your Country or to qualified personnel specifically authorized by the Distributor.**

- To avoid shocks, kicks, or whatever action, always reserve a protected area with no access to unqualified personnel as installation site of the product.
- In case the product is used near children and animals closest supervision is necessary.

✦ **Never expose children to high sound pressures.**





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## 1 - PRODUCT DESCRIPTION



**Fig. 1: PLM6800**

### 1.1 - 4-channel power amplifier with digital loudspeaker management (Fig. 1)

Model PLM6800 is a "powered loudspeaker controller" designed to be used with the PalcoPlus line-array system.

The internal digital controller (functionally equivalent to the external LM24 model) is equipped with "state-of-the-art" DSP and A/D and D/A converters, will drive the power amplifiers, and will operate simultaneously as a cross-over, equalizer and limiter, optimizing the system's response.

The four amplifiers, each one capable of delivering up to 1700 W @ 4 ohms, may effortlessly drive one PalcoPlus system of two RA16 speakers and one RAB1815 woofer.

The system's wiring is made easy thanks to an "intelligent" control of the power amps output wiring: the internal wiring of the loudspeaker connectors is controlled via software.

The unit enables them in function of the loaded preset, thus offering a real protection of the system's drivers against wiring errors.

Thanks to the four balanced line outputs, that may be configured as controller's outputs or as input link, the PLM6800 may be used to drive other power amplifiers without internal controller, external powered subwoofers (like the subwoofers of the Montarbo BX series) or powered speakers.

The internal four power amplifiers may also be used to drive external, wide-band, passive loudspeaker systems (like the Montarbo W17P).

The PLM6800 may be used in free-standing mode by means of the front panel's LCD display and keyboard, operating on factory pre-sets with adjustable parameters, or it may be controlled by a personal computer that, thanks to the RACON control software and the LD2.4 USB interface (fig. 2), allows adjustment and configuration of a network of up to eight PLM6800.



**Fig. 2: LD2.4 USB interface**

For wiring instruction, refer to chapter 2.

For detailed instructions about free-standing operation, refer to chapter 3.

For the RACON software, refer to chapter 4.

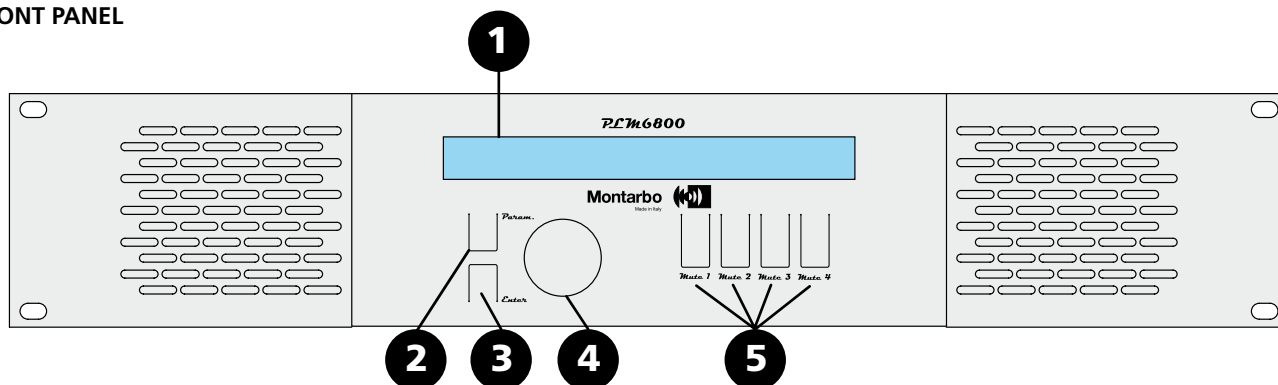






## 1.2 - CONTROLS AND CONNECTIONS

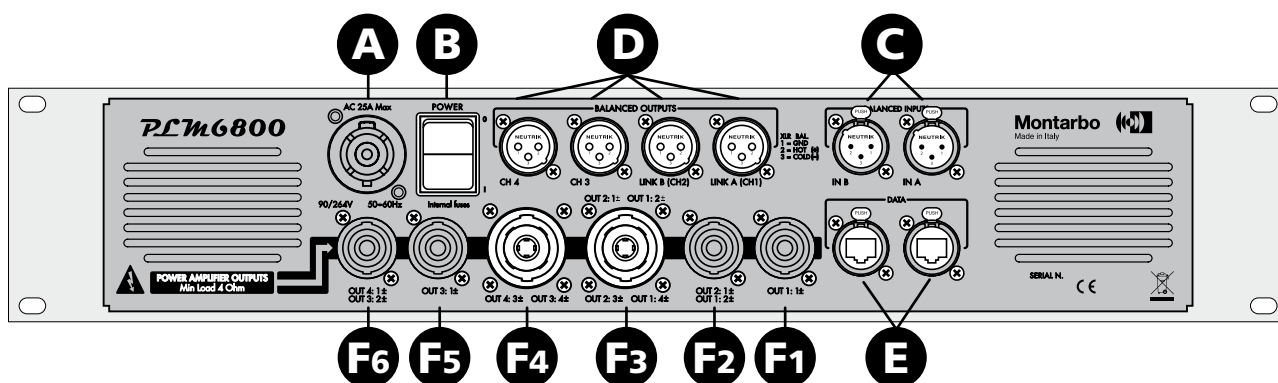
### FRONT PANEL



The front panel comprises:

- The two lines LCD display (1)
- the PARAM key (2), that allows entering the parameter's programming - display mode
- the ENTER key (3), used to confirm any modification
- the rotary encoder (4) that allows to scroll through the various display's windows and to modify a parameter's value
- the MUTE (5) keys, that allow to individually mute the four outputs.

### REAR PANEL



The rear panel comprises:

- the PowerCon HC® mains power connector (A)
- the mains on/off switch (B),
- the XLR3-F sockets of the two balanced inputs A and B (C),
- the XLR3-M sockets of the four balanced outputs 1, 2, 3 and 4 (D)
- the RJ-45 sockets of the two RS485 DATA ports (E)
- the SPEAKON® connectors of the power amplifiers outputs (F1, F2, F3, F4, F5, F6).





### 1.3 - SHORT FORM TECHNICAL DATA

Size	2 x 19" standard rack unit
Depth	526 mm
Weight	11.5 Kg.
Power supply	SMPS, 85-270 V ac – 50/60 Hz
Max. ac current drain	25 A
Power amplifier section	
output power	4 x 1700 W EIAJ @ 4 ohms 4 x 1000 W EIAJ @ 8 ohms
Signal to noise ratio	> 100 dB
Forced cooling with temperature controlled, low noise fans	
Digital controller section	
Inputs and outputs	Balanced, max in-out level + 13 dBu
DSP	56 bit
ADC	24 bit
Dynamic Range	112 dB
SNR	111 dB
THD+N	-102 dB
DAC	24 bit
Dynamic Range	113 dB





## 2 - INSTALLATION AND WIRING

### 2.1 - INSTALLATION

The unit may be used free-standing or may be installed in a rack cabinet or in a flight-case box. When the unit is installed in a cabinet or in a case, make sure that the flow of air, necessary for proper cooling, is not obstructed. Do not block front and rear air vents.

Close, using blank rack panels, any open space in the rack: this will guarantee that the hot air, expelled from the amplifier's rear side, cannot reach the front panel's air intakes.

Leave open the rear of the rack. If this is not possible, install a suitable hot air exhaust system.

NOTE: when transporting, amplifiers should be supported at both front and back.

The high current drain of very high power amplifiers require an adequate system of ac mains power supply.

It is thus mandatory to use an electrical panel of adequate characteristics, built in respect of the applicable, country specific, technical and safety regulations, tested by a qualified technician.

### 2.2 - WIRING OF AC MAINS SUPPLY CABLE

The high current drain of the PLM6800 amplifier made mandatory the choice of an adequate ac connector.

The NEUTRIK PowerCON HC® is rated at 32A at 250V ac.

It is a connector without breaking capacity, thus it must always be plugged and un-plugged with the amplifier switched off.

#### 2.2.1 - Selection of AC mains cable

The maximum current drain of a PLM6800 amplifier is 25 A (at 100 V mains), thus the power cable must be three conductor type, each with a minimum copper cross section of 2.5 mm<sup>2</sup>.

The cable characteristics must be suitable for the application.

When using in places open to the general public, the cable insulation must be of the fire-retardant, low-smoke zero-halogen (LSZH) type.

Country-specific technical regulations may apply.

We suggest to consult a qualified supplier for the cable selection.

#### 2.2.2 - Selection of mains plug

The choice of a suitable power cable's plug or connector is left to the user or to the designer of the electrical supply panel.

Type IEC309 32A plugs may be used.

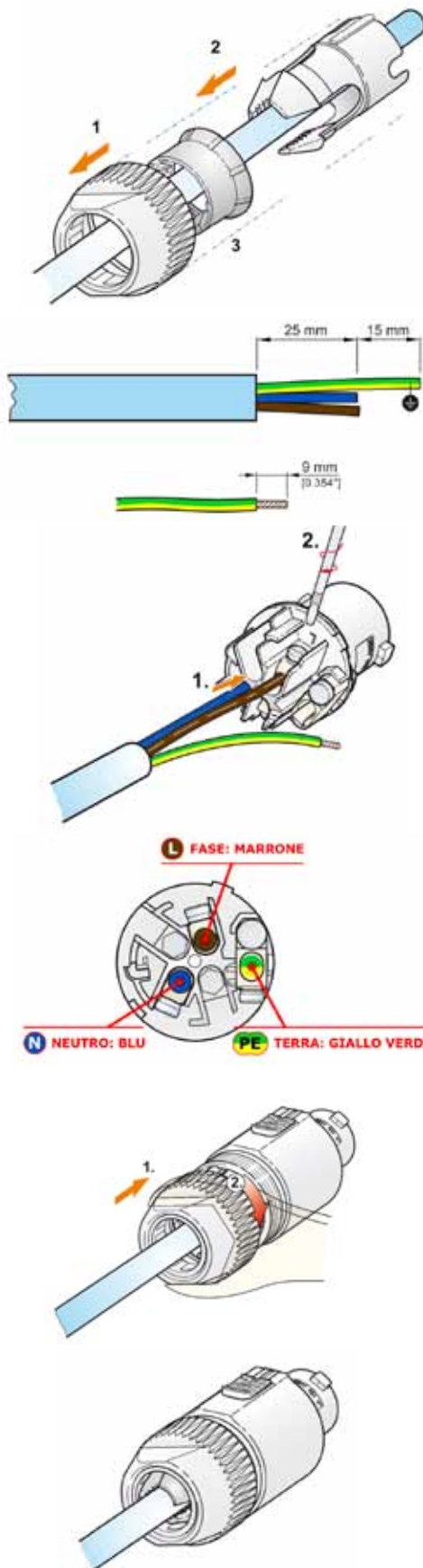
We heartily suggest to consult a qualified technician for the design of the electrical panel.





### 2.2.3 - Wiring of POWERCON® connector

The outer diameter of the cable must be in the 8 to 22 mm range.



