

LAKE PEOPLE

MONITOR CONTROLLER

LAKE PEOPLE MC100

USER 's MANUAL



MC100 (Standard) =

Volume Control with Alps RK 27 Potentiometer

MC100 PRO =

Volume Control in 256 Steps of 0,4 dB with Reed-Relays

Content

Theme	Page
About LAKE PEOPLE	4
Safety Instructions	5
The Earth / Grounding Concept	6
Connection / Connectors	8
General	9
Block Circuitry	11
Power, Inputs, Controls	12
The Monitoring Functions	14
Signal Processing	14
Volume, Outputs	15
Headphone Amp	17
PRE-GAIN explained	18
Protective Circuits	19
Programming	19
Things to Know	20
Disposal	22
Technical Data	23
Dismantling	24
Jumper / PRE-GAIN Setting	25

CAUTION!!

**THE HIGH OUTPUT LEVELS ACHIEVABLE
WITH THIS UNIT MAY
DAMAGE YOUR HEARING OR THE HEADPHONES
IF OPERATED CARELESSLY!!**

Cordial thanks for your decision in favour of a Lake People product !

Lake People electronic GmbH develops, manufactures and distributes products in the professional range, for broadcast, television, airports, exhibition halls, festival venues, theatres, large-scale installations, private studios and more. In the private sector as well, Lake People products become increasingly popular due to their outstanding quality.

Who develops Lake People equipment ?

The devices are exclusively developed in Germany by the engineers of Lake People electronic GmbH. In doing so, the team of developers can draw on thirty years of experience and countless products for the pro-audio domain.

Among others, the first German-made 20-bit A/D and D/A converters were developed by Lake People in the early nineties of the past century.

Who manufactures Lake People equipment ?

The devices are exclusively manufactured in Germany by Lake People electronic GmbH or contractors in the company's vicinity.

Lake People puts high emphasis on domestic manufacturing. As well, all component suppliers are chosen in order to achieve the main part of added value inland.

How do Lake People devices get to the customer ?

Lake People devices can be obtained from respective specialist suppliers. If there is none such accessible regionally, the customer is supported by transregional distribution partners (google may help...) and, of course, by Lake People on-line shop.

... and if it doesn't work like it should ?

Lake People devices are covered by a 24-month warranty. In case of any malfunction during this period, they can be shipped to the manufacturer directly. Of course, the client will benefit from Lake People's full technical support even when warranty has expired. Any technical questions or need for advice is welcome.



LAKE PEOPLE electronic GmbH
Turmstrasse 7a
D-78467 Konstanz

Fon +49 (0) 7531 73678
Fax +49 (0) 7531 74998

www.lake-people.de
www.lake-people.com
www.NIIMBUS-audio.de
www.NIIMBUS-audio.com
www.vioelectric.de
www.vioelectric.com

General Safety Instructions / WARNING

For your protection, please read the following:

Water, Liquids, Moisture:

This appliance should not be used near water or other sources of liquids.

Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

Power Supply:

The appliance should be connected to the dedicated power source, delivered with the item.

It must be operated with the voltages described in this manual.

Wide AC Voltage:

The external Power supply accepts voltages from 90 to 260 V AC and 50 to 60 Hz AC frequency.

It is thus usable worldwide.

Power Cord:

The appliance is powered from an external power supply

Care should be taken that the mains power cord is in faultless condition without any injuries.

Run the power cable in a way that it can't be hurt and will not become a source of accidents.

The power supply is supplied with a 3-wire German power cable including protective ground.

Delivered to other countries, a fitting mains cable is often supplied.

However, in some countries the user is in charge to provide a matching mains cable.

Please refer to the table below to connect a mains plug:

Übersicht: Netzkabelfunktionen und Farben						
Leiter / CONDUCTOR			Farbe	COLOR	Alternativ	Alternativ
L	Phase	LIVE	Braun	BROWN	Schwarz	BLACK
N	Null	NEUTRAL	Blau	BLUE	Weiss	WHITE
E 	Erde	EARTH GND	Grün-Gelb	GRN+YLW	Grün	GREEN

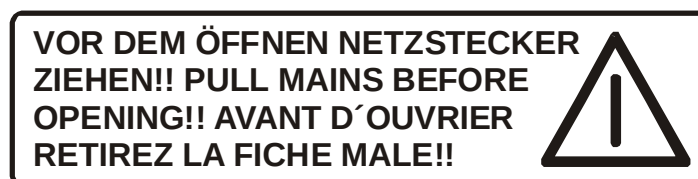
U.K. Mains Plug Warning:

A moulded mains plug that has been cut off from the cord is unsafe. Discard the mains plug at a suitable disposal facility.

NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAINS PLUG INTO A 13 AMP POWER SOCKET. Do not use the mains plug without the fuse cover in place. Replacement fuse covers can be obtained from your local retailer. Replacement fuses are 13 amps and MUST be ASTA approved to BS 1362.

Service / Repair:

To reduce the risk of fire or electric shock, the user should not attempt to service the appliance beyond the measures described in the operating manual. All other servicing or repair should be referred to qualified personnel !!

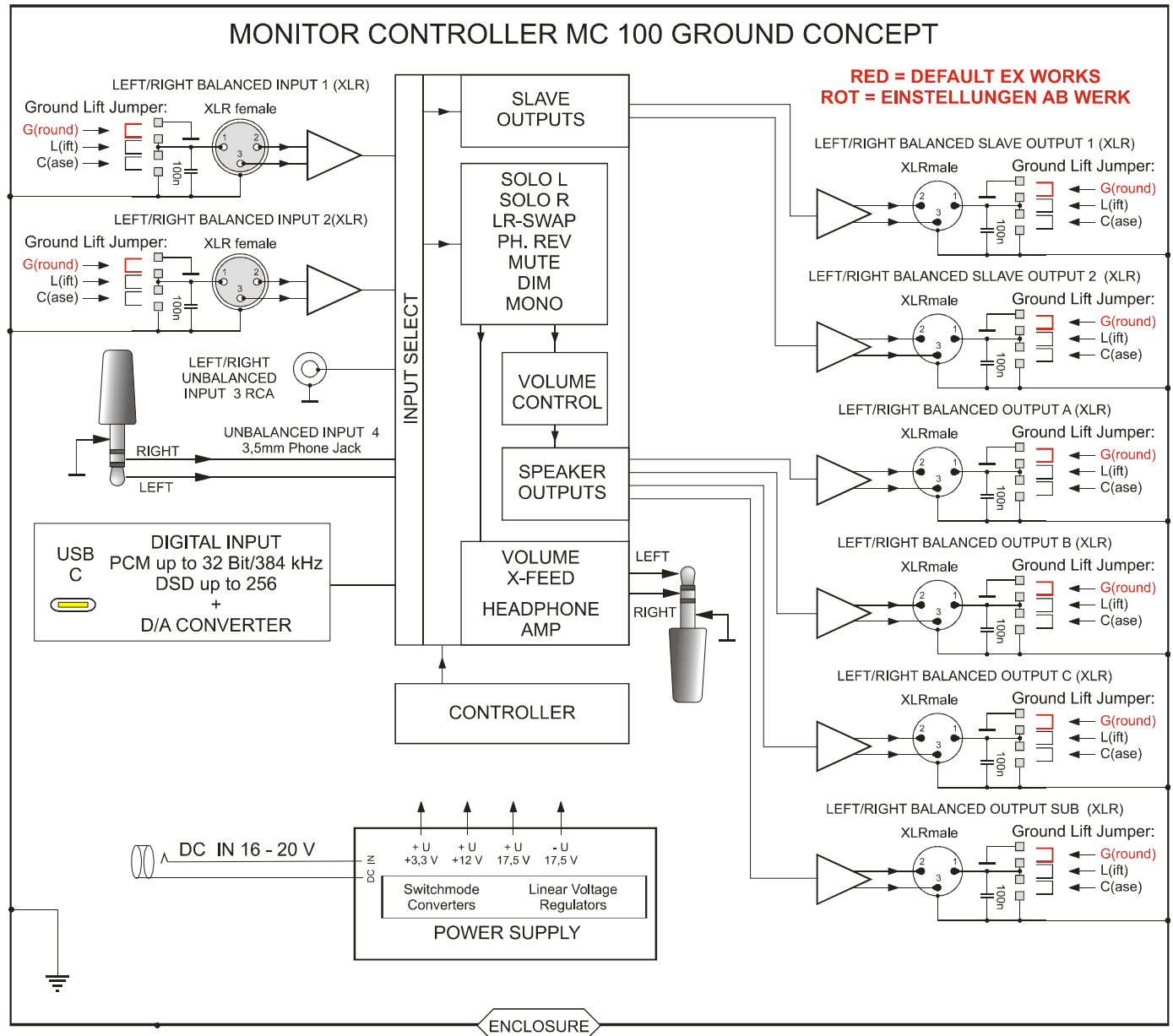


Electromagnetic Compatibility

This unit conforms to the Product Specifications noted as **Declaration of Conformity** at the end of this manual. Operation is subject to the following conditions:

