



*Reference Series*

# ANALOG-DIGITAL CONVERTER ADC RS 04



## USER'S MANUAL



**LAKE PEOPLE** electronic GmbH

development and manufacturing of audio electronic  
Turnsstrasse 7a 78467 Konstanz GERMANY  
Tel. +49 (0) 7531 73678  
Fax +49 (0) 7531 74998  
www.lake-people.de

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## **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.

## **Å 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**

**LAKE PEOPLE electronic GmbH**  
**Turmstrasse 7a**  
**D-78467 Konstanz**

**Fon +49 (0) 7531 73678**

**Fax +49 (0) 7531 74998**

[www.vioelectric.de](http://www.vioelectric.de)   [www.vioelectric.com](http://www.vioelectric.com)  
[www.lake-people.de](http://www.lake-people.de)   [www.lake-people.com](http://www.lake-people.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 Sources:

The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

### Grounding:

Care should be taken that this appliance is operated with proper grounding only.

### Power Cord:

Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

This unit is equipped with a 3-pole mains cable with German 3-pin mains plug. In some countries this unit must be operated with a mains adaptor, supplied by the owner.

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

OVERVIEW: POWER CORD FUNCTION AND COLORS			
CONDUCTOR		COLOR	Alternativ
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E 	PROTECTIVE EARTH	GREEN+YELLOW	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.

**Mains Fuse:**

The mains fuse of this appliance is soldered in place and accessible from the inside only!!

A blown fuse may indicate an internal problem and should be replaced during qualified servicing or repair work !!

**Switchable Power Supply:**

Connect this unit to the power source indicated on the equipment rear panel only to ensure safe operation !!

This unit is provided with a switch-mode AC power supply and will work properly with all worldwide AC voltages from 90 . 260 V AC and 50 . 60 Hz.

**Service / Repair:**

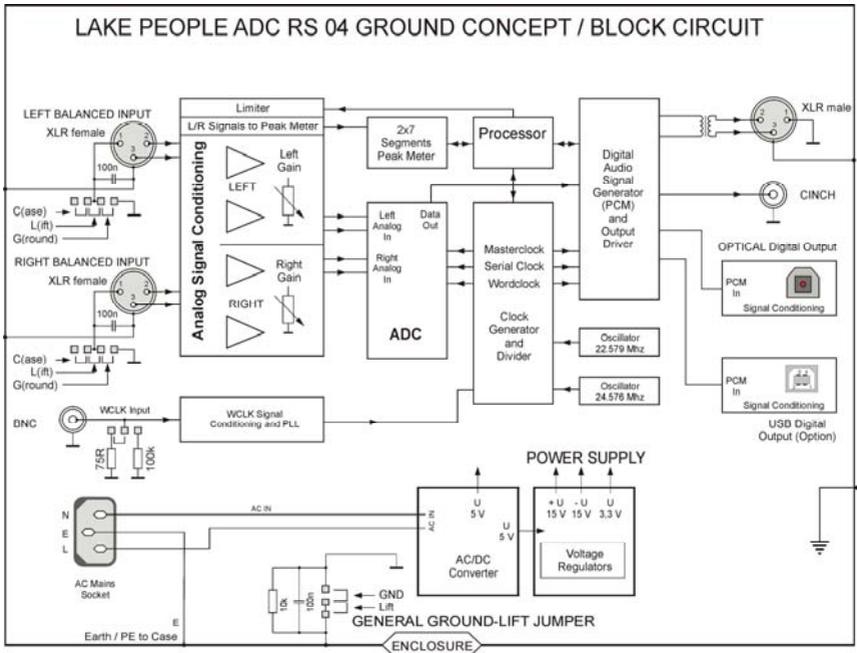
To reduce the risk of fire or electric shock, the user should not attempt to service the appliance beyond the measures described in the operating manual. All other servicing or repair should be referred to qualified personnel !!

**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 Earth / Grounding Concept



**General GROUND-LIFT Jumper - accessible from the inside.  
Mind the SECURITY INSTRUCTIONS !!**

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

The internal ground potential is ~~lifted~~ **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.

