

**PROFESSIONAL PORTABLE
MULTITRACK RECORDER**

**SONOSAX
SX-R4+**

USER MANUAL

HARDWARE DESCRIPTION
Preliminary

Audio equipment manufacturer

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Version: june 2015

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1. INTRODUCTION

Congratulations for purchasing your SONOSAX SX-R4+ professional portable audio recorder. Based on a high technology design, it has been manufactured to deliver many years of outstanding performances.

As with all SONOSAX products, the SX-R4+ recorder is built without any compromise in quality, using only the best components available and passes severe quality controls.

The informations 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.

IMPORTANT NOTE

This User manual covers all topics related to the Hardware of the SONOSAX SX-R4+; please refer to the separated SX-R4+ "User Interface" manual for the operating instructions related to the latest firmware revision.

2. MAIN FEATURES

Inputs / Outputs

- 4x XLR-3F inputs, individually configurable as:
 - ANALOG: Mic/line levels, electronically balanced, with phase reversal, 48V phantom, LF cut and level control on the front panel
 - DIGITAL: transformer balanced AES3 or AES42 with individual ASRC, phase reversal, LF cut and level control on the front panel
- 2x Line inputs, electronically balanced on TA-3 with level control on the front panel
- 1x Line output on TA-3, 2 channels analogue unbalanced
- 4x AES3 balanced inputs with individual ASRC on multi-pin connector
- 1x AES3 I/O with ASRC on TA-3, balanced output switchable as AES3 input by menu
- Up to 12x Mic inputs when connected to the SONOSAX SX-AD8+
- Optional audio over IP on RJ45 connector, such as AVB, Dante & Ravenna
- Optional balanced analogue output

Performances

- 132dB overall dynamic range from analogue input to recorded file
- 90kHz overall frequency response @192kHz recording
- 40 bits processing

Recording capabilities

- up to 16 tracks recording on 2x SD cards (SDHC, SDXC)
- uncompressed BWF with iXML metadata
- 44,1 up to 192kHz @ 24bits, Pull up/down 0.1% for NTSC world

User Interface

- Touch screen 2.4" TFT color display
- WiFi dynamic web interface

Powering

- Removable 14.4V 45Wh to 90Wh Lithium battery, SMBUS capable
- External DC 9 to 18V on Hirose 4 pin, SMBUS capable, electrically isolated
- 12V regulated decoupled DC output to power peripherals equipments up to 7 Watts
- Intelligent energy management with detailed on-screen information

TimeCode

- Accuracy: 0.5 PPM
- Independent in/out on 5 pin Lemo connector
- 23.976, 24, 25, 29.97DF, 29.97ND, 30DF, 30ND

Mechanical

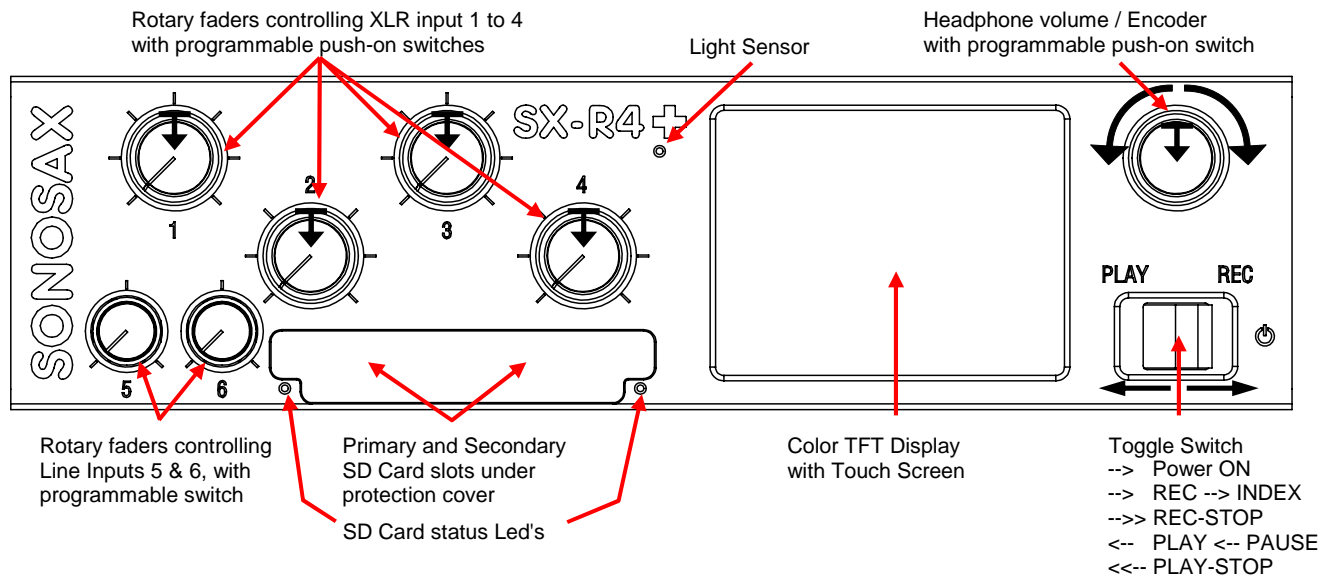
- Machined aluminium housing, hard anodized
- Overall dimension: 200 x 50 x 144.5mm (7.87" x 1.96" x 5.7")
- Weight: 0,89kg / 1,96lbs without battery -- 1.2kg / 2.64lbs with 45Wh battery fitted

2.1 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 personal as your nearest SONOSAX authorized reseller.
- ◆ Do not defeat the grounding or polarization of the SX-R4+ Recorder mixer or its power supply.
- ◆ 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.

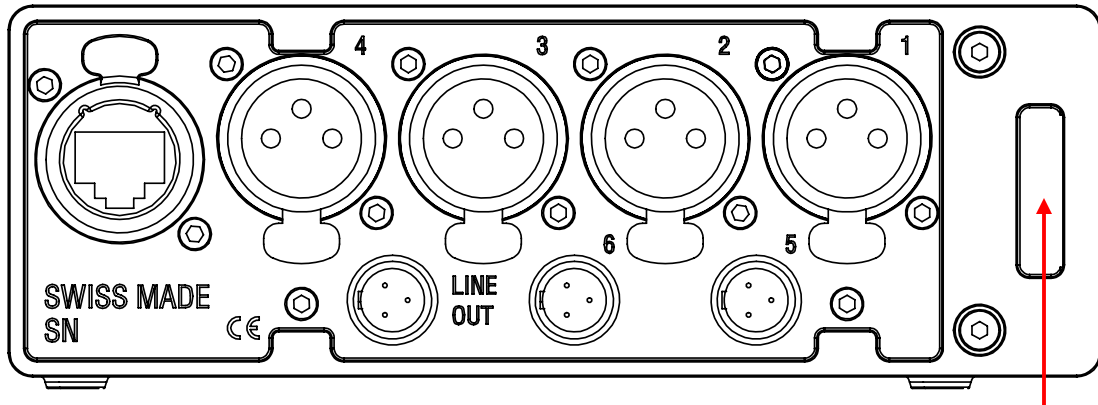
3. HARDWARE DESCRIPTIONS

3.1 FRONT PANEL



FEATURES	FUNCTIONS / DESCRIPTION
Faders 1 to 4	Volume control of XLR's inputs 1 to 4 (controlling the DSP) <ul style="list-style-type: none"> Primarily assigned to XLR inputs 1 to 4, either set as analogue or digital input Fader range adjustable by menu
Push-On switch 1 - 4	Switches with two programmable functions selected by a short press or a long press <ul style="list-style-type: none"> Read the User interface manual for further information
Faders 5 & 6	Retractable potentiometer with a function switch <ul style="list-style-type: none"> Analogue volume control dedicated to Line inputs 5 & 6 on TA-3 Read the User interface manual for further
Headphone Encoder	Multifunction encoder with push-on switch, <ul style="list-style-type: none"> Primarily controls the headphones volume Scroll specific functions or values according to displayed contextual menu
Push-On switch	Switches with two programmable functions selected by a short press or a long press <ul style="list-style-type: none"> Read the User interface manual for further information
Toggle Switch	Primarily dedicated for Record and Playback functions
SD Card slots	Accepts SD/SDHC/SDXC cards, High speed class 10 cards are recommended. Press to insert with notched corner oriented toward the right. Press to eject. Push protection cover firmly in place to avoid dust and water ingress
SD Card status Led	The Led's indicate the status of the SD Cards <ul style="list-style-type: none"> Read the User interface manual for further information
Color Touch Screen	Touch the screen to call and navigate sub-menus

3.2 LEFT SIDE PANEL



Cut-Out for shoulder strap

FEATURES	FUNCTIONS / DESCRIPTION
XLR inputs 1 to 4	Configured in the [INPUTS] menu as: <ul style="list-style-type: none"> • Analogue: electronically balanced Mic/Line input • AES42: transformer balanced digital Mic input with 10V Phantom (mode 1) • AES3: transformer balanced digital input Pin 1 = Ground / Pin 2 = High (+) / Pin 3 = Low (-)
Line inputs 5 & 6 – TA-3	Configured in the [INPUTS] menu <ul style="list-style-type: none"> • Two independent line inputs, electronically balanced Pin 1 = Ground / Pin 2 = High (+) / Pin 3 = Low (-)
Line outputs – TA-3	Configured in the [OUTPUTS] menu: <ul style="list-style-type: none"> • Stereo or 2 channels unbalanced analogue line outputs Pin 1 = Ground / Pin 2 = Left / Pin 3 = Right
Optional connector	Either RJ45 for Audio over IP In/Out such as AVB, Ravenna interface or optional analogue balanced output

3.2.1 XLR inputs [IN1 to IN4]

The four XLR connectors can be independently configured as analogue Mic/Line input, AES42 input for digital microphone or as AES3 digital line input. The input mode and settings such as 48V Phantom, Primary Gain, LF Cut, Phase Reversal, Delays, Track Assignments etc are configurable in the [INPUTS] menu.

