PROFESSIONAL PORTABLE MULTITRACK RECORDER

SONOSAX SX-R4

USER MANUAL

Soft version 2.5.1746

Audio equipment manufacturer

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1. INTRODUCTION

Congratulations on your purchase of your SONOSAX SX-R4 professional portable audio recorder. Based on a high techology design, it has been manufactured to deliver many years of excellent performances.

As with all SONOSAX products, the SX-R4 reocrder is built without any compromise in quality, using only the best components available and a severe quality control. The result of this research and development project is an ergonomic recorder with extraordinary characteristics and an excellent reliability.

The information and instructions contained in this manual are necessary to ensure safe operations of your equipment and to maintain it in good working condition; please read it carefully.

2. GENERAL DESCRIPTION

The SONOSAX SX-R4 is a digital audio recorder of the last generation, designed in 2007-2008, using the latest available technologies, with the unequaled SONOSAX design and ergonomics.

Our 30 years of experience have helped us to develop and build this recorder which is designed to sustain a long life-span, despite an intensive use under the worst possible conditions. It can be used under the rain and is resistant to water splashes.

Built in a strong, rugged and anodized aluminum housing, the SONOSAX SX-R4 recorder provides the best solution whenever top performance, versatility and small size are important. All potentiometers are especially made for SONOSAX and watertight according to IP45. All capacitors are of professional type, with low loss and a long life-span

2.1 MAIN FEATURES

- 8 tracks on HardDisk plus 2 track on CompactFlash Card, with recording capabilities from 44,1 kHz up to 192kHz at 24 bit and 16 bits (dithered or troncated)
- File format: *.WAV with BWF chunk and iXML metadata
- 4x Mic/Line transformer-less input with RF Filter, 48V Phantom powering, pre LF-Cut, phase reversal, PAD attenuator, protection Limiter, Led level metering and extended Linking facilities.
- Ultra low noise, high bandwidth,semi-discrete microphone preamplifier.
- 1x Stereo/two-channel Line input, adjustable from –10dBu to +25dBu
- 8 x Digital inputs channels (4x AES/EBU)
- 1x Stereo/two-channel Line output, adjustable up to +12dBu
- High quality, water resistant, potentiometers and switches (IP45)
- Full TimeCode capability supporting all frame rates
- WordClock I/O and video sync capability, all formats including tri- level & bi-level sync
- USB2.0 for high speed file transfert
- Low power consumption (less than 4Watts average), powered either from 6x standard NiMh AA cells or external DC power supply from 6 to 18VDC
- Small dimensions and light weight, only 0,8kg / 1,75lbs without batteries

2.2 SAFETY INSTRUCTIONS

- Read all the safety and operation instructions before operating the SX-R4 Recorder and its external power supply.
- Keep the instructions for further reference.
- Follow all warnings, notes and instructions in this operation manual.
- Keep the SX-R4 Recorder and its external power supply away from heat sources such as radiators or other devices that produce heat.
- Connect the SX-R4 Recorder only to the optional external power supply delivered by SONOSAX. Route power supply cords so that they are not likely to be walked on or pinched by items placed on or against them, paying particular attention to cords at plugs, inlets and the point where they exit the console. Keep power cords away from audio cords.
- Do not drop objects or spill liquids onto the SX-R4 Recorder and its power supply.
- The SX-R4 Recorder and its external power supply should be serviced only by qualified service personnel as your nearest SONOSAX authorized reseller.
- Do not defeat the grounding or polarization of the SX-R4 Recorder mixer or its power supply.
- Line voltage selectors should only be reseted and equipped with a proper plug for alternate voltage by a qualified service technician.
- To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.
- Internal settings must be executed by an authorized SONOSAX distributor or reseller. Damage due to manipulations inside the unit cancels the SONOSAX warranty immediately.

3. OPERATING INSTRUCTIONS

3.1 BATTERY POWER

The SONOSAX SX-R4 recorder can be internally powered by 6x rechargeable Nickel Cadmium (NiCd) or Nickel Metal Hydride (NiMH) AA-Cells (LR6), or disposable Lithium batteries.

WARNING: Conventional dry cells such as Alkaline batteries should not be used to power the SX-R4 as they could lead to unexpected powering Off

NOTE: The running time highly depends on the battery type (NiCd, NiMH or Lithium), the kind of microphone beeing used and weither the 48V Phantom is turned On. It also depends on the number of tracks beeing assigned and the sample frequency

3.1.1 Opening the battery compartment

To open the battery compartment located on the rear of the unit, press on both locking pins on each side of the compartment and slide out the battery holder.
Insert 6x AA-Cells (LR6) and check for correct polarity

WARNING: Never leave discharged batteries in the compartment. To ensure an optimal running time, use only premium quality rechargeable cells and check the expiry date

3.1.2 Closing the battery compartment

Slide the battery holder into its compartment. Its shape is designed so it can not be reversed. Press fermly but without excessive force on both side of the battery holder to securely lock the pins.

3.1.3 Battery Low alarm

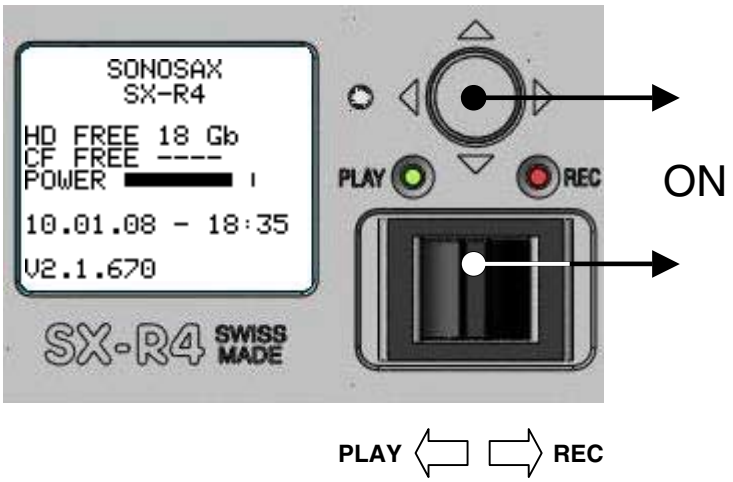
When the average voltage per cell reaches 1.05 Volt, an alarm is displayed on the LCD screen and a bip tone is heard in the headphone. This alarm indicates that the SX-R4 still have a running time of aprox 10 to 20 minutes. When the voltage reaches 1.0 Volt per cell then the SX-R4 will automatically turns Off, thus protecting your rechargeable batteries from excessive discharge.

NOTE: If a recording is in progress, the SX-R4 will stop the recording and then properly save the recorded file on the hard disk before turning Off.

3.2 EXTERNAL DC POWER SUPPLY

SX-R4 Recorder can be powered from any regulated external DC power source from 6 to18 Volts. The DC source must be capable to sustain at least 1,5A under 12 Volts DC. The average power consumption is aprox 4 to 7 Watts depending on the microphone powering and the configuration of the SX-R4.

3.3 SWITCHING ON THE UNIT



To power On the SX-R4, press simultaneously the Toggle switch and the Joystick to the right
A boot up screen is displayed for approx. 2 seconds and shows the following information:

- The remaining free available space on the hard disc and on the Compact Flash card
- A power indication of either the batteries or the external PSU by means of a bar graph
- Date and Time
- The currrent firmware version

NOTE: posting the remaining free space on the HD and on the CF card can take a certain time depending on effective free space and the number of stored files.

As mentioned the SX-R4 can be powered either from the internal batteries or from an external DC source
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- Using rechargeable batteries LR6 (AA-cell), NiCd ou NiMH:

  Insert 6 batteries in the battery holder and switch On the unit as indicated here above. The LCDscreen must turn On. If not:

  - Check that the batteries have been correctly inserted in the battery holder according to the polarity.
  - Check that the batteries are properly charged .

- Using an external power source:

  Connect the external DC power supply DC plug to the DC IN connector located on the right side of the recorder and then and switch On the unit as indicated here above. The LCDscreen must turn On. If not:

  - Check that the external power supply Voltage is between 6 to 18Volts DC
  - Check that your power supply is strong enough to power on the SX-R4.
  - Check that the DC plug is correctly wired.
    Pin 1 = GND or negative / Pin4 = +VDC or positive

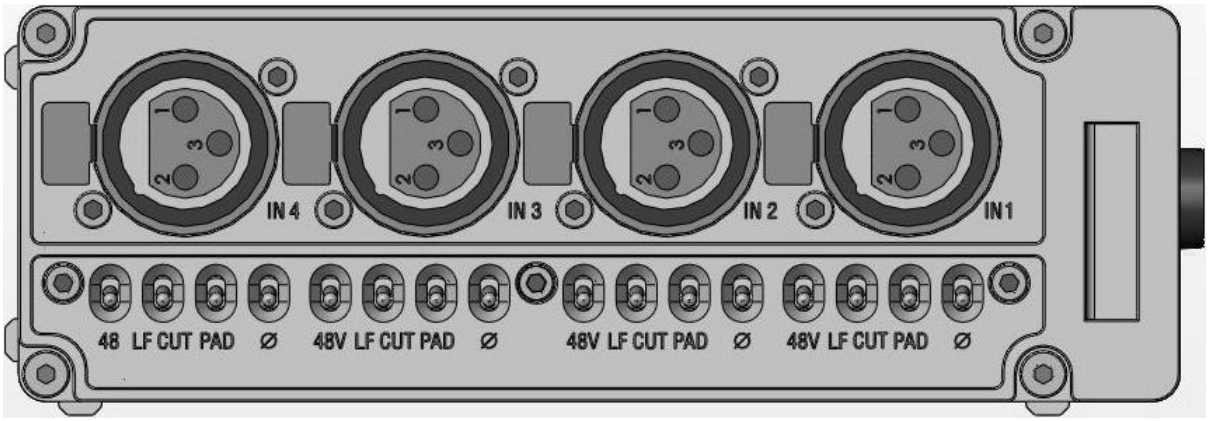
3.4 SWITCHING OFF THE UNIT

Switching OFF the unit is controlled by the software. The fonction [SWITCH OFF] is accessed via the contextual menu. (see chapter 5.1.4)

4. DETAILED DESCRIPTIONS

4.1 LEFT SIDE PANEL

The left side contains the four Mic/Line inputs with their respective function switches as illustrated below:



4.1.1 Inputs [IN1 to IN4]

Each of the input channels is transformer-less, electronically balanced is equiped in standard with a RF Filter They corresponds to the input channels 1 to 4 of the internal matrixing system.

Input connectors are standard XLR-3 female where:
Pin1 = Gnd / Pin2 = High (+) / Pin3 = Low (-).

To connect an unbalanced source such as CD Player, Minidisk or else, pin 3 must be bridged to pin 1 (Gnd) and wired to the Gnd on the source. Then use pin 2 for the unbalanced input signal.

WARNING: Never use the 48V Phantom in case of unbalanced connection or you could severly damage the sourcing device !

NOTE: a stereo/dual-channel unbalanced Line input is available in the right side (see chapter 4.2.1)

4.1.2 Phantom power [48V]

This switch turns the 48V Phantom power On or Off on the corresponfing channel [IN1 à IN4]. In lower position the 48V phantom is turned On to power condenser microphone. In upper position the Phantom power is turned Off for connection of Dynamic microphone or any other analog sources.

WARNING: Never use the 48V Phantom when an external device other than a condenser microphone is connected to the input or you may severly damage the output circuitries of that device.
Never use the 48V Phantom in case of unbalanced connection

NOTE: Almost all modern condenser microphones of the latest generation are operating under 48V Phantom power. Because of the excellent common mode rejection (CMRR) it has been decided to include only this kind of microphone powering on the SX-R4.

4.1.3 Pre-LF Cut Filter [LF Cut]

In lower position, this switch activates a passive low frequency cut circuitry (Pre LF-Cut). The Pre LF-Cut filter circuitry is acting before the microphone pre-amplifier to attenuates the low frequencies of high level that could affect the pre-amplifier and thus preventing an optimal setting of the input gain.
These low frequencies of high level can be generated, among other, by the microphone capsule especially when recording outdoor in strong wind condition.

This Pre LF-Cut frequency is set at 135Hz and its slope is –6dB/octave.

4.1.4 Input Attenuator [PAD]

In lower position, this switch activates a 20dB Line attenuator [PAD] on the corresponding channel.

NOTE: The [PAD] should only be used for high level signals such as Line level coming from an external device. For an optimanl signal to noise ratio it is recommanded not to use the PAD.