- this device may not cause harmful interferences
- this device must accept any interference received, including interference that may cause undesired operation
- this device must not be operated within significant electromagnetic field

The Protective Earth (PE) / Ground Concept



General GROUND-LIFT Jumper - accessible from the inside. (See page 25)

Mind the SAFETY INSTRUCTIONS !!

Ex-works this jumper is set to the **LIFT** position.

The internal ground potential is "lifted" by means of this jumper.

As a result, the interconnection for DC voltages and lower frequencies (< 150 Hz) will be cut.

Higher frequencies will be bled off to earth potential through the RC filter.

The LIFT position is helpful in case of hum or jitter caused by different ground/earth potentials.

As can be seen from the above picture, the Ground – Lift – Case relationship of the balanced inputs and outputs can be modified.

XLR GROUD-LIFT Jumper (Page 25)

(accessible from the inside. Mind the SAFETY INSTRUCTIONS !!):

G(ROUND): Ex-works all jumpers are set to "G" (ground) position. Pin 1 is connected to the internal ground reference. High frequency interference is deflected to the case via a 100 nF capacitor.

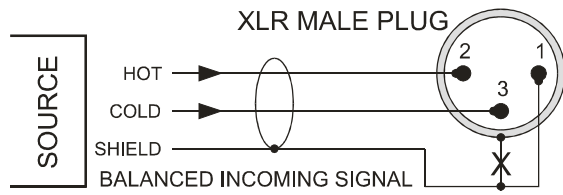
L(IFT): The interconnection between Pin 1 and ground is open. High frequency interference is deflected to the case via a 100 nF capacitor. This jumper position is specifically useful if the unit is equipped with transformers !!

C(ASE): Pin 1 is connected to the case, the 100 nF capacitor is bridged. This jumper position may be varied together with the **General GROUND-LIFT jumper**.

**Please note that with jumpers not in the ex-works position
EMC emission might occur,
for which the user is responsible only !**

Connection / Connectors for Analog Signals

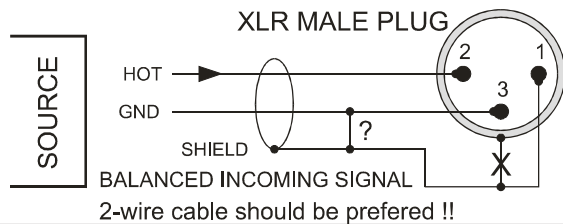
ANALOG SIGNALS



Balanced Cable (Signal) to Balanced Input

Shield = Signal Ground = Pin 1
 Hot / + Phase = Pin 2
 Cold / - Phase = Pin 3
 The case of the connector should not be wired to the shield of the cable. The connector is routed to earth potential (PE) when plugged into the corresponding socket of the case !

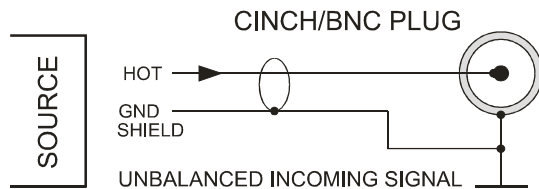
ANALOG SIGNALS



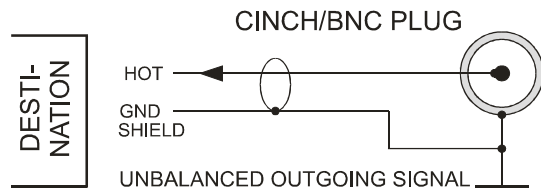
Unbalanced Cable (Signal) to Balanced Input

Shield = Signal Ground = Pin 1
 Hot / Signal = Pin 2
 Cold / Ground = Pin 3
 The case of the connector should not be wired to the shield of the cable. The connector is routed to earth potential (PE) when plugged into the corresponding socket of the case !

ANALOG SIGNALS

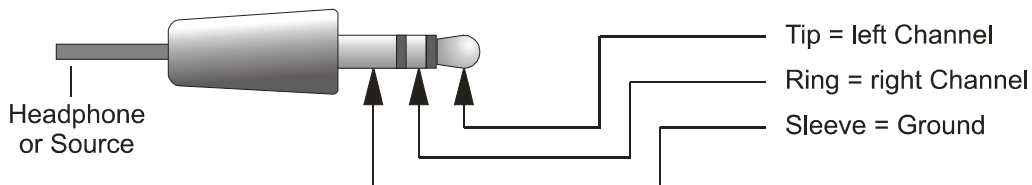


Unbalanced Input / Output to Unbalanced Cable

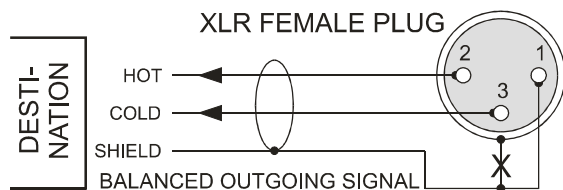


UNBALANCED PHONE JACK

3.5 mm / 6.3 mm (1/4") TRS Phone Jack (Tip - Ring - Sleeve Connector)



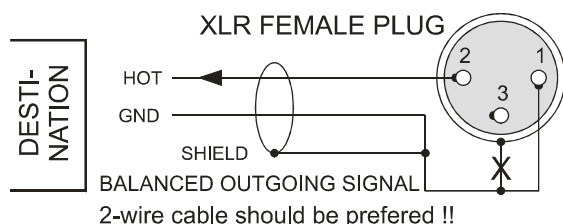
ANALOG SIGNALS



Balanced Output to Balanced Cable

Shield = Signal Ground = Pin 1
 Hot / + Phase = Pin 2
 Cold / - Phase = Pin 3
 The case of the connector should not be wired to the shield of the cable. The connector is routed to earth potential (PE) when plugged into the corresponding socket of the case !

ANALOG SIGNALS



Electronically Balanced Output to Unbalanced Cable

Shield = Signal Ground = Pin 1
 Hot / Signal = Pin 2
(Cold) = Pin 3 = must be left open !!
 The case of the connector should not be wired to the shield of the cable. The connector is routed to earth potential (PE) when plugged into the corresponding socket of the case !

GENERAL

With its five inputs, including a USB input with high-quality D/A converter, 2 slave outputs, 3 loudspeaker outputs plus subwoofer output and the headphone path with X-Feed, the Lake People **Monitor Controller MC100** offers significantly more than conventional monitor controllers. The full set of stereo signal manipulation options such as solo L/R, channel swap, phase reverse, mono, mute and dim and the high-quality volume control make it stand out from the crowd. In addition, it is as low in noise and distortion as physics is allowing.