The four rotary faders 1 to 4 on the front panel primarily control the volume of these four XLR inputs; the level range of the faders is individually definable in the [INPUTS SETUP] menu.

3.2.2 Line inputs [IN5 - IN6]

Line inputs 5 & 6 are electronically balanced. All settings and parameters such as LF Cut, Phase Reversal, Delays, Track Assignments etc are configurable in the [INPUTS] menu.

The two rotary faders 5 & 6 on the front panel are dedicated to these two inputs and can not be assigned to other tracks.

3.2.3 Subsidiary Stereo / 2 channels output [LINE OUT]

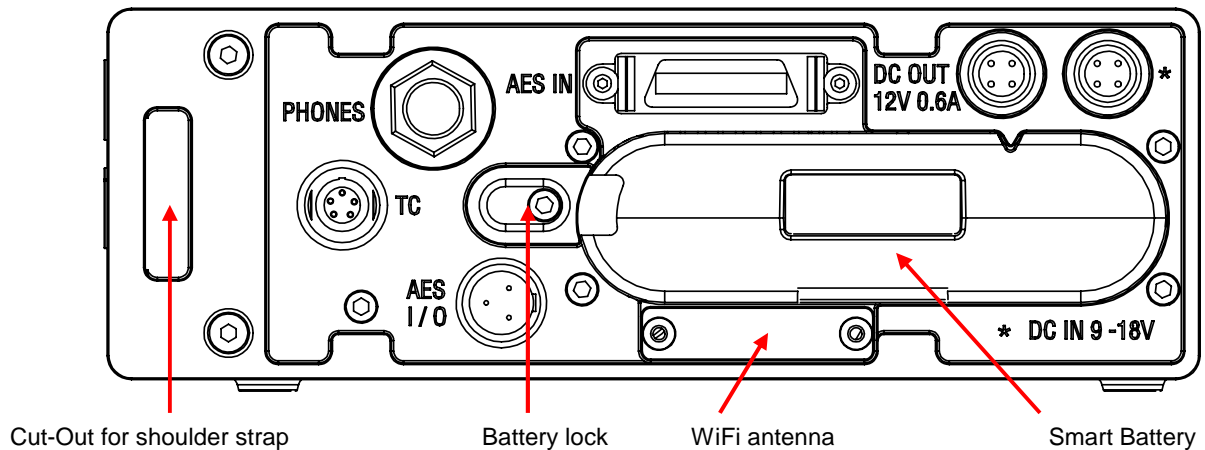
The [LINE OUT] TA-3 connector outputs two unbalanced analogue channels. Through the [OUTPUTS] menu any combination of tracks can be routed to output either a stereo mix or two independent mono mixes to feed cameras, external recorders, wireless systems or any other destination whenever a sub-mix is required. It can also be used to feed an alternate monitoring system.

3.2.4 Optional Connector

The Optional Connector is an optional output either analogue or digital such as:

- Audio over Ethernet RJ45. Internal interface to stream multiple audio channels using protocols such as AVB, Ravenna or else (no yet developed). These interfaces are proprietary boards manufactured by SONOSAX.
- Analogue balanced XLR-5M.

RIGHT SIDE PANEL



FEATURES	FUNCTIONS / DESCRIPTION
PHONES	1/4" stereo jack headphones output <ul style="list-style-type: none"> The output selection is configured in the [HEADPHONES] menu Minimum headphone impedance: 30 Ohms Tip = Left / Ring = Right / Sleeve = Ground
AES IN	26 pin 3M connector providing 4x AES3 inputs, 2x RS422 Tx/Rx bus, Monitor output and Word Clock Out <ul style="list-style-type: none"> Each AES3 input has its own ASRC (Asynchronous Sample Rate Converter) RS422 Tx/Rx are used to control external units such as SONOSAX SX-AD8+ and the mixing control surface Wiring: see diagram below
DC OUT - Hirose 4	DC Voltage Output to supply external equipments, configured in [POWER] menu to supply either: <ul style="list-style-type: none"> An internally regulated 12V, max 0,6A → 7,2 Watts, if the SX-R4+ is power from its battery Or a DC Voltage derived from the DC Input connector when the SX-R4+ is powered from an external DC source Pin 1 = Neg. (-) / Pin 2 = n.c / Pin 3 = n.c. / Pin 4 = Pos (+)
DC IN - Hirose 4	External power supply, accept any regulated source from 9 to 18V DC SMBus Capable Pin 1 = Neg. (-) / Pin 2 = SMBus Data / Pin 3 = SMBus Clock / Pin 4 = Pos (+)
TC - Lemo 5	Unbalanced TimeCode Input/Output Pin 1 = Ground / Pin 2 = TC Out / Pin 3 = n.c. / Pin 4 = n.c. / Pin 5 = TC Out
AES I/O - TA-3	AES3 Digital transformer balanced, switchable as input or output <ul style="list-style-type: none"> The selection is configured in the [INPUTS] and [OUTPUTS] menu Pin 1 = Ground / Pin 2 = High (+) / Pin 3 = Low (-)
Battery enclosure	Enclosure for Smart Battery of the 2050 series, see powering section
WiFi Antenna	WiFi access point to manage the SX-R4+ with a smartphone or tablet

3.2.5 Headphone output [PHONES]

The headphone output on a 6,35mm (1/4") jack allows connection of any mono or stereo headphones having an impedance greater than 30 Ohms. The headphone level is controlled by the rotary encoder.

The combination of tracks to be monitored, the monitoring mode and functionalities such as monitor mix level, alarm tones etc are set in the [HEADPHONES] menu.

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

WARNING: The headphone amplifier of the SX-R4+ is quite powerful. It is recommended to set the headphone level at a reasonable loudness to protect your precious ears.

3.2.6 Auxiliary AES input/output [AES I/O]

The [AES I/O] TA-3 connector is an AES3, digital input or transformer balanced output. Its configuration and settings are accessible in the [INPUTS] and [OUTPUTS] menu.

3.2.7 TimeCode connector [TC]

The TimeCode input/output connector is a Lemo 5 pin, compatible with the Aaton wiring as below. It is compatible with all TimeCode format, including pull-up / pull-down. Settings and parameters are accessible in the [TIMECODE] menu.

- 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

3.2.8 Digital inputs [AES IN]

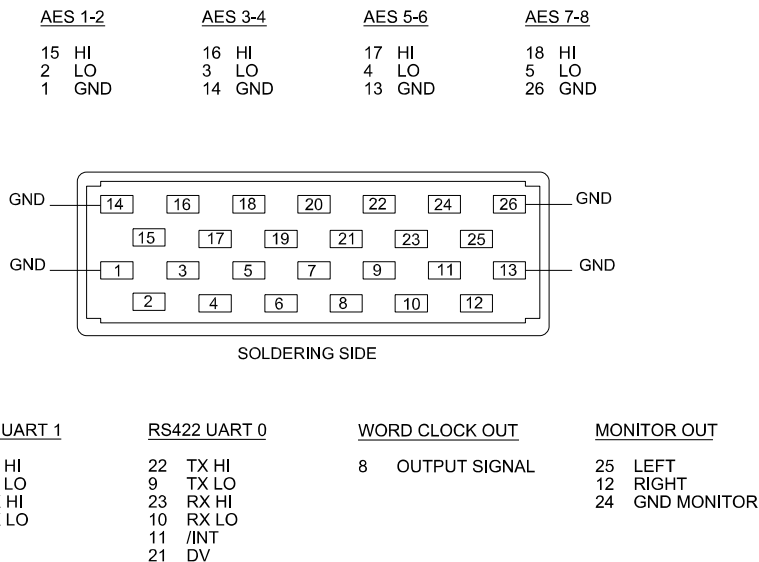
The [AES IN] 26 pin connector provides 4x independent AES3 inputs (8 audio channels). Each of these 4 inputs has its own ASRC circuitries allowing connection of independent asynchronous sources. Configuration and settings are available in the [INPUTS] menu.