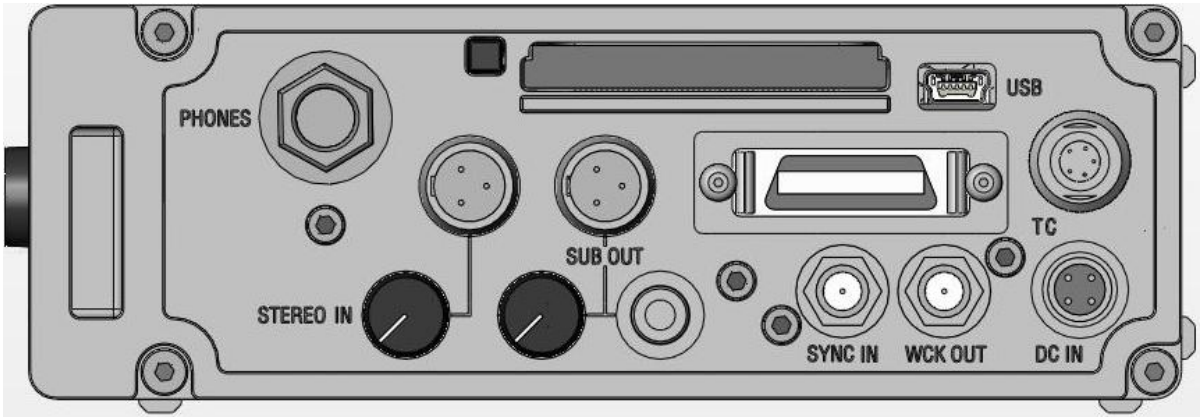
4.1.5 Phase reversal [Ø]

In lower position, this switch reverses the phase of the input signal. It can be used to correct a reversed cable wiring or to address a phase problem between two microphones due to their placement.

4.2 RIGHT SIDE PANEL

This panel contains followings connections:

- Headphone output [PHONES] on a ¼" jack
- Unbalanced stereo/dual-channel Line input [STEREO IN] with adjustable sensivity
- Unbalanced stereo/dual-channel Line output [SUB OUT] with adjustable output level
- External Video or Wordclock sync input [SYNC IN] and Wordclock output [WCKOUT]
- Digital Input AES 1 to AES 4 on a 26 pin multiway connector
- TimeCode input/output [TC] all format on a 5 pin Lemo
- External 6 to 18 Volts DC power supply [DC IN] on a 4 pin Hirose
- USB2 high seed connector [USB] for connection to any computer
- CompactFlash card slot



NOTE: The mating cable connector for the [STEREO IN] and the [SUB-OUT] a TA-3 female.
It is available under SONOSAX part nr SX860266 or Swtichcraft TA3FX

4.2.1 Headphone output [PHONES]

The headphone output on a 6,25mm (¼") jack allow connection of any mono or stereo headphone having an impedance greater than 30 ohms.
The headphone level is adjustable by the Joystick (see chapter 5.1.3). Pressing the Joystick to the left will decrease the volume, pressing the Joystick to the right will increase the volume. The volume control is only possible while in REC Mode or in PLAY mode.
The combination of tracks to be monitored and the monitoring mode is set in the [MONITORING] menu. It is also possible to listen to each track individualy (mode SOLO , chapter 5.1.5)

The headphone connector [PHONE] is a stereo jack 6,35mm (1/4") where:
Sleeve = Gnd / Ring = Right / Tip = Left

WARNING: the headphone amplifier of the SX-R4 is quite poweful. It is recommanded to set the headphone level for a reasonable loudness to protect your precious ears

4.2.2 Stereo/dual-channel Line Input [STEREO IN]

This unbalanced stereo/dual-channel Line Input is provided to connect any external device to the SX-R4 such as for example a SONOSAX SX-M32 or SX42 mixer, receivers of wireless systems or any other external analog source.
The input signal corresponds to the Input channels 5 (Left) & 6 (Right) in the routing matrix system.
The retractable potentiometer adjusts the input sensivity from –10dBu to +25dBu to reach a digital recording level of 0dBFS

The [STEREO IN] connector is a mini-XLR TA-3 male where:
Pin1 = Gnd, Pin2 = Left channel, Pin3 = Right channel.

4.2.3 Subsidiary Stereo Output [SUB OUT]

This unbalanced stereo/dual-channel Line Output is provided to send a rough pre-mix to any external analog device such as for example a video camera, a transmitter or an alternative monitoring system.

This stereo/dual-channel [SUB OUT] is totally independent of the [PHONES] output and has its own matrixing/mixing system. The combination of tracks and their routing to the Left or Right channel is similar to the Monitoring system but is defined in the [LINE OUT] menu. It offers the same facilities including the Mono summing and the M/S decoding (see chapter 5.2.4)

For ease of connections, this Line output is provided simultaneously on a TA-3 connecotr and a stereo Mini-Jack wired in parallel. The mini-jack can also accommodate a headphone. (minimum impedance is 30ohms)

The retractable potentiometer adjusts the output Level between from –10dBu to +25dBu for 0dBFS.

The [SUB OUT] connector is a mini-XLR TA-3 male where:
Pin1 = Gnd, Pin2 = Left channel, Pin3 = Right channel.

4.2.4 External Sync [SYNC IN]

This SMA connector provides an input for an external Wordclock or a Video reference. Thus, it allows to synchronize the A/D Converters of the analog inputs 1 to 6 on an external reference. The selection of the synchronisation signal is achieved in the contexctual menu (see chapter 5.2.2)

4.2.5 Sync Out [WCKL OUT]

This SMA connector delivers a Wordclock sync signal. Its frequency depends either of the selected sample frequency selected in the in the "Sampling settings" menu, or of the incoming frequency of the [SYNC IN] if it is a valid WordClock, or of the sample frequency of the incoming AES input if a valid AES input in connected on chanel 7/8 and properly routed in the matrix system.

4.2.6 External DC input [DC IN]

The SONOSAX SX-R4 can be powered by means of an external DC supply, either a main adapter or an external high capacity battery bank. The voltage must be regulated between 6 to 18VDC
The average power consumption of the recorder is around 4 Watts. This represents a DC current of 330mA under a supply voltage of 12Volts. However, while turning On the recorder the inrush current mayreach 2A, therefore make sure that your external DC supply can sustain this peak of current

To ensure optimal performances we recommand you to use the optional main adapter available by your local dealer.

the DC IN connector is a Hirose 4 pin female :
Pin 1 = Gnd ou negative / Pin4 = +V DC or positive; the voltage range is 6 to 18 Volts DC

The Hirose 4 pin male cable connector is available by SONOSAX or by your local dealer under references:
SONOSAX part nr SX860217 or Hirose HR10-7P-4P

4.2.7 Time Code Connector [TC]

The TimeCode input/output connector is a Lemo 5 pin, compatible with the Aaton wiring as below:

Pin 1 = Gnd
Pin 2 = Smpte Out
Pin 3 = not connected
Pin 4 = not connected
Pin 5 = Smpte In

The mating cable connector Lemo 5 pin is available by SONOSAX or by your local dealer under ref part SONOSAX SX-860232 or Lemo FGG.0B.305.CLAD52

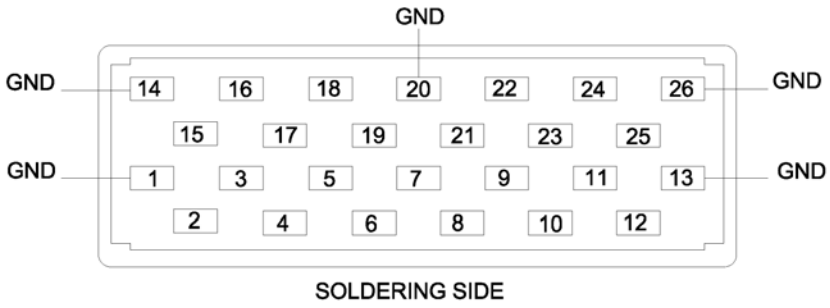
4.2.8 Digital Input [ACCESSORY]

This 26pin connector provides 4x AES/EBU digital audio inputs [AES1 to AES4]. The sync signals such as the Sync In and the Wckl Out, the Time Code In and Out and the Monitor Out are internaly wired in paralel to the corresponding main connectors. The serial bus is provided for future use

The mating cable connector is available under SONOSAX ref: SX-860570
Split cables wired for the 4x AES inputs are also available, please check with your local dealer.

AES 1-2	AES 3-4	AES 5-6	AES 7-8 *
15 HI	16 HI	17 HI	18 HI
2 LO	3 LO	4 LO	5 LO
1 GND	14 GND	13 GND	26 GND

* THE AES SYNC IS TAKEN ON AES INPUT 7-8



TIME CODE IN	WORLD CLOCK IN or VIDEO IN	WORLD CLOCK OUT	SERIAL BUS	MONITOR OUT
19 HI	7 INPUT SIGNAL	8 OUTPUT SIGNAL	22 TX HI	25 LEFT
6 LO	20 GND	20	9 TX LO	12 RIGHT
20 GND			23 RX HI	24 GND MONITOR
			10 RX LO	
			11 INT	
			21 DV	

4.2.9 USB2 connector [USB]

This connector is of USB2 type only. The SX-R4 is not compatible with anciliary USB 1.0 system
It allows to connect the SX-R4 to any computer (PC or Mac) providing with aa standard USB2 port. As soon as connected, the SX-R4 will appear on the computer desktop as an external Harddisk drive. If a Compact Flash card is inserted, it will also appears on the desktop.

WARNING: It is highly recommanded to use a Certified "USB 2 High Speed" cable. The data rate transmission is so high that using a non certified cable may lead to unpredictable malfunctions such as : Disk not recognized, SX-R4 nor appearing on your desktop, Windows error code 10 etc etc

4.3 FRONT PANEL

The front side of the SX-R4 contains all functions commonly used during a recording session. It has two distinct sections: the analog section that controls the inputs channels and the User Interface that controls all functions of the recorder

ANALOG SECTION [IN1 to IN4]

This section covers the functions related to input control such as Gain level, channels linking. It also offers a small 3 led peak-meters to visualize the modulation level, the eventual overloads and also to indicates the Limiter activities.

4.3.1 Input Gain control [LO-HI]

The input gain is controlled jointly by the gain switches [LO-HI] and the gain potentiometer.

position High [HI] the input sensivity goes from –18,5dBu to –61,0dBu for 0dBFS
position Low [LO] the input sensivity goes from +1.5dBu to –38.5dBu for 0dBFS
position Low [LO] with [PAD] the input sensivity goes from +21.5dBu to –18.5dBu for 0dBFS

NOTE: Gain control should be used with care since the adjustment range is extensive. A signal level set too high can cause distortion and will leave you with less headroom; a level set too low causes a bad signal-to-noise ratio.

4.3.2 Channel Linking [LINK]

This switches allow to Link the Gain potentiometers of the input channels, thus a single potentiometer controls two or more channels which ensure to keep the stereo balance of a stereo microphone, a M/S pair or any other stereo source.
The Linking can be done either per pairs of channels such as for example 1&2 and/or 3&4, or for 3 channels such as for double M/S system by linking channels 2 & 3 & 4, or even all 4 channels together as for the Soundfied "B-Format" where all four channels will be linked to channel # 4 that has a quad potentiometer.

The Linkings are achieved as follow:

Channel nr 1: lower position = no linking
position 2 = Link channel 1 to channel 2. Fader nr 2 controls channels 1 & 2
position 4 = Link channel 1 to channel 4. Fader nr 4 controls channels 1 & 4

Channel nr 2: lower position = no linking
position 3 = Link channel 2 to channel 3. Fader nr 3 controls channels 2 & 3
position 4 = Link channel 2 to channel 4. Fader nr 4 controls channels 2 & 4

Channel nr 3: lower position = no linking
position 4 = Link channel 3 to channel 4. Fader nr 4 controls channels 3 & 4

4.3.3 Led's Peakmeters

This small peak meters has three distinct functions. It indicates not only the input level of the channel but also the Limiter activities as soon as the signal reaches the threshold level and the eventual overloads. These meters are connected at the input of the A/D Converter

Level indication:

Green Led:	the modulation reaches an internal level of aprox -20dB.
Yellow Led:	the modulation reaches the nominal internal level 0dB (-18dBFS)
Red Led:	the modulation reaches an internal level of aprox +10dB

Limiteurs: The Limiteur activity is shown by lighting simultaneously the Red and the Green led's for a period of aprox 1 second

Overloads: the overload is indicated as soon as the clipping level is reached 0dBFS. In this case all led's light at the same time

NOTE: The Leds intensity vary automatically depending on ambiant light. It is controlled by the light sensor located on the left side of the Joystick

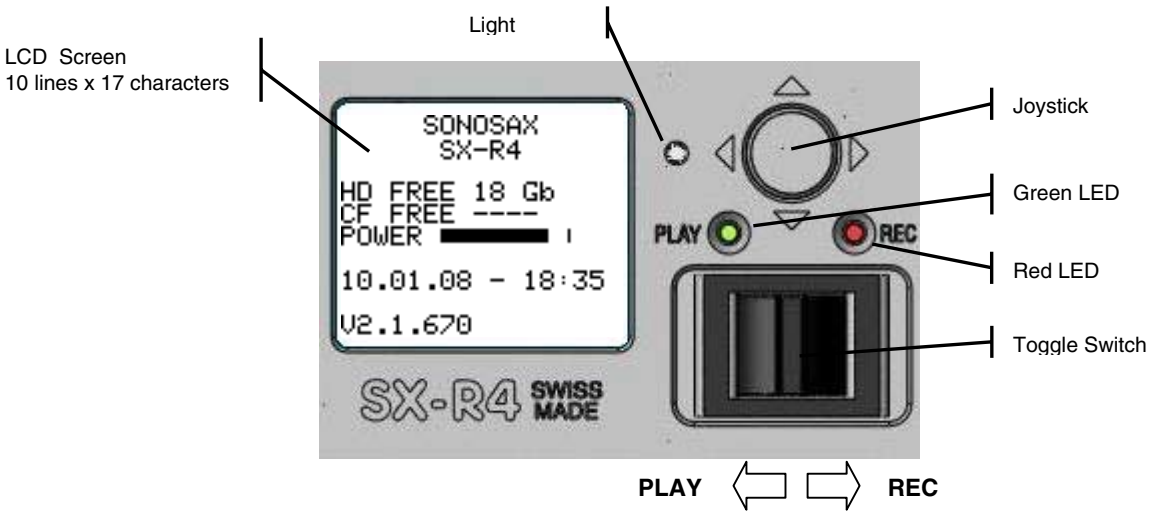
4.3.4 Input Limiter

Each of the 4 input channel is equiped with a protection Limiter which is part of the microphone pre-amplifier design. The Limiter is automatically activated 2dB below the clipping level of the A/D converter (–2dBFS) and can not be de-activated. The Threshold is set at factory and can not be modified by the user
The Limiter activities is indicated by the 3 Leds Peak-Meter by lighting the Red and the Green Led for a period of aprox 1 second.