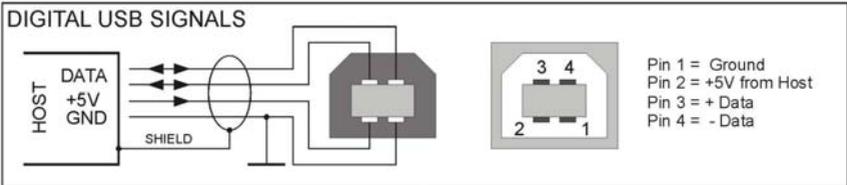
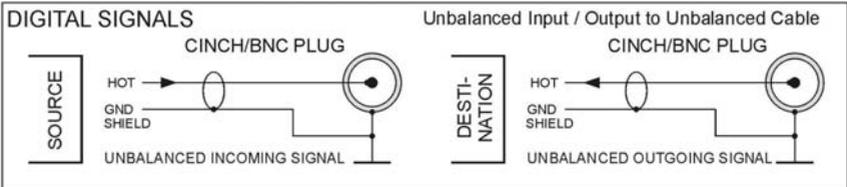
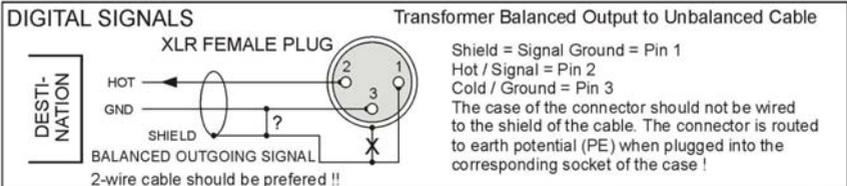
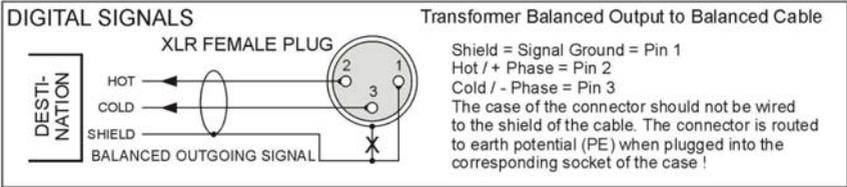
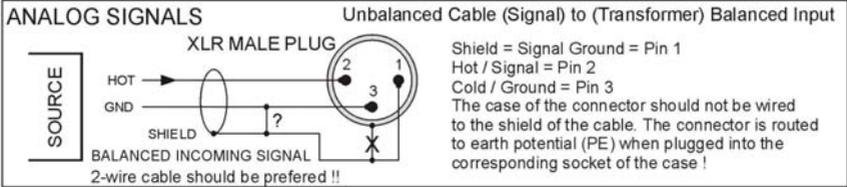
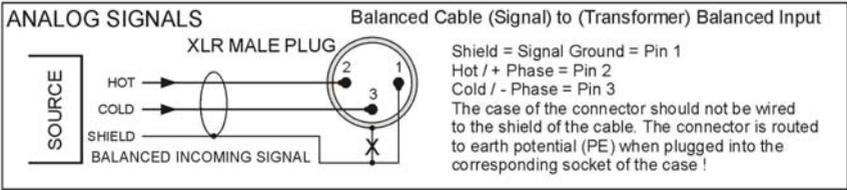
Of course full electrical protection is granted as the case is always connected to ground/earth potential !

Unfortunately there is no general recommendation how to solve hum and jitter problems - or even minimize them. The best way to succeed is to check different options !! In case of balanced cables, it should always been verified that the shield of the cable is connected to the shell of the XLR connector. The shell is ALWAYS connected to earth potential when the connector is inserted !!

Concerning ANALOG inputs and outputs, the relationship between ground and earth may be modified. Electrical safety is always ensured, since the earth conductor is permanently connected to the enclosure !!

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

# Connection / Connectors



## GENERAL INFORMATION

The Lake People ADC RS 04 is a top-range Analog-to Digital Converter distinguished by its very particular analog input stages. By means of their specially designed, variable low-noise and low-distortion circuitry, the ADC RS 04 fulfils even highest demands.

ADC RS 04 consists of the analog-digital converter and the affiliated circuitry for clock generating. The unit converts a stereophonic analogue input signal into a linear (PCM) 24 bit digital output signal with a dynamic range of 119 dB and THD+N of . 109 dB (@ 48 kHz) and 32 ÷ 192 kHz sample rate.

The analogue inputs are electronically balanced and equipped with XLR type connectors. Input sensitivity may be adjusted by two rotary faders on the front panel.