4 analogue Stereo Inputs, input impedance 10 kOhm, max. input level +22 dBu

LEDs for the activated Input(s), PCM oder DSD format

- 2 x balanced via XLR, gold plated
- 1 x unbalanced via RCA sockets, gold plated
- 1 x unbalanced via 1/8" (3,5 mm) phone jack on the front panel

1 digitaler Input

- USB-C, PCM up to 32 Bit and 384 kHz, DSD 64 – 256

7 Monitoring Functions

- SOLO L, left channel alone
- SOLO R, right channel alone
- L-R SWAP, left – right channel swap
- Ø REV, left channel phase reversed
- MONO
- MUTE
- DIM (-20 dB attenuation)

2 analogue Stereo Slave Outputs, level not adjustable

- Output impedance < 1 Ohm, max. output level Pegel +26 dBu
- balanced via XLR, gold plated

Attenuation

- Alps RK 27 volume control
- **MC100 PRO: 256-steps Relais volume control**

3 analogue Stereo Speaker Outputs, level adjustable

selectable as single action or summing on the front panel

- Level adaption via 3-way switches (0, -6, -12 dB) on the back panel
- Output impedance < 1 Ohm, max. output level +26 dBu
- balanced via XLR, gold plated

1 analogue Sub Speaker Output, MONO (!), level adjustable

As there is no Bass-Management provided, this output may also serve as a true mono output, it may be assigned to any other speaker output

- Level adaption via 3-way switches (0, -6, -12 dB) on the back panel
- Output impedance < 1 Ohm, max. output level +26 dBu
- balanced via XLR, gold plated

Headphone Amplifier,

- own volume control independent from Master Volume
- X-FEED**, separately switchable e
- X-Feed continuously variable
- 2 headphone outputs 1/8" (3,5 mm) and 1/4" (6,3 mm) phone jack
- Extremely powerful amps, Pre-Gain internally selectable in 7 steps

- High-grade MKP capacitors in the signal path
- 0,1 % und 1 % Metallfilm resistors
- delayed relay-based output activation during power on / instant cut-off for power off
- several protective circuits
- external power supply
- Rugged Aluminum case, black anodized
- 8 mm massive Aluminum front panel

THE CASE

of Lake People **Monitor Controller MC100** is made of 3 + 4 mm Aluminum and a thick 8 mm aluminum front panel. This choice of material ensures high mechanical stability and resistance whilst maintaining a high optical and haptic quality.

GROUND AND PROTECTIVE EARTH

The case of Lake People **Monitor Controller MC100** should be connected to protective earth.

POWER SUPPLY

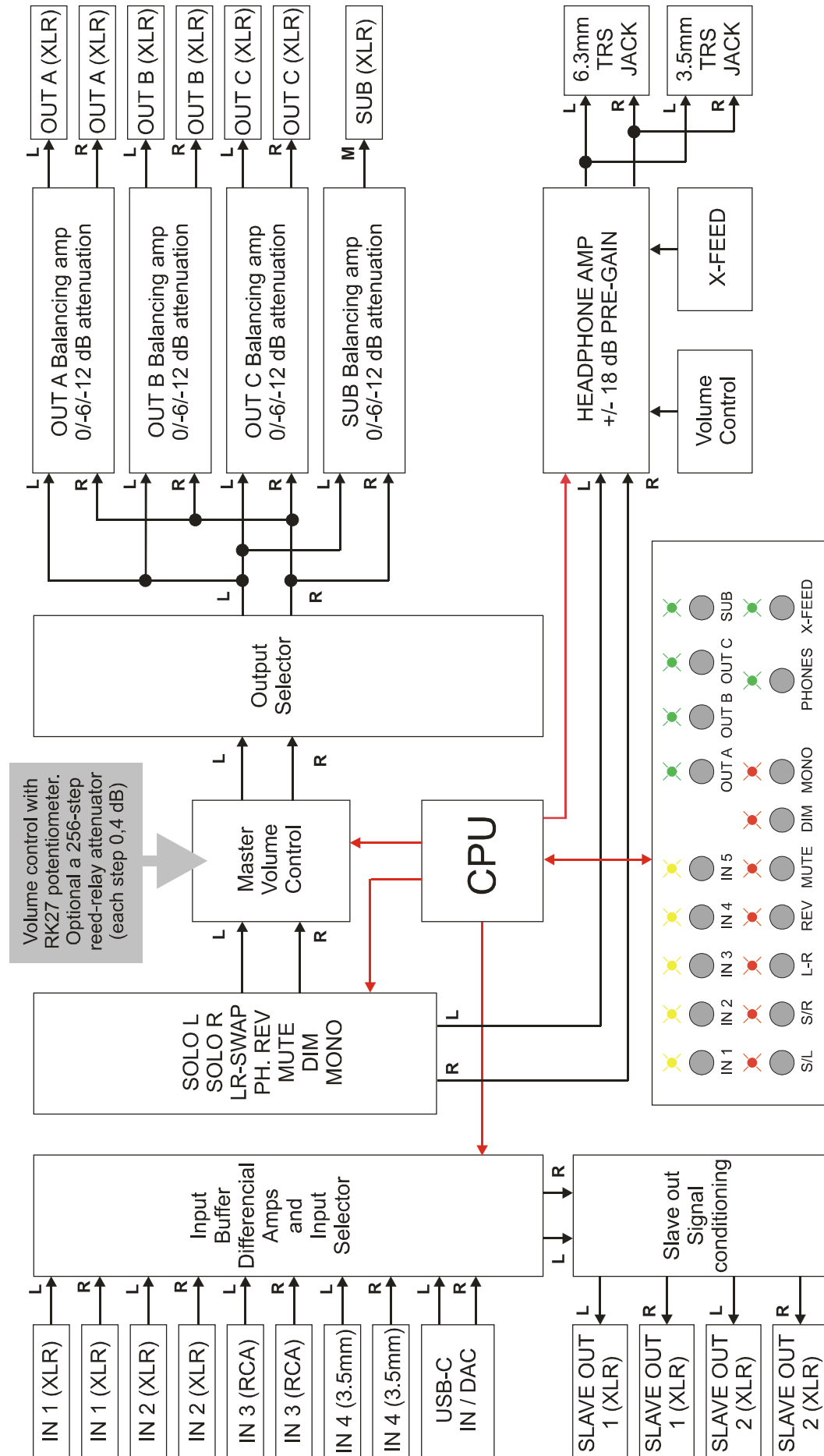
The appliance should be connected **EXCLUSIVELY** to the dedicated power adaptor, delivered with the item. The power adaptor offers a wide AC input, working from 90 ... 260 V AC.

Because of the interchangeable and detachable power cord of the power adapter, the Lake People **Monitor Controller MC100** can be operated worldwide.

The Monitor Controller MC100 must only be operated with the supplied power adapter !!



LAKE PEOPLE MC100 block circuitry



THE POWER -SWITCH

The unit is put into operation by means of the power switch.

The power-on procedure takes about 5 seconds.

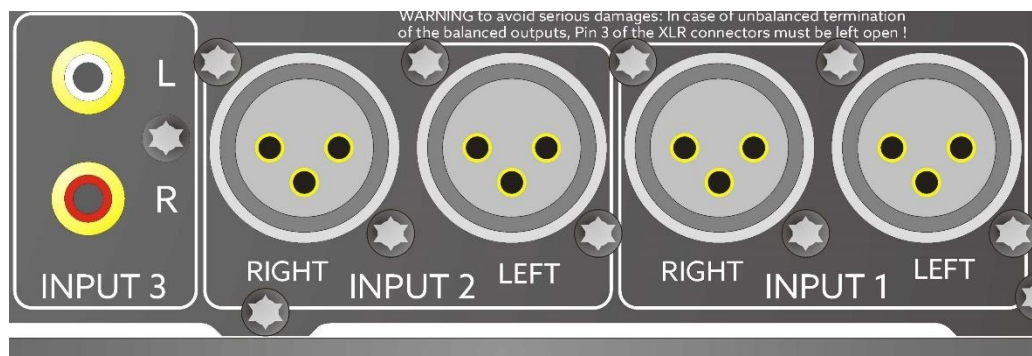
During this time all outputs are muted

Any breakdown will also cause the outputs to be muted.

The unit will always start with the last settings of the input-, output- and function configuration. The last operating status is therefore always recalled.



DIE ANALOGUE SIGNAL INPUTS



THE BALANCED SIGNAL INPUTS

are situated on the rear panel of the unit and are labelled as "INPUT 1 LEFT / RIGHT" and "INPUT 2 LEFT / RIGHT". They are fitted with gold plated XLR sockets.

Please note:

Unbalanced signals may be injected as well by means of an adaptor.
See page 8/9 to learn more.