4.3.5 Red Led [OVD LINE]

This Red Led indicates the eventual overload on the Line Inputs 5 & 6. It lights as soon as the clipping level of the A/D Converter 5&6 is reached

5. USER INTERFACE



5.1.1 PRINCIPLE OF OPERATION

Status

The Status of the SX-R4 is displayed by means of the Red and the Green leds and by the LCD Display. The following status are possible:

- RECORD READY
  the Red LED is flashing, the SX-R4 is ready to start recording.
- RECORDING
  the Red LED lights On steady, confirming that a recording is in progress
- PLAYING
  the Green LED lights On steady, a Take is playing
- PLAY PAUSE
  the Green LED flashes, indicating that the loaded Take is currently paused.
- PLAY STOP
  A Take is loaded ready to be played, no LED lights on, nor flashes

Main scren display

The main working screen [TRACK MONITORNG] displays the Level Meters of the 8 tracks.
The global meter's range is 72dB with following resolutions :

1dB steps from –72dBFS up to –24dBFS
0.5dB steps from –23.5dBFS up to 0dBFS.

A configurable reference line can be displayed at -9, -12, -18, or –20 dBFS (see configuration menu)

Convention for displayed informations and function keys

The last line on the screen displays the Joystick's function.
By default, pushing the Joystick Up or Down modifys the parameters, to the Right will select the parameter and to the Left cancel the action or steps back in the contextual menu.
A single Arrow symbol denotes that an action is achieved by briefly pushing the Joystick.
A double Arrow symbol means that the Joystick must be pushed longer to achieve the action.
A round Dot symbol denotes a pressure on the center of the Joystick

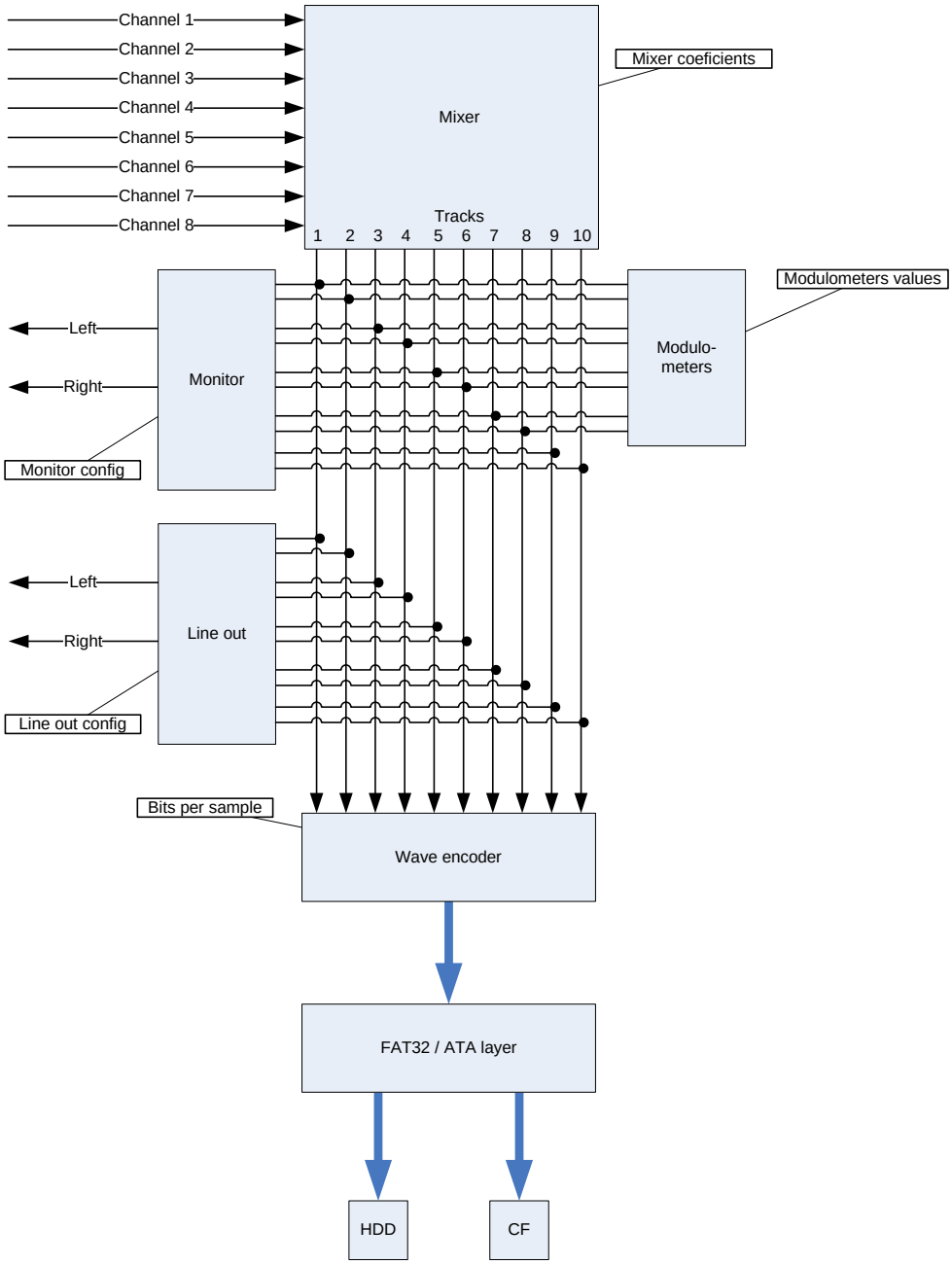
5.1.2 ARCHITECTURE - AUDIO PATH

The SONOSAX SX-R4 offers 14 physical input channels, 6 analog and 8 digital. Up to 8 of these physical input channels can be assigned to any of the 10 available tracks, and any analog/digital channel combination is possible. These physical channels are groupped per pair as follow:

- 1, 2 : either MIC/LINE input 1 & 2 or AES 1
- 3, 4 : either MIC/LINE input 3 & 4 or AES 2
- 5, 6 : either LINE input 5 & 6 or AES 3
- 7, 8 : AES4 only

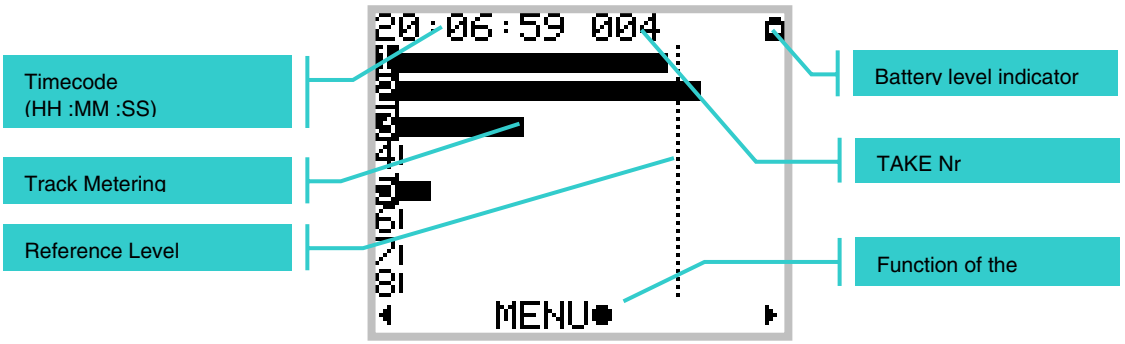
The routing Matrix allows to asssign and mix any of the input channels to any of the 10 available tracks. The first 8 tracks are dedicated to the hard disc (HD) and the 2 additional tracks are dedicated to the Compact Flash card (CF).

For Monitoring purposes, you can configure and listen to any combination of these 10 tracks. However, the display shows only the Peak meters of the 8 hard disk's tracks



5.1.3 TRACK MONITORING

The TRACK MONITORING is the default page beeing displayed by the SX-R4. The track numbering from 1 to 8 is always displayed and is related to the HardDisk tracks. The number of each active track in use (assigned in the matrix) is posted in reverse video.



Note: The peak meter reference level can be set in the "Configuration" menu.

The actions or functions of the Joystick and the Toggle switch are described as follow:

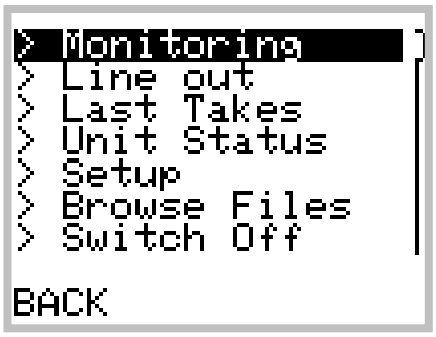
Joystick	**Short pressure**	**Long pressure**
LEFT	Reduce the headphone volume in 1dB steps	Reduce the volume continuously down to minimum
RIGHT	Increase the headphone volume in 1dB steps	Increase the volume continuously up to maximum
UP and DOWN	SOLO MONITORING	
CENTER	Call the contextual Menu page	Lock/Unlock the Joystick action

Toggle switch	**Short pressure**	**Long pressure**
RIGHT	Start recording	
RIGHT while recording	Add an Index **	Stop recording
LEFT	Call and Play the last take	
LEFT while playing	Pauses at current position	Stop playing

** **Index** = New TAKE
A brief pressure to the Right on the toggle switch while Recording will automatically create a new [TAKE]. This new Take nr is automatically incremented by 1.
The audio files of this new Take are cut at the sample level (precision of one sample). Takes can then be seamlessly re-assembled in an editing software with the help of the TimeCode.

Pressing the Joystick to the Left or to the Right displays temporarily will post a temporary screen showing the headphone level by means of a bar graph. The headphone level is adjustable in 1dB steps from –30dB to +18dB.

5.1.4 CONTEXTUAL MENUS



The Contextual Menu allows a quick navigation between the different pages and configurations menu of the SX-R4. The Contextual Menu can only be accessed from the Track Monitoring page (not while in Solo Monitoring Mode) by a pressure on the center of the Joystick.

Joystick	Short pressure	Long pressure
LEFT	Steps back from the menu to the Tracks Monitoring page	
RIGHT and CENTER	Confirm the selection	
UP	Scroll the selection upward	
DOWN	Scroll the selection downward	

The possible choices in the Contextual Menu depend on the current "Status" of the SX-R4 as described here below:

While Recording:

- >Monitoring
- >Line Out
- >Unit Status

While Playing or in Pause:

- >Last Takes
- >Monitoring
- >Line Out
- >Unit Status
- >Delete Take

While in Record Ready:

- >Monitoring
- >Line Out
- >Last Takes
- >Unit Status
- >Setup
- >Browse Files
- >Switch Off

While in Stop:

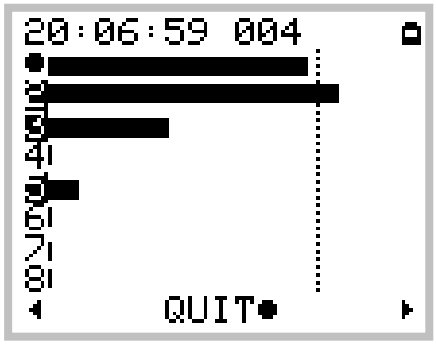
- >Last Takes
- >Exit Player Mode
- >Monitoring
- >Line Out
- >Unit Status
- >Browse Files
- >Delete Take
- >Switch Off

5.1.5 SOLO MONITORING

The [SOLO MONITORING] page is accessed from the [TRACK MONITORING] page by pressing the Joystick Up or Down. It allows you to Monitor in mono any individual track or a specific pair of tracks.
The page beeing displayed is visually almost identical to the [TRACK MONITORING] page with the expection that a round dot indicates the selected track being soloed.