Input level is displayed by two fast and precise acting 7-segment LED peak-meters with a range of -36 ÷ 0 dBFs.

A switchable soft acting limiter in the analogue domain serves for trouble-free level settings with only little risk of digital overload.

The internal sample rate can be switched to 32, 44.1, 48, 88.2, 96, 176.4 or 192 kHz. Furthermore a WCLK input is provided for external synchronization within a range of 28 . 210 kHz.

The digital outputs are designed to transformer balanced AES/EBU specifications (XLR) as well as to unbalanced S/P-DIF (AES-id) standard and optical Tos-Link specifications.

As an option, ADC RS 04 may be equipped with a USB interface capable of 96 kHz sample rate.

Digital output format can be set to either consumer or professional format.

The Features:

- 2 electronically balanced inputs via XLR (unbalanced operation possible with adaptors)
- Signal treatment on the front end with typically **128 dB dynamic range**
- Peak level meter with 2 x 7 LEDs from -36 ÷ 0 dBFs

- 6 dB meter offset adjustable in the menu
- switchable soft acting limiter
- 24 Bit conversion with **109 dB THD+N** and **119 dB dyn. range**
- Internal sample-rate generation with precise oscillators for 44.1, 48, 88.2, 96, 176.4 und 196 kHz
- Wordclock input via BNC for external synchronization from 28 . 210 kHz with low Jitter PLL
- 3/4 digital outputs:
  - transformer balanced via XLR (AES 3), 24 Bit / 192 kHz
  - coaxial via RCA (S/P-DIF, AES-3id), 24 Bit / 192 kHz
  - optical vial TOS-Link, 24 Bit / 96 kHz
  - optional USB output Style B, 24 Bit / 44.1, 48, 96 kHz
- LEDs for Lock, Sample Rate, clock source and Limiter
- High quality MKP capacitors in the signal chain
- 0,1 / 1 % metal film resistors throughout the unit
- Switch-mode supply for trouble free worldwide operation
- elaborate supply voltage filtering and stabilization
- Case made of Aluminum - black anodized

## **THE CASE**

The case as well as the front/rear panels are made of solid aluminum. This choice of material ensures high mechanical stability and resistance.

## **EARTH AND GROUND**

The case of ADC RS 04 is grounded. Internal reference ground is bridged to protective earth by means of a jumper. The jumper is set to the 'LIFT' position (see also: page 7 "Earth/Ground concept", page 23 "Technical Appendix").

## **POWER SUPPLY**

Mains power is provided via a three-pin IEC/CEE socket and mating "cold-appliance" mains cord with Schuko-type plug. Depending on the

location of purchase other mains cords like GB-style, US-style or China-style may be supplied.

This unit offers a switch-mode supply to enable trouble free worldwide operation with mains voltages ranging from 90 . 260 V and 50 . 60 Hz. The internal supply generates a stabilized and filtered voltage of 5 V DC which is used for many digital building blocks and from which other voltages are derived:

-/- 15 Volt, stabilized and filtered for the analogue circuitry.

+3,3 Volt, stabilized and filtered for other digital circuitry.

## **MAINS FUSE**

The 0.25A time-lag fuse is soldered in place on the circuit board. In case, it must be replaced with a fuse of the same type only.

### **CAUTION !!**

#### **MIND THE SAFETY INSTRUCTIONS:**

A blown fuse indicates an internal fault and should be replaced during qualified repair or servicing only !!

## **THE POWER SWITCH**

The unit is activated by means of the power switch. Power-on status is indicated by the green LED below.

## **THE ANALOG INPUTS**

are situated on the rear panel and equipped with balanced XLR connectors. XLR pinout corresponds to AES 14-1992 recommendations:  
1 = Ground, 2 = (+) Phase, 3 = (-) Phase

Input impedance is 5 kOhms, while input sensitivity for digital full scale can be calibrated individually for both channels within a range of +2 ... +25 dBu approximately.

Of course also unbalanced signals can be fed with the aid of an adaptor. Please take care that in this case the Pin 3 of the XLR connector is connected to Pin 1 . meaning this pin is connected to ground.

The quality of the A/D conversion will not suffer as ADC RS 04 has the ability to reconstruct the missing phase in a perfect way.



## Analog and Digital Levels

in such appliances like A/D converters are normally not denoted as voltages (V) but in deciBel (dB).