A WordClock output is provided to synchronize external equipments.

Two RS422 Tx/Rx lines are available to control the SONOSAX SX-AD8+ pre-amplifier and the mixing control surface.

The headphone output is also available; it is wired in parallel to the [PHONES] jack.

The mating cable 26 pin connector is available by SONOSAX or by your local dealer under ref part SONOSAX SX-860570



SX-R4+ ACCESSORY CABLE CONNECTOR
SONOSAX PART NUMBER 860570

JUNE 2015

3.2.9 WiFi

Manage the SX-R4+ through the integrated Wifi using the web-browser of a smartphone, tablet or PC. The WiFi settings are accessible in the [WLAN] menu. Read the User interface manual for further information.

POWERING THE SX-R4+

The SONOSAX SX-R4+ can be powered from a removable "Smart Battery" or from any external power source providing a regulated DC voltage between 9 to 18 Volts.

The SX-R4+ features an intelligent power management through the SMBus and provides with detailed on screen informations. Please refer to the menu [POWER] for further informations.

3.2.10 Internal "Smart Battery"

The battery enclosure is designed for the so called "Smart Battery" of the 2050 series having a nominal voltage of 10,8 or 14,4Volts. The Smart Batteries communicate with the SX-R4+ through the SMBus, providing precise indications such as remaining charge and running time.

Two different battery lengths are currently available:

- 86,4mm / 3,4" fits in the enclosure and is secured by the battery locking pin
- 152,4mm / 6" longer version with higher capacity; extending outside the enclosure it has to be secured in the bag by a strap or other means.

Compatible Smart Batteries:

Inspired Energy 2050 series:	ND 2054 / 14,4V - 3,4Ah - 45Wh NH 2054 / 14,4V - 6,8Ah - 98Wh - extended version ** NL 2054 / 14,4V - 6,8Ah - 97Wh - extended version ** low temperature NL 2050 / 10,8V - 8,8Ah - 97Wh - extended version ** low temperature
Chargers:	Mono: CH4000 charger / CH5000 calibrator CH7000E, with European main adapter, 12 to 24V, solar, vehicle CH7000A, with US / Japan main adapter, 12 to 24V, solar, vehicle CH7000U, with UK main adapter, 12 to 24V, solar, vehicle Dual: CH4040 charger / CH5050 calibrator
RRC 2050 series:	RRC2054 / 14,4V - 3,2Ah - 46Wh NH 2054 / 14,4V - 6,8Ah - 98Wh - extended version**
Chargers:	PMC02A or PMC10A or RRC-SMB-UBC
AudioRoot eSmart series:	eSMART Li 49 / 14,4V - 3,1Ah - 45Wh eSMART Li 89 / 14,4V - 6,2Ah - 89Wh - extended version**
Chargers:	eSMART Mono charger or Dual charger with LCD display eLC-SMB simple mono charger without display

Dimensions of compatible Smart Batteries:

Height: 22,9mm / 0,9"

Width: 78,7mm / 3,1"

Length: 86,4mm / 3,4" for 45 & 49Wh

**152,4mm / 6,0" for 89Wh and above (extends outside the enclosure)

NOTE: The battery can not be recharged by the SX-R4+; it must be recharged by its own specific charger.

WARNING: Each battery manufacturer may implement its own proprietary firmware; therefore, generally speaking, batteries should only be operated with chargers or other devices made by the same manufacturer. If your batteries do operate with chargers or devices made by another manufacturer it may be a fortunate coincidence. SONOSAX has no knowledge of possible compatibility or interoperability between batteries and chargers or devices of different manufacturers. If you choose to operate a battery of a manufacturer with chargers or devices made by another manufacturer you do so at your own risk.

3.2.11 External powering [DC IN]

SX-R4+ recorder can be powered from any external regulated DC source from 9 to 18 Volts such as a main adapter or any external battery pack such as lead acid or LiOn battery. The DC source must be capable to supply at least **1,5 A** under 12 Volts DC.

The average power consumption is approx **7 to 12 Watts** depending on the configuration of the SX-R4+, this represents a continuous current of approx **xxmA** under 12 Volts.

The [DC IN] connector handles the SMBus for external compatibles LiOn batteries.

DC IN wiring:

- Pin 1: negative (-)
 - Pin 2: SMBus Data*
 - Pin 3: SMBus Clock*
 - Pin 4: positive (+)
- * Leave unconnected when unavailable

Accessories:

- Hirose 4 pin cable connector: Hirose HR10-7P4P / SONOSAX ref SX-860217
- Main DC adapter 100-240VAC / 50 - 60Hz / 12VDC with Hirose 4: SONOSAX ref SX-008450.

3.2.12 Powering peripherals [DC OUT]

The Hirose 4 pin connector supply a DC voltage to power peripheral equipments such as the SONOSAX SX-AD8+ microphone preamplifiers, a SX-M32 mixing console, RF systems or any other equipment requiring a 12VDC.

This output is configured in the [POWER] menu, it supplies either a voltage derived directly from the [DC IN] connector, decoupled to avoid ground loop with connected peripherals, or a 12V regulated by the SX-R4+.

The maximal power output is 7,2 Watts, which represents a current of max. 0,6 Amp under 12 Volts.

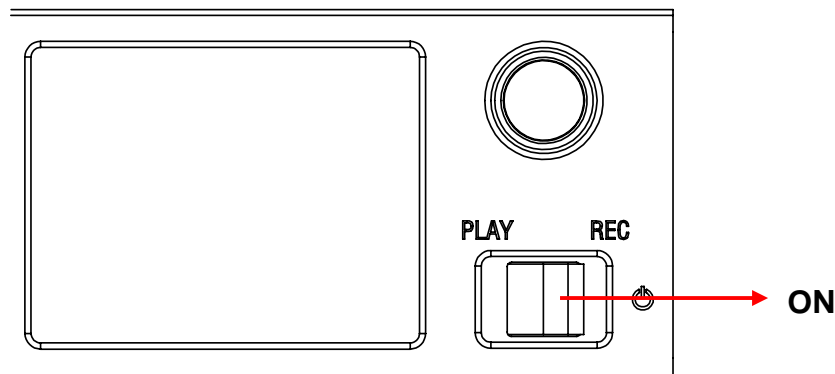
DC OUT wiring:

- Pin 1: negative (-)
- Pin 2:
- Pin 3:
- Pin 4: positive (+)

3.2.13 On screen powering information

The main screen displays powering informations such as power source and voltage. Other informations and settings are accessible through the menu [POWER].

3.3 SWITCHING ON THE UNIT



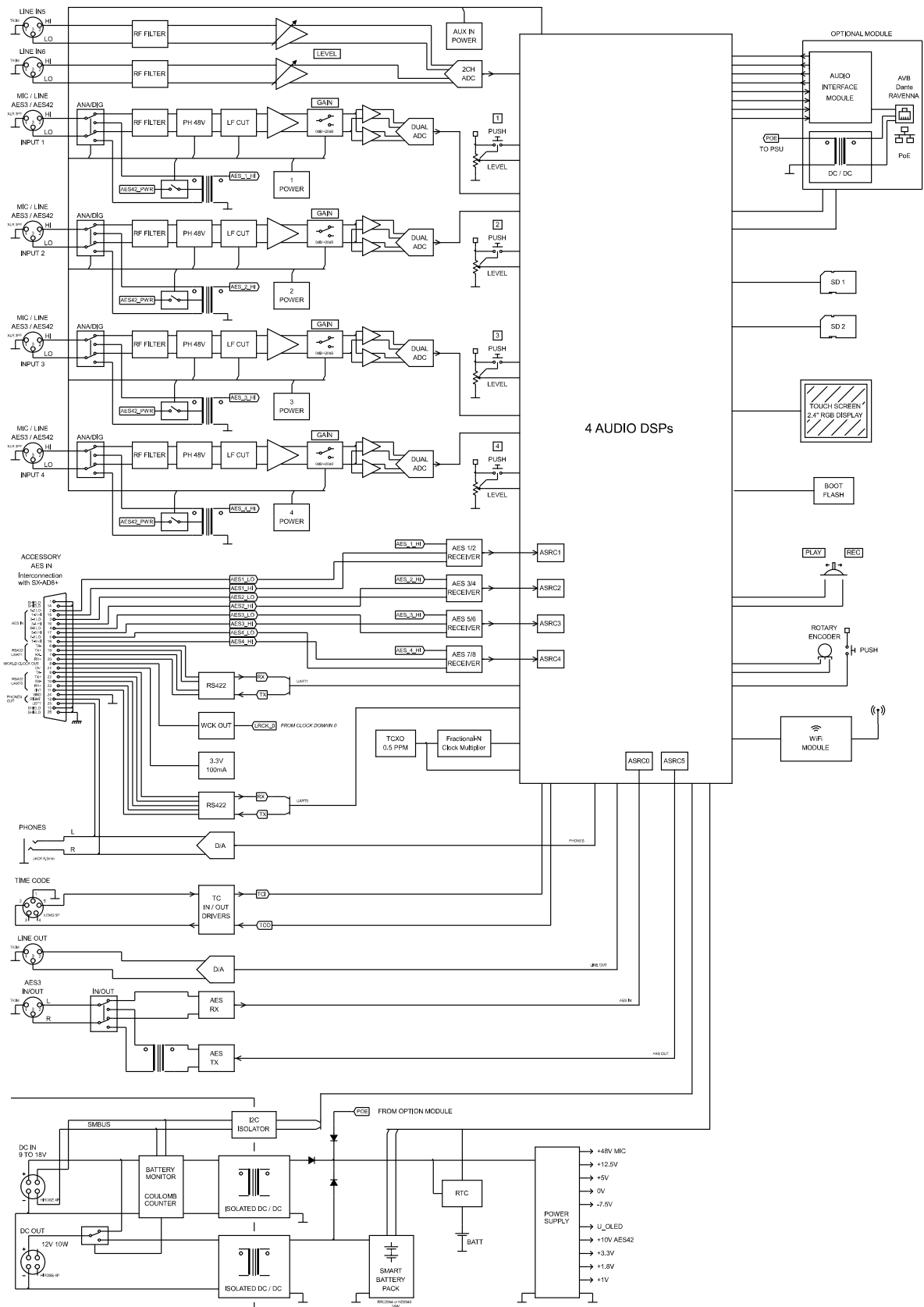
Power On the SX-R4+ by pressing the Toggle switch to the right
A boot up screen is displayed for a couple of seconds, followed by the main metering display.