A) Slide the bushing (1) and the chuck (2) onto the cable end.  
If the cable outer diameter is less than 15 mm, use reducing piece (3).

B) Prepare cable as shown.  
Leave the ground conductor longer as shown, to allow for slackening.  
Strip the wires, removing 9 mm of insulation.

C) Insert wires in terminals marked L, N, PE (  $\perp$  ) and tighten.  
Attention: max torque 180 cNm.

#### Wiring

D) 1. Push insert and chuck into housing.  
Important: align the chuck and insert by positioning the nose into the keyway.

2. Tighten the bushing by using a 27 mm open wrench, min. torque: 3.5 Mn.

Assembled connector.





### 2.3 - SYSTEM WIRING

Due to the low impedance of the speakers and the high power levels involved, it is necessary to use cables with adequate copper section. For a simpler approach, we recommend the use of 4-conductor cables wired to Neutrik SPEAKON® plugs (type NL-4 for the RA16 speakers and NL-8 for the RAB1815 woofers).

Each cable conductor must have the minimum cross section shown on the following table. The cables must be of adequate quality, with a flexible insulation, suitable for the installation's environmental conditions, and with sufficient copper section to minimize power loss.

For use with loudspeakers other than those in the PalcoPlus line, outputs number 1 and 3 are also available on independent SPEAKON® connectors, wired on pins 1+ and 1-.

For this application, we recommend two conductors cables, having the same specifications

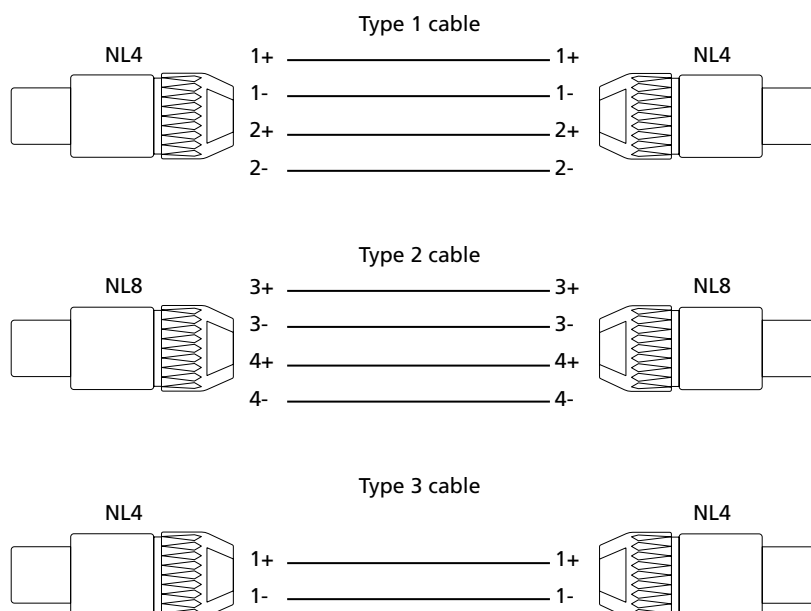


Cable length	Cable section
Up to 20 meters	2.5 mm <sup>2</sup> (AWG 10)
More than 20 meters	4.0 mm <sup>2</sup> (AWG 6)

Each pair of RA16 speakers requires an interconnect cable, 0.5 meters long, equipped with Neutrik SPEAKON® NL-4 plugs, at least 4 x 1.5 mm<sup>2</sup>.

**The high power involved make mandatory a correct wiring of the system: any error in wiring or any cable reversal will result in serious damage to the speakers.**

**The "intelligent" wiring system featured by model PLM6800 will protect the drivers from a cable plugged in the wrong connector, but cannot assure protection against a wrongly wired cable.**





Power amplifier and speaker systems connectors are wired as shown here below.

Connector F1: Out 1, to be used with other speaker systems

PLM6800 F1	Cable	Speaker
Ch1 hot / 1+	Type 1 or Type 3	Speaker hot / 1+
Ch1 cold / 1-		Speaker cold / 1-
Not connected / 2+		Not connected
Not connected / 2-		Not connected

Connector F2: Out 1 & Out 2, to be used with one RA16 speaker

PLM6800 F2	Cable	RA16
Ch2 hot / 1+	Type 1	LF hot / 1+
Ch2 cold / 1-		LF cold / 1-
Ch1 hot / 2+		HF hot / 2+
Ch1 cold / 2-		HF cold / 2-

Note: when using other speaker systems, use pins 1+ and 1- only (Out 2).

Connector F3: Out 1 & Out 2, to be used with a RAB1815 woofer

PLM6800 F3	Cable	RAB1815
Not connected / 1+	Not connected	Not connected
Not connected / 1-	Not connected	Not connected
Not connected / 2+	Not connected	Not connected
Not connected / 2-	Not connected	Not connected
Ch2 hot / 3 +	Type 2	18" hot / 3 +
Ch2 cold / 3 -		18" cold / 3 -
Ch1 hot / 4 +		15" hot / 4 +
Ch1 cold / 4 -		15" cold / 4 -

Connector F4: Out 3 & Out 4, to be used with a RAB1815 woofer

PLM6800 F4	Cable	RAB1815
Not connected / 1+	Not connected	Not connected
Not connected / 1-	Not connected	Not connected
Not connected / 2+	Not connected	Not connected
Not connected / 2-	Not connected	Not connected
Ch4 hot / 3 +	Type 2	18" hot / 3 +
Ch4 cold / 3 -		18" cold / 3 -
Ch3 hot / 4 +		15" hot / 4 +
Ch3 cold / 4 -		15" cold / 4 -





Connector F5: Out 3, to be used with other speaker systems

PLM6800 F5	Cable	Speaker
Ch3 hot / 1+	Type 1 or Type 3	Speaker hot / 1+
Ch3 cold / 1-		Speaker cold / 1-
Not connected / 2+		Not connected
Not connected / 2-		Not connected

Connector F6: Out 3 & Out 4, to be used with one RA16 speaker

PLM6800 F6	Cable	RA16
Ch4 hot / 1+	Type 1	LF hot / 1+
Ch4 cold / 1-		LF cold / 1-
Ch3 hot / 2+		HF hot / 2+
Ch3 cold / 2-		HF cold / 2-

Note: when using other speaker systems, use pins 1+ and 1- only (Out 4)

To connect to the mixer's outputs and to link the PLM6800 outputs to other amplifiers' inputs, always use SCREENED cables (signal cables, balanced), of adequate section and quality.

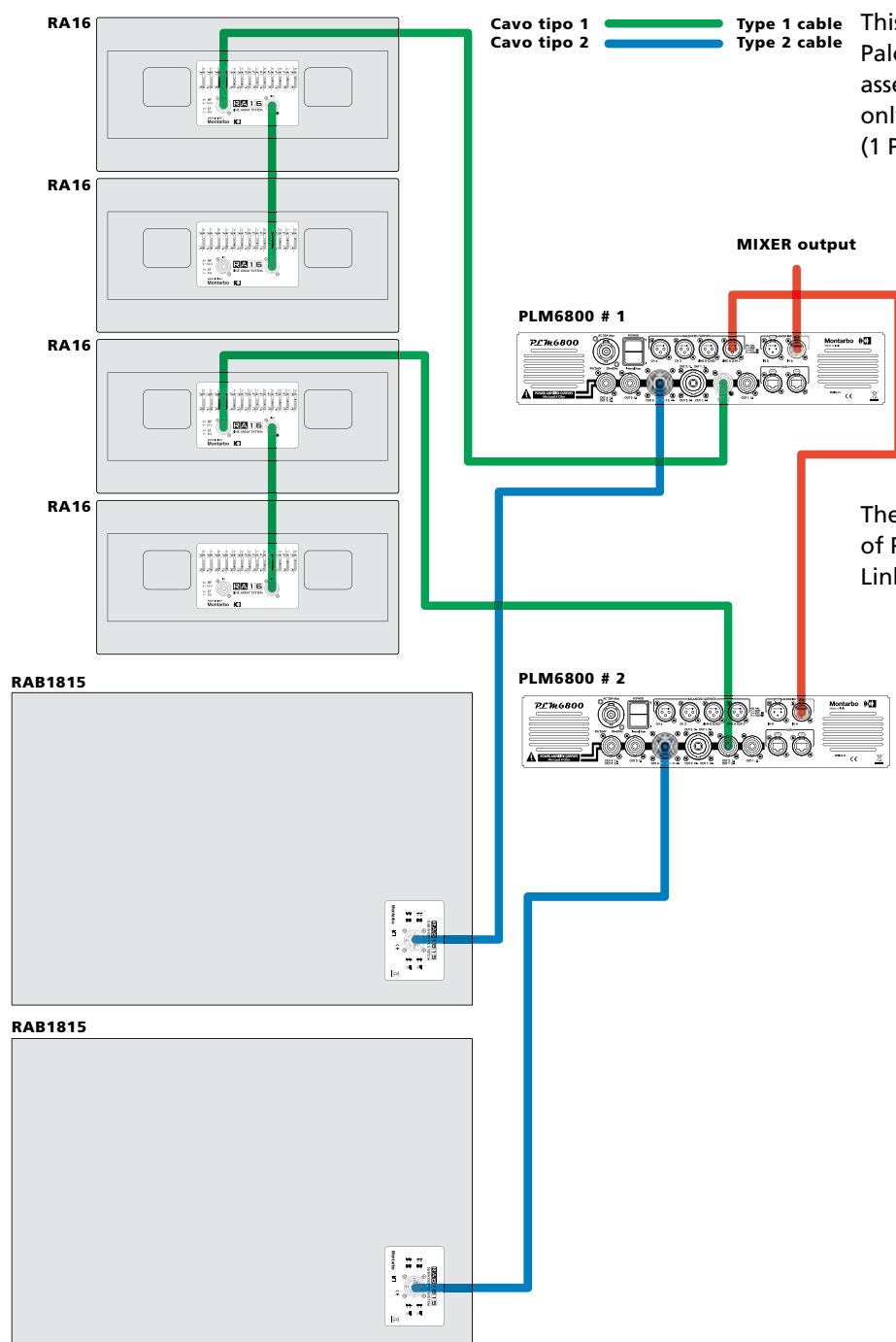
The system's wiring is a function of the selected set-up.

The following pages illustrate the wiring corresponding to the PLM6800's factory Set Up (see list on chapter 3, paragraph 3.3).



**PALCOPLUS wiring, standard configuration (RA16 + RAB1815 A Flw)**

Name	Description	PLM6800 n. 1	Input A	Input B	Ch 1	Ch 2	Ch 3	Ch 4
RA16 + RAB1815 A Flw	Standard PalcoPlus flown		Mono	Disabled	RA16 HF (1 couple) flown	RA16 LF (1 couple) flown	RAB1815 no. 1 15"	RAB1815 no. 1 18"
		PLM6800 n. 2	Input A	Input B	Ch 1	Ch 2	Ch 3	Ch 4
			Mono	Disabled	RA16 HF (1 couple) flown	RA16 LF (1 couple) flown	RAB1815 no. 2 15"	RAB1815 no. 2 18"



This example shows a standard PalcoPlus system. It is possible to assemble a reduced system, using only half of the above components (1 PLM6800 + 2 RA16 + 1 RAB1815).