The deciBel is a logarithmic measure which is very practicable as in modern electronics some values might become very large or very small.

The deciBel makes it handy to describe such values.

In the analog world there are multiple reference levels - but the most important is 0 dBu. As it is a reference level it is related to 0,775 V. Also common is 0 dBV which is related to 1 V. Smaller signals are denoted negative, larger signals positive. + or - 6 dB (independent of dBu or dBV) describes double or half the value.

+/- 20 dB is a factor of 10 or  $1/10 = 0,1$

+/- 40 dB is a factor of 100 or  $1/100 = 0,01$

+/- 60 dB is a factor of 1000 or  $1/1000 = 0,001$  and so on.

Form the above table it is easy to see that it is more handy to describe a distortion of 0,001 % as -100 dB.

The maximum output voltage of a specific electrical appliance is always depended on its internal supply voltage. A unit with +/- 15 Volt split supply is able to produce a signal level of about  $9.5 V_{\text{eff}}$  which is +19 dBV or +21 dBu.

The broadcaster's reference level is +6 dBu. A safety range of 15 dB headroom is added to this level. So the maximum level is +6 dBu + +15 dBu = +21 dBu.

The level ratio in the digital world is totally different.

Because there can't be more than all Bits set to 1, there is only one reference level which is 0 dBFS = **deziBel Full scale**.

From this level only negative value are possible.

In the beginning of the digital age it was not so easy to fill the bits meaningful. Specially the A/D converters had been of doubtful quality.

So during recording the headroom was reduced by 6 dB and since this time 0 dBFS equals an analog level of +15 dBu (and not 21 dBu).

Listening to modern pop-music productions all the knowledge of levels and dynamics seems to be lost

Today's modern digital equipment offers more than necessary 24 Bit which represent 144 dB of dynamic range what is more than any analog content.

**HENCE** relax - just leave some dB of space during recording and avoid digital distortion. It is not at all needful to drive everything to full scale. Your recording will benefit from this measure.

## INPUT POTENTIOMETERS

By means of two independent gain pots for left and right channel, input sensitivity can be set individually. Input level may vary between +2 ... +25 dBu for digital full scale.

Please note that your ADC RS04 offers more dynamic range than any analogue input signal can offer. So it is not necessary to drive everything to the full.

Different from the analogue world where always some headroom is possible, digital levels are really restricted to 0 dBFS. It is more safe and senseful to not illuminate the yellow and red LEDs from the level

display. So it is granted that also sudden transients may come through without hitting full scale.

To enable the limiter function and setting the level display to the +6 dB sensitive mode will support your efforts to achieve a dynamic recording without digital overshoots.



## THE LIMITER FUNCTION

is situated in the analog part of the circuitry.

It is a fast diode limiter which will reliably cut soft overshoots to avoid digital overload when engaged.

Beneath the fact that the limiting function is often appreciated because of its sound, you should normally make sure that this emergency brake is not often altering your analog level. The limiter will begin to reduce the level from -3 dBFS.

The limiter function is activated or deactivated by pressing both buttons simultaneously. The active status is displayed by the yellow LIMITER ON+LED.

## THE LEVEL METER

consists of two 7-segment LED displays for both left and right channel. Meter range is from -36 ... 0 dBFS whereas 0 dBFS means full scale of the A/D converter.

Dynamic law of the meter corresponds to DIN PPM (Peak Program Meter) specifications. Risetime for full scale is 2 msec while the release time is 1.5 sec for -20 dB signal decrease.

The level meter can be made 6 dB more sensitive in Menu 2 (see %the Menu+on page 20). When the sensitive mode is active the level meter's red LED represents a level of -6 dBFs, thus enlarging the safe level region of the A/D converter and lowering the risk of digital overload.

## **THE A/D CONVERTER**

Although rather small from its physical dimensions the core of ADC RS 04 is one of the best A/D converters in the market.

It is called CS5381 and offers a 24 bit wide digital output signal with up to 192 kHz sample rate. The achievable dynamic range exceeds 119 dB with THD+N at . 109 dB.

Up to the year 2010 the development of high quality A/D converters was rather challenging concerning new benchmarks for bit-width, sample rates and scores for higher dynamic range and lower distortions.

This vibrant development has come to an end concerning top-range converters as they now offer better data than most analogue signal conditioning in front of the converter.