3.3.1 Switching Off the unit

Switching Off the unit is controlled by the software, accessed via the [SETUP] menu.

4. BLOCK DIAGRAM

SX-R4+ (Simplified Blockdiagram)



Improvement may cause change of features and specifications without notice

1603

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5. 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).

5.1 SUMMARY OF CHARACTERISTICS

The information contained in this manual is subject to change without notice.
All specifications mentioned in this manual apply to standard models only.
SONOSAX SAS SA reserves the right to modify these characteristics at any time without prior notice.

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Version: August 2015

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1. INTRODUCTION

This manual describes the user interface, the operating instructions and all functionalities related to the Firmware version 1.2 of the SONOSAX SX-R4+.

For all information's concerning the hardware, powering information's, connectors diagram, specifications etc please refer to the SONOSAX SX-R4+ User Manual "Hardware Description".

1.1 CONVENTIONS

For sake of clarity in reading this manual, please note:

- Input, output, channel: refer to physical inputs or outputs of the recorder
- Tracks: refer to virtual tracks of the recorder
- Knob: refer to a physical knob
- Button or Key: refer to a logical "tactile" function on the touch screen
- A single arrow ► implies that an action is achieved by a short pressure on a knob or a tactile button
- A double arrow ►► implies that an action is achieved by a long pressure on a knob or a tactile button
- A check key  implies that a selection must be confirmed by pressing the key
- Information key  displays additional information related to the selected field




A button is mostly used to activate / enable a function and/or toggle parameter values when dark, the function is disabled
When highlighted in blue, the function is enabled and the parameter value is posted



A key can also be used to call a sub-menu in which functionalities and/or parameter values can be set. The chosen functionality respectively the selected values are posted.



A button with a scroll bar is used to select a specific parameter; the symbol  appears on the top right corner of the screen indicating that parameter values are set by turning the encoder wheel.

1.2 TOGGLE SWITCH



Play-Pause-Stop Start/Stop Recording / Add an Index

The action of the toggle switch depends of the operating mode:

RECORDER operating mode

Toggle switch	Short pressure ►	Long pressure ►►
RIGHT in any situation except recording	Start recording	
RIGHT while recording	Add an INDEX **	Stop recording
LEFT while in record ready	Call the last take and start playing	

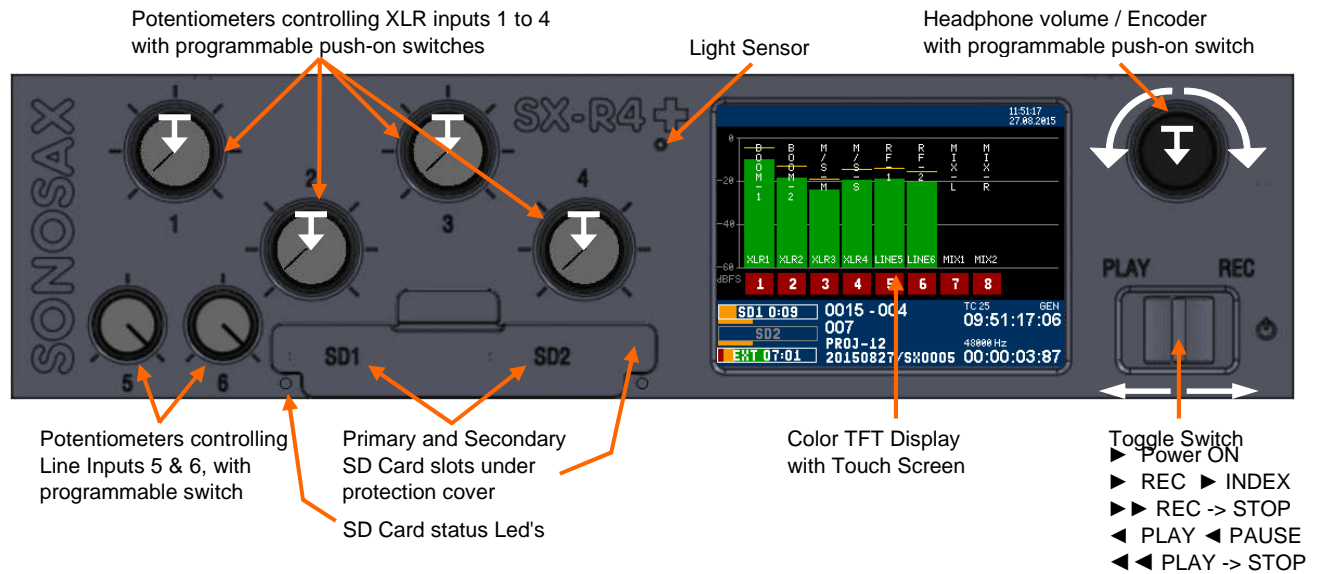
** INDEX = New TAKE: pressing the toggle switch briefly to the right while recording automatically creates a new TAKE; the Take number is automatically incremented by 1.

PLAYER operating mode

Toggle switch	Short pressure ►	Long pressure ►►
LEFT while in Stop	Play the Take from the beginning of the Take	
LEFT while Playing	PAUSES at current position	STOP playing
LEFT while in Pause	Play the Take from the current position	
RIGHT	Switches to Record mode and start recording (scratch record)	

2. PRINCIPLE OF OPERATION

2.1 FRONT PANEL

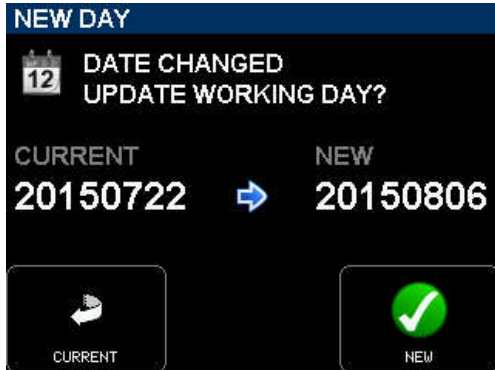


FEATURES	FUNCTIONS / DESCRIPTION
Potentiometers 1 to 4	Level or Gain control of XLR's inputs 1 to 4 (controlling the DSP) <ul style="list-style-type: none"> Primarily assigned to XLR inputs 1 to 4, either set as analogue or digital input Fader range adjustable by menu
Push-On switch 1 - 4	Switches with two programmable functions selected by a short press or a long press such as: <ul style="list-style-type: none"> Solo monitoring - Mute - Phase reversal - etc
Potentiometers 5 & 6	Retractable potentiometer with a function switch <ul style="list-style-type: none"> Analogue volume control dedicated to Line inputs 5 & 6 on TA3 User programmable switch to activate Solo monitoring of the input is activated by releasing the knob
Headphone Encoder	Multifunction encoder with push-on switch, <ul style="list-style-type: none"> Primarily controls the headphones volume Scroll specific functions or values according to displayed contextual menu
Push-On switch	Switches with two programmable functions selected by a short press or a long press such as: <ul style="list-style-type: none"> Lock/Unlock touch screen - Lock/Unlock volume control
Toggle Switch	Primarily dedicated for Record and Playback functions
SD Card slots	Accepts SD/SDHC/SDXC cards, High speed class 10 or higher are recommended. Press to insert with notched corner oriented toward the right. Press to eject. Push protection cover firmly in place to avoid dust and water ingress
SD Card Led status	The Led's indicate the status of the SD Cards such as: <ul style="list-style-type: none"> Blinking: ready to Record ON: recording in progress OFF: SD Card not present, not formatted or full
Color Touch Screen	Touch the screen to call and navigate sub-menus

2.2 SWITCHING ON THE UNIT



Press the toggle switch to the right to power on the SX-R4+ . A boot up screen is displayed for a couple of seconds, followed by:



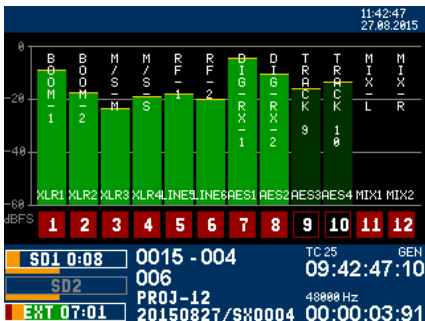
If the working day has changed while powering up the unit, the system asks to confirm the date of the new working day. This allows keeping the date of the current working days if the on going production works is passing across midnight.