The track selection sequence is as follow: 1, 2, 1+2, 3, 4, 3+4, 5, 6, 5+6, 7, 8, 7+8.
The UP key moves the selection upward; the DOWN key moves the selection downward
The Solo Monitoring is only possible with active (assigned) tracks

Joystick	**Short pressure**	**Long pressure**
LEFT	Reduce the headphone volume in 1dB steps	Reduce the headphone volume continously
RIGHT	Increase the headphone volume in 1dB steps	Increase the headphone volume continously
UP	Select the previous track	
DOWN	Select the next track	
CENTER	Returns to the TRACKS MONITORING	Lock/Unlock the Joystick

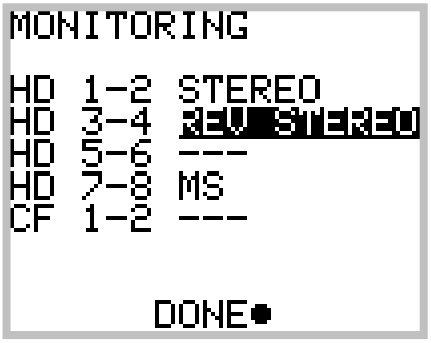


The example above shows a configuration of 4 active (or assigned) tracks: 1, 2, 3, and 5.
Track 1 being currently selected for Solo Monitoring.

In this particular case, the selection sequence for the Solo is: 1, 2, 1+2, 3, 5

5.1.6 MONITORING

This Monitoring page is used to configure and mix the 10 tracks of the SX-R4 for it's headphone output.
The configuration of the monitoring is done by means of a specific menu as shown below :



The Monitoring is always configured per pair of tracks (10 tracks = 5 pairs of tracks)
The table below shows the available choices and their respective monitoring results on the stereo headphone output for the pair of tracks 1 and 2.

Monitoring Mode	Result on the Left channel	Result on the Right channel
---	---	---
MONO	1 + 2	1 + 2
STEREO	1	2
REV STEREO	2	1
MS	1 + 2	1 – 2
MONO L	1 + 2	---
MONO R	---	1 + 2

The table below descibes the actions of the Joystick :

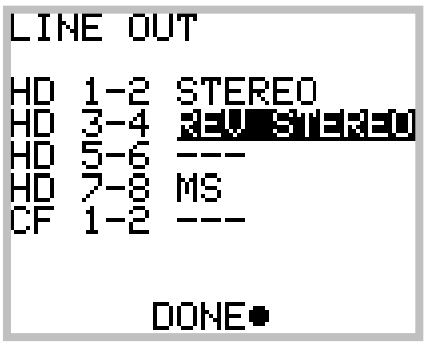
Joystick	Short pressure	Long pressure
LEFT	Change the monitoring mode.	
RIGHT	Change the monitoring mode.	
UP	Move the selector upward	
DOWN	Move the selector downward	
CENTER	Save the modifications and return to the previous Menu	

Note: If a pair of tracks is not activated (not assigned) the only possible value is : " --- " (No Monitoring)

5.1.7 LINE OUT

SETUP > LINE OUT

The SX-R4 provides with a stereo/two-channels line output [SUB OUT] that can be used to record a sub-mix onto a camera, or to send it via a wireless link or simply to provide with an alternate monitoring selection. This line output can be configured on the same maner as the Monitor. Thus, this menu allows to assign and mix the 10 tracks to the [SUB OUT] connectors as described here below:



The Line Out is always configured per pair of tracks (10 tracks = 5 pairs of tracks). The table below shows the available choices and their respective results on the [SUB OUT] output for the pair of tracks 1 and 2.

Type	Result on the Left channel	Result on the Right channel
---	---	---
MONO	1 + 2	1 + 2
STEREO	1	2
REV STEREO	2	1
MS	1 + 2	1 – 2
MONO L	1 + 2	---
MONO R	---	1 + 2

The table below shows the actions of the Joystick :

Joystick	Short pressure	Long pressure
LEFT	Change the Line Out mode.	
RIGHT	Change the Line Out mode.	
UP	Move the selector upward	
DOWN	Move the selector downward	
CENTER	Save the modifications and return to the previous Menu	

Note: If a pair of tracks is not activated (not assigned) the only possible value is: " --- " (no output)

5.1.8 LAST TAKE

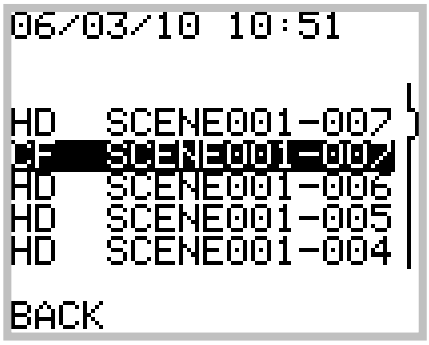
This page provides a quick access to the Last Takes having been recorded. The Takes appear in a reverse order, thus the last Take appears at the top of the list.

The first line displays the date (YY/MM/DD) and the start time of the selected Take
Each TAKE is presented with following format:

XX YYYYYYYY-ZZZ

Where: XX is the media source where the TAKE is stored (HD or CF)
YYYYYYYY is the scene name (max 8 characters)
ZZZ is the TAKE number

By selecting a TAKE, the SX-R4 loads it to it's memory. Depending of the media source and the TAKE length, it may take a certain time before the TAKE becomes ready for the Playback.



Joystick	Short pressure	Long pressure
LEFT	Return to the CONTEXTUAL MENU	
RIGHT or CENTER	Load the selected TAKE	
UP	Scroll the selector upward	
DOWN	Scroll the selector downward	

5.1.9 PLAYER Mode

This page is posted when a TAKE is selected

Joystick	Short pressure	Long pressure
LEFT	Reduce the headphone volume in 1dB steps	Reduce the headphone volume continously
RIGHT	Increase the headphone volume in 1dB steps	Increase the headphone volume continously
UP and DOWN	Activate the SOLO MONITORING	
CENTER	Return to CONTEXTUAL MENU	Lock/Unlock

Toggle switch	Short pressure	Long pressure
LEFT	Play the selected Take	
LEFT while Playing	Pauses at current position	Stop playing
RIGHT	Switches to Record mode and start recording (scratch record**)	
RIGHT while Recording	Add an Index	Stop recording

** **NOTE**: while switching directly from Play mode to Record mode by pressing the Toggle switch to the Right, the SX-R4 starts recording immediately (scratch record). In this case the pre-record buffer remain empty, thus the pre-record time is equal to zero.

5.1.10 Mode SEARCH

The SEARCH mode can only be activated while the Player is in => PAUSE mode (not from Stop mode)
Pressing the Joystick to the Left or to the Right respectively Fast Rewinds or Fast Forwards within the selected TAKE.

in SEARCH mode => FORWARD

One pressure to the Right:	>>	Fast Forwards at 2x the Play speed with Monitoring
2 quick pressure to the Right:	>>>	Fast Forward in steps of 5% of the TAKE length, no monitoring

in SEARCH mode => REWIND

One pressure to the Left:	<<<	Fast Forward in steps of 5% of the TAKE length, no monitoring

in SEARCH mode => PAUSE — No action on the Joystick

Joystick	**1 pressure**	**2 quick pressures**
LEFT	<<< Fast Rewing, no monitoring	
RIGHT	>> Fast Forward with monitorng (2x Play speed)	>>> Fast Forward, no monitoring
UP and DOWN	Activates the SOLO MONITORING	
CENTER	Return to CONTEXTUAL MENU	

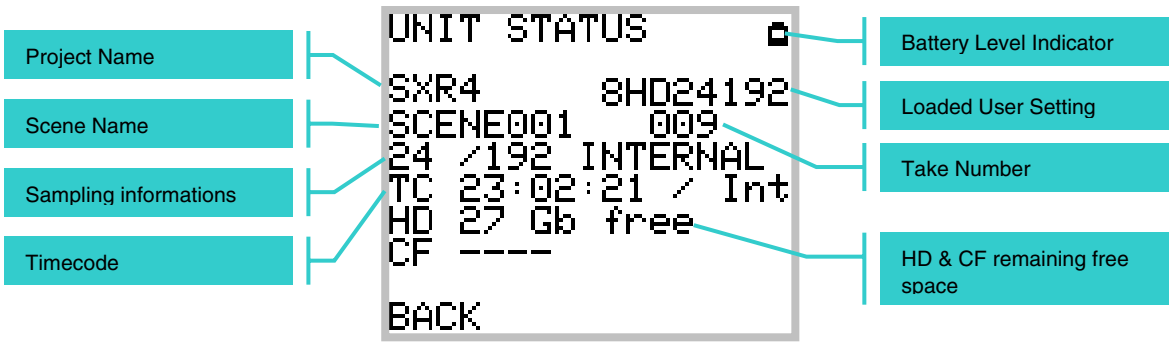
Toggle switch	**Short pressure**	**Long pressure**
LEFT while in Pause	Play from current position	Change from Pause to Stop
LEFT while Playing	Pauses at current position	Stop playing

Fast Rewind " <<< "

Fast Forward " >>> "

5.1.11 UNIT STATUS

This page displays the main current parameters of the SX-R4



The displayed parameters are:

- Line 1 : the battery level indicator or a dart symbol if an external PSU is connected
- Line 3 : the current Project name,
  the loaded User Setting (posted only if the loaded setting has not been modified)
- Line 4 : Scene name and Take number
- Line 5 : Sampling rate (24/16) / Sampling frequency, synchronisation source such as INTERNAL, AES, WCK IN
  or video stream type: PAL/25, NTSC/29.97, 1080/23.97, 1080/24, 1080/25, 1080/29.97, 1080/30, 720p/24, 720p/25, 720p/29.97, 720p/30, 720p/50, 720p/59.94, 720p/60, 295M-P/25 or Video Err.
- Line 6 : Timecode and its format: Int (Internal), 24, 25, 29 (29.97 Non Drop),
  29D (29.97 Drop), 30 (30 Non Drop) or 30D (30 Drop). If the Time Code cannot be read (unknown format) the Time Code value becomes: -- :-- :--
- Line 7 : Remaining free space on the Hard Disc
- Line 8 : Remaining free space on the CompactFlash card

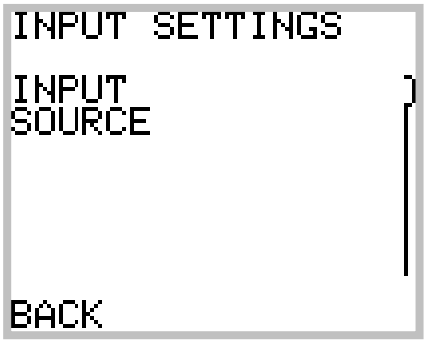
Joystick	Short pressure	Long pressure
LEFT	Return to CONTEXTUAL MENU	

5.1.12 SETUP (Configurations Menus)

The Configuration Menus are posted by calling the Contextual Menu and then by selecting [SETUP] in the list. The menus are sorted in headings (rubrics), and grouped in a logical order. The navigation from heading to heading is done by pushing the Joystick UP or DOWN. On the right side of the screen, a scroll bar indicates the position in the list of the available headings.

Press the Joystick to the RIGHT or CENTER to enter the sub-menu, to the LEFT [EXIT] or [BACK] to return to the preceeding page.

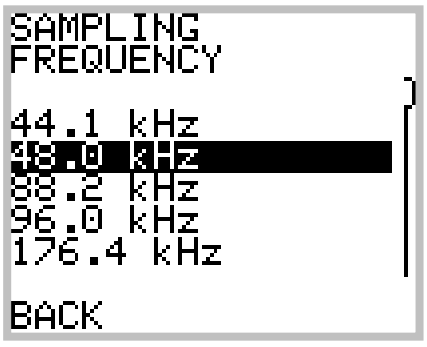
The tree structure of the menus imposes the use of sub-menus until the parameter which one wishes to modify is reached.



A menu with no parameter shown, posts one heading per screen. Thus classifying the various selectable parameters.

A menu showing parameters corresponds to the end of the tree structure; thus it posts the current value of the parameter that can be modified.

Pressing the Joystick to the RIGHT or CENTER, in a menu with parameter, allows to change its value. One distinguishes several manners of carrying out this change
.



A menu with a list shows the possible choices of a parameters. The selection is posted in reverse video

The text-editing menu.
The text to be edited is displayed between brackets which shows the limits of the text size.
Two arrows point the selected character. Press the Joystick Up or Down to modify the selected character. Keep pressing to scroll the characters. LEFT and RIGHT moves the cursor to select the character.
Pressing the Joystick on its CENTER save the text and return to the preceeding page.
A long pressure to the LEFT cancels the edition and returns to the preceeding page.

5.2 MENU'S TREE STRUCTURE

The grayed menus are those where parameters are visible.