Balanced XLR pin-out:	
PIN 1	GND
PIN 2	(+) PHASE
PIN 3	(-) PHASE

THE UNBALANCED SIGNAL INPUT (Back Panel)

For the use with unbalanced signals, gold plated RCA sockets are provided.

They are labelled as "INPUT 3 L / R". Here, gold plated RCA connectors are used.

THE UNBALANCED SIGNAL INPUT (Front Panel)

For the use with unbalanced signals e. g. from mobile devices, a 1/8" (3.5 mm) phone jack on the front panel is provided.
It is labelled as "IN 4".

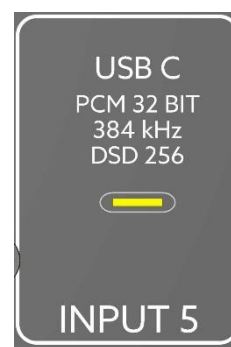


The input impedance on all analogue inputs is 10 kohms.
Maximum input level should not exceed +22 dBu.

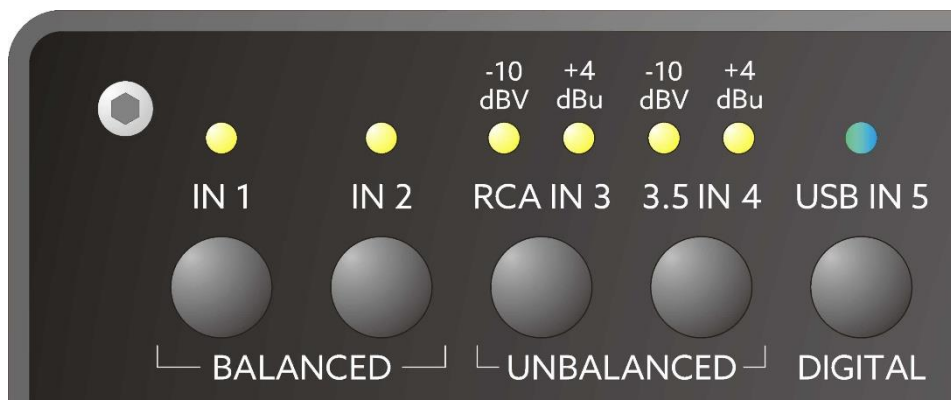
THE DIGITAL SIGNAL INPUT

can be found on the back panel as a USB-C input connector.

Here, PCM Signals up to 32 Bit and up to 384 kHz are accepted, as well as DSD Signals up to DSD 256.



SELECTING / ACTIVATING AN INPUT



With the "INPUT" buttons on the front of MC 100 one out of five inputs or a selection of several inputs can be chosen. The dedicated LED(s) above the button(s) are illuminated.

The inputs may be selected in two ways:

1. Summing: all inputs may be summed together.
2. Selective: Only the selected input is active, all others are not active.

Changing-over both input modes is done as follows:

1. SUMMING:

- Push and hold the "IN 1" button for 2-3 Seconds
- The corresponding LED flashes as long as you push the button
- Release the "IN 1" button, the input selection is set to "SUMMING MODE"

2. SELECTIVE:

- Push and hold the "IN 2" button for 2-3 Seconds
- The corresponding LED flashes as long as you push the button
- Release the "IN 2" button, the input selection is set to "SELECTIVE MODE"

The inputs "RCA IN 3" and "3.5 IN 4" may be set to a sensitivity of -10 dBV or +4 dBu.

This adjustment must only be made once, when (re-) activating the input, the sensitivity setting will be recalled.

The setting of the sensitivity is done as follows:

- Push the button "RCA IN 3" or "3.5 IN 4" for 2-3 Seconds
- The setting will change its state
- The sensitivity is displayed by the LEDs "-10 dBV" "or +4 dBu" above the dedicated button
- Release the button

When activating the digital input, the corresponding "USB IN 5" LED will display two colors, green for "PCM" or blue for "DSD" as long as there is a valid digital signal.

The default color is green.

THE MONITORING FUNCTIONS

A number of buttons serve for essential monitoring functions. These can be used individually or in combination. The activated function(s) are displayed by red LEDs.



SOLO L: Only the left channel is output to the left speaker or headphone output.

Also pushing the "MONO" button will cause the left channel to be output on both loudspeaker or headphone channels.

SOLO R: Only the right channel is output to the right speaker or headphone output.

Also pushing the "MONO" button will cause the right channel to be output on both loudspeaker or headphone channels.

L-R SWAP: The left and right channel are exchanged.

Ø REV: The phase of the left channel is reversed in relation to the phase of the right channel.

The phase is twisted by 180°.

This function is useful to check the stereo image.

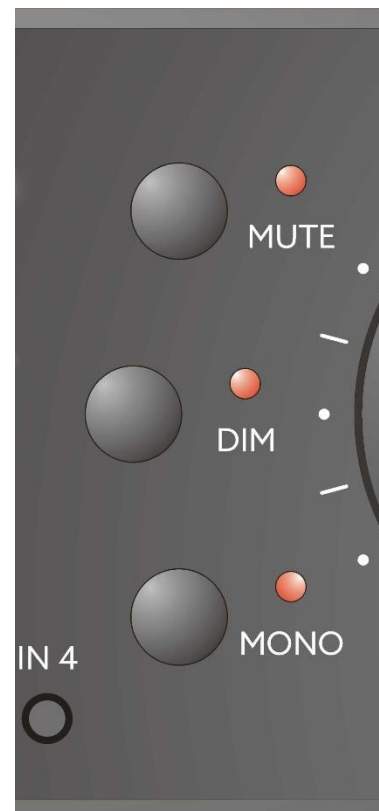
HINT:

When M/S Signals are present, the M (MONO) signals may be checked by pressing the "MONO" button, whilst the "S" (Side) Signal may be checked by pressing the "Ø REV" + "MONO" button

MUTE: Depressing the "MUTE" button will cause the "SPEAKERS" and headphone outputs to be muted.

DIM: Pushing the "DIM" button will attenuate the "SPEAKERS" and headphone outputs by -20 dB.

MONO: Pressing the "MONO" button will sum the input signal to be mono.



THE SIGNAL TREATMENT INSIDE MC100

All input signals are fed to dedicated input buffers.

These care for the differentiation of the balanced signals, unbalanced signals are buffered and made low impedance. This also complies for the signals from the built-in D/A converter.

By the inputs buttons of the MC100 it is determined what signal is activated respectively which signals are summed together.

This selection is routed on one hand to both balanced "SLAVE 1 / 2" outputs, on the other hand they are fed to the "MONITORING" section. Here, the above described settings may be done. Leaving the "MONITORING" section, the signal is fed to the headphone unit and via the "MASTER VOLUME" attenuator to the speakers selection.

The headphone unit is activated by the "PHONES" button and features its own volume control. A "PRE-GAIN" function is available from the inside to perfectly match the abilities of the headphone amp to the sensitivity of the connected headphones. The "PRE-GAIN" may be set in 7 steps of 6 dB from -18 to +18 dB (see page 26 to learn more).

The "X-FEED" button will activate the "X-FEED" control. "X-Feed" is an adjustable function to come across the "In-Head-Localisation" which is often perceived as annoying and simulates the hearing with speakers - but with headphones.

The "SPEAKERS" selection is made with three buttons "OUT A / B / C" and the "SUB" channel which is mono and assignable to each output.

All „SPEAKERS" outputs are electronically balanced, their levels are adjustable in 3 steps 0, -6, -12 dB with toggle switches. We are using toggle switches because these are much more neutral in the signal path compared to potentiometers. By this measure the sound wins image, neutrality and transparency. Also, the crosstalk is not affected in a negative way.

THE MASTER VOLUME ATTENUATOR

is to adjust the desired stereo level for all "SPEAKERS" outputs simultaneously.