Press [OK] to confirm the new working day
Press [CANCEL] to keep the current working day

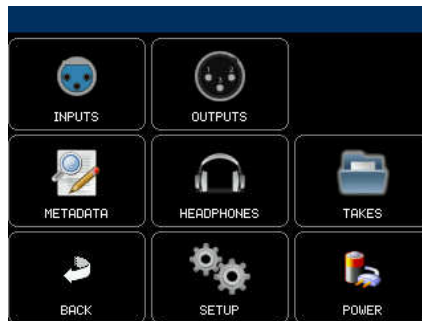
When one of the key is pressed, the unit will continue the booting procedure; wait a few seconds until the main screen is displayed.

2.2.1 Switching Off the unit

Switching OFF the unit is controlled by the software, accessed via the [MAIN] menu then [POWER].



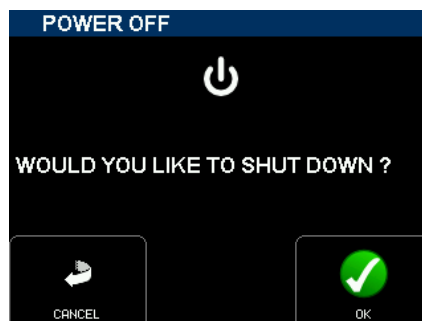
Touch in the modulometers area



Select the [POWER] key



Under [GENERAL] Tab Select [POWER OFF]



Select [OK] to power off the recorder

3. MAIN SCREEN DISPLAY

When the booting procedure is completed, the main screen displays the modulometers of the tracks, information's related to the set up of the recorder and most of the recording parameters.

The modulometers are displayed "dynamically", showing only the assigned tracks whether armed or not. The overall meter's range is 60 dBFS with a resolution of 0.5dB

Touching the screen within the modulometers area calls the [MAIN MENU]

Touching the centre of the blue area calls an overlay to quickly edit the metadatas.

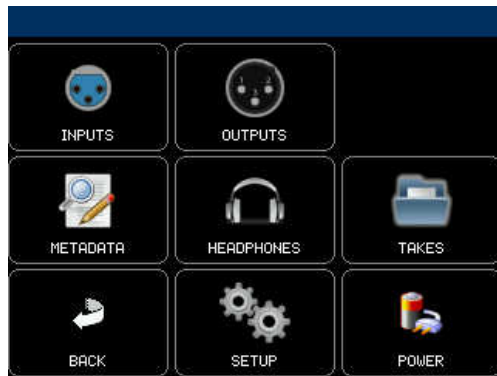
Examples of typical displayed screens

Track name		System Date and Time
Input sources and Mix assignment		Track name
Track nr / highlighted tracks = armed		Input source & MIX assignment
Remaining capacity on SD1		Non-highlighted tracks nr = not armed
Remaining capacity on SD2		Time Code format ,and value
Power source and voltage	Sampling rate	
	Elapsed time	
	<p>Touching the screen over this area calls an overlay to edit metadatas</p>	

Track name		System Date and Time
Input sources and Mix assignment		<p>Non-highlighted tracks nr means the tracks are not armed, the corresponding modulometer is darkened.</p>
Track nr / highlighted tracks = armed		Time Code format ,and value
Bargraph of the SD1 Ram buffer		Sampling rate
Bargraph of the SD2 Ram buffer		Elapsed time
Power source and voltage		

4. MAIN MENU

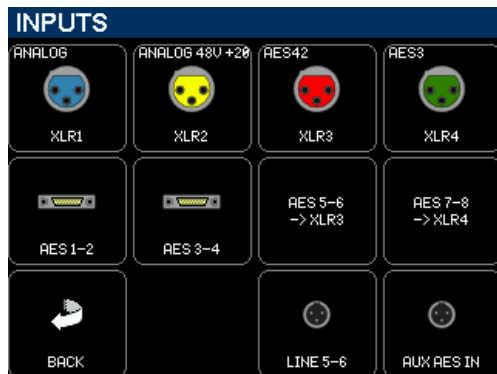
Pressing the main screen anywhere above the blue area will call the Main Menu. Pressing any key calls a Sub-Menu.



- [INPUTS] configure the physical inputs of the recorder
- [OUTPUTS] configure the physical outputs and the MIX
- [METADATA] edit the Metadatas
- [HEADPHONE] configure the Headphones outputs
- [TAKES] browse recorded takes on the SD cards
- [BACK] return to the main screen
- [SETUP] configure all parameters of the recorder
- [POWER] displays power sources informations

4.1 INPUTS

The [INPUT] menu gives access to the configuration pages of the physical inputs of the recorder. Pressing a key calls subsequent configuration and setting pages.



- [XLR1 to XLR4] configure the physical XLR inputs of the recorder, each XLR can independently be configured as Analogue, AES42 or AES3. The icon reflects the actual settings
- [AES 1-2] to [AES 3-4] configure the physical AES3 type digital input of the 26 pin connector
- [LINE 5-6] configure the physical TA3 Line Inputs 5 & 6 connectors
- [AUX AES] configure the physical TA3 AES I/O connector

4.2 XLR SETUP

Pressing on a XLR icon calls the corresponding [XLR SETUP] page, showing the current configuration and settings.

When an [XLR SETUP] page is called, the headphones monitoring switches to SOLO mode so that the corresponding input is heard in solo in the headphones; a bargraph displays the modulation level of the physical input (not the level of the track on which the input is assigned).

4.2.1 XLR SETUP - Analogue

When an XLR is set as analogue for a Microphone or a Line input, that particular input is obviously a mono input and is heard as such in the headphone. The modulation level is shown by a single bargraph.

	XLR2 SETUP				
LF CUT: toggles OFF, 60Hz, 120Hz	LF CUT 60Hz	PHASE NORMAL	LEVEL +3.3 dB	ASSIGN TRACK 2	Call a sub-menu to assign the input on a track
Input Modulometer	XLR2				
Toggle the polarity of the input: (phase normal or phase reversed)	[Bargraph]				Call a sub-menu to adjust the range of the fader and how the range is stepped; the actual fader level is displayed
Call a sub-menu to setup the type of the XLR input, showing the actual status	[Status]				
Return to previous page	BACK	STATUS ANALOG 48V	PREVIOUS	NEXT	Call the Setup page of the Next or Previous physical input

- NOTE:**
- When the XLR is configured as Analogue input, the [LF CUT] key activates an analogue circuitry in the input preamplifier. The [PHASE] and [LEVEL] are controlled by the DSP.
 - The analogue inputs are protected by an internal RF Filter

4.2.2 XLR SETUP - Digital

A digital input, whether AES42 for a digital Microphone or as AES3 for a digital line, carries two channels; therefore the [XLRx SETUP] show controls and modulation level for both channels. The headphones monitors in stereo, the odd channel on the Left and the even channel on the Right.

	XLR3 SETUP				
LF CUT: toggles OFF, 60Hz, 120Hz	LF CUT OFF	PHASE NORMAL	LEVEL -4.6 dB	ASSIGN TRACK 13	Call a sub-menu to assign the input on a track
Input Modulometer of the Left channel	AES5				
Toggle the polarity of the input: (phase normal or phase reversed)	LF CUT OFF	PHASE NORMAL	LEVEL -4.6 dB	ASSIGN TRACK 14	Call a sub-menu to adjust the range of the fader and how the range is stepped; the actual fader level is displayed
Input Modulometer of the Right channel	AES6				
Return to previous page	BACK	STATUS AES42	PREVIOUS	NEXT	Call a sub-menu to configure the input type (Analogue AES42, AES3), the current type is displayed

4.2.3 XLR INPUT TYPE

Pressing the [STATUS xxx] key calls a new page to configure the input type of the XLR connector

	XLR1 TYPE					
Select the input type or turns the input OFF to save on battery	OFF	ANALOG	AES	AES42	Select Analogue for a Mic/Line input Select AES3 for a digital line Select AES42 for a digital microphone	
When configured as analogue input, a primary gain of 20dB and the 48V Phantom can be activated.	GAIN +20 dB	PH 48V	AES 1-2		This example shows that AES1-2 is available for the 26 pin connector	
Return to previous page	BACK	XLR1	XLR2	XLR3	XLR4	Short cut the another XLR input

4.2.4 NOTES ABOUT THE AES RECEIVERS

The SX-R4+ recorder is equipped with 4x independent AES receivers, representing 8 audio input channels grouped per pair (as per AES standard); each of them having its own ASRC (Asynchronous Sample Rates Converter) allowing connection of non-synchronized digital sources.