**Attention!**

The InLink configuration parameter of PLM6800 no. 1 must be set to LinkOn (default). Refer to page 60.

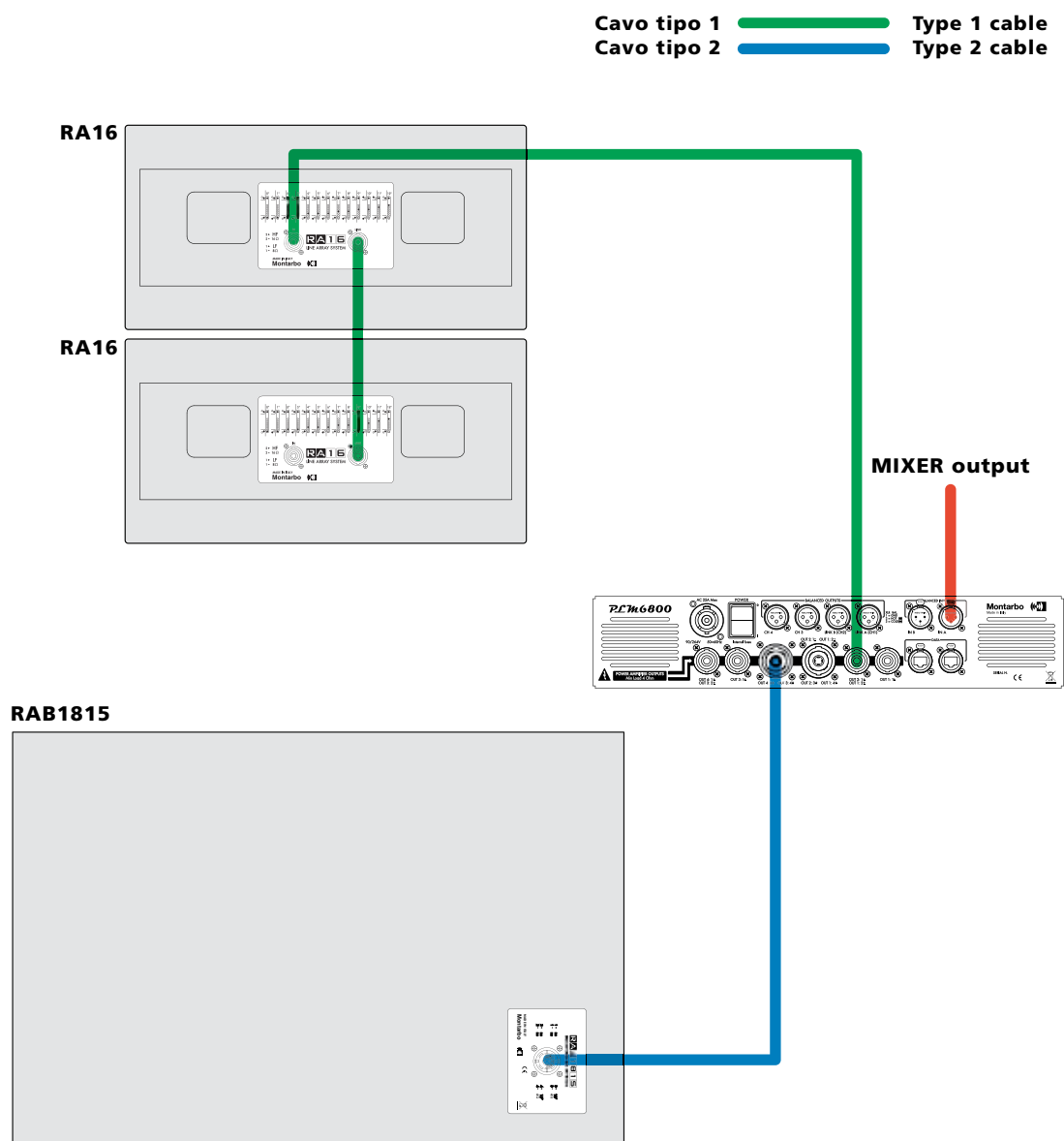





**PALCOPLUS wiring, small configuration (RA16 + RAB1815 A Stk)**

Name	Description	Input A	Input B	Ch 1	Ch 2	Ch 3	Ch 4
RA16 + RAB1815 A Stk	PalcoPlus stacked	Mono	Disabled	RA16 HF (1 couple) stacked	RA16 LF (1 couple) stacked	RAB1815 15"	RAB1815 18"

This example shows a PalcoPlus system in a small configuration. It is possible to assemble a larger system, using the double of the above components (2 PLM6800 + 4 RA16 + 2 RAB1815), wiring the second PLM6800 as described in the preceding page.

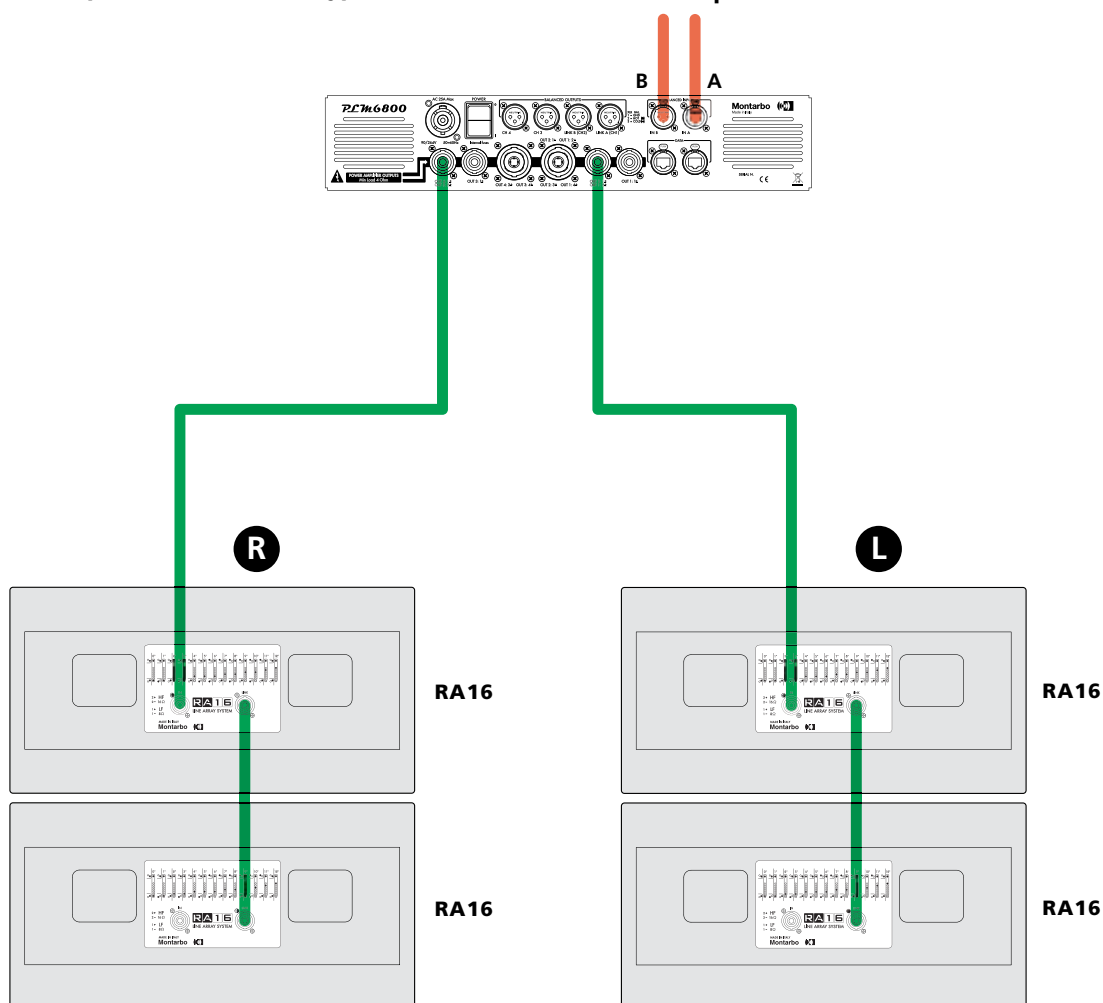


**PALCOPLUS wiring, RA16 stereo configuration (RA16 + RA16 A&B)**

Name	Description	Input A	Input B	Ch 1	Ch 2	Ch 3	Ch 4
RA16 + RA16 A&B	RA16 (2 couples) stereo	Ch L	Ch R	RA16 HF flown - L	RA16 LF flown - L	RA16 HF flown - R	RA16 LF flown - R

Cavo tipo 1  Type 1 cable

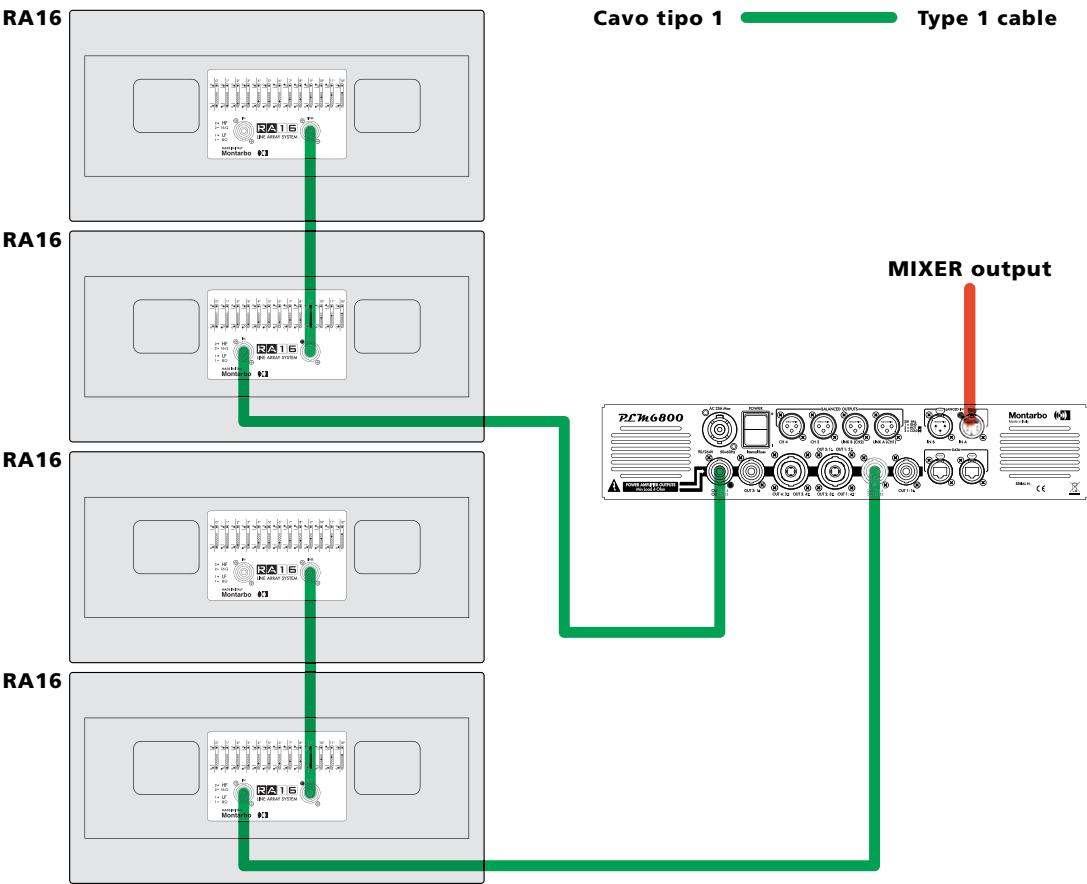
MIXER outputs





PALCOPLUS wiring, split RA16 configuration (RA16 4Ch in A)