Inside ADC RS 04 we could need a bit better A/D converter (if there would be any) as our analogue signal conditioning offers 128 dB dynamic range with distortions as low as -112 dB !

## **THE DIGITAL OUTPUTS**

ADC RS 04 offers a balanced, a coaxial and an optical digital output.

As an option there can be also a USB output. All digital outputs are situated on the rear panel. Independent from their design, the data word (professional or consumer) on all outputs is identical.

- The balanced output is equipped with an XLR type connector and corresponds to AES 3-1992, transformer balanced, impedance 110 ohms, output voltage  $> 4 V_{ss}$ .

- The coaxial output is equipped with an RCA connector and corresponds to IEC 958, unbalanced, impedance 75 ohms, output voltage  $1 V_{ss}$ . This signal can also be used for AES-id applications.
- The optical output provides a TOS-Link connector according to EIAJ RC-5720. The sample rate on this output should be restricted to max. 96 kHz due to the general specifications of the optical transmitter and the limitations of the optical cable.
- The optional USB output is specified as an audio interface according to USB 1.1 / 2.0. Also on this output the sample rate is restricted to 96 kHz.



## THE DIGITAL OUTPUT FORMAT

The digital output format is the same on all digital outputs.

**The format is set to *professional* mode ex works.**

Dealing with old digital gear it may happen that this format is rejected out of several specific reasons. In this case the format can be set to *consumer* mode in *Menu 1+*. See also the *Menu* on page 20.

### HINT:

In *consumer* mode the SCMS (serial copy management system) is handled as follows:

- Byte 0, Bit 2 = 1: copy permitted / copyright not asserted
- Byte 1, Bit 7 = 1: original / pre-recorded data

The sample rate entries into the data word are correct in *professional* mode. In *consumer* mode the entries are correct only for 32, 44.1 and 48 kHz, higher sample rates are not scheduled here.

## ABOUT THE SAMPLE RATE

Every A/D converter needs some clocks to convert analog signals into the digital domain. The basic frequency of these clocks is called **Sample Rate**, the common ones are today 44.1, 48, 88.2, 96, 176.4, 192 kHz. The maximum upper frequency of a converted analog signal is half of the sample rate. That means that an analog signal of up to 24 kHz can be converted with 48 kHz sample rate. If the sample rate is 88.2 kHz, analog signals of up to 44 kHz may be input.

Although it is common sense that the human hearing is limited to 20 kHz it may be useful to convert with 88.2 or 96 Hz due to flat filter designs with less phase shift to not harm the signal within the hearable range. Higher sample rates are regarded critical and of little benefit by the author ò

If a red-book compatible CD shall be the target of your recording efforts you should prefer sample rates of 88.2 or 176.4 kHz as these can be converted with little effort to 44.1 kHz.

The precision of the sample rate itself is of no big interest.

It is of little matter if a signal is converted with 48 kHz or 47.998 or 48.002 kHz which mirrors a clock precision of 50 ppm. The flaw is affecting the tone frequency and it is relatively inoffensive if pitch A is 440.01 or 439.99 Hz instead of 440 Hz.

What really counts is the jitter as it relatively fast impairs the quality of the conversion. Therefore we are using high quality low jitter oscillators inside ADC RS 04.

## THE EXTERNAL CLOCK (WCLK)

is used when the A/D conversion shall be synchronous to a master clock. This is absolutely necessary when signals are converted one by one and afterwards shall be processed simultaneously.

A common signal for this purpose is the external **Wordclock** which is input to the dedicated socket on the back panel.

Interestingly there is no clear standard to specify the wordclock signal.

According to common agreements the wordclock is like a TTL square wave signal with 5 V<sub>ss</sub> amplitude and an impedance of 75 Ohms. To avoid any connection problems the sensitivity of the wordclock input of ADC RS 04 is as low as 0.5 Volt so that also weak signals can be utilized.

The frequency of the wordclock signals is equal to the sample rate. To generate all necessary internal clocks a so called PLL is used inside ADC RS 04. The precision and the absence of jitter of this PLL is directly responsible for the conversion quality.

Pushing the %WORDCLOCK+button is activating the wordclock input. If here a valid signal is present the frequency of this signal will be displayed by the four sample rate LEDs as far as the frequency is within a range of +/- 5 %. Simultaneously the green %CLOCK+LED is lit.

When the wordclock signal is outside +/- 5 % range but still valid, only the green %CLOCK+LED is lit.