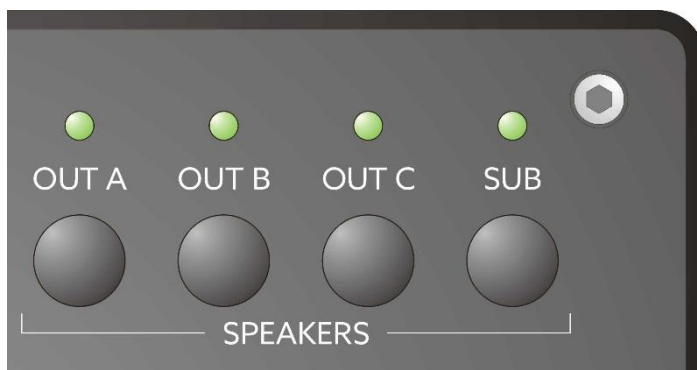
While the MC 100 (Standard) offers a "normal" RK27 Potentiometer, the **MC100 PRO** features a sophisticated Reed-relay based attenuator with 256 steps of 0.4 dB each. Ba this measure highest channel separation between left and right and best channel matching is accomplished.

Please note: When adjusting the volume of **MC100 PRO** small interferences may appear due to the switching action of the relays.



SELECTING / ACTIVATING AN OUTPUT

With the "SPEAKERS" buttons on the front of MC 100 one out of three outputs or a selection of several outputs can be chosen. The dedicated LED(s) above the button(s) are illuminated.



The outputs may be selected in two ways:

1. Summing: all outputs may be activated together.
2. Selective: Only the selected output is active, all others are not active.

Changing-over both output modes is done as follows:

1. SUMMING:

- Push and hold the "OUT A" button for 2-3 Seconds
- The corresponding LED flashes as long as you push the button
- Release the "OUT A" button, the input selection is set to "SUMMING MODE"

2. SELECTIVE:

- Push and hold the "OUT B" button for 2-3 Seconds
- The corresponding LED flashes as long as you push the button
- Release the "OUT B" button, the input selection is set to "SELECTIVE MODE"

The "SUB" output may be assigned to one or more "SPEAKERS" outputs.

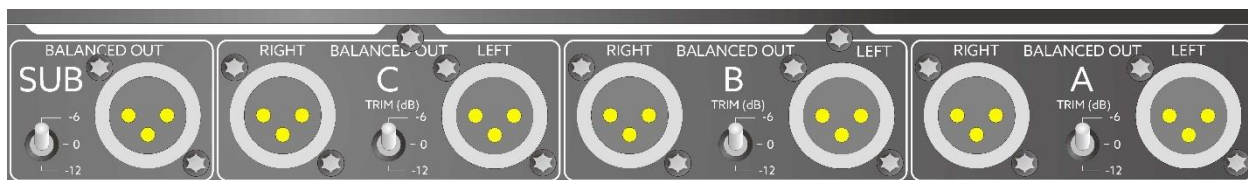
To do so, the "SUB" output is activated together with the activated "SPEAKERS" output.

The "SPEAKERS" selection together with the "SUB" output is stored and will be recalled with the next activation of the dedicated "SPEAKERS" output.

THE BALANCED "SPEAKERS" OUTPUTS

can be found on the back of the MC100 case. They are marked with "BALANCED OUT A / B / C and LEFT / RIGHT".

Gold plated XLR connectors are used here.



The stereophonic output groups are marked with "A/B/C", they are activated by the corresponding buttons on the front panel. This applies also to the mono "SUB" output.

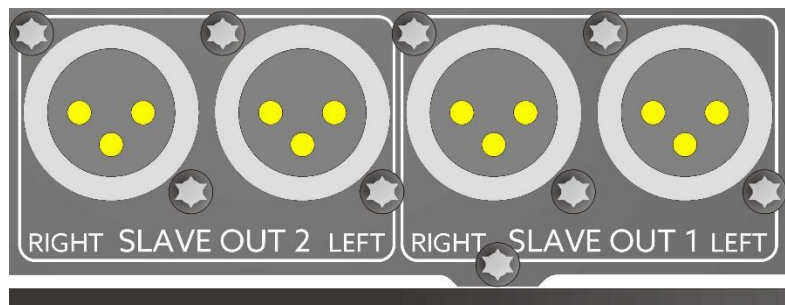
The level of all output groups can be attenuated by 0, -6 or -12 dB using three-position toggle switches. By choosing toggle switches compared to the usual potentiometers at this point, the amount of attenuation for both channels is absolutely the same, sound and crosstalk is not negatively influenced.

THE BALANCED "SLAVE" OUTPUTS

can be found on the back of the MC100 case. They are marked with "SLAVE OUT 1 / 2 / LEFT / RIGHT".

Gold plated XLR connectors are used here.

Both outputs are connected to the activated input signals with identical level.



The unbalanced input signals and the signals from the USB input (DAC) are converted to balanced output signals.

Here, level meters or external gear like DAWs may be connected.

Hint:

With a balanced-to-unbalanced adapter the above outputs may also be used for unbalanced signals.
PLEASE NOTE THAT IN THIS CASE PIN 3 HAS TO BE LEFT OPEN!

See also page 8

Balanced connection of the XLR outputs:		Unbalanced connection Of the XLR outputs:	
PIN 1	GND	PIN 1	GND
PIN 2	(+) PHASE	PIN 2	(+) PHASE
PIN 3	(-) PHASE	PIN 3	OPEN !!

THE HEADPHONE AMPLIFIER

is positioned after the "MONITORING" section, thus reacts to all settings done there.

The headphone amp is activated by the "PHONES" button, the active state is displayed by the affiliated LED. Volume is adjusted by the "PHONES VOLUME" attenuator.

The "X-FEED" button serves to activate the "X-FEED" function and the "X-FEED" control.

"X-FEED" simulates a speaker-like reproduction of sound when hearing with headphones. This can be helpful to minimize the sometime annoying "In-Head-Localisation" when hearing with headphones.

Two "PHONES OUT" sockets are provided to directly connect headphones with 1/8" (3.5 mm) or 1/4" (6.3 mm) phone jacks. The pin-out of these connectors is also described on page 8.

The headphone amp itself is derived from our G108 stand alone headphone amp. To customize the amp for "exotic" headphones, the amp features the "PRE-GAIN" function which serves primarily to maximize the travel of the volume control. To do so, inside the amp some Dip-switches are provided to adapt the gain in a range of -18 ... +18 dB. The PRE-GAIN "ex-works" setting is 0 dB and will be sufficient for most applications (see page 26 to learn more).



Pin-out of the Headphones sockets:	
TIP	Left Channel
RING	Right Channel
SLEEVE	GND

Too loud? Too soft? The PRE-GAIN method

Headphones may have load impedances from 8 to 2000 ohms and efficiency ratios from 85 to 115 dB per Milliwatt. Thus, it can be quite tricky for a headphone amplifier to fulfil all demands, since...

... owners of high-efficiency headphones will rarely set the volume control higher

than 9 o'clock in order to exclude hearing damage, while

... the maximum setting may still be too soft for low-efficiency headphones, but

... all users expect highest quality at lowest noise and distortion.

Thus, the *circuitry* must adapt itself as the headphones will not do and the sources will seldom do!

WE CALL THE SOLUTION TO THIS PROBLEM PRE-GAIN

The headphone amp of MC100 is set to no gain (gain = 0 dB = factor 1). By this measure the amps will produce an extremely low self-generated noise which can hardly be heard even with highest sensitive in-ear-monitors (IEM).

On the other hand, the amps are quite powerful and are able to drive low efficiency or high impedance headphone to the full with ease. This effortless action will save your precious headphones as they will under normal circumstances never see a distorted signal from the amp. To optimise the travel of the volume control and to minimize the self-generated noise, the audio signal through the amp can be attenuated or boosted in seven steps, which are -18 / -12 / -6 / 0 / +6 / +12 / +18 dB. Thus the amp may be adapted by 36 dB which equals factor 64 !

To do so, inside MC100 two banks of dip-switches for the left and right signal can be found. The alignment between amplifier and headphone is provided by the preamp stage, which can boost or attenuate the input signal in seven steps of -18 / -12 / -6 / 0 / +6 / +12 / +18 dB.

See also page 26 for more details.

HOW TO OPTIMIZE THE PRE-GAIN SETTING:

(how to remove the upper lid of MC100 and where to find the dip-switches is described from page 24)

Activate one or more of the connected source, plug in your headphone and listen !!