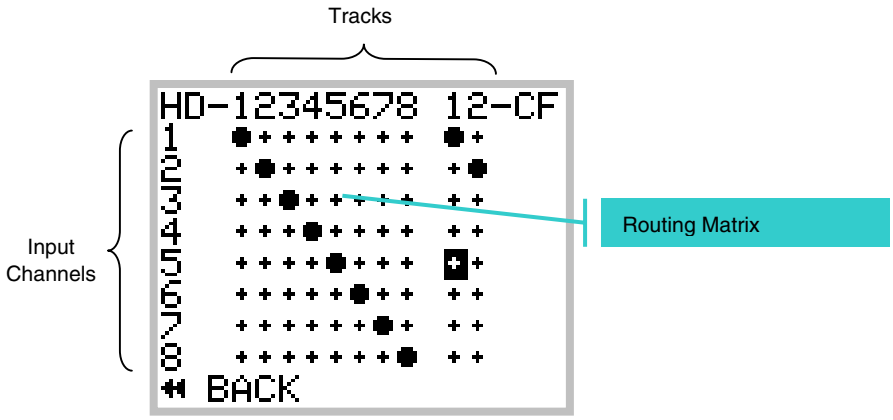
Level 1	Level 2	Level 3	Changeable values
ROUTING SETTINGS	ROUTING	Specific Menu (cross matrix)	
	MIXING LEVEL		NONE, ATT1.5, ATT3, ATT6
RECORD SETTINGS	PROJECT NAME		Text Editor
	SCENE NAME		Text Editor
	FILE FORMAT		MONO, STEREO
	SAMPLING SETTINGS	SAMPLING FREQUENCY	44.1, 48, 88.2, 96, 176.4, 192 kHz
		SAMPLING UP/DOWN	Nominal, UP o/oo, DOWN o/oo
		SAMPLING RATE	24 bits, 16 bits dither, 16 bits
	PRE-RECORD TIME		1, 2, 5, 10, 20 sec
	PRE-INDEX DELAY		0, 1, 2, 3, 5 sec
	SYNC MODE		OFF, WDCKIN, VIDEO IN
INPUT SOURCE	MIC/LINE 1-2		AES, MIC/LINE
	MIC/LINE 3-4		AES, MIC/LINE
	LINE 5-6		AES, LINE
TIMECODE SETTINGS	SOURCE		EXTERNAL JAM SYNC, EXTERNAL NO JAM, INTERNAL, INTERNAL OUTPUT
	FORMAT		AUTODETECT, 24, 25, 29.97 NON-DROP, 29.97 DROP, 30 NON-DROP, 30 DROP
	RUNNING MODE		FREE RUN, RECORD RUN
	SET MANUAL		
	SET FROM TIME		
MODULO-METERS SETTINGS	REFERENCE		NONE, -9, -12, 18, -20 dB
	HOLD TIME		NONE, 5 sec, 10 sec, 2 min, INFINITE
USER SETTINGS	Specific menu		
MISC	DATE	Specific Menu to set up Date	
	TIME	Specific Menu to set up Time	
	SYSTEM INFO	Post the software/hardware revisions and battery voltage	
	USER INTERFACE CHECK	Check the LCD display, the LEDs and the functions of the keys	
	FACTORY SETTINGS	Re-set all parameters to factory default	

Explanation of each menu is detailled in the following chapters.

5.2.1 ROUTING SETTING

SETUP > ROUTING SETTINGS > ROUTING

The routing, or channel assignement to the tracks, is done by means of a specific menu as shown below:



The round dot assigns the Inputs Channels to the Tracks. Any combination is possible and any input channel can be routed to any track. An input channel can be routed to multiple tacks and multiple channels can be routed on the same track (mixing). In the figure above, a 1x1 routing is established between the Inputs and the Hard Disc Tracks. In addition, input channels 1 & 2 are also routed to the CF card

The table below shows the actions of the Joystick :

Joystick	Short pressure	Long pressure
LEFT	Move the selection cursor to the Left	Return to the previous menu
RIGHT	Move the selection cursor to the Right	
UP	Move the selection cursor upward	
DOWN	Move the selection cursor downward	
CENTER	Activate/Desactivate the assignement	

NOTES: It is not possible to leave this menu without saving the configuration
The un-assigned Tracks (no dot on the crossing) are automatically desactivated.

SETUP > ROUTING SETTINGS > MIXING LEVEL

The [MIXING LEVEL] menu defines the attenuation to be applied to each channel when summing (mixing) multiple input channels onto the same track, thus avoiding a possible digital clipping. Four possibilities are offered and the choice depends on the phase coincidence of the sources.

- NONE no attenuation at all
- ATT1.5 mainly used if the sources have no phase coincidence
- ATT3 recommanded for phase coincident sources such as sereo or M/S microphone
- ATT6 only used if the sources are absolutaly in phase

The table below summarizes the exact attenuations computed and applied according to the number of input channels assigned to the same track.

Number of input channels assigned to the same track	NONE [in dB]	ATT1.5 [in dB]	ATT3 [in dB]	ATT6 [in dB]
1	0	0	0	0
2	0	1.8	3.3	6
3	0	2.5	5	10.1
4	0	3.3	6	12
5	0	3.3	7.2	14.5
6	0	4.1	7.2	14.5
7	0	4.1	8.5	18.1
8	0	5	8.5	18.1

5.2.2 RECORD SETTINGS

SETUP > RECORD SETTINGS > PROJECT NAME

This menu allows you to set the PROJECT Name. It has several aims:

- Sets the name of the directory where the Takes will be stored.
- Archives the Project name in each WAVE file (sub-chunk BWF and iXML)

The format of the Project Name is as follows:

- 8 characters maximum
- alphanumeric characters, space and underscore only (A..Z, 0..9, _)

SETUP > RECORD SETTINGS > SCENE NAME

This menu allows you to set the SCENE Name. It has also several aims:

- Partially names the directory where the audio files of the Takes will be stored
- Archives the Scene name in each WAVE file (sub-chunk BWF and iXML)

The format of the Project Name is as follows:

- 8 characters maximum
- alphanumeric characters, space and underscore only (A..Z, 0..9, _)

SETUP > RECORD SETTINGS > FILE FORMAT

The File format offers two choices :

- MONO
- STEREO

If MONO is selected, each track is recorded in a separate mono file.
If STEREO is selected, the system records each pair of tracks in a stereo file. The pairs are always 1+2, 3+4, 5+6 and 7+8.
If the Routing defines incomplete pairs of tracks (for example tracks 1, 3, 4 and 7) each insulated track is recorded in a stereo file and uses a half of the file size.

SETUP > RECORD SETTINGS > SAMPLING SETTINGS > SAMPLING FREQUENCY

This menu lets choose the sampling frequency. Choices are : 44.1, 48, 88.2, 96, 176.4 and 192 kHz.

If a AES input is assigned, then the SX-R4 will automatically lock on the incoming AES sample frequency and thus the selected sampling frequency will be overwritten.

WARNING: The DSP of the SX-R4 will lock on the incoming sample frequency, however both the BWF and iXML header will stamp the sample frequency that was selected in this menu.

SETUP > RECORD SETTINGS > SAMPLING SETTINGS > SAMPLING UP / DOWN

The Pull-Up / Pull-Down correction for the NTSC world can be set in this MENU. The possible values are NOMINAL (use of the nominal sampling value), UP ‰ (positive correction of one per thousand) and DOWN ‰ (negative correction of one per thousand).

SETUP > RECORD SETTINGS > SAMPLING SETTINGS > SAMPLING RATE

This menu sets the number of bits per sample (also called sampling rate or bit depth) recorded in the WAVE files. The possible values are 24 bits, 16 bits dither and 16 bits. The dithering is of the triangular type.

SETUP > RECORD SETTINGS > PRE-RECORD TIME

The Pre-Record time can be set from 1 second up to 20 seconds. The selected value may not always be possible due to the physical limitation of the built-in memory and the selected configuration.
The Pre-Record time depends on following factors:

- Number of Tracks being assigned
- Sampling frequency
- Sample Rate and Pull UP/ Pull DOWN correction

When the required pre-record time is not possible, the SX-R4 will perform on "best effort" basis to provide with the maximum possible. The table below shows the max. values of the pre-record time [sec.]:

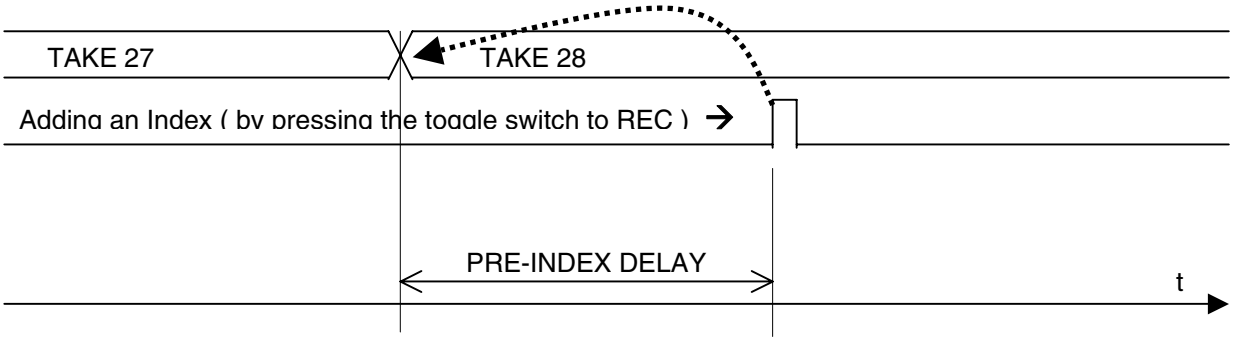
16 bits	Tracks count									
fs	1	2	3	4	5	6	7	8	9	10
44100	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	18.5	16.6
48000	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.1	17.0	15.3
88200	20.0	20.0	20.0	20.0	16.6	13.9	11.9	10.4	9.2	8.3
96000	20.0	20.0	20.0	19.1	15.3	12.7	10.9	9.6	8.5	7.6
176400	20.0	20.0	13.9	10.4	8.3	6.9	5.9	5.2	4.6	4.2
192000	20.0	19.1	12.7	9.6	7.6	6.4	5.5	4.8	4.2	3.8

24 bits	Tracks count									
fs	1	2	3	4	5	6	7	8	9	10
44100	20.0	20.0	20.0	20.0	20.0	18.5	15.9	13.9	12.3	11.1
48000	20.0	20.0	20.0	20.0	20.0	17.0	14.6	12.7	11.3	10.2
88200	20.0	20.0	18.5	13.9	11.1	9.2	7.9	6.9	6.2	5.5
96000	20.0	20.0	17.0	12.7	10.2	8.5	7.3	6.4	5.7	5.1
176400	20.0	13.9	9.2	6.9	5.5	4.6	4.0	3.5	3.1	2.8
192000	20.0	12.7	8.5	6.4	5.1	4.2	3.6	3.2	2.8	2.5

In these tables, the UP/DOWN correction is not taken into account (negligible).

SETUP > RECORD SETTINGS > PRE-INDEX DELAY

The pre-index delay reflects the time of anticipation, to compensate the user reaction time, when adding an index. It offers the following values: 0, 1, 2, 4 and 5 seconds. The graph below illustrates an example of this Pre-Index delay



The pre-delay index is not absolute; the software does its best to cut the Take to nearest desired time (best effort). However, no data is lost during the addition of an index !

SETUP > RECORD SETTINGS > SYNC MODE

The synchronization mode of the SX-R4 can be choosen in this menu. By synchronization, one means the use of an external clock on a given signal to synchronize the selected sample frequency of the SX-R4.
This section does not treat the use of timecode.
The current active mode of synchronization is posted in the page "Unit Status".
All modes are explained below with the various parameters and their validity

OFF

Internal Generator:

The SX-R4 has a very stable internal clock generator, capable of generating all the sample frequencies (44.1, 48, 88.2, 96, 176.4 and 192 Khz).
This generator is used only when no other clock is available.

- Sampling frequency: active
- Sampling up/down: active
- Sampling rate: active

Synchronisation on AES input:

The SX-R4 is automatically locked on the **incoming AES clock of the channels 7-8**

- Sampling frequency: inactive
- Sampling up/down: inactive
- Sampling rate: active

WCK IN

Synchronisation WCK IN

WCK IN must be set in the menu SYNC MODE to use the Word Clock connected on the [SYNC IN]. This mode is not used if a valid AES signal is present.

- Sampling frequency : inactive
- Sampling up/down : inactive
- Sampling rate: active

VIDEO IN

Synchronisation Video IN

VIDEO IN must be set in the menu SYNC MODE to use the Clock of a Video feed
This mode is not used if a valid AES signal is present.

- Sampling frequency : active
- Sampling up/down : inactive
- Sampling rate: active

5.2.3 INPUT SOURCE

SETUP > INPUT SOURCE

This menu is used to choose and select which input source will be applied to the channels 1-2, 3-4 and 5-6
For the channels 1-2 and 3-4, the possible sources are:

- AES
- MIC/LINE

For the channels 5-6, the possible sources are:

- AES
- LINE

5.2.4 TIME CODE

SETUP > TIMECODE SETTINGS > INPUT SOURCE

The SX-R4 can either receive or generate a TimeCode. This menu lets you choose between an external TimeCode source or its own internal TimeCode generator its working mode as desribed below.