These 4x AES receivers can be individually connected either on the 26 pin [AES IN] connector or on a XLR connector:

- AES receiver 1 can receive a feed from 26 pin AES 1-2 or from XRL1
- AES receiver 2 can receive a feed from 26 pin AES 3-4 or from XRL2
- AES receiver 3 can receive a feed from 26 pin AES 5-6 or from XRL3
- AES receiver 4 can receive a feed from 26 pin AES 7-8 or from XRL4

For example, if XLR x is configured as AES42 or AES3, the corresponding AES x on the 26 pin is no longer available.

The figure shows three screenshots of the user interface. The first screenshot, 'XLR1 TYPE', shows 'ANALOG' selected, with 'GAIN +20 dB' and 'PH 48V' options, and 'AES 1-2' available. The second screenshot, 'XLR3 TYPE', shows 'AES42' selected, with 'GAIN +20 dB' and 'PH 48V' options, and 'AES 5-6' available. The third screenshot, 'INPUTS', shows 'XLR1' as ANALOG, 'XLR2' as ANALOG 48U +20, 'XLR3' as AES42, and 'XLR4' as AES3. Below these, it shows 'AES 1-2', 'AES 3-4', 'AES 5-6 -> XLR3', and 'AES 7-8 -> XLR4'. There are also 'BACK', 'LINE 5-6', and 'AUX AES IN' options.

XLR1 configured as Analogue input
The AES 1-2 on the 26 pin is available

XLR3 configured as AE42 input
AES 5-6 on the 26 pin is not available

INPUT menu showing that
XLR3 has taken AES 5-6
XLR4 has taken AES 7-8

4.2.5 LEVEL SETUP

The faders 1 to 4 control the level (or gain) of the corresponding XLR inputs 1 to 4 on the DSP. The [LEVEL] key calls a page where the parameters of the fader can be set according to the selected input type.

The range of a fader is stepped differently if it has to control the gain of a microphone or the level of a line input (analogue or digital). The fader range is adjustable and goes up to 128dB, but in most case the overall necessary range rarely exceeds 60 to 70dB.

The fields [MINIMUM] and [MAXIM] define the limits of the fader range and how it is stepped; typical settings would be:

- Dynamic Microphone: Min 0dB Max 70dB
- Condenser microphone: Min 0dB Max 50dB
- Line input (analogue or digital): Min -50dB Max +12dB

	P1 LEVEL SETUP				Use the encoder wheel to set values
Indicate the level value (or gain) as per fader position	LEVEL VALUE		MINIMUM	-10	Set the minimum value between -50 to +60dB of gain
	+0.6 dB		MAXIMUM	+60	Set the maximum value between the settled minimum up to +78dB
Indicate the range of the fader as set per Min and Max fields	LEVEL RANGE		MUTE AT MIN		Mute the input when the fader is closed
	70 DB		BYPASS		Bypass the fader control
LINK the input with another fader	LINK	P2	PRESET 1		4 presets to store and recall user settings
			PRESET 2	PRESET 3	
Return to previous page	PRESET 4				

LINK: Channels can be linked together; select the [LINK] field and set the potentiometer [P1 to P4] with which the channel must be linked with the encoder wheel. The channel is then controlled by the selected fader. A fader can control multiple XLR input channels so that a stereo pair, an M/S or double M/S system or a multi-channel microphone, such a Soundfield for example, can be controlled by a single fader. To ensure that the gain or level settings are identical on all linked channels, the fader range must be set with the same value on each channel.

OFFSET: an offset can be applied between linked channels by changing the fader range of a channel. An offset allows to vary the spread on an M/S pair for example, or to correct a stereo pair when the microphones are not perfectly matched. For example if a [MIN] value is set to -12 on one channel and to -9 on the other, a constant offset of 3dB is applied between channels.

PRESETS: Press 2 seconds on a [PRESET] key to store the settings as they appear on screen. A brief pressure recalls a stored configuration. These presets are useful to store the configuration of input sources being used on regular basis; for example
 Preset 1 = Condenser mic / Preset 2 = close vocal mic / Preset 3 = RF Receiver / Preset 4 = digital mic

4.2.6 TRACK ASSIGNMENT

Any input can be freely assigned to any track or onto multiple tracks, but multiple inputs can not be summed on a single track.

On the [XLR SETUP] page press on the [ASSIGN TRACK...] key to call a matrix showing the 16 tracks of the recorder, then select the track(s) on which that input is to be routed.

	XLR1 TRACK ASSIGN				
Track number Assigned input	1	2	3	4	
	XLR1	XLR2	XLR3	XLR4	
	5	6	7	8	Track number Assigned input
	9	10	11	12	
	13	14	15	16	Un-assigned tracks
Return to previous page	Return				

4.3 AES INPUT SETUP

Pressing on a multi-pin connector icon calls the corresponding [AES SETUP] page, showing the current configuration and settings of that input. The configuration and settings are done in a similar way as on the [XLR SETUP].

Obviously an AES input implies two channels, therefore when an AES setup page is called, the headphones monitoring switches to SOLO mode in stereo.

	AES 3-4 SETUP				
Toggles LF CUT: OFF, 60Hz, 120Hz	LF CUT OFF	PHASE NORMAL	LEVEL -2.0 dB	ASSIGN TRACK 9	Call a sub-menu to assign the input channel on a track
Modulometer of the odd / left channel	AES3				
	LF CUT OFF	PHASE NORMAL	LEVEL +3.0 dB	ASSIGN TRACK 10	Call a sub-menu to trim the input gain of the channel. The channels can be adjusted independently
Modulometer of the even / right channel	AES4				
Return to previous page	BACK	POWER	PREVIOUS	NEXT	Turns the input On or Off to save on battery

NOTE: The [LF CUT] is controlled by the DSP; the slope is 12dB/octave.

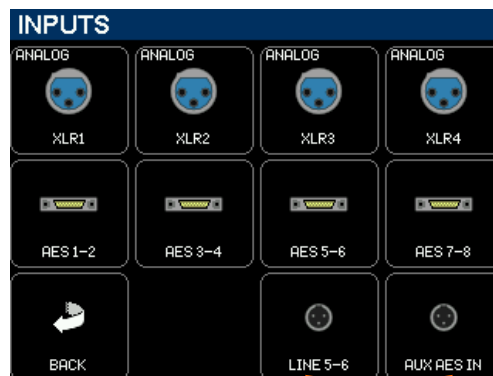
4.3.1 AES INPUT GAIN TRIM

The level of a digital input can be controlled by means of a Gain Trim. Each channels of the AES pair can be adjusted individually within a range of -20dB to +20dB.

	GAIN TRIM		
Bargraph indicating the Gain trim of the channel,	+2.0 dB		
Adjust with the UP or Down keys or with the encoder wheel from -20dB to +20dB	↓	↑	
Return to previous page	BACK		

4.4 LINE INPUTS & AUX AES SETUP

The [LINE 5-6] and [AUX AES] inputs are configured and settled in exactly the same way as the AES inputs



NOTE: By default the [AUX AES] TA3 connector is set as an input. Setting this connector as an output is done in the [OUTPUTS] menu.

4.5 OUTPUTS

The [OUTPUTS] menu configures the stereo / 2 channels analogue [LINE OUT], the [AUX AES] when set as an output, the [REFERENCE TONE] generator and the [MIX] of the recorded tracks

	OUTPUTS			
Turns the LINE OUT output On or Off to save on battery	LINE OUT POWER	LINE OUT ROUTING		Calls a sub-menu to route tracks to the LINE OUT output
Switches the AUX I/O to output mode and toggles the output's sampling rate at 48, 96 or 192kHz	AUX AES OFF	AUX AES ROUTING		Calls a sub-menu to route tracks to the AUX AES output
Return to previous Menu				Call a sub-menu to configure the Ref Tone generator
	BACK	REF TONE GEN	MIX	Call a sub-menu to configure the Mix

4.5.1 LINE OUT ROUTING & SETUP

The modulation routed to the TA3 [LINE OUT] connector can be configured as a stereo pair or as two independent mono channels.

The tracks are grouped per pair so that stereo or M/S microphones can be routed accordingly; in this case the odd tracks are routed to the Left channel and the even track to the Right channel of the [LINE OUT] connector.