Name	Description	Input A	Input B	Ch 1	Ch 2	Ch 3	Ch 4
RA16 4Ch in A	RA16 (2 couples) channel A	Mono	Disabled	RA16 HF (1 couple)	RA16 LF (1 couple)	RA16 HF (1 couple)	RA16 LF (1 couple)



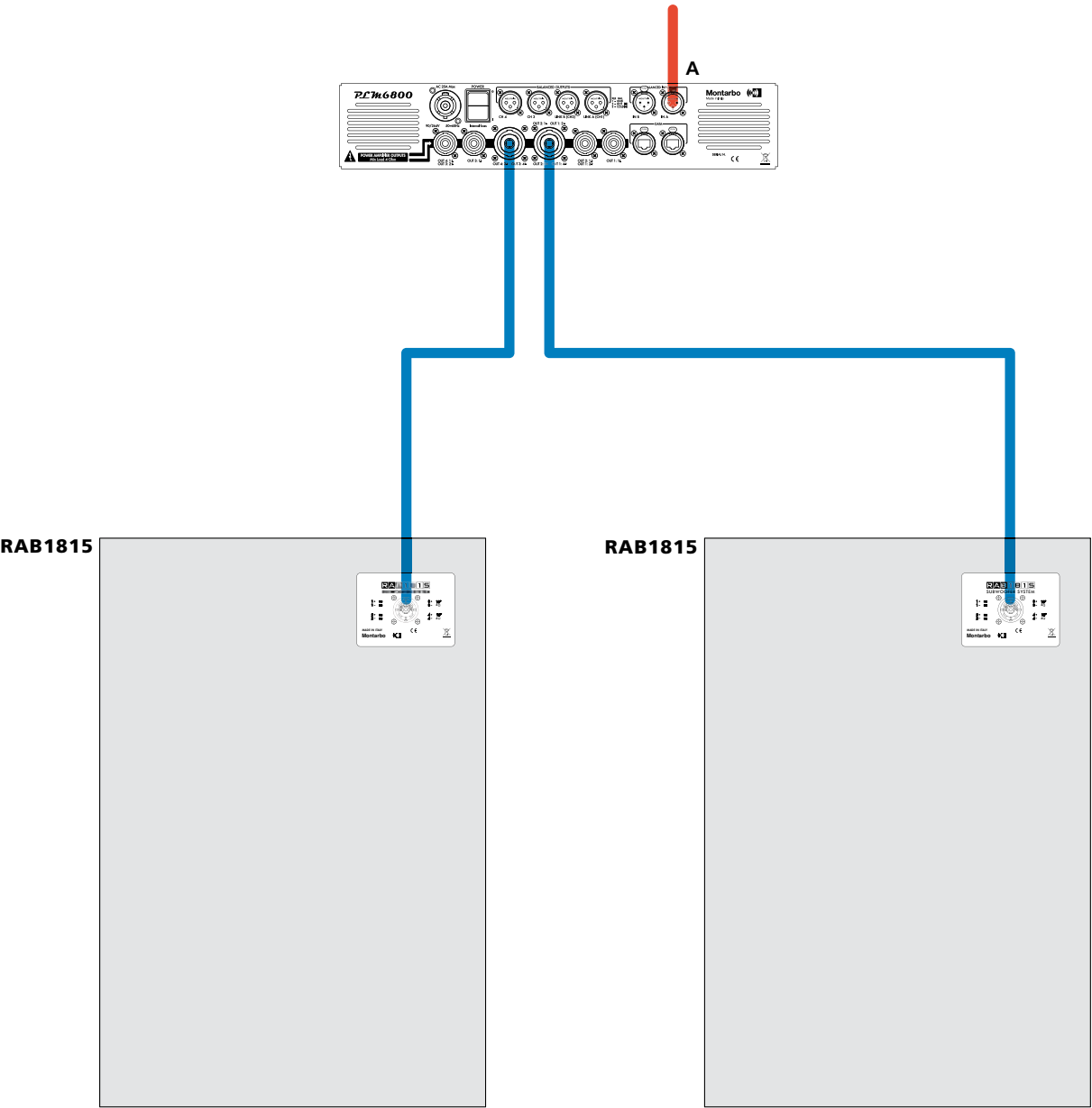


**PALCOPLUS wiring, RAB1815 split configuration (RAB1815 x 2 in A)**

Name	Description	Input A	Input B	Ch 1	Ch 2	Ch 3	Ch 4
RAB1815 x 2 in A	RAB1815 split array	Active	Disabled	RAB1815 no. 1 15"	RAB1815 no. 1 18"	RAB1815 no. 2 15"	RAB1815 no. 2 18"

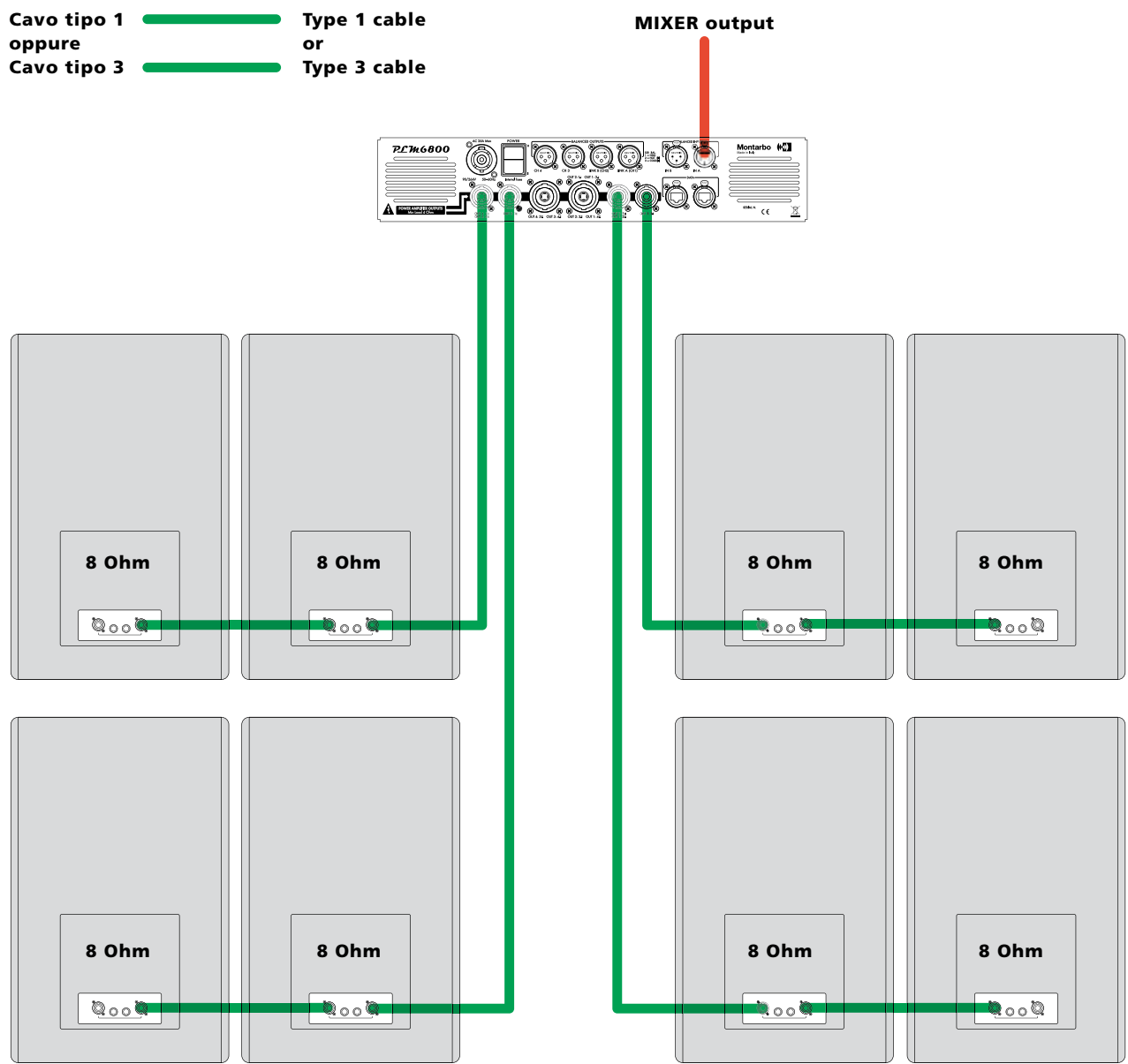
Cavo tipo 2        Type 2 cable

MIXER output



PLM6800 wiring, for standard wide range passive speakers, mono

Name	Description	Input A	Input B	Ch 1	Ch 2	Ch 3	Ch 4
4Ch Mono in A	4 passive speakers input A	Active	Disabled	Speaker no. 1	Speaker no. 2	Speaker no. 3	Speaker no. 4