- External Jam Sync
- External No Jam
- Internal in this mode the TC. output is disabled
- Internal Output in this mode the TC. output is enabled on the Lemo 5 pin connector

NOTE: while selecting "Internal Output", then the frame rate other than "Autodetect" must be selected in the TimeCode Input Format menu. If "Autodetect" is selected, then a warning will be posted on the screen

SETUP > TIMECODE SETTINGS > INPUT FORMAT

The SX-R4 can automaticaly detect the Timeode format applied at the input of the TC connector. However, in order to be sure to use the correct format, it is possible to specify it. In this case, the detection of a format different from that specified will post an alarm. The formats choices are:

- Autodetect
- 24
- 25
- 29.97 Non Drop
- 29.97 Drop
- 30 Non Drop
- 30 Drop

SETUP > TIMECODE SETTINGS > RUNNING MODE

Two possible choices:

- FREE RUN
- RECORD RUN

In FREE RUN mode, the Time Code is absolute and linear. It runs continuously and never stops.
In RECORD RUN, mode, the Time Code is running only while Recording.

SETUP > TIMECODE SETTINGS > SET MANUAL

This menu allows to set the TimeCode address manually

SETUP > TIMECODE SETTINGS > SET FROM TIME

This menu will set the TimeCode exactly at the time of the internal real time clock of the SX-R4.

5.2.5 MODULOMETERS

SETUP > MODULOMETERS SETTINGS > REFERENCE

This menu allows to set and display a level reference for the modulometers on the TRACK MONITORING :

- NONE
- - 9 dB
- -12 dB
- -18 dB
- -20 dB

SETUP > MODULOMETERS SETTINGS > HOLD TIME

The function "Hold Time" detects the absolute peak level and keeps it posted for:

- NONE
- 3 secondes
- 10 secondes
- 2 minutes
- INFINITE

5.2.6 USER SETTINGS

SETUP > USER SETTINGS

The "User Settings" menu allows to save, load or update a complete configuration to/from an ASCII file

CREATE NEW
Allows you to create a new configuration file based on the current (active) configuration of the SX-R4.

The setting name is formatted as follow:

- 8 characters maximum
- alphanuméric characters, space and underscore only (A..Z, 0..9, _)

RECALL SELECTED
Loads the selected configuration file. **Caution:** this operation will crush the current configuration !

DELETE SELECTED
Delete the selected configuration file.

OVERWRITE SELECTED
Overwrite an existing configuration by the current configuration of the SX-R4.

5.2.7 MISCELANEOUS

SETUP > MISC > DATE

Set the Date of the internal Real Time Clock (format is DD.MM.YYYY)

SETUP > MISC > TIME

Set the Time of the internal Real Time Clock (format HH:MM:SS).

SETUP > MISC > SYSTEM INFO

This menu shows all the hardware and software characteristics of the SX-R4:

DSP software version, version of display's microcontroler (PIC), and CPLD interface.
Battery voltage
Hardware version of the AES receivers.

SETUP > MISC > USER INTERFACE CHECK

This menu allows you to check the Joystick, the toggle switch, the LCD display, the LEDs.

Joystick	Short pressure	Long pressure
LEFT	Joystick test	Return to preceeding menu
RIGHT	Joystick test	
UP and DOWN	Joystick test	
CENTER	Joystick and screen test	

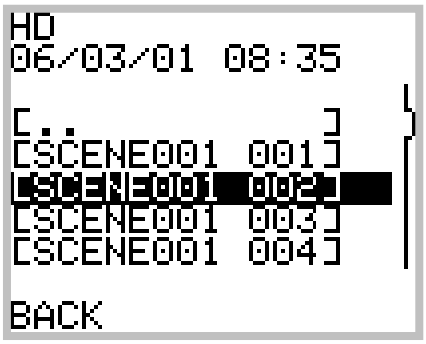
Toggle switch	Short pressure	Long pressure
LEFT	Check the Toggle switch and the Green Led	
RIGHT	Check the Toggle switch and the Red Led	

SETUP > MISC > FACTORY SETTINGS

This menu allows you to re-initialize the SX-R4 in its basic configuration (factory default).
Caution: this operation crushes the currently loaded configuration. It does not modify the audio data on the discs nor the user settings.

5.2.8 BROWSE FILES

The file browser uses a specific menu:

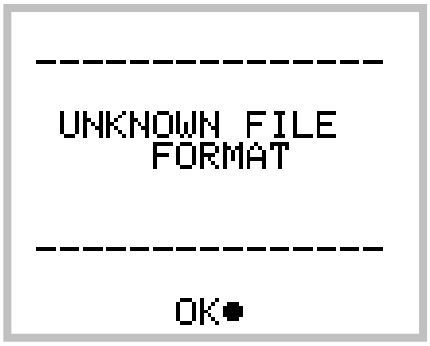


The directory [..] allows you to go back one step in the tree structure.
By pressing to the Right [SELECT] the action is depending of the context:

- Within a Take directory, the selected Take is loaded.
- Within a directory (e.g. a Project), its contents is listed.
- If a firmware release is posted, the update starts after a request for confirmation
- In all other cases, an error message is posted (see below).

Selecting [..] at the root level of a disc (e.g. the root of the HD) allows you to swap to the other disc (e.g. the root of the CF). This is achieved by means of a selection menu.

When a file is not recognized or cannot be interpreted, the following message is posted



6. MANAGING THE SX-R4

6.1.1 HardDisk and CompactFlash card format

By defalut, the HardDisk of the SX-R4 is formatted as a single partition. However it is possible to create 2 distinct partition to separate the audio files form the configuration files, thus alowing to reformat the audio partition without erasing the configuration files.

- [CONFIG] partition, size = aprox 50 to 100Mb, format: FAT32
- [AUDIO] partition, size = all the remaining space, format: FAT32

CompactFlash card: before using a CompactFlash with the SX-R4 it must be formatted FAT32

NOTES:

- while creating a volume, you must select "Primary Partition"
- Quick Format is sufficient, format at low level does not improve the preformances
- MAC OS X, can not format a drive with 2 partitions. In this case all CONFIG and AUDIO Folders and Files are in the same volume. The MS-DOS file system must be choosen.
- Always format your CF card before using it with the SX-R4
- Some CF Cards are much faster than others. Please contact you SONOSAX distributor for more information

6.1.2 How to format FAT32 with MAC OSX:

1. Open the Disk Utility, and select the drive to be formatted
2. Click on "Erase", then choose the MS-DOS File system in the menu "Volume Format"
3. Type a name for this drive, e.g. MINIR82 (max 8 characters)

6.1.3 HD and CF Organisation

The first partition [CONFIG] is structured as follow :

[CONFIG]

- CONFIG.DAT
  Binary file, it contains all information of the current configuration. This file is loaded while powering on the MINIR82; it is overwritten with the current (active) configuration and settings while powering off. This file is not modifiable by the user..
- [SETTINGS]
  Directory containing the (.TXT) files of the saved configurations (saved User Settings), which can be reloaded on the "User Setting" menu. These files can be modified and even created with an ASCII editor such as the Windows Notepad.

The second, [AUDIO] is structured as follow :
(The CF has the same structure except that it doesn't have a Trash)

[AUDIO]

- [PROJECT NAME]
  Project Folder (8 characters)
  - [SCENE_NAME]
    Scene Folder (8 characters)
    - [SCENE_NAME.TAKE_NUMBER]
      The Folder name and the Scene name (8 characters) followed by the TAKE nr (3 characters)
      This folder contains all the BWF (.WAV) files of a Take and the configuration (.INI) file. This is an ASII file that contain the exact configuration of the MINIR82 at the time the Take was recorded. It is used to reconfigure the MINIR82 to Playback this Take. This file shall not altered.

- [TRASH]
  Trash directory
  This folder contains all "deleted" Takes, except those from the CF

Notes :

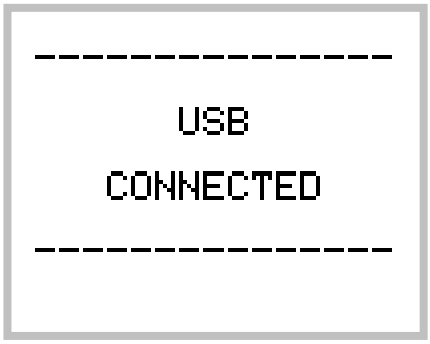
- The BWF and INI files have a unique identifier name. These names always start with an X on the HD and XC on the CF Card. They are incremented by 1 in an hexadécimal form (0 to F)each time a new Take is created.
- This counter is resetted and the naming restart at zero only is the drive is reformatted or if the CONFIG.DAT file is deleted

6.1.4 USB

The SX-R4 is equipped with a USB 2.0 port (USB 1 is not supported)
The SX-R4 allows connection to a computer for file transfer to a computer (PC or Mac) only while in one of the following menus::

- TRACKS MONITORING
- SOLO MONITORING
- Unit Status

The SX-R4 posts the following screen when the USB connection is active:



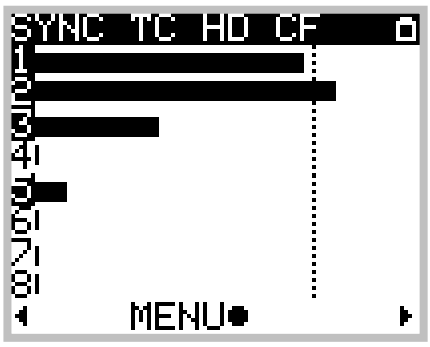
Important notes for MAC OSX users:

When deleting files stored on the Hard disk and/or on the CF, **do not forget to empty the Trash Bin** on your desktop **before** you disconnect the USB port. Otherwise, the disk space of the deleted files is not released and can not be re-alocated. Reconnecting the USB a second time does'nt solve the problem. It is very likely that your SX-R4 will then indicates a free available space "HD FREE" lower than the value given by the computer. In this case it will be necessary to reformat your hard drive.

WARNING: It is highly recommanded to use a Certified "USB 2 High Speed" cable. The data rate transmission is so high that using a non certified cable may lead to unpredictable malfunctions such as : Disk not recognized, SX-R4 nor appearing on your desktop, Windows error code 10 etc etc

6.1.5 Alarms

Certain situations require that the user has to be warned on a particular point. When this occurs, the SX-R4 intermittently flashes a warning concerning the detected problem and a beep tone is heard in the headphone. The beep tone will disappear as son as any key is depressed. However the warning keep flashing in the display
One distinguishes 5 kinds of alarms, whose causes are explained below:



The Alarm AES occurs when one of the following conditions is checked:

- One or more Tracks is assigned from an AES input, but no valid AES signal is present.
- Input channels 7 & 8 are not assigned (AES 7 & 8 => SYNC)
- The incoming sample frequency on the AES signal is out of tolerance (+/- 0,2%)

The Alarm SYNC occurs when one of the following conditions is checked:

- the SX-R4 is set to WCK IN but no valid Word Clock signal is present
- the SX-R4 is set to VIDEO IN but no valid Video signal is present

The Alarm TC occurs when one of the following conditions is checked:

- The TimeCode is set to Internal Output but the format is set to Autodetect
- The TimeCode is set on External No Jam, but no TC signal is present
- The TimeCode is set on External No Jam, a TC signal is present but the format selected in the SX-R4 does not match with the detected format.

The Alarm HD or CF occurs when one of the following conditions is checked:

- The remaining Free space on a disk is less than 100Mb.
- The disk is too fragmented

The Alarm POWER occurs when one of the following conditions is checked:

- The power voltage is soon too low to maintain the SX-R4 running.

6.1.6 Errors treatment

This section addresses the possible errors and problems that may occur while using the SX-R4.

Power issue
When the supply voltage becomes too weak, the SX-R4 proceeds to a safe shut down. If a recording is in progress, it is stopped properly.

Note: please remember not to use dry cell batteries but only NiMh or NiCd rechargeable batteries

Insufficient disc space
If the remaining free space in a disc is not sufficient, the recording in progress is stopped. When two discs are used (HD + CF), the recording is stopped if one of the two discs does not have enough free space.

Maximum file size
The FAT32 file system limits the size of the files to 4 GB. If the recording in progress reaches this limit, the SX-R4 adds an index (create a new TAKE) and continues to record in the new file.
(no data will be lost !!).

Disc too fragmented
During the power-up, the SX-R4 checks the fragmentation of the discs. In case of severe fragmentation the recording is not allowed, an error message informs the user of the problem.
It is then advisable to re-format the disc (while having saved the existing data before!).

Real Time Clock (RTC)
During the power-up, the SX-R4 checks if the Date and the Time of the system are coherent. If it is not the case, a menu forces the user to define them. While setting the date, an error message can occur if the date format is not valid.