When the wordclock signal is outside the specifications the %CLOCK+LED is not lit and the digital outputs are muted.

#### **Hint:**

To avoid further adapting problems the impedance of the wordclock input may be set from 75 Ohm impedance (ex works setting) to 10 kOhm internally.

See %Jumper Setting+on page 23 to learn more.

## **THE INTERNAL CLOCK GENERATION**

Inside ADC RS 04 two crystal oscillators are used because they are precise and offer very low jitter figures.

The basic frequencies are 22.579 and 24.576 MHz from which the three clocks, Masterclock, Serial clock and Wordclock are derived by dividers.

Those are synchronous to each other with a fixed divider ratio.

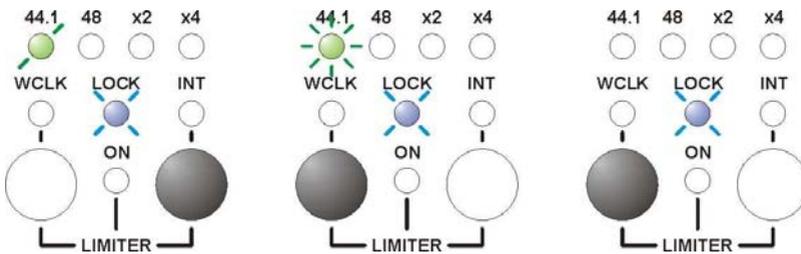
The internal clock is activated by shortly pressing the %INTERNAL+ button. Pressing the button repeatedly will change the internal clocks from 44.1 up to 192 kHz. The blue %CLOCK+LED is lit as soon as the clock is stable.



## THE MENU

contains two settings.

### 1. Menu Item: The Digital Output Format (Professional & Consumer)



When the **right** button is depressed for longer than two seconds the menu control is initiated and the blue LED flashes constantly.

The LED under **44.1** flashes once to indicate menu item 1.

Afterwards the LED is constantly on or off. This status can be altered by pushing the **left** button.

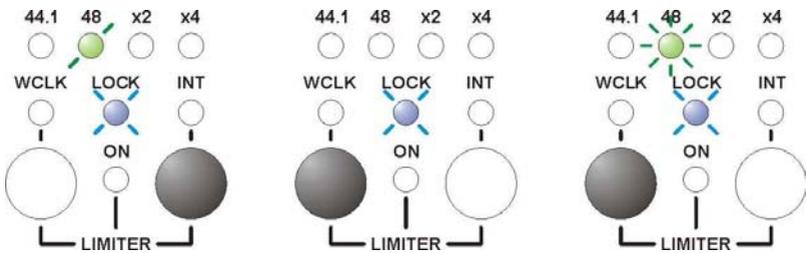
LED ON = The digital output word is set to professional mode.

**This is the ex works setting !!**

LED OFF = The digital output word is set to %Consumer Mode+

See also page 17 for details.

## 2. Menu item: Calibration of the LED Peak Meter



Depressing the **right** button shortly will lead to menu item 2.

The blue LED flashed constantly.

The LED under %48+flashes once to indicate menu item 2.

Afterwards the LED is constantly on or off. This status can be altered by pushing the **left** button.

LED OFF = 0 dBFs of the level control shows the true value of 0 dBFs.

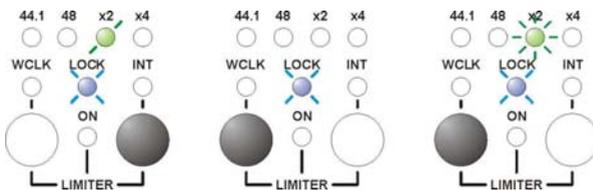
**This is the ex works setting !!**

LED ON = 0 dBFs of the level control represents a level of -6 dBFs.

With this setting the safe area is stretched by 6 dB and the yellow and red LEDs may be used without the fear of digital overload.

See also page 15 for details.

## 3. Menu item: (reserved)

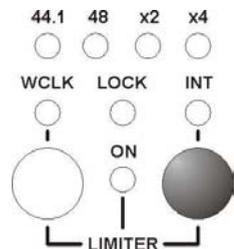


Depressing the **right** button shortly leads to the third menu item . but without any content in the moment.

### Menu Termination

To exit the menu depress the right button for more than two seconds.

The blue LED stops flashing.