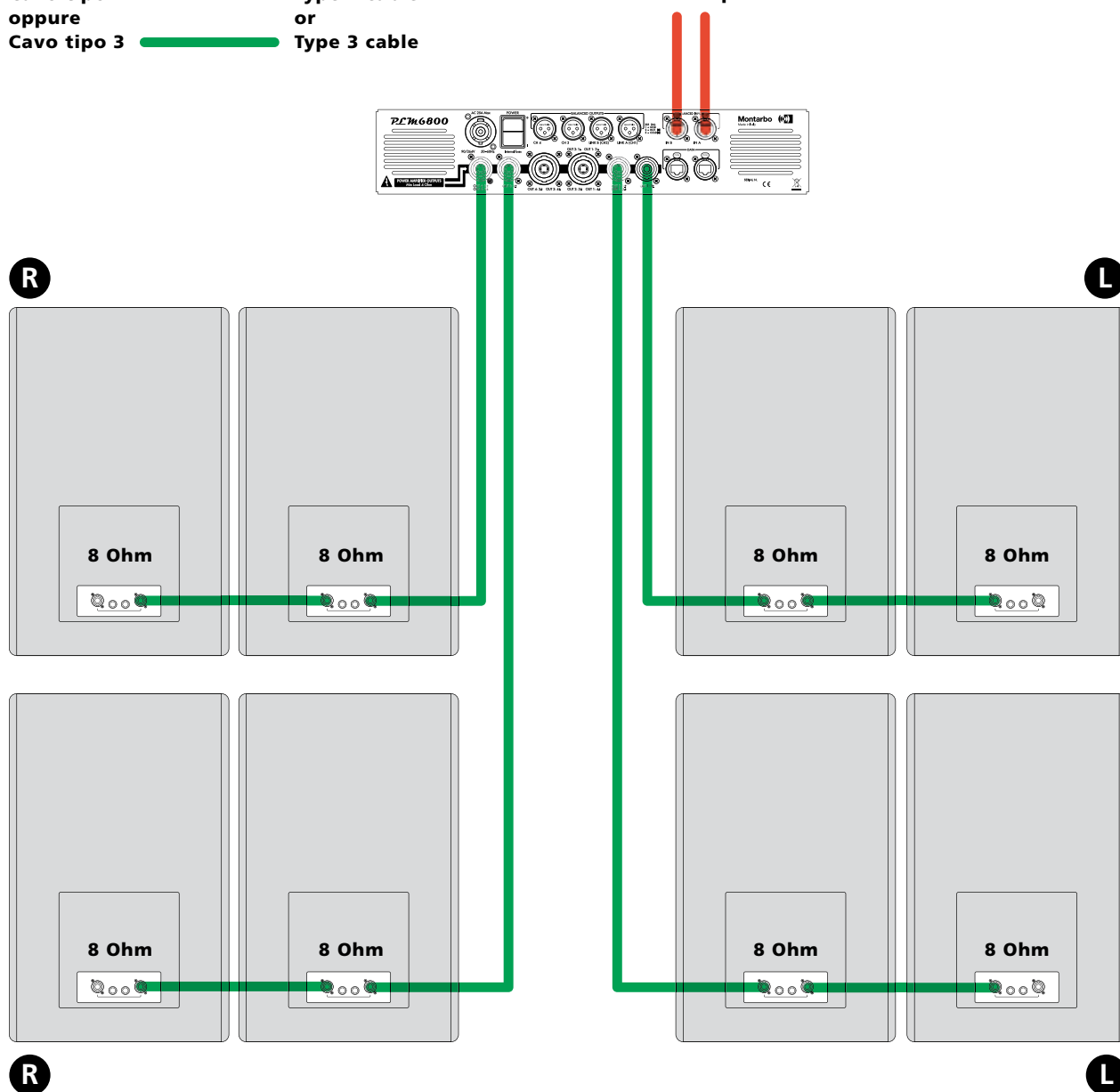


**PLM6800 wiring, for standard wide range passive speakers, stereo.**

Name	Description	Input A	Input B	Ch 1	Ch 2	Ch 3	Ch 4
4Ch Stereo in A&B	4 passive speakers stereo inputs A&B	Channel L	Channel R	Speaker no. 1 L	Speaker no. 2 L	Speaker no. 3 R	Speaker no. 4 R

**Cavo tipo 1**  **Type 1 cable**  
**oppure** **or**  
**Cavo tipo 3**  **Type 3 cable**

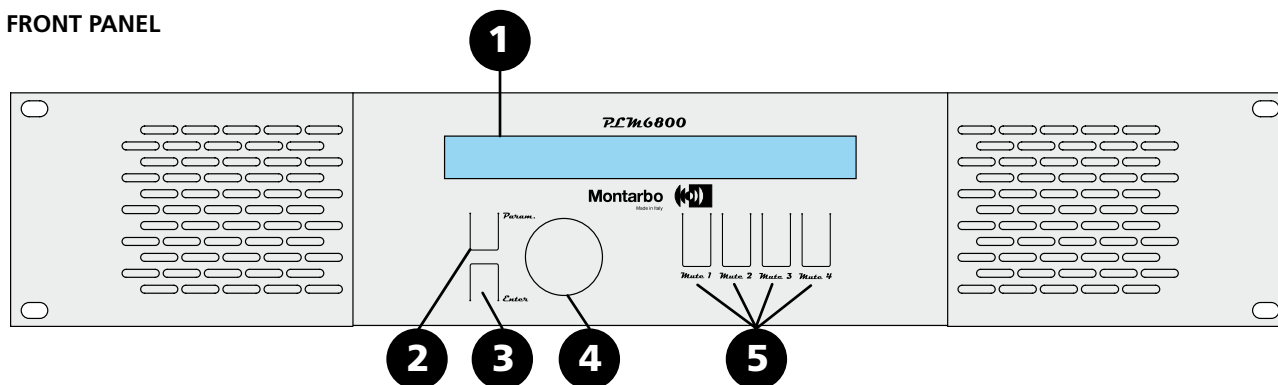
**MIXER outputs**



### 3 - OPERATION

This description is limited to the use of the PLM6800 amplifier with a Montarbo PalcoPlus line-array system.

#### FRONT PANEL



#### 3.1 - POWERING ON

Plug-in the cables from mixer and speakers as described in chapter 2, connect the unit to a mains socket and switch it on.

At switch-on, the display will display the state of the internal memory.



After the internal self check, the display will show the main operation window. The following is one of the many possible.



Under the A, B, 1, 2, 3, 4 characters are the 7 segment level indicators displaying signal presence and level for the A and B inputs and the 1, 2, 3 and 4 outputs. If any output is muted, a character 'M' is displayed in place of the corresponding number.

If the input level is near the maximum allowable (clipping), a '+' character is displayed in place of the corresponding level indicator.

In presence of an overload of the internal data converters, an 'S' character is displayed near the '+' character.





When the controller is connected to a PC, at power on the display shows:



to indicate that the front panel's controls are disabled: the device may be controlled only by the computer.

In paragraph 3.3 are listed the parameters that may be modified "locally" from the front panel's controls (other parameters may be modified "remotely" using a Personal Computer).

The parameters list scrolls on the display by rotating the encoder knob (4)

When the cursor '>' is showing a parameter's name on the upper line of the display, that parameter may be selected by pressing the PARAM key (2). The cursor '>' moves to the lower line, and the parameter's value may be modified by rotating the encoder.

Once a value has been modified, it is accepted by pressing the ENTER key. Any modification to a parameter's value is immediately effective but, if the new values must be stored and loaded at next power-up, the modified values must be stored by saving the User Setup (see following pages).







### 3.2 - LOADING A SETUP

The controller is supplied with a number of pre-programmed configurations (Factory SetUp), listed in the following table. Other Factory SetUp will be available and the user may store them using the PC connection.

Name	Description	Input A	Input B	Output F1	Output F2	Output F3	Output F4	Output F5	Output F6
RA16 + RAB1815 A Flw	PalcoPlus Standard flown	Mono	Disabled	Do not use (*)	RA16 (1 couple) flown	Active Not used	RAB1815 (1 speaker)	Disabled	Disabled
RA16 + RAB1815 A Stk	PalcoPlus stacked	Mono	Disabled	Do not use (*)	RA16 (1 couple) stacked	Active Not used	RAB1815 (1 speaker)	Disabled	Disabled
RA16 + RA16 A&B	RA16 2 couples Stereo	Ch L	Ch R	Do not use (*)	RA16 (1 couple) Ch L	Active Not used	Active Not used	Do not use (*)	RA16 (1 couple) Ch R
RA16 Ch4 in A	RA16 2 couples Ch A	Mono	Disabled	Do not use (*)	RA16 (1 couple) flown	Active Not used	Active Not used	Do not use (*)	RA16 (1 couple) flown
RAB1815 x 2 in A	RAB1815 2 woofers	Mono	Disabled	Disabled	Disabled	RAB1815 1° speaker	RAB1815 2° speaker	Disabled	Disabled
4 Ch Mono in A	4 speakers Mono Input A	Mono	Disabled	Speaker no. 1	Speaker no. 2	Active Not used	Active Not used	Speaker n. 3	Speaker n. 4
4 Ch Stereo in A&B	4 speakers Stereo Inputs A and B	Ch L	Ch R	Speaker no. 1 L	Speaker no. 2 L	Active Not used	Active Not used	Speaker n. 3 R	Speaker n. 4 R
EXTRA PRESET	Uploadable from PC								

(\*) NOTE: outputs F1 and F5 are active, but they must not be used to drive one RA16 speaker because they are wired to one channel (HF) only.





To load a SetUp, rotate the encoder until the cursor, in the display's upper line, will point to **> Hardware Config.**



The lower line will show the name of the loaded SetUp, like:

**RA16 + RAB1815 A**, corresponding to the first preset.

Pressing the PARAM key the cursor will move to the lower line.

Rotate the encoder knob to scroll through the list of pre-loaded presets.

The cursor character is displayed in negative: '**>**'.

The display will show: **OK to Load** – requiring the user to confirm the modification. To load the desired preset, press the ENTER key.

The display will show **Loading Config.** to indicate that the new preset is being loaded.

When the new preset has been successfully loaded, the display will show its name.

### 3.3 - PARAMETERS

The user can freely modify any of the following parameter's values:

**InVol A and InVol B:** A and B inputs gain, respectively. When using some of the presets, the B input is disabled, and the parameter InVol B is not displayed. The values may be modified at 0.5 dB steps.

**VolRA16 and VolRAB:** output attenuations for the outputs 1/2 and 3/4, respectively.

The values may be modified at 0.5 dB steps.

This is the default condition, with the standard setting for the PALCOPLUS system: output channels 1 and 2 are assigned to the RA16 speakers and output channels 3 and 4 are assigned to the RAB1815 woofers.

These two parameters may be given different names with other presets.

**DlyRA16 and DlyRAB:** the delay time assigned to the output channels 1/2 and 3/4, respectively.

The parameter may be modified at 1 ms steps. These two parameters may be given different names with other presets.

**InLink:** this parameter selects the link of inputs A and B to the outputs 1 and 2.

When set to **LinkOn** the two balanced outputs CH1 and CH2 are linked with the inputs IN A and IN B, respectively. This allows to connect them to the inputs IN A and IN B of another PLM6800 amplifier, that will be driven in parallel (see the wiring example of page 50).

- When set to **LinkOFF** the four balanced outputs CH1, CH2, CH3 and CH4 are connected to the four outputs of the internal digital processor.

This allows to drive other "standard" power amplifiers, without an internal processor.





Modifications to the parameter's values and the loaded SetUp are not permanent. For storing them as permanent modifications, they must be stored using the **Save User SetUp** menu.



This way, at next power on the active preset will be the one loaded before, with the user-modified parameter's values.

The last parameter that can be displayed is "**IdName**", the number in Hex format that identifies in an univocal way the PLM6800. This number cannot be modified, and will be required when setting up a remotely controlled network of PLM6800 units.