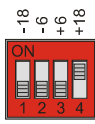
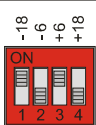
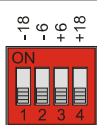
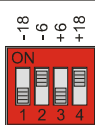
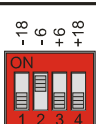
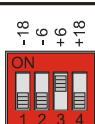
Your amp is adjusted best by the individual PRE-GAIN setting when the volume control for "normal" listening is positioned around 12 o'clock.

So it is provided that there is enough attenuator travel to boost the signal through lower level passages or to listen with higher volume. On the other hand, the attenuator travel is optimized to reduce the self-generated noise from the amp.

In case you cannot reach the 12 o'clock position because the input signal is too loud, feel free to reduce the signal with the PRE-GAIN steps -6 / -12 / -18 dB.

In case the signal is too soft even with volume settings above 12 o'clock please use the PRE-GAIN settings +6 / +12 / +18 dB to achieve more gain.

Other than the above settings are not useful but harmless.

 PRE-GAIN -18 dB 1 = ON	EX WORKS SETTING	 PRE-GAIN +18 dB 4 = ON
 PRE-GAIN -12 dB 1 + 3 = ON	 PRE-GAIN +/- 0 dB All OFF	 PRE-GAIN +12 dB 2 + 4 = ON
 PRE-GAIN -6 dB 2 = ON	EINSTELLUNG AB WERK	 PRE-GAIN +6 dB 3 = ON

CAUTION

To avoid unwanted level leaps the settings should be altered under the following conditions only:

- the "VOLUME" control should be set to minimum
or the headphone outputs shall be deactivated using the "PHONES" button
- left and right channel settings should be the same
unless you want to settle the amp for different hearing abilities

Ex-factory, all switches are set to their lowest position - i.e. 0 dB PRE-GAIN - which should be sufficient for most applications.

PROTECTIVE CIRCUITS:

To ensure a preferably flawless operation and to protect your valuable headphones, power amps or active speakers, the LAKE PEOPLE MC100 is equipped with some protective circuits:

- To protect the headphones amps, active speakers from interferences during powering on/off the outputs are cut during powering on. This procedure takes about five seconds. When powering off the outputs are cut instantly
- The frequency range is limited to 20 Hz – 20 kHz to protect connected items from inaudible frequencies.

PROGRAMMING

The **INPUTS** may be selected in two ways:

1. Summing: all inputs may be summed together.
2. Selective: Only the selected input is active, all others are not active.

Changing-over both input modes is done as follows:

1. SUMMING:

- Push and hold the "IN 1" button for 2-3 Seconds
- The corresponding LED flashes as long as you push the button
- Release the "IN 1" button, the input selection is set to "SUMMING MODE"

2. SELECTIVE:

- Push and hold the "IN 2" button for 2-3 Seconds
- The corresponding LED flashes as long as you push the button
- Release the "IN 2" button, the input selection is set to "SELECTIVE MODE"

The **SENSITIVITY** of the inputs "RCA IN 3" and "3.5 IN 4" may be set to -10 dBV or +4 dBu. This adjustment must only be made one time, when (re-) activating the input, the sensitivity setting will be recalled.

The setting of the sensitivity is done as follows:

- Push the button "RCA IN 3" or "3.5 IN 4" for 2-3 Sekunden
- The setting will change its state
- The sensitivity is displayed by the LEDs "-10 dBV" or "+4 dBu" above the dedicated button
- Release the button

The **OUTPUTS** may be selected in two ways:

1. Summing: all outputs may be activated together.
2. Selective: Only the selected output is active, all others are not active.

Changing-over both output modes is done as follows:

1. SUMMING:

- Push and hold the "OUT A" button for 2-3 Seconds
- The corresponding LED flashes as long as you push the button
- Release the "OUT A" button, the input selection is set to "SUMMING MODE"

2. SELECTIVE:

- Push and hold the "OUT B" button for 2-3 Seconds
- The corresponding LED flashes as long as you push the button
- Release the "OUT B" button, the input selection is set to "SELECTIVE MODE"

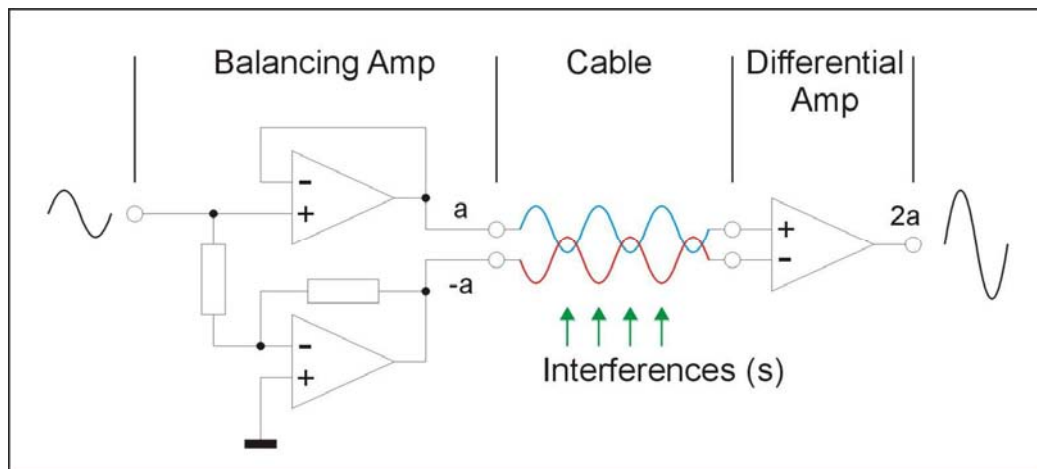
Things to know ...

Why makes it sense to make such huge efforts?

A Monitor Controller amplifier is a device designed to condition audio signals from differing sources with the target to reproduce them on varying speakers. An additional headphone amplifier serves to precisely evaluate these signals. This does not sound too spectacular at the first glance and can be achieved relatively easy. As with many things however, the devil is in the details and much more effort is required to switch, manipulate and judge variant sources in a neutral way with in highest possible quality.

Which advantages do balanced signals offer?

In contrast to unbalanced signals, balanced signals are carried by two wires (plus ground/shield). In the transmitting device, a balanced signal is created by generating an inverted signal (180° phase shifted). The "hot" wire carries the original signal (a), the "cold" wire carries the inverted signal (-a).



In the receiving device, the balanced signal is processed by a differential amplifier which detects the difference between both: $(a) - (-a) = 2a$.

On its way between devices, the useful signal can be affected by interference (s). Interferences however are in phase on both wires and fed to the differential amplifier as well. Again, the amplifier detects the difference between the interference contents: $(s) - (s) = 0$. Thus - in an ideal situation - all interference on the signal path is eliminated.

Why are op-amps ideal for low-level signal processing?

Discrete amplifiers (designed with transistors) are very popular in high-end audio design also for preamplifier stages. This is often marketed as an optimization measure, but the partially exorbitant extra expenses are of course to be paid by the customer.

But an op-amp consists of transistors as well ... moreover, its structure has the advantage of thermal coupling between its internal components. Also ageing issues play a much less important role. Due to the large number of op-amps types offered, it is possible to pick an optimum type for any specific application.

Why does PRE-GAIN make sense?

Headphones are available with very different impedances and sensitivities. A headphone amplifier that can be used "for everyone and every headphone" is therefore usually designed for low sensitive / high-impedance headphones. With the consequence that the noise is avoidably increased for high efficient/low-impedance headphones and you can usually only move the volume control carefully - and rarely above the 9 o'clock position. This brings with it another disadvantage, namely that the channel matching from the volume control left of 12 o'clock is clearly and audibly increased. That's why there is "PRE-GAIN" in all Lake People devices with a headphone jack.

With PRE-GAIN, the gain of the headphone amplifier can be adjusted to the abilities of the headphone. This optimizes the control range of the volume control and minimizes the self-generated noise. For this purpose, the device offers a switching unit for the right and left channel to adjust the gain in a range of +/- 18 dB. Ex factory, the gain is set to 0 dB to "fit" most headphones. For PRE-GAIN adjustment, see page 18 and 26.

Why does frequency bandwidth limiting make sense?