Each track can also be individually routed as a mono track.

- A primary switch toggles the different modes per pairs 1-2, 3-4 ... 15-16:
OFF – MONO – STEREO – REVERSE STEREO – M/S – OFF.
- Two secondary switches freely assigns each tracks of the pair to the Left or Right channel of the Line Output:
OFF (-) ; Left [L] ; Right [R] ; Centre [C] (*route the track with an equal volume to the Left and Right channels*);
when the tracks are individually assigned the primary switch displays "USER".

	LINE OUT					
	1-2	3-4	5-6	7-8	9..16	
Primary switches toggles the monitoring mode per pair: OFF, MONO, STEREO, REV-ST, M/S	ST	ST	ST	ST		Call 2nd page to configure tracks 9 to 16
<i>Odd track of the pair</i> Secondary switches route each track individually: OFF - L - R - C <i>Even track of the pair</i>	1 L	3 L	5 L	7 L		Call a SETUP page for the monitoring
	2 R	4 R	6 R	8 R		
Return to previous Menu		PRESET 1	PRESET 2	PRESET 3	PRESET 4	4 preset keys to store and recall user's selections <i>see note</i>

NOTE: Press 2 seconds on a [PRESET] key to store the configuration as it appears on screen.
Briefly press on a [PRESET] key to recall a configuration.

Pressing the [SETUP] key calls a sub-menu to adjust various parameters of the Line Output

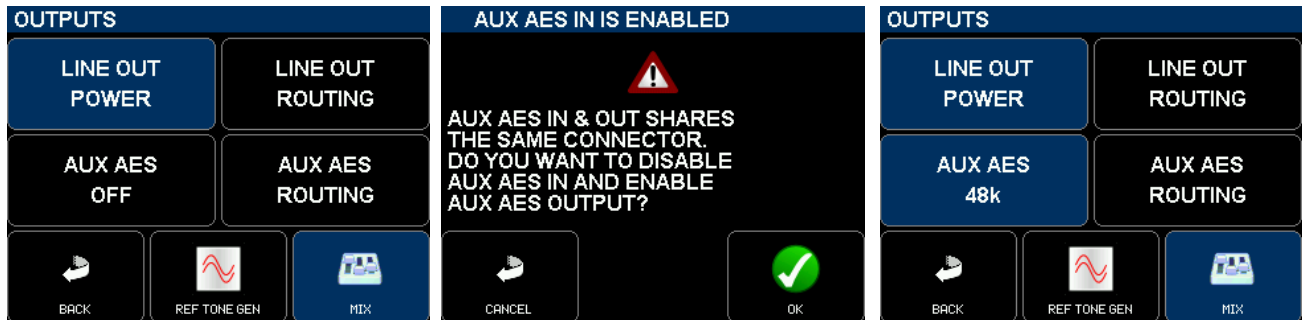
	LINE OUT SETUP			
Use the encoder wheel to adjust the LINE OUT level from +20dB to 80dB	LEVEL 0.0 dB	MIXING LEVEL -1.5 dB		Adjust the mixing level from 0 to -6dB <i>see chapter below</i>
Enable / disable the ALARM level on the LINE OUT output	ALARM ENABLE	ALARM LEVEL -20.0 dB		Adjust the ALARM level on the LINE OUT outputs
Enable / disable the REC TONES on the LINE OUT output	REC TONES ENABLE	REC TONES LEVEL -40.0 dB		Adjust the REC TONE level on the LINE OUT outputs
Return to LINE OUT page		BACK		

4.5.2 AUX AES ROUTING & SETUP

The TA3 [AUX AES] connector can be configured either as a digital input or as a digital output; the digital format is AES3.

When the AES I/O button is darkened in the [OUTPUTS] page, the AES I/O is configured as a digital input; touching the AES I/O key switches the [AUX AES] TA3 connector to output mode and toggles the output sampling frequency to 48, 96 or 192 kHz. The AUX AES output has its own ASRC (Asynchronous Sampling Rate Converter) so that the sampling frequency at this output can be different than the sampling frequency set for the recordings.

When set as an output, the modulation routed to the [AUX AES] connector is routed and configured exactly in the same manner as the [LINE OUT].



AUX AES set as an input

Selecting AUX AES as an output posts a warning

AUX AES set as an output at 48kHz sampling frequency

4.5.3 MIX SETUP

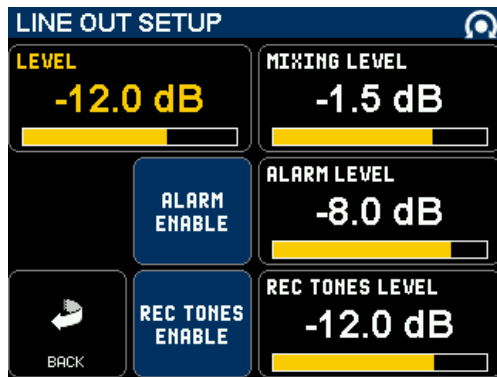
The [MIX] and [MIX SETUP] pages are used to create a down-mix of the recorded tracks (not of the inputs). One can create a stereo mix, 2 independent mono mixes or a single mono mix.

The routing matrix works in the same manner as the LINE OUT where the tracks are grouped per pair so that stereo or M/S microphones can be routed accordingly, but any track of a pair can be considered as a mono track and can be freely assigned to MIX1 (L) or MIX 2 (R) in the MIX SETUP page.

<p>Primary switches toggles the monitoring mode per pair: OFF, MONO, STEREO, REV-ST, M/S</p> <p>Secondary switches route each track individually: OFF - L - R - C</p> <p><i>Odd track of the pair</i> <i>Even track of the pair</i></p> <p>Return to previous Menu</p>		<p>Call 2nd page to configure tracks 9 to 16</p> <p>Call a SETUP page for the monitoring</p> <p>4 preset keys to store and recall user's selections <i>see note</i></p>
<p>Use the encoder wheel to adjust the MIX level from -80 to +20dB</p> <p>Use the encoder wheel to freely assign the MIX1 (Left) to any of the 16 tracks</p> <p>Return to previous Menu</p>		<p>Adjust the mixing level from 0 to -6dB <i>see chapter below</i></p> <p>Use the encoder wheel to freely assign the MIX2 (Right) to any of the 16 tracks</p>

NOTE: Press 2 seconds on a [PRESET] key to store the configuration as it appears on screen. Briefly press on a [PRESET] key to recall a configuration.

4.5.4 SETUP >> MIXING LEVEL



The [MIXING LEVEL] button on the [LINE OUT] [AUX AES] [MIX] and [PHONES] pages defines the attenuation to be applied to each track when summing (mixing) multiple tracks onto the same output or track; the attenuation is computed to avoid a digital clipping. The mixing attenuation is set with the encoder wheel from 0 to +6dB, the choice depends essentially on the phase coincidence of the sources.

- 0 dB no attenuation at all
- - 1.5 dB mainly used if the sources have no phase coincidence
- - 3.0 dB recommended for phase coincident sources such as stereo or M/S microphone
- - 6.0 dB only used if the sources are absolutely in phase

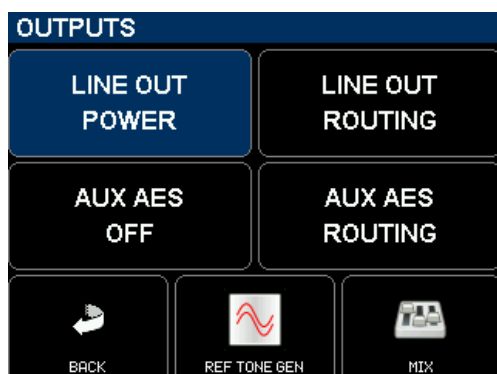
The table below summarizes the exact attenuations applied according to the number of summed track.

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	1.5	3.0	6.0
3	0	2.4	4.8	9.5
4	0	3.0	6.0	12.0
5	0	3.5	7.0	14.0
6	0	3.9	7.8	15.6
7	0	4.2	8.5	16.6
8	0	4.5	9.0	18.1
9	0	4.8	9.6	19.1
10	0	5.0	10.0	20.0
11	0	5.2	10.4	20.8
12	0	5.4	10.8	21.6
13	0	5.6	11.1	22.3
14	0	5.7	11.5	22.9
15	0	5.9	11.8	23.5
16	0	6.0	12.0	24.0

4.5.5 Reference Tone Generator

A 1 kHz Reference Tone Generator can be toggled On or Off from the [OUTPUTS] menu. When turned On, the reference tone is sent to all assigned tracks regardless if armed or not.

The reference level can be adjusted from 0dBFS to -60dBFS with the encoder wheel.



NOTE: a "double wave" symbol is posted on the main screen when the reference tone is enabled.

4.6 TRACKS MONITORING [HEADPHONES]

The modulation sent to the [PHONES] output corresponds to the track's selection and their routing as set in this menu.