## 4 - RACON SOFTWARE

### 4.1 - HARDWARE REQUIREMENTS

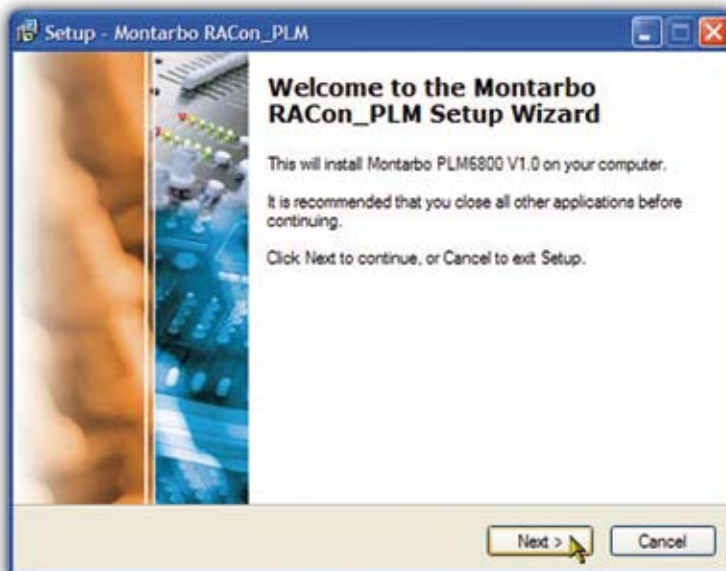
- operating system: Windows® 98 SE or higher,
- processor: Pentium® III 750 MHz or higher,
- video card with **1024 x 768** pixel resolution - 16M colors,
- RAM: 64 MB,
- free disk space for installation: 10 MB

### 4.2 - INSTALLATION



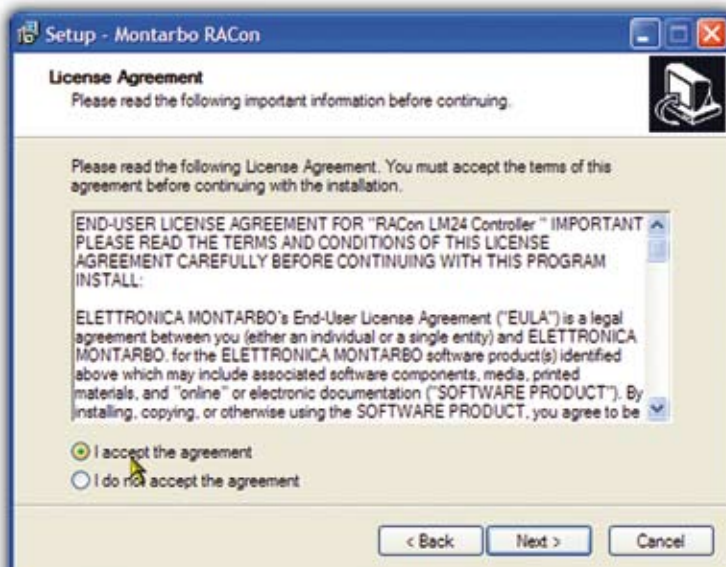
During the installation the **USB cable MUST BE UNPLUGGED FROM THE PC.**

Insert the CD supplied with the interface LD2.4 in the computer drive. The installing menu will be launched. It will be possible to select the appropriate application. If the installation process does not start (the "auto run" function may be disabled in your PC), start the process manually by opening "my computer" and double-clicking on the *setupLD24.exe* file contained in the CD.



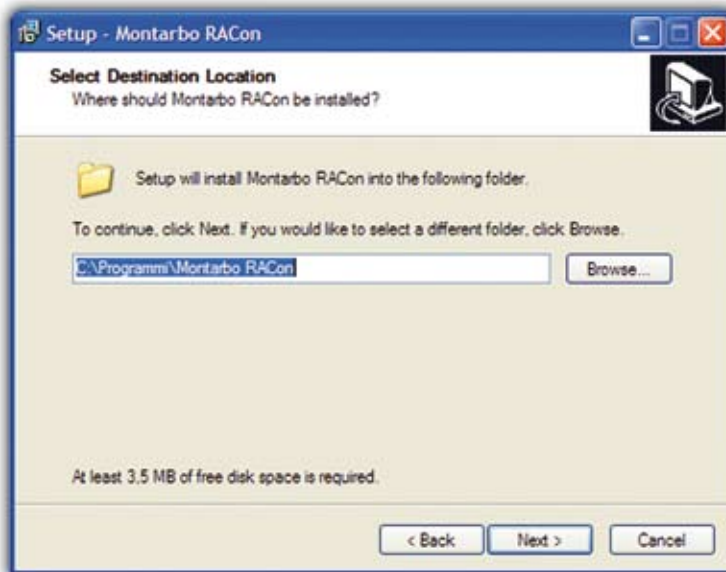
Follow the indications of the *setup wizard* to customize the installation.

Click on the *Next* button. The following window will open, asking you to accept the license agreement.



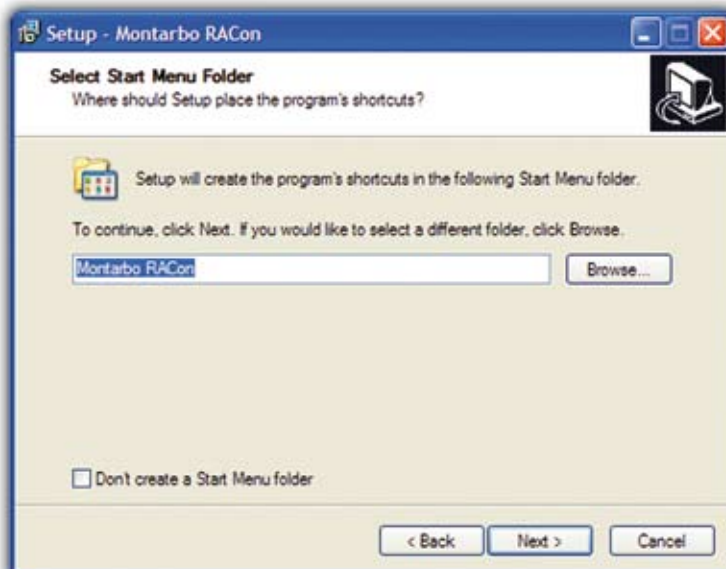
If you want to continue the installation process, click on "*I accept the agreement*", and then click on *Next*.



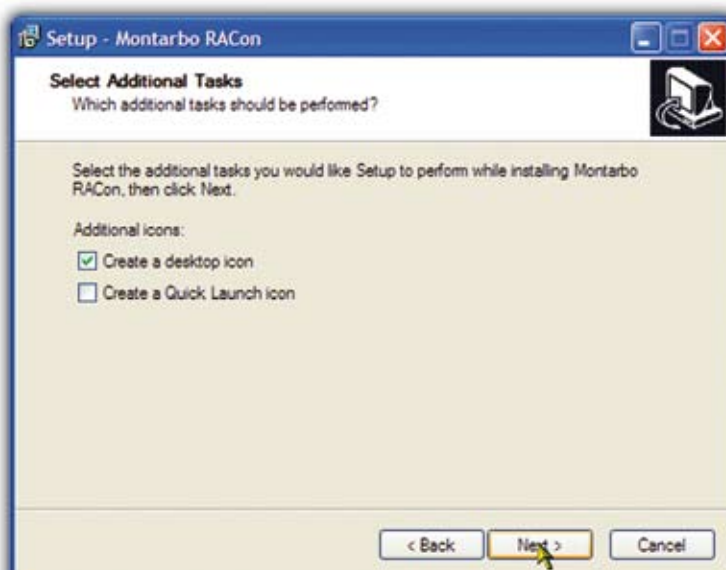


This window will open, asking in which folder you want the program installed.

Write the folder name, or browse to search for it, or simply accept the default folder.

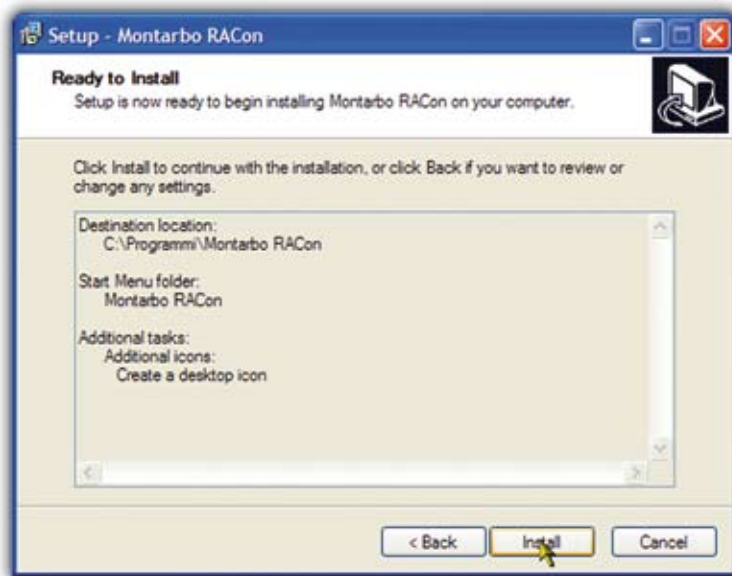


The following window allows you to select the program's group name in the START Menu.



The following window allows you to create icons for the program on the Desktop and/or in the Quick launch bar.

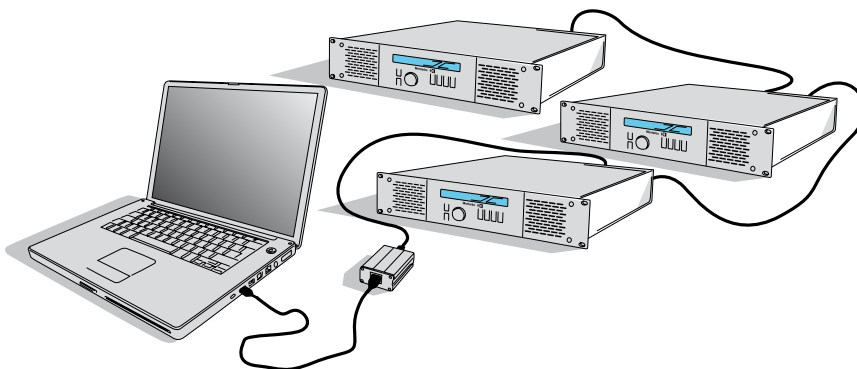




Once the various options have been selected, the installation program is ready to copy the program's files to the PC.

Click on *Install* and the **RACon** program will be installed in your PC.

After completing the RaCon program's installation, the process will continue with the USB driver for the USBnet - LD2.4 interface, required for the PC to communicate with the PLM6800 controllers via the RS485FD serial interface.



During the installation the **USB cable MUST BE UNPLUGGED FROM THE PC.**



While the USB driver is being installed the operating system will display a warning about failure of compliance regarding the Windows Logo testing program: click on *Continue*.







The following window will display when the RACon program setup process has been completed. It is now possible to continue with the installation of the EASE Focus aiming software.



EASE Focus requires the Microsoft® ".NET 1.1" libraries; If these are not installed on your PC, you can install them by executing the **dotnetfx.exe** file present on the supplied CD.

Now it is possible to plug in the USB cable and the LD24 interface. The PC will detect the new hardware and will add it to the system's registry.



The software is located on the PC hard drive so it is not necessary to search for it: select "No, not now" and click Next.





In the following window the operating system will ask how it must search for the interface driver:

Use the suggested method (automatic) and click **Next**.



As you did previously, ignore the Windows Logo compatibility message by clicking on **Continue Anyway**.



If requested, select **Montarbo USBNet** and click on **Next**.







The installation process continues with the new registration of the new hardware and its driver.



At the end of the process, the LD24 interface and the Montarbo USBNet are ready for use.