Note: the SX-R4 does not have an internal back-up battery to keep the RTC running uninterrupted when NiMh batteries are removed or external DC supply is not present. However it will maintain Date and Time for a period of at least 1h. It is therefore advised to leave well-charged batteries in their compartment.

6.1.7 Software up-date procedure

The file name of the new software is : Vxxxxx.BIN

1. Connect your SX-R4 to the USB2 port of your computer (Mac or PC).
2. ***For PC Compatible:*** using the Windows Explorer, copy the Firmware file to root of your SX-R4's hard disk.

   For MacOS: your SX-R4 hard disk will be posted on your desktop within a couple of seconds. If not, you must mount them by using the MacOS Disk Utility: select the volume (s) in the list, then choose « File => Mount ». Then copy the Firmware file to the root of your SX-R4's hard disk
3. The Software file can also be installed using the CompactFlash Card instead of the Harddisk.
4. Disconnect the USB2 cable and power off the SX-R4 as indicated on its display.
5. Power On the SX-R4, go into the «MENU» then choose «Browse Files». The file name of the new Software appears on the screen at the bottom of the root of the harddrive. If not, scroll down using the cursor by pressing «DOWN" the Joystick ». If you have copied it on the CompactFlash Card, go into the CF trough « [..] », then choose « COMPACT FLASH ».
6. Select the Software file (ex. V22954.BIN), and press on « SELECT ». The screen will indicate the current « Running Version : (ex. 2.1.634) » and the new version to be installed « File Version : (V2.2.954) ». To proceed with the Up-Date, simply press on OK to confirm, or « CANCEL » to abort.
7. Once the up-date procedure has started, a progression bar appears on the screen. Wait untill the end is confirmed and then press « OK »

IMPORTANT NOTES :

- The « SETTINGS » folder containing all your « USER SETTINGS » can be saved before reformatting your hard disk and then copied back onto the "CONFIG partition.
- When receiving your SX-R4 from the factory, the hard disk is formatted with a single partition of aprox 29GB. PC users can splitt the harddisk into 2 partitions to separate the CONFIG files and the AUDIO files. Thus a CONFIG partition of aprox 50MB and a second partition with all the remaining available space can be created.
  For MAC users running either MacOSX or Windows for MAC, the hard disk of the SX-R4 can only be formatted with a single partition because the MacOS "Disk Utility" does not handle multiple MS-DOS (FAT32) partitions.
- The CONFIG partition, should contain nothing else but the CONFIG.DAT file generated by SX-R4 and the « SETTINGS » folder.
- The audio WAV files as well as the «PROJECT» and «SCENE» folders can not be copied back onto the SX-R4 as it can no longer manage them as previously.
- Please carefully note that when the CONFIG partition has been reformated or when the CONFIG.DAT file is erased, then the WAV file numbering will be re-initialised such as X00000_x.WAV or X00000xx.WAV

6.1.8 Recommandations

Due to the architecture of the SX-R4 and its operating software we suggest following recommendations:

Copy of Takes
It is strongly advised to copy (transfer) the Takes carried out by the SX-R4 to the hard disc of a computer. The opposite is however not possible: the SX-R4will not be able to read an audio file copied to its disc from a computer.

Defragmentation
Never attempt to defragment the discs used by the SX-R4. For performance reasons, Recording the Takes is carried out by interlacing the various files, which make it up. These files must remain interlaced so that the playback of the Takes remains possible. In the event of too severe fragmentation of a disc, it should be re-formatted (the fast formatting is enough).

Deleting files
Deleting a file is possible, but it must always be carried out by Take (suppression of the Take directory only). The suppression of a project is completely possible too.

Formatting
The SX-R4 works only with the FAT32 file system. The setting of the clusters size can be left in the default value.

7. APPENDIX

Example of a USER SETTING file

"USER0000.TXT", located in the "SETTINGS" folder, it can be edited with a simplet test editor.

```
# Sonosax SX-R4
# ---------------------------------

# Format: max 8 alphanum chars
Project name = TESTMIC

# Format: max 8 alphanum chars
Scene name = GAIN0DB

# Values: +15 dBu, +6 dBu, 0 dBu, -10 dBu
Line in level = +15 dBu

# Values: 1 sec, 2 sec, 5 sec, 10 sec, 20 sec
Pre-Record Time = 1 sec

# Values: 0 sec, 1 sec, 2 sec, 3 sec, 5 sec
Pre-Index Delay = 0 sec

# Values: 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
Sampling Frequency = 176.4 kHz

# Values: 24, 16D, 16
Sampling Rate [bits] = 24

# Values: Nominal, Up 1 o/oo, Down 1 o/oo
Sampling Up/Down = Nominal

# Values: Mono, Stereo
File format = Mono

# Values: OFF, External WCK, Video In
Synchro mode = OFF

# Values: AES, MIC
Input source 1-2 = MIC

# Values: AES, MIC
Input source 3-4 = MIC

# Values: AES, LINE
Input source 5-6 = LINE

# Line out configuration
# Values: DISABLED, MONO, STEREO, MS, REVERSE STEREO, MONO L, MONO R
Monitor HD Tracks 1-2 = STEREO
Monitor HD Tracks 3-4 = DISABLED
Monitor HD Tracks 5-6 = DISABLED
Monitor HD Tracks 7-8 = DISABLED
Monitor CF Tracks 1-2 = DISABLED

# Routing configuration
# Values: CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8
# To use multiple values, use ','
Routing HD Track 1 =  CH1
Routing HD Track 2 =  CH2
Routing HD Track 3 =
Routing HD Track 4 =
Routing HD Track 5 =
Routing HD Track 6 =
Routing HD Track 7 =
Routing HD Track 8 =
Routing CF Track 1 =  CH1
Routing CF Track 2 =  CH2

# Values: NONE, ATT1.5, ATT3, ATT6
Mixing level = NONE

# Monitor configuration
# Values: DISABLED, MONO, STEREO, MS, REVERSE STEREO, MONO L, MONO R
Monitor HD Tracks 1-2 = STEREO
Monitor HD Tracks 3-4 = DISABLED
Monitor HD Tracks 5-6 = DISABLED
Monitor HD Tracks 7-8 = DISABLED
Monitor CF Tracks 1-2 = DISABLED

# Values: +18..-30 [dB]
Headphones Level = 0

# Values: NONE, -9 dB, -12 dB, -18 dB, -20 dB
Modulometers Reference = -9 dB

# Values: NONE, 3 sec, 10 sec, 2 min, Infinite
Modulometers Hold Time = NONE

# Values: Ext Jam Sync, Ext No Jam, Internal, Internal Output
Timecode Input Source = Ext Jam Sync

# Values: Autodetect, 24, 25, 29.97 Non Drop, 29.97 Drop, 30 Non Drop, 30 Drop
Timecode Input Format = Autodetect

# Values: Free Run, Record Run
Timecode Running Mode = Free Run
```

X000001.INI (example of file)

Located in each "TAKE" folder, it gives the configuration at the time the take was recorded.

```
# Sonosax SX-R4       Configuration file
# ---------------------------------------------

# Format: max 8 alphanum chars
Project name = TESTMIC

# Format: max 8 alphanum chars
Scene name = GAIN0DB

# Values: +15 dBu, +6 dBu, 0 dBu, -10 dBu
Line in level = +15 dBu

# Values: 1 sec, 2 sec, 5 sec, 10 sec, 20 sec
Pre-Record Time = 1 sec

# Values: 0 sec, 1 sec, 2 sec, 3 sec, 5 sec
Pre-Index Delay = 0 sec

# Values: 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
Sampling Frequency = 176.4 kHz

# Values: 24, 16D, 16
Sampling Rate [bits] = 24

# Values: Nominal, Up 1 o/oo, Down 1 o/oo
Sampling Up/Down = Nominal

# Values: Mono, Stereo
File format = Mono

# Values: OFF, External WCK, Video In
Synchro mode = OFF

# Values: AES, MIC
Input source 1-2 = MIC

# Values: AES, MIC
Input source 3-4 = MIC

# Values: AES, LINE
Input source 5-6 = LINE

# Line out configuration
# Values: DISABLED, MONO, STEREO, MS, REVERSE STEREO, MONO L, MONO R
Monitor HD Tracks 1-2 = STEREO
Monitor HD Tracks 3-4 = DISABLED
Monitor HD Tracks 5-6 = DISABLED
Monitor HD Tracks 7-8 = DISABLED
Monitor CF Tracks 1-2 = DISABLED

# Routing configuration
# Values: CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8
# To use multiple values, use ','
Routing HD Track 1 =  CH1
Routing HD Track 2 =  CH2
Routing HD Track 3 =
Routing HD Track 4 =
Routing HD Track 5 =
Routing HD Track 6 =
Routing HD Track 7 =
Routing HD Track 8 =
Routing CF Track 1 =  CH1
Routing CF Track 2 =  CH2

# Values: NONE, ATT1.5, ATT3, ATT6
Mixing level = NONE

# Monitor configuration
# Values: DISABLED, MONO, STEREO, MS, REVERSE STEREO, MONO L, MONO R
Monitor HD Tracks 1-2 = STEREO
Monitor HD Tracks 3-4 = DISABLED
Monitor HD Tracks 5-6 = DISABLED
Monitor HD Tracks 7-8 = DISABLED
Monitor CF Tracks 1-2 = DISABLED

# Values: +18..-30 [dB]
Headphones Level = 0

# Values: NONE, -9 dB, -12 dB, -18 dB, -20 dB
Modulometers Reference = -9 dB

# Values: NONE, 3 sec, 10 sec, 2 min, Infinite
Modulometers Hold Time = NONE

# Values: Ext Jam Sync, Ext No Jam, Internal, Internal Output
Timecode Input Source = Ext Jam Sync

# Values: Autodetect, 24, 25, 29.97 Non Drop, 29.97 Drop, 30 Non Drop, 30 Drop
Timecode Input Format = Autodetect

# Values: Free Run, Record Run
Timecode Running Mode = Free Run
```

partition organization on the HD and the CF Card

SX-R4, MINIR82 and STREC82

The only accepted characters for the PROJET, SCENE and SETTINGS names are: 0->9, A->Z and " _ " underscore.
Characters in Lower case are automatically converted to Upper-case. A Space character is automatically converted to an Underscore.

HD drive with a single partition**:** (FAT32)

```
E:\                                                [HDD NAME]                    name of the disk (choice of name is free)

    CONFIG.DAT                                     [CONFIG.DAT]                  machine configuration file (binary)

    SETTINGS\                                      [SETTINGS FOLDER]                     directory for the User Settings files

                NEW1.TXT                           [SETTING FILES NAME]          User Settings files (can be modified with a text editor)
                NEW2.TXT

    MINIR82\                                       [PROJET FOLDER NAME]          Directory for a Project (8 characters)

                SCENE001\                          [SCENE FOLDER NAME]           Directory for the Scenes (8 characters)

                        SCENE001.001\              [SCENE NAME.TAKE NUMBER]      Directory for the Takes files (3 digits, automatic incrementation)

                                        X00002_1.WAV   [BWF FILES]      X             = SONOSAX
                                        X00002_2.WAV                     00002       = unique indentifier (hexadecimal)
                                        X00002_x.WAV                           _1    = MONO channel 1
                                        X00002_8.WAV
                                        X00002.INI     [RECORD SETTING FILE]        configuration of the unit at the time the take was recorded ( do not alter )

                        SCENE001.002\   X00003_x.WAV
                                        X00003.INI


                        SCENE001.003\
                                        X0000412.WAV   [BWF FILES]      X             = SONOSAX
                                        X0000434.WAV                     00002       = unique indentifier (hexadecimal)
                                        X0000456.WAV                          12     = STEREO channels 1 and 2
                                        X0000478.WAV
                                        X00004.INI

                        SCENE001.004\   X00005xx.WAV
                                        X00005.INI

    TRASH\                                         [TAKE DELETED FOLDER]         Directory of deleted Takes (Trash bin)

                X00002_1.WAV                       [TAKE DELETED FILES]          BWF and INI files of the deleted Takes
                X00002_x.WAV
                X00002_8.WAV
                X00002.INI
```

HD drive with 2 partitions**:** (2x FAT32 for PC only, MAC OSX can not manage not create 2x FAT32 partitions)