## **DISMANTLING / JUMPER SETTINGS**

### **Hint:**

Here we are talking about internal adjustments inside your ADC RS 04. You are in need of a screw drivers TORX style size T10 or a 3mm hex allen key.

You should by all means

**PULL THE MAINS PLUG !!!**

Only thereafter the settings can be altered without any hazard.

### **DISMANTLING**

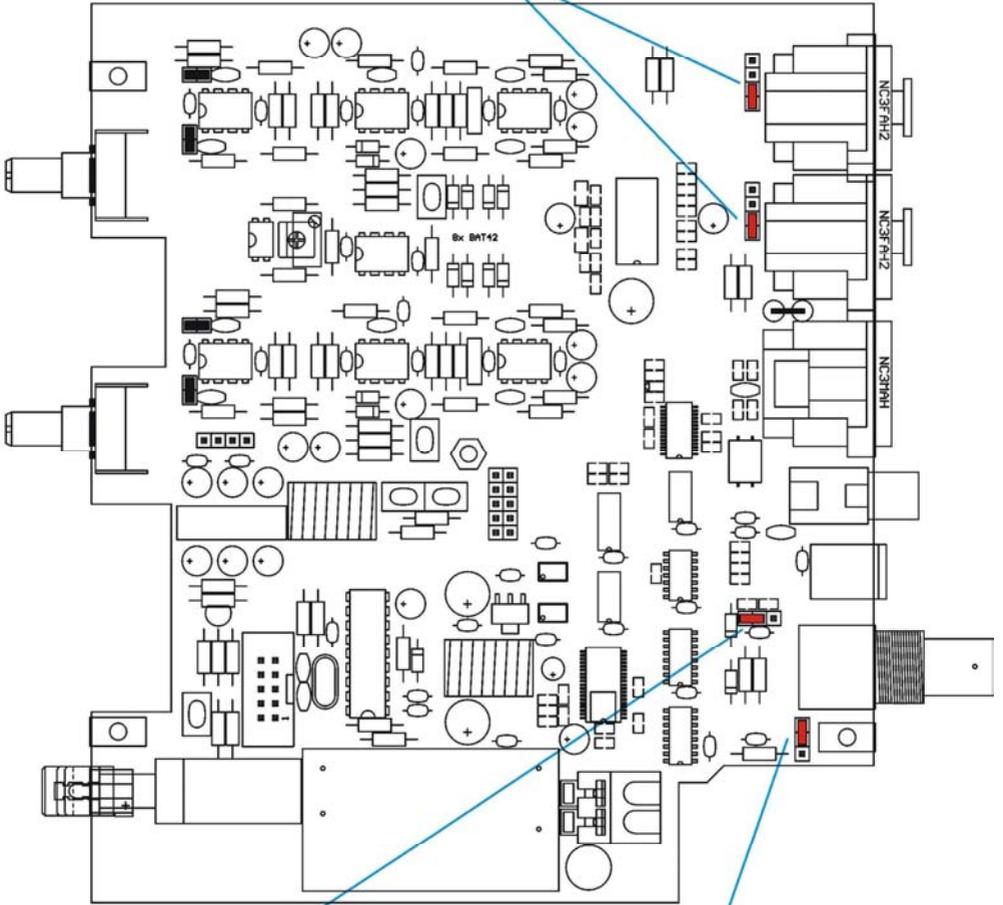
To avoid damages please follow the instruction below:

1. screw off both upper screws on the front panel
2. screw off both upper screws on the back panel
3. now lift the upper lid
4. make your personal jumper settings

Assemble the unit in reverse order

# JUMPER SETTING ADC RS 04

XLR-GROUNDLIFT JUMPER (see Page 8)		
 GROUND POSITION (Ex Works)	 LIFT POSITION	 CHASSIS POSITION



WCLK INPUT IMPEDANCE (see Page 20)	
 75 Ohm (Ex Works)	 10 kOhm

GROUNDLIFT JUMPER (see Page 7/8)	
 LIFT POSITION (Ex Works)	 GROUND POSITION

# TECHNICAL DATA ADC RS 04

All Measurement RMS unwt'd., 20 Hz - 20 kHz, Sample-rate 48 kHz, digital level = -1 dBfs, analog input level = +15 dBu, as not otherwise noted