#### 4.3 - USING THE PROGRAM

To start using the program, double click on the desktop icon.

The main program window is shown in the following screen shot.



The program will start searching for the LD2.4 USB interface. If there is no interface connected to the PC, the message window will show **NoDevice**.



In this case, plug in the interface cable and wait for the *Search...* message to disappear. The message window will show **Montarbo USBNet** for a short time, then **Status OK**.



Now it is possible to start an automatic scan of the network to connect to the PLM6800 controllers, or you can add controllers manually.





#### 4.3.1 - Automatic Scan

Check for the correct wiring of the controllers (with CAT5 cables: Ethernet type), then set the number of PLM6800 in the network by writing their number in the **MaxSrch** window, then click on **NetScan**.



This operation may be interrupted by clicking on **StopScan**.

The program will search for any controller in the network and will read their **IdNames**, and then register them in its memory.

#### 4.3.2 - Manual connection

As an alternative to the automatic scan you can connect to one or more PLM6800 controllers if you know their **IdName** (which can be read on the controller's display).

To do this, click on **AddManually**, then type in the **IdName** in the dialog window.



When you click on **Ok** the program will search for that PLM6800 on the network. If the **IdName** is correct, the controller is registered. This step must be repeated for each controller in the network.



If a PLM6800 that was registered on the computer has been removed from the network, it is advisable to delete its registration by clicking on **Remove HW**; then select the **IdName** to be removed. Doing this will eliminate recurrent searching of the network for the missing PLM6800 controller.





Once the automatic scan or the manual connection has been completed successfully, the program's windows will display the system's elements on which it is possible to operate.

This will be the program's main windows.



A maximum of eight PLM6800 may be registered in one PC (two are shown in the above example).

The window will show the images of the PLM6800 with their unique **IdNames** in "Hxxxxxxxxxxxx" format, the "**hardware preset**" which has been programmed to them, and the selected "**UserConfig**".

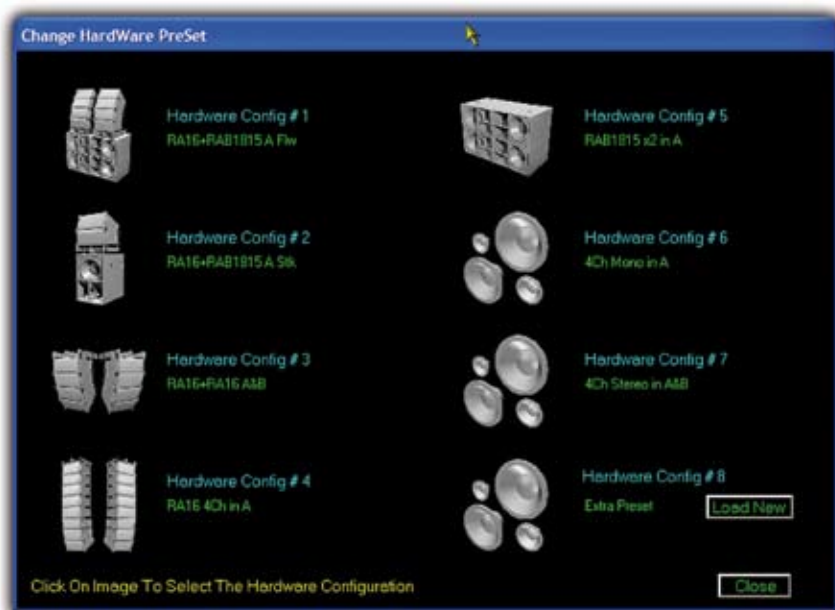
The display will also show the temperatures of the power amplifiers: T1 and T2, corresponding to channels 1&2 (T1) and 3&4 (T2).

By clicking on the speaker images the user may modify the configuration, selecting one of the factory presets.



The following page's window will be displayed.





The default configuration is the first one: **RA16 + RAB1815 A flw**



Caution: different configurations require different wiring (refer to chapter 5).



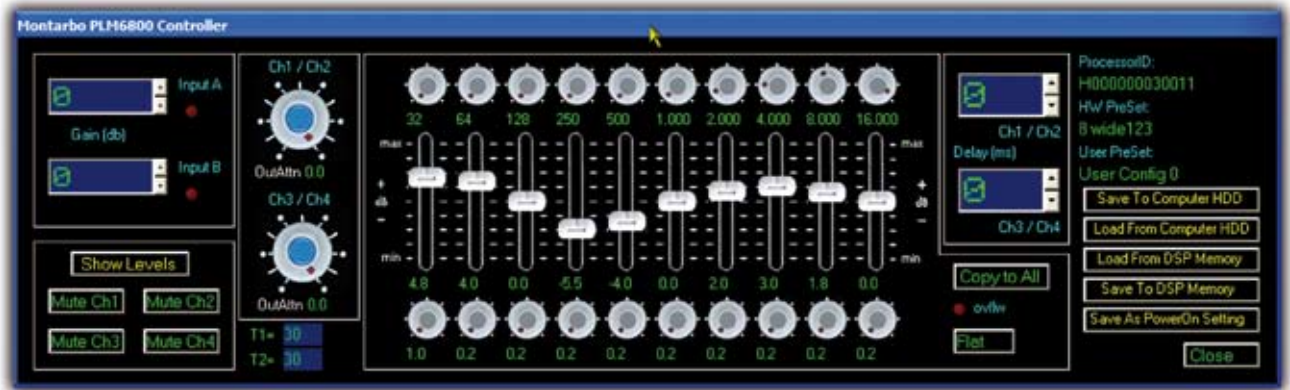
By clicking on the "Load New" button it is possible to load a new preset, supplied by Montarbo, when this will be available.





#### 4.3.3 - Main controller's window

By clicking on the image of one of the PLM6800 shown in the previous window, the connection is activated and the **controller's main window** opens.



This windows allows you to adjust all user-modifiable parameters of the PLM6800

- Input Gain
- Mute
- Output Attenuation
- Delay
- Load User Preset
- Save User Preset

The display will also show the temperatures of the power amplifiers: T1 and T2, corresponding to channels 1&2 (T1) and 3&4 (T2).

The equalizer section comprises 10 parametric filters, and it's combined response curve is displayed in the Filter Graph window, that is displayed at the bottom of the control's windows.

The default frequencies are set on standard octave-band centers so that the equalizer may be used as a standard octave graphic equalizer, but each filter is independent and it's center frequency, gain and Q are completely adjustable.

The equalizer setting may be saved in the PLM6800's internal EEPROM memory and in the Personal Computer's hard disk.

This way they are available for being exchanged with other users or with other Personal Computers used in PALCOPLUS systems.



By clicking on the *Close* button the control window is closed and the program returns to the previous screen.







The main controller's window is divided into sections, one for each function:

#### Gain

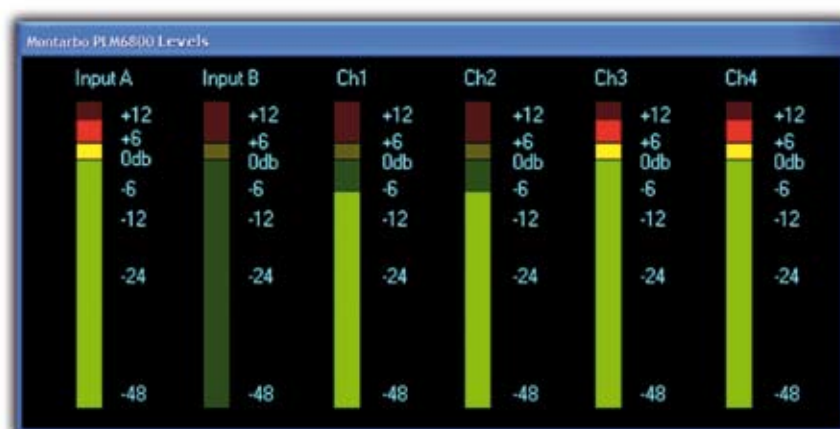
The input gain of each of the two PLM6800 input channels can be adjusted (the setting for input B has no effect if the preset does not use this input). The 'indicator' turns red when an A/D converter overload is detected.



#### Mute

These buttons can be used to mute the corresponding outputs (keyboard shortcuts F1 - F2 - F3 - F4).

It is possible to display the input/output levels, as can be seen in the following screenshot, by clicking on **Show Levels**.



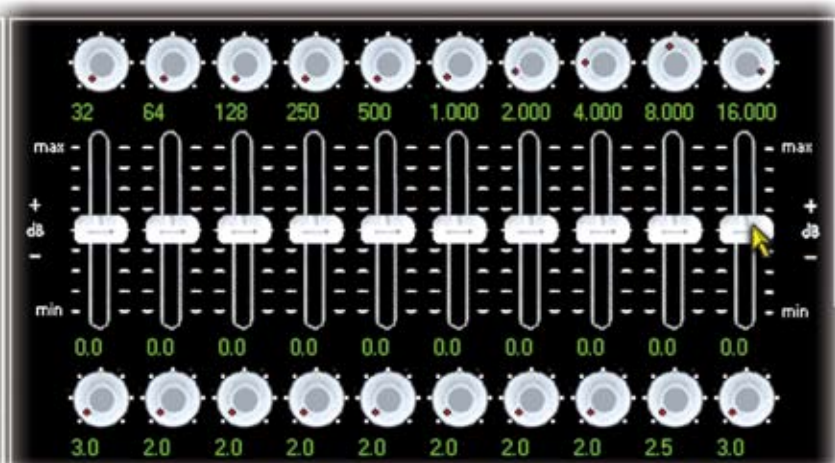
#### Delay

The time delay can be set for each of the output channels' couples: 1/2 and 3/4. The value can be adjusted by one millisecond steps (about 34 cm: 13 inches); the maximum value is 310ms (more than 100 meters: 334 feet).

#### Equalizer

The center frequency of each filter may be adjusted from 10Hz to 18Khz. Filter gain may be adjusted from -12 to +12 dB and filter Q (filter width:

Quality factor) from 0,2 to 50.



To adjust a parameter's value, move the cursor of the mouse onto the desired knob and move it while keeping the left button pressed. Click on the central button of the mouse to quickly set the Gain controls to the '0' position.





On rotary knobs it is possible to move the cursor to the minimum or maximum position (the cursor will change to a + or – sign), then adjust the parameter by clicking with the left button of the mouse (fine adjustment) or right button (coarse adjustment).



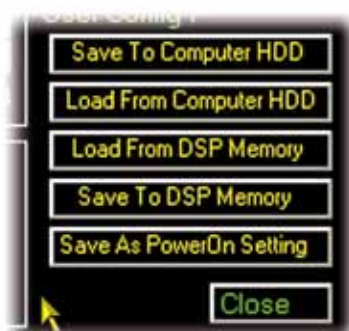
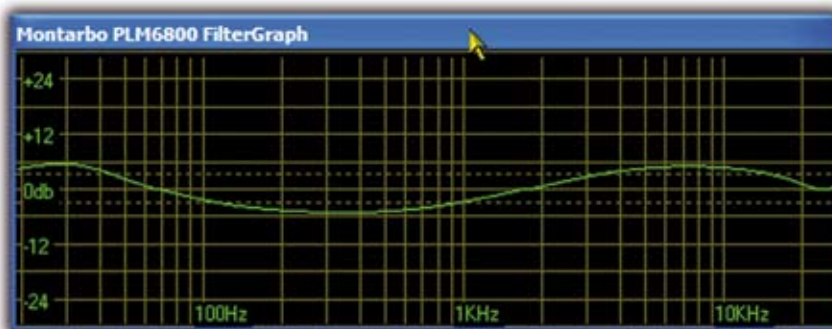
The **Flat** button allows you to enable/disable the equalizer.