In signal processing, sound is represented by AC voltages. Sound is audible - for young people - from about 20 to 20000 Hz. The elder the listener, the less he will hear high frequencies in particular. In order to transmit these frequencies at optimum quality, the frequency response of an amplifier should be as wide and as "flat" as possible. At the low end of the scale, this limit is represented by DC, as there is no frequency lower than zero. In upward direction, the limit can be set to practically any frequency, but the higher, the more susceptible the device becomes concerning electro-magnetic interference. This is not audible in the first place - but may interfere with the useful signal and then become evident. Therefore, unrestricted frequency response attests thoughtlessness rather than remarkable engineering skill.

Why a good volume attenuator is essential?

"Normal" devices do have a volume potentiometer which is a mechanical control element, it can be obtained on the market at any low price. Meanwhile it is often replaced by electronic circuitry, often exhibiting essential disadvantages concerning dynamic range, noise and distortion. Conductive-plastic resistive tracks, high-quality multi-tap wipers and separated chambers for the individual sections are highly desirable for sophisticated applications, and high quality is inevitable to ensure trouble-free operation for years. Since the market for really good pots is a small one, manufacturers like Noble or Panasonic don't offer these anymore. A current sample of top-of-the-line pots is the RK27 by ALPS, which is used inside MC 100 (standard version).

The different measures inside MC100 to control the volume

The "standard" MC100 offers the Alps RK27 attenuator which is often found in high quality audio appliances. According to his name, the body of the attenuator measures 27mm. In separated chambers for left and right the resistive traces and the "multitap" wipers are positioned. This attenuator is known for its long lasting quality. In case of MC100, the attenuator is equipped with a 41-detent which makes it easier to reposition specific positions.

About the sophisticated volume control of MC 100 PRO

It offers the standard big knob on the front panel marked with "256 step **PRO**CONTROL". To enable the same touch and feel of standard solutions we are using again the RK27 from Alps. The potentiometer itself has nothing to do with the analogue signals from MC 100 PRO but generates a control voltage which is transferred into the digital domain by an analogue-to-digital converter and fed to a micro controller which generates the digital word to control a 256 step R-2R attenuator.

The relays in charge to drive the R-2R ladder are very special "Reed Relays". Here, the switching contacts are situated in a glass tube filled with a protective gas. The contacts are actuated by a magnetic field.

The 256 steps are realized with 8 relays per channel because $2^8 = 256$.

Each step is defined as 0.4 dB which totals in over 100 dB attenuation range. The contacts of the relays are switching between resistors with an accuracy of 1% or 0.1% to attenuate the signal. So, best channel matching and minimal crosstalk is realized - and the relays will never scratch.

Why does a output relay make sense when switching power?

Amplifiers generate unwanted output signals when applying or removing power, which can damage the connected equipment. The relay breaks the connection between amplifier and the following items for some seconds after power-on and thus protects the latter until electrical conditions have stabilized.

DISPOSAL

Disposal of Old **E**lectrical & **E**lectronic **E**quipment - WEEE Regulation

(Applicable in the European Union and other European countries with separate collection systems)



This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment.

By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product.

The recycling of materials will help to conserve natural resources.

For more detailed information about recycling of this product, please contact your local Civic Office, your household waste disposal service or the shop where you purchased the product.

TECHNICAL DATA LAKE PEOPLE MC 100

All values RMS unwtld. 20 Hz - 20 kHz, Pre-Gain set to 0 dB

Input Parameter Analogue

Inputs (stereo, analogue): 2 x XLR female, balanced,
1 x RCA, unbalanced
1 x 3,5 mm (1/4") Phone Jack, unbalanced

Max. Input Voltage: + 22 dBu

Input Impedance: 10 kohm

Input Parameter Digital

Input (stereo, digital) 1 x USB-C, PCM up to 32 Bit, 384 kHz / DSD up to 256

Output Parameter

Slave Outputs (stereo, analogue): 2 x XLR male, balanced

Speakers Outputs (stereo, analogue): 3 x XLR Male, balanced, Gain 0, -6, -12 dB adjustable

Sub Output (mono, analogue): 1 x XLR Male, balanced, Gain 0, -6, -12 dB adjustable

Max. Output Voltage: + 27 dBu

Output Impedance: < 1 Ohm

Frequency Range: 5 Hz ... 70 kHz (- 0,5 dB)

Dynamic Range: > 120 dB

THD+N: < -100 dB

Noise: < -103 dBu

Crosstalk: < -105 / -85 dB @ 1 / 15 kHz

Headphone Amp Parameter

Gain: 6 dB

PRE-GAIN (internal): -18 / -12 / -6 / 0 / +6 / +12 / +18 dB

Dynamic Range: > 115 dB

THD+N (1kHz/2x10V/100R = 1W): < -106 dB / < 0,0005 % / @ 1 kHz

THD+N (1kHz/2x4V/32R = 0,5W): < -100 dB / < 0.001 % / @ 1 kHz

Output Impedance: 0,125 Ohm

Damping Factor (Load 50 Ohm): 400

Headphone Outputs: 1 x 6,3 mm (1/4") Phone Jack
1 x 3,5 mm (1/8") Phone Jack

Max. Output Level

Conditions:
Both Channels driven
(1kHz / < 0.1% THD+N)

R _L	U _a (dBu)	U _a (V)	P _a (mW)
600	26,3	16,0	425
300	26,0	15,5	800
100	25,7	15,0	2250
50	21,3	9,0	1620
32	17,6	5,9	1100
16	11,2	2,8	490

Power Supply: 20 V max. 50 VA with ext. Power Supply

Front, Back: 8 mm / 3 mm Aluminium, black anodized

Case: 3 mm / 4 mm Aluminium, black anodized

Dimensions Case: 290 x 80 x 254 mm / 11,4" x 3,15" x 10" (W x H x D)

Dimensions Over All: 290 x 90 x 282 mm / 11,4" x 3,5" x 11,1" (W x H x D)

Dismantling / Jumper Settings

Please note:

In the following, the internal settings of the MC 100 are discussed.

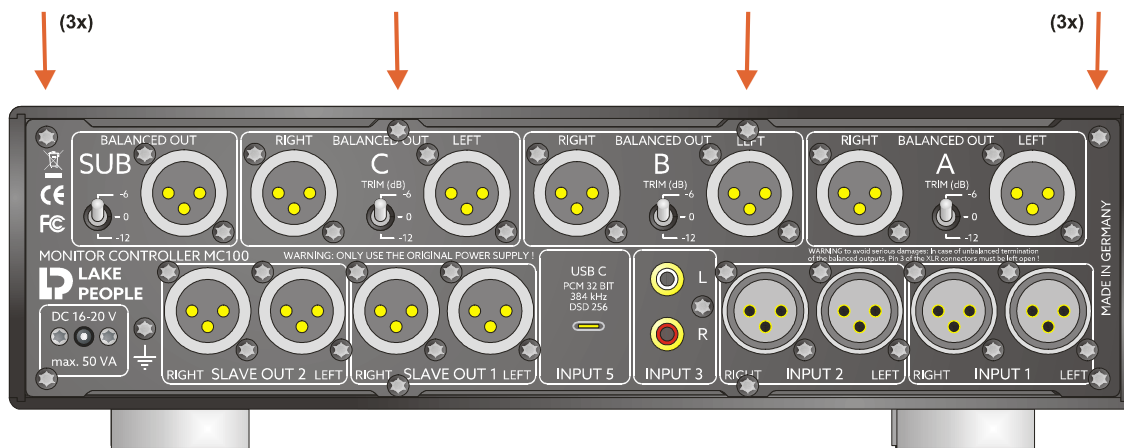
For changing these, a TORX T10 screwdriver is required and you should by all means

PULL THE MAINS PLUG !!!

Only thereafter the settings can be altered without any hazard.

Dismantling

1. Screw off eight screws (Torx T10 or Philips) from the top of the case



2. The upper lid is situated in a rabbet of the front panel
Lift the lid on the back end and slide it out.
3. Make your settings.
4. Assemble the unit in opposite order.