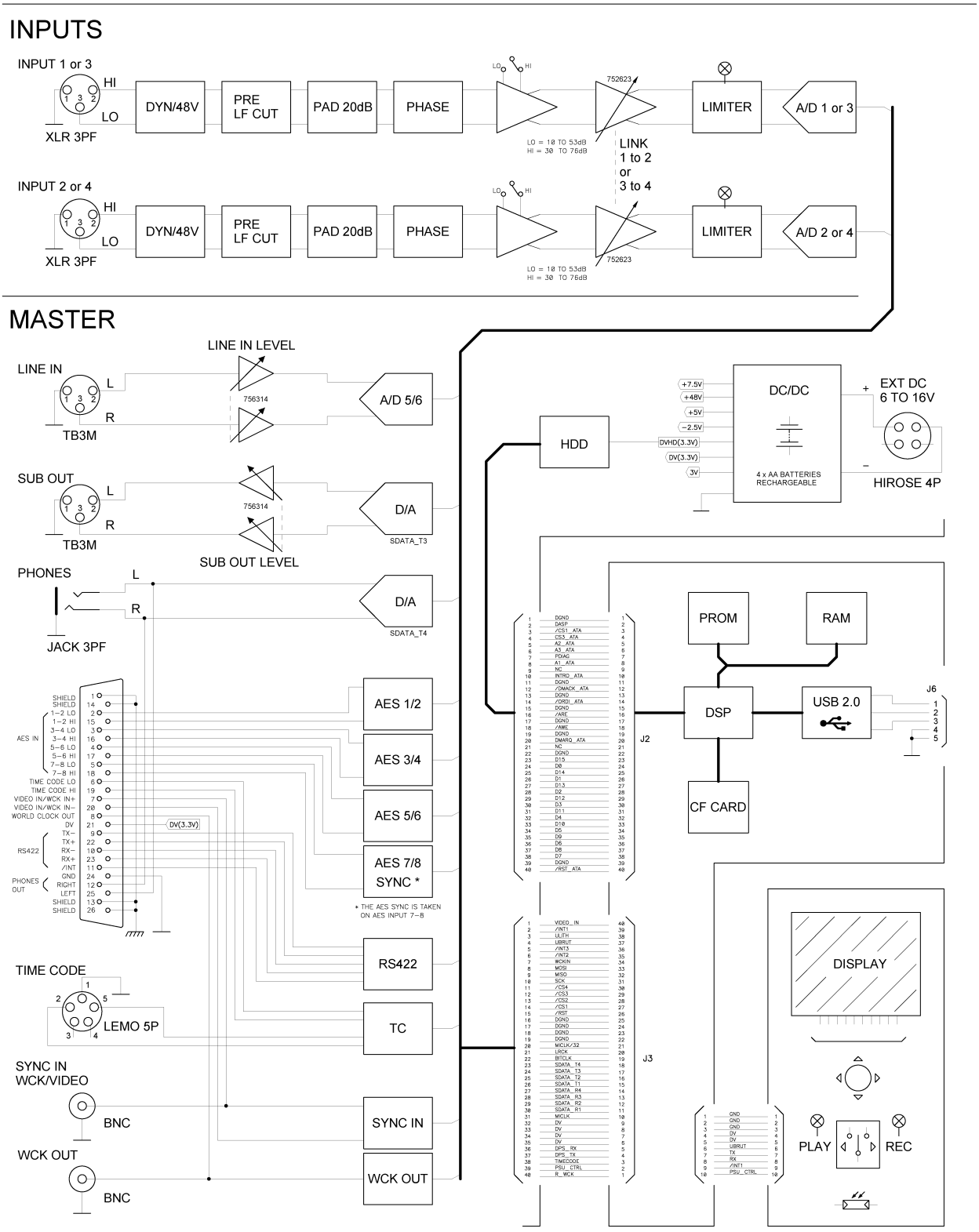
```
E:\                                                 [HDD NAME] (CONFIG)             volume name, CONFIG by default, partition between 50 to 100MB

    CONFIG.DAT                                      [CONFIG.DAT]                    machine configuration file (binary)

    SETTINGS\                                       [SETTINGS FOLDER]                       directory for the User Settings files

             NEW1.TXT                               [SETTING FILE NAME]             User Settings files (can be modified with a text editor)
             NEW2.TXT
---

F:\                                                 [HDD NAME] (AUDIO)              volume name, AUDIO by default

    SX-R4\                                          [PROJET NAME]                   Directory for a Project (8 characters)

                SCENE001\                           [SCENE NAME]                    Directory for the Scenes (8 characters)

                        SCENE001.001\               [SCENE NAME.TAKE NUMBER]        Directory for the Takes files (3 digits, automatic incrementation)

                                        X00002_1.WAV    [BWF FILES]     X           = SONOSAX
                                        X00002_2.WAV                     00002      = unique indentifier (hexadecimal)
                                        X00002_x.WAV                           _1   = MONO channel 1
                                        X00002_8.WAV
                                        X00002.INI      [RECORD SETTING FILE]       configuration of the unit at the time the take was recorded ( do not alter )

                        SCENE001.002\   X00003_x.WAV
                                        X00003.INI


                        SCENE001.003\
                                        X0000412.WAV    [BWF FILES]     X           = SONOSAX
                                        X0000434.WAV                     00002      = unique indentifier (hexadecimal)
                                        X0000456.WAV                           12   = STEREO channels 1 and 2
                                        X0000478.WAV
                                        X00004.INI

                        SCENE001.004\   X00005xx.WAV
                                        X00005.INI

    TRASH\                                          [TAKE DELETED FOLDER]           Directory of deleted Takes (Trash bin)

            X00002_1.WAV                            [TAKE DELETED FILES]            BWF and INI files of the deleted Takes
            X00002_2.WAV
            X00002_x.WAV
            X00002_8.WAV
            X00002.INI
```

On the CompactFlash CF: (FAT32) (no Trash Bin, \TRASH)

```
G:\                                                [HDD NAME]                    name of the disk (choice of name is free)

   MINIR82\                                        [PROJET FOLDER NAME]          Directory for a Project (8 characters)

            SCENE001\                              [SCENE FOLDER NAME]           Directory for the Scenes (8 characters)

                        SCENE001.001\              [SCENE NAME.TAKE NUMBER]      Directory for the Takes files (3 digits, automatic incrementation)

                                     XC0002_1.WAV  [BWF FILES]      XC           = SONOSAX on CF card
                                     XC0002_2.WAV                    0002        = unique indentifier (hexadecimal)
                                     XC0002_x.WAV                         _1     = MONO channel 1
                                     XC0002_8.WAV
                                     XC0002.INI    [RECORD SETTING FILE]         configuration of the unit at the time the take was recorded ( do not alter )

                        SCENE001.002\ XC0003_x.WAV
                                      XC0003.INI


                        SCENE001.003\
                                     XC000412.WAV  [BWF FILES]      XC           = SONOSAX sur CF carte flash
                                     XC000434.WAV                    0002        = unique indentifier (hexadecimal)
                                     XC000456.WAV                         12     = STEREO channels 1 and 2
                                     XC000478.WAV
                                     XC0004.INI

                        SCENE001.004\ XC0005xx.WAV
                                      XC0005.INI
```

8. BLOCK DIAGRAM

SONOSAX SX-R4 BLOCK DIAGRAM



Improvement may cause change of features and specifications without notice

2504

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9. SPECIFICATIONS

All specifications mentioned hereafter apply to standard models only. SONOSAX SAS SA reserves the right to modify these characteristics at any time without prior notice.

For measures and/or settings the reference is: 0dBu = 0.775V (i.e. +6dBu = 1.55V).

9.1 SUMMARY OF CHARACTERISTICS

Audio connections

Mic/Line input

Mode:	electronically balanced, transformer-less,<with RF Filter
Impedance:	2.2kΩ
Connector:	XLR3 female
Max input level:	+26dBu (with PAD and Limiter, compression 6dB)
Limiter:	Threshold at -2dBFS
Range of GAIN Potentiometer:	40dB
Noise:	< -128dBu (150Ω, at max gain)
Dynamic:	114dB
THD:	< 0.01% (-10dBFS, 1kHz)
Bandwidth, gain 40dB:	10Hz (–1dB) to 72kHz (-3dB)
PAD attenuator:	20dB
LF Cut filter:	135Hz, 6 dB/oct

Input Level for 0dBFS	GAIN Trim potentiometer	GAIN Switch	PAD
+20dBu	minimum	LO	ON
-20dBu	maximum	LO	ON
0dBu	minimum	LO	OFF
-40dBu	maximum	LO	OFF
-20dBu	minimum	HI	OFF
-60dBu	maximum	HI	OFF

Stereo Line input

Mode:	unbalanced stereo / two-channel
Impedance:	< 6kΩ
Connector:	mini XLR3 male
Max input level:	+25dBu
Potentiometer range:	35dB
Dynamic:	114dB
THD:	< 0.01% (-10dBFS, 1kHz)
Bandwidth:	10Hz (–1dB) à 72kHz (-3dB)
Input Level for 0dBFS:	-10dBu to +25dBu

Sub-Out

Mode:	unbalanced stereo / two-channel
Output inpedance:	< 50Ω
Load impedance:	minimum 50 Ω
Connector:	mini XLR3 mâle
Max output level:	+12dBu
Potentiometer range:	35dB
Dynamic:	106dB
THD:	< 0.01% (-10dBFS, 1kHz)
Bandwidth:	10Hz (–1dB) à 72kHz (-3dB)
Output Level for –18dBFS:	-29dBu to +6dBu

AES input

Mode:	4 channel AES/EBU , transformer-less (AES3)
Connector:	Accessory 3M 26 pin
Impedance:	110Ω

Synchronisation connections

Sync in

Word Clock:

Mode:	square wave
Input format:	44.1, 48, 88.2, 96, 176.4 et 192kHz ± 0.2%
Impedance:	75Ω
Connectors:	SMA and Accessory 3M 26 pin
Levels:	0.3 – 7Vpp

Vidéo:

Mode:	Tri-level & bi-level sync-compatible
Input format:	PAL/25, NTSC/29.97, 1080/23.97, 1080/24, 1080/25, 1080/29.97, 1080/30, 720p/24, 720p/25, 720p/29.97, 720p/30, 720p/50, 720p/59.94, 720p/60, 295M-P/25

Word Clock output

Mode:	square wave
Impedance:	75Ω
Connectors:	SMA and Accessory 3M 26 pin
Levels:	3Vpp

TimeCode connection

TC Input

Mode:	SMPTE unbalanced, JAM sync, no JAM and Internal
Format:	Auto, 24, 25 et 29.97, 30 drop and non-drop
Impedance:	2kΩ
Connectors:	LEMO 5 pin Aaton and Accessory 3M 26 pin
Levels:	0.3 – 7Vpp

TC Output

Mode:	SMPTE unbalanced
Format:	24, 25 et 29.97, 30 drop and non-drop
Impedance:	100Ω
Connectors:	LEMO 5 pin Aaton and Accessory 3M 26 pin
Level:	3Vpp

TC

Mode:	Free run, Record run and Set from time
Remark:	The clock time is maintained without batteries nor external PSU for a period of at least 1 hour. Its accuracy is ±1ppm at 25°C, and ± 2ppm from 0°C to 40°c

Power supply connection

Voltage:	6 to 18V DC
Current:	≈ 330mA sous 12 Volts
Consumption:	average ≈ 4W peak ≈ 6W max ≈ 10W during power-up
Connector:	Hirose HR10-7P-4P

USB connection

Mode:	USB 2.0 HI-SPEED (slave mode only)
Connector:	USB mini B

Storage media

Internal Hard disk:	30G, ATA interface, 4200 rpm, FAT32
CompactFlash:	CF type I and Type II, FAT32

System

Sample frequencies:	44.1, 48, 88.2, 96, 176.4 and 192kHz
NTSC frequency swift:	Pull UP & Pull DOWN 0.1%
Internal clock accuracy:	< 0.2 ppm at 20°C and ± 1.5ppm from –20°C to +70°C
ADC and DAC resolution:	16bits, 16bits dithering and 24bits
DSP resolution:	40bits

Group delay

FS=>	44.1kHz	48kHz	88.2kHz	96kHz	176.4kHz	192kHz
Analog Input / Phones	3.65mS	3.35mS	1.796mS	1.648mS	820uS	750uS
Analog Input / Sub-Out	3.612mS	3.319mS	1.772mS	1.628mS	863.38uS	793.23uS

Weight and Sizes

Dimensions:	180 x 140 x 50 mm / 7,09" x 5,5" x 1,96"
Weight:	0.8 kg / 1,75 lbs (without batteries)

Recording time

HDD 30G		FS											
		44.1kHz		48kHz		88,2kHz		96kHz		176.4kHz		192kHz	
		16bits	24bits	16bits	24bits	16bits	24bits	16bits	24bits	16bits	24bits	16bits	24bits
TRACKS	1	94h28	62h59	86h48	57h52	47h14	31h29	43h24	28h56	23h13	15h45	21h42	14h28
	2	47h14	31h29	43h24	28h56	23h37	15h45	21h42	14h28	11h48	7h52	10h51	7h13
	3	31h29	21h00	28h56	19h17	15h45	10h30	14h28	9h39	7h52	5h13	7h13	4h49
	4	23h37	15h45	21h42	14h28	11h48	7h52	10h51	7h13	5h54	3h56	5h25	3h37
	5	18h54	12h36	17h21	11h34	9h27	6h18	8h40	5h47	4h43	3h09	4h20	2h53
	6	15h45	10h30	14h28	9h39	7h52	5h15	7h13	4h49	3h56	2h37	3h37	2h24
	7	13h30	9h00	12h24	8h16	6h45	4h30	6h12	4h07	3h22	2h15	3h06	2h04
	8	11h48	7h52	10h51	7h13	5h54	3h56	5h25	3h37	2h57	1h58	2h42	1h48