The **Copy to All** button allows you to copy the equalizer's setting to all PLM6800 in the network.

The **ovflw** indicator light comes on when the parameter's limits have been exceeded (e.g. maximum gain, low Q and frequency near the limits).

When the **ovflw** indicator is on, the equalizer's effective settings may be different from the ones shown by the knob settings.

In any case, the filter's response is displayed in the **Graph** window:



#### Preset control buttons

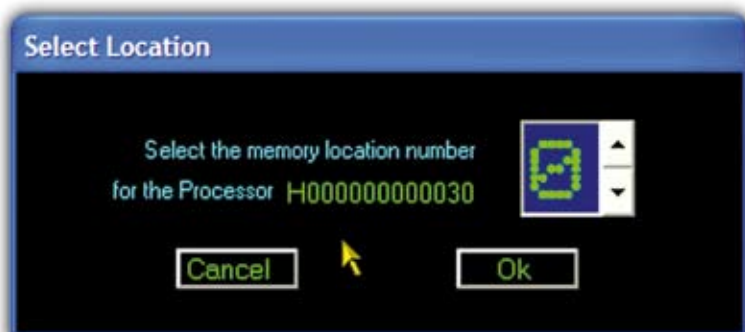
The system buttons give access to the windows where you may select the memory location where the modified preset will be stored or from where an existing preset must be recalled.

There are 8 memory locations, numbered from 0 to 7.

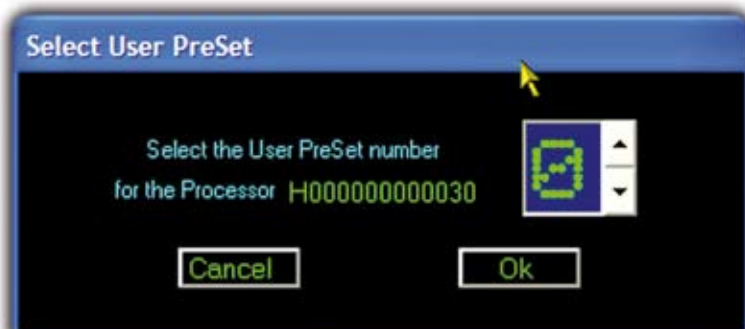
The button operates only on the selected controller:



to store the same settings on all the network's controllers it is necessary to repeat the memory store operations on each of them.



Clicking on the **Save to DSP memory** button will open a new window where you can elect the **location** where the parameters must be stored.



Clicking on the **Load from DSP memory** button will open the **Select User Preset** window where you can select a the preset that will be loaded and made active.







#### Save as PowerOn setting

Any preset may be saved as "**default preset**" so that it will be loaded as the active preset when the controller is turned on (independent of the PC connection), by clicking on the **Save as PowerOn setting** button.



#### Output attenuation (OutAttn)

As for the **Delay**, these setting operate on a couple of outputs (1/2 and 3/4). The adjustment range is **0dB** to **-32dB**.





## 5 - TECHNICAL DATA

### PLM6800 - POWERED CONTROLLER

*Powered Loudspeaker Management System 2 Inputs - 4 outputs*

Slew Rate (8 ohm)	30 V/μs (input filter disabled)
S/N ratio (amplifier + processor)	>100 dB (inweighed)
Distortion	<0.5% (THD, DIM, SMPTE)
Inputs	Balanced
CMRR	65dB (20÷20KHz) Min.
Input impedance	10 kohms
Gain	38 dB
Efficiency (4 ohms load)	75% (typical)
Power factor	better than 0,95
Outputs (power amplifier)	unbalanced
Bandwidth (4 ohms)	5 Hz ÷ 25 kHz
Damping factor (20 Hz – 1000 Hz)	> 200
Power EIAJ – all channels operating, each channel	4 ohms 1700 W 8 ohms 1000 W
Crosstalk	106dB (20÷20KHz) Min.
Power requirement	85 ÷ 270 V ca (50/60 Hz) – 25A Max
Dimensions	2 standard 19" rack units, depth 526 mm
Weight	11.5 kg

Protection systems:

- Thermal protection (temperature controlled power limiter, overheat protection).
- Output short circuit / output overload.
- Clip limiter, permanent signal limiter, high frequency protection.
- Will not be damaged by a temporary line voltage of up to 400 V ac.

8 factory presets (1 up-gradable by the user).

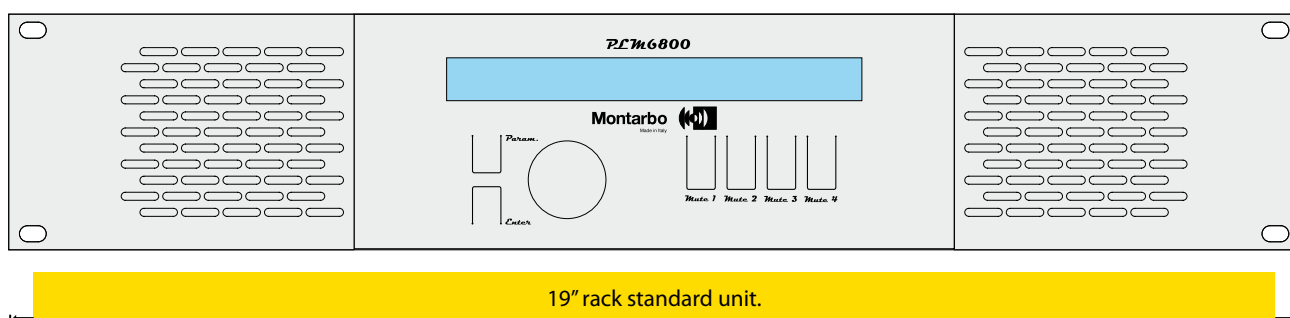
Upgrades and new presets will be available.

8 user preset

56-Bit DSP

24-Bit Sigma Delta AD/DA converters

Remotely controllable by PC via LD2.4 USB Montarbo interface.

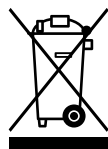
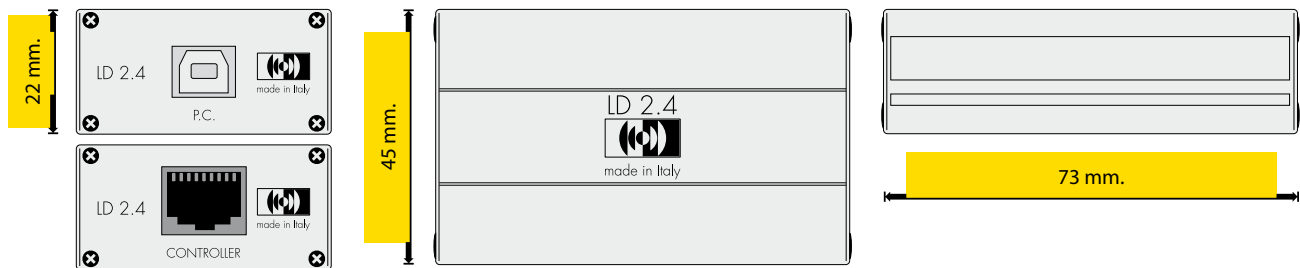




## LD2.4 - USBNET INTERFACE

USB 2.0 To Montarbo network interface

Dimensions	W 73 x H 45 x D 22 mm
Connections	1 x USB-B / 1 x RJ45
Network's Max Cable Length	100m (cavo CAT5)
Max number of PLM6800 in network	8 unità



### Waste from Electrical and Electronic Equipment

#### Attention !

The crossed out wheeled bin symbol that can be found on this product means that the product is covered by the Waste from Electrical and Electronic Equipment Directive. The symbol is intended to indicate that waste from electrical and electronic equipment must be subject to a selective collection. For more details on available collection facilities please contact your local government office or the retailer where you purchased this product.

The solid bar underneath indicates that the product has been put on the market after 13th August 2005.

### INFORMATION ON PROPER DISPOSAL

#### Information on Disposal for Users (private households)

##### In the European Union

Attention: If you want to dispose of this equipment, please do not use the ordinary dust bin! Used electrical and electronic equipment should not be disposed of via the normal household waste stream but must be treated separately and in accordance with legislation that requires proper treatment, recovery and recycling of used electrical and electronic equipment.

Following the implementation by member states, private households within the EU states may return their used electrical and electronic equipment to designated collection facilities free of charge\*. In some countries\* your local retailer may also take back your old product free of charge if you purchase a similar new one. \* Please contact your local authority for further details.

**In other Countries outside the EU:** If you wish to dispose of this product, please contact your local authorities and ask for the correct method of disposal.

**In Switzerland:** Used electrical or electronic equipment can be returned free of charge to the dealer, even if you don't purchase a new product. Further collection facilities are listed on the homepage of [www.swico.ch](http://www.swico.ch) or [www.sens.ch](http://www.sens.ch).

#### Information on Disposal for Professional Users

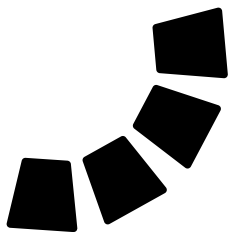
##### In the European Union

If the product is used for business purposes and you want to discard it: please contact your Montarbo dealer who will inform you about the take-back of the product. You might be charged for the costs arising from take-back and recycling. Small products (and small amounts) might be taken back by your local collection facilities.

**In Spain:** Please contact the established collection system or your local authority for takeback of your used products.

**In other Countries outside the EU:** please contact your local authorities and ask for the correct method of disposal.





*Le informazioni contenute in questo manuale sono state attentamente redatte e controllate. Tuttavia non si assume alcuna responsabilità per eventuali inesattezze. Questo manuale non può contenere una risposta a tutti i singoli problemi che possono presentarsi durante l'installazione e l'uso dell'apparecchio. Siamo a vostra disposizione per fornirvi eventuali ulteriori informazioni e consigli.*

*La Elettronica Montarbo srl non può essere ritenuta responsabile per danni o incidenti a cose o persone, causati o connessi all'utilizzazione o malfunzionamento dell'apparecchio.*

*Caratteristiche, dati tecnici e immagini possono essere modificati senza preavviso.*

*The information contained in this manual have been carefully drawn up and checked. However no responsibility will be assumed for any incorrectness. This manual cannot cover all the possible contingencies which may arise during the product installation and use. Should further information be desired, please contact us or our local distributor.*

*Elettronica Montarbo srl can not be considered responsible for damages which may be caused to people and things when using this product*

*Specifications, features and pictorial material are subject to change without prior notice.*

# *PLM 6800*

## POWERED CONTROLLER

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