The tracks are grouped per pair so that stereo or M/S microphones can be heard accordingly; in this case the odd tracks are routed to the Left channel and the even track to the Right channel of the headphones. However each track can also be individually routed as a mono track.

- The first row of switched activate SOLO MONITORING mode.
- A primary switch toggles the different monitoring modes per pairs 1-2, 3-4 ... 15-16:
OFF – MONO – STEREO – REVERSE STEREO – M/S – OFF.
- Two secondary switches freely assigns each tracks of the pair to the Left or Right channel of the monitor output:
OFF (-) ; Left [L] ; Right [R] ; Centre [C] (equal volume to the Left and Right channels);
when the tracks are individually assigned the primary switch displays "USER".

	PHONES	
The first row activates the SOLO MONITORING		Call 2nd page to configure tracks 9 to 16
Primary switches toggles the monitoring mode per pair: OFF, MONO, STEREO, REV-ST, M/S		
<i>Odd track of the pair</i> Secondary switches route each track individually: OFF - L - R - C <i>Even track of the pair</i>		Call a SETUP page for the monitoring
Return to previous Menu		4 preset keys to store and recall user's selections **

NOTE: Press 2 seconds on a [PRESET] key to store the configuration as it appears on screen.
Briefly press on a [PRESET] key to recall a stored configuration.

4.6.1 SOLO MONITORING MODE *(not yet implemented)*

Touching a key in the first row on the [PHONES] page activates the SOLO MONITORING; this page is used to listen in SOLO any individual track, or pair(s) of track(s) or any combination.

	SOLO MONITORING	
Enable / disable the pair, the monitoring mode is as configured in the PHONES page (Non exclusive selection)		
		Second row: enable / disable the pair and toggles its listening mode: Odd - Even - Stereo - MS - OFF (Non exclusive selection)
3rd and 4th row: Select each track individually in exclusive mode, all other tracks are muted		
Return to PHONES page, the monitoring is resettled in its original configuration		No Preset in Solo Monitoring mode

4.6.2 MONITORING SETUP

Touching the [SETUP] key in [PHONES] page calls the MONITORING SETUP page;

	PHONES SETUP	
Adjust the PHONES volume by turning the encoder wheel from -80dB to +20dB		Adjust le mixing level from 0 to -6dB <i>see chapter above</i>
Enable / disable the Alarms in the phones output		
Enable / disable the REC TONES in the phones output		Adjust the ALARM level on the phones outputs
Return to PHONES page		Adjust the REC TONE level on the phones outputs


4.7 METADATA

The audio files embed metadatas in both BWF and iXML formats. Metadatas can be pre-settled while the recorder is in Record Ready mode, edited while recording and/or re-edited post-recording when the unit is in Player mode.

Editing the metadata can be done either directly on the [METADATA] page or by using a smartphone or a tablet through the WiFi interface.

The upper 4 fields concern the next Takes to be recorded		Select a field then edit with the encoder wheel
When enabled, all subsequent takes will be tagged as Wildtrack		Last recorded TAKE name Tag the last recorded Take as Circled, No Good or False Start
Return to Main Menu		Edit the PROJECT name, calls a keyboard to type the project name NOTE, calls a keyboard to type notes,

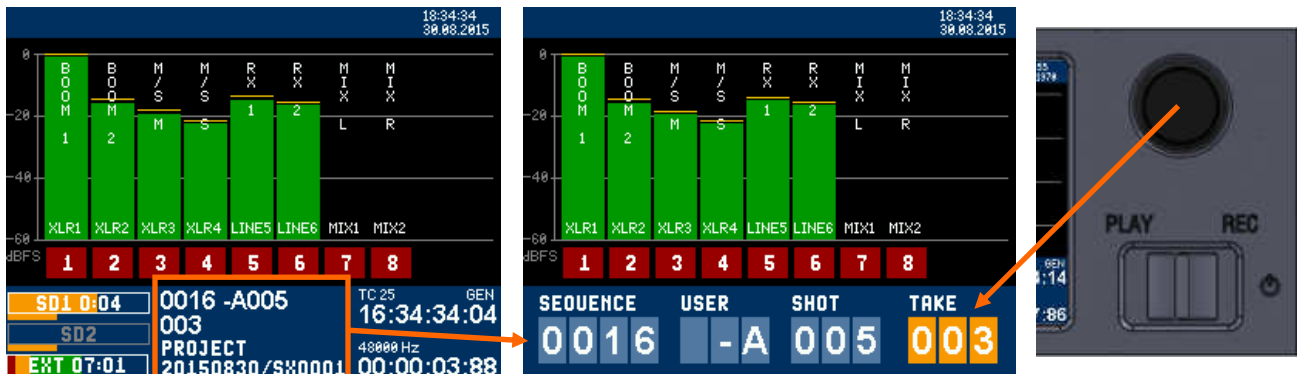
The [METADATA] page displays several editable fields:

- The upper row concerns the metadatas of the next take to be recorder; these four fields are the same as shown - and editable - on the main screen: Sequence (or scene name) / User ID / Shot nr / Take nr. When a Sequence and/or a Shot nr is modified, the Take nr is automatically reset to 001.
- When "Wild Track" is enabled, all subsequently recorded files will be tagged as "Wild Track". the symbol  is posted on the main modulometer's screens warning the user that the tag is enabled. Recorded audio files are notified with the suffix "W" in the [TAKE] menu.
- The 3 keys [CIRCLED], [NO GOOD] and [FALSE START] concern the last recorded Take. The name of the last Take is posted just above these 3 keys. If no file is available the screen posts [NO TAKE AVAILABLE] The Firmware version 1.2 does not provide with a trash bin. When a file is tagged as False Start it simply appears in red in the TAKES list.
- The PROJECT key calls a keyboard to type the project name with up to 8 characters. Typing a new Project name will create a new directory at the root level of SD Card(s); all subsequently recorded files are stored in "working day's" subdirectories in that Project folder.
- The NOTE key calls a keyboard to type notes, up to 256 characters.

4.7.1 METADATA Quick Editing Mode

Metadatas can be rapidly edited by using the "on screen short cut"; touching the screen within the metadata area will overlay four data fields showing: SEQUENCE - USER ID - SHOT NR - TAKE NR

Touching a field will highlight the corresponding data; use the encoder wheel to rapidly incremented the value.



4.8 TAKES MENU

The [TAKES] key calls a [TAKE LIST] displaying all takes recorded on both SD cards **** (see notes)**. The takes are listed in reverse order so that the last recorded take is posted on the top of the list.

The takes are sorted by "File Tag", a unique identifier generated by the system, see [FILE TAG] in the [SYSTEM] menu. Scroll the takes with the encoder wheel, the selection is highlighted in blue in the middle of the screen; press on the encoder wheel to load the selected take in the player.

SCENE	TAKE	TR	TAG	LENGTH	START
0016 - 003	001	8		00:00:37	11:57:41
0016 - 002	005	8	C	00:00:03	11:57:31
0016 - 002	004	8	F	00:00:00	11:57:30
0016 - 002	003	8		00:00:19	11:57:14
0016 - 002	002	8	W	00:00:24	11:56:47
0016 - 002	001	8		00:00:24	11:56:20
0015 - 004	013	8		00:00:05	11:56:02

SX0014	48000 Hz
20150827	30 MB
SD1	TC11:57:14

TAKE LIST 4/17: the highlighted take is the 4th of 17 takes in the list

SCENE = sequence nr followed by the shot nr
 TAKE = take nr
 TR = track count (*number of recorded tracks*)
 TAG C = circled
 F = False Start or No Good
 W = Wild track
 LENGTH = duration of the take
 START = time code value at the start of the take

Additional Information's related to the selected take:
 SX0014 = File Tag of the take 48000Hz = Sampling frequency
 20150827 = working day 30MB = Size of the file
 SD1** = file is stored on SD1 TCxxx = TimeCode at start

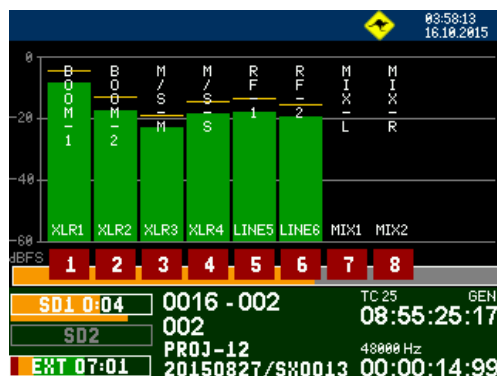
****NOTE:** Depending on how the SD cards are managed by the user, the content on SD1 and SD2 may be different. The Take List shows the content of both cards; if a file is present on both cards, the blue field of additional informations will post SD1 SD2. If a file is stored only on one card, the system will mention on which SD card the file is stored.

4.9 PLAYER MODE

When a TAKE is loaded, the recorder switches to PLAYER mode and automatically starts playing the selected take. Press the toggle switch toward [PLAY] to