SETTINGS ON LAKE PEOPLE Mc100

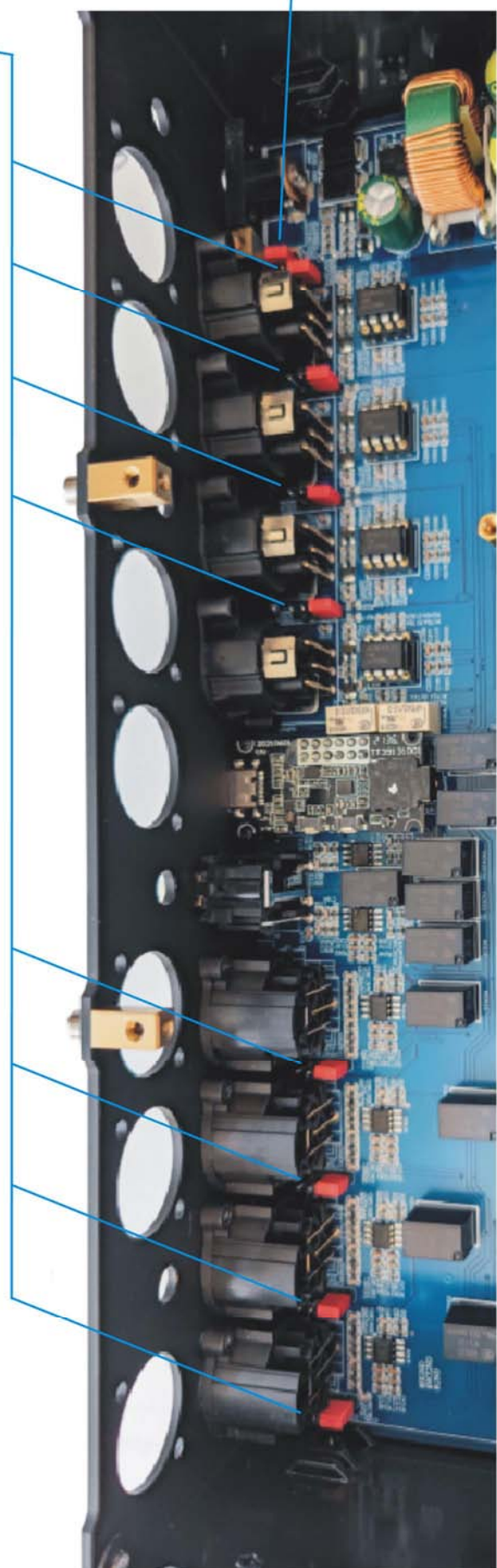
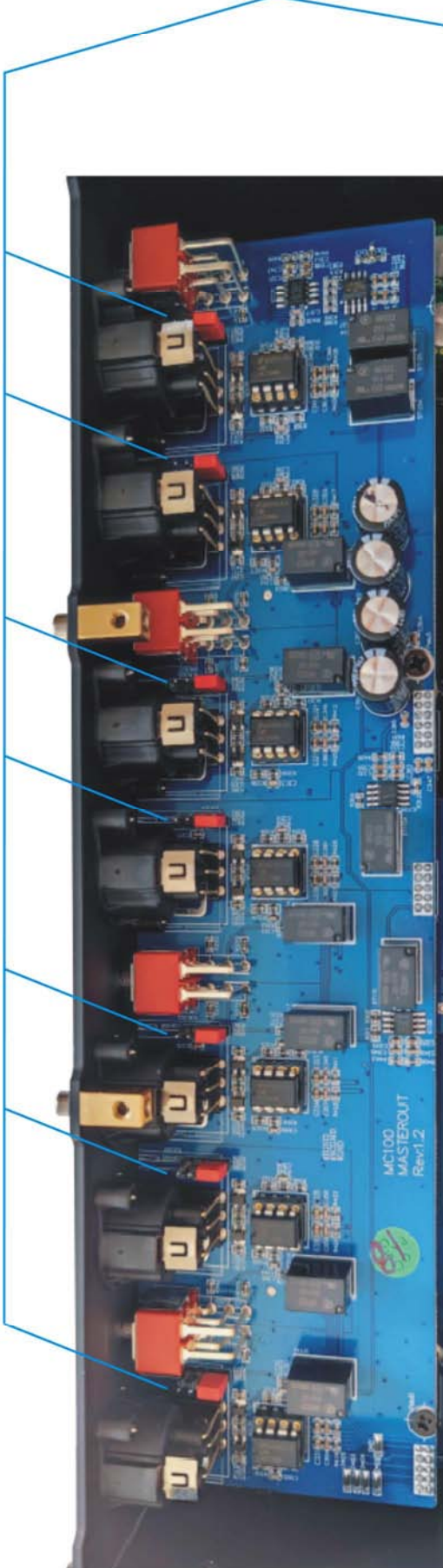
(leave all other settings as they are - except you know exactly what you are doing !!)

XLR GROUND-LIFT JUMPERS (see page 6/7)

 GROUND POSITION (ex works)	 LIFT POSITION	 CHASSIS POSITION
--	---	--

GENERAL CASE) GROUND-LIFT JUMPER (see page 6/7)

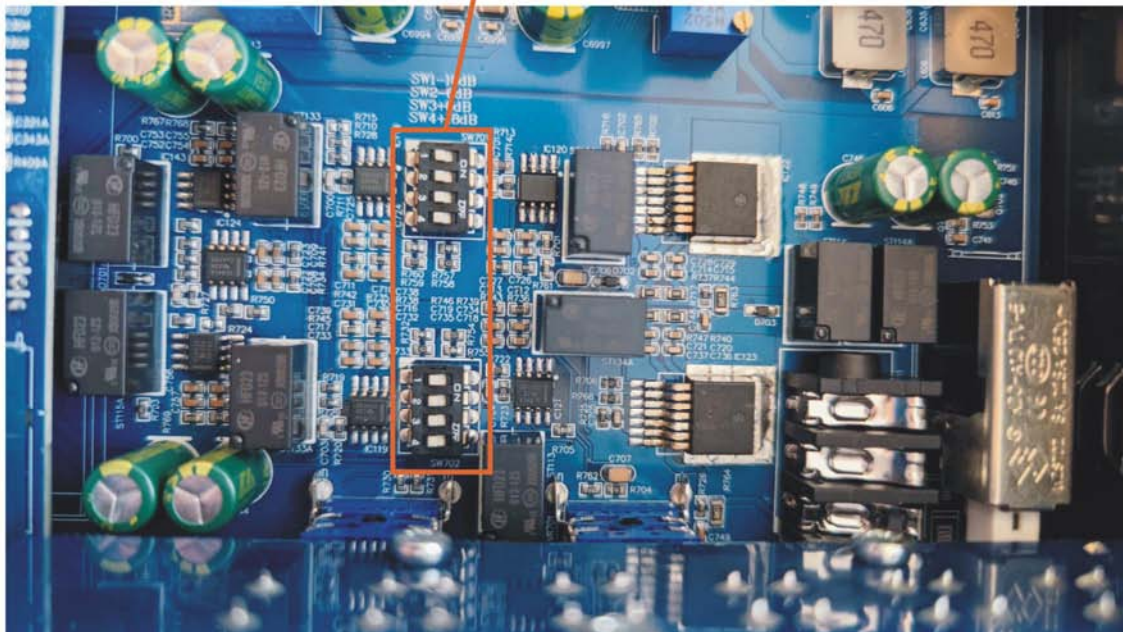
 LIFT POSITION (ex works)	 GROUND POSITION
--	---



PRE-GAIN LAKE PEOPLE Mc100

(leave all other settings as they are - except you know exactly what you are doing !!)

 <pre> +18 PRE-GAIN +6 +18 dB -6 -18 1 = ON </pre>	SETTINGS EX WORK	 <pre> +18 PRE-GAIN +6 -18 dB -6 -18 4 = ON </pre>
 <pre> +18 PRE-GAIN +6 +12 dB -6 -18 1 + 3 = ON </pre>		 <pre> +18 PRE-GAIN +6 -12 dB -6 -18 2 + 4 = ON </pre>
 <pre> +18 PRE-GAIN +6 +6 dB -6 -18 2 = ON </pre>		 <pre> +18 PRE-GAIN +6 -6 dB -6 -18 3 = ON </pre>



The settings shall be made for both dip switch arrays (left and right) !