## SYNC

External Inputs: 1 x BNC, unbal, Imp. 75 Ohm/10 kOhm  
Sensitivity: 200 mV at Tnom/2  
Input Formats: WCLK  
Lock Range: 28 ÷ 210 kHz  
Internal Clocks: 44.1, 48, 88.2, 96, 176.4, 192 kHz  
Sync Source Indicators: WCLK, INT  
Clock Indicators: Lock, 44.1, 48, x2, x4 ,  
Jitter: < 1 nS

## ADC

Analog Inputs: 2 x XLR, electr. Bal. Impedance 5 kOhms  
CMRR (@15 kHz): > 60 dB  
Input Sensitivity: +2 dBu ... +25 dBu  
Level Meter: 2 x 7 LEDs, -36, -20, -12, -8, -4, -2, 0 dBfs  
Crosstalk (@ 15 kHz): < -110 dB  
Frequency Range (-1 dB): 10 Hz ... 70 kHz  
THD+N (@ Fs -1 dB): - 109 dB  
Dynamic Range: 119 dB (A-wtd)  
Output Word Length: 24 bit  
Digital Output Format: Prof/Con, 24 Bit, 28 ÷ 192 kHz  
Digital Outputs: 1 x XLR male, transf. bal, imp.110 ohms  
Output voltage > 4 Vss  
1 x RCA, unbal., imp. 75 ohms  
Output voltage 1 Vss  
1 x Optical, Tos-Link  
1 x USB 96 kHz (option)

## General

Supply Voltage: 90 . 260 V AC, 10 VA  
Case, Front and Back: Black anodized Aluminum  
Dimensions: 168 x 49 x 145 mm (W x H x D)

# EC CONFORMITY STATEMENT:

We herewith declare that the following unit

Name: **LAKE PEOPLE ADC RS 04**

Serial No. : -all -

is in conformity with the following EC directives:

<b>2006/95/EG</b>	Low voltage directive
<b>20014/30/EC</b>	EMC directive
<b>EN 60065:2002+A12:2011</b>	Security directives for audio-, video- und similar electronic devices
<b>JIS C6065:2013</b>	
<b>2001/95/EC</b>	General Product Safety Directive

For verification of conformity with regard to electromagnetic compatibility the following harmonized standards are applied:

<b>EN 50081-1:1992</b>	Generic emission standard
<b>EN 50082-1:1992</b>	Generic immunity standard

Product family standard for audio, video, audio-visual entertainment apparatus:

<b>EN 55013:2001</b>	<b>EN 61000-3-2:2000</b>
<b>EN 55020:2002</b>	<b>EN 61000-3-3:1995</b>

**2011/65/EU**, RoHS directive

**2012/19/EU**, WEEE directive / Member No.: DE 26076388

This declaration is given under responsibility of:



**LAKE PEOPLE *electronic GmbH***  
**Turmstrasse 7a**  
**D-78467 Konstanz**  
**Fon +49 (0) 7531 73678**  
**Fax +49 (0) 7531 74998**

A handwritten signature in blue ink that reads 'Fried Reim'.

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Konstanz 05.01.2016      Fried Reim      CEO

# WARRANTY

Since 1986 we are constructing and manufacturing sophisticated electronics for ambitious customers.

Since the early beginnings we are trying hard by accompanying measures, the use of 1st choice components and multiple quality checks during production to avoid faults at large.

We are quite effective in that and this is . amongst others - why we enjoy such a good reputation.

Despite all accurateness faults may occur which may derogate the proper operation of your product.

In this case your unit is protected by a **2-year Warranty !**

Needless to say that we will care for your product even after the expiration of the warranty. If it is necessary please dispatch your item to:

Lake People electronic GmbH  
Turmstrasse 7a  
D-78467 Konstanz

Fon +49 (0) 7531 73678  
Fax +49 (0) 7531 74998  
E-Mail [info@lake-people.de](mailto:info@lake-people.de)

Your warranty claim begins with the date of purchase, which should be denoted on your proof of purchase.

In case of return do not forget to include the receipt of sales or a copy of the receipt.

Please also include a short description of the fault(s).

For the reshipment we need you correct address !!

Care for a safe packaging. Best is to use the original packaging.

Please keep in mind that we cannot accept collect freight.

We will grant a quick repair and quick return of the unit.

In case of a warranty repair we will reship free of charge.

Please denote here the serial number and the date of purchase:

Serial Number

Date of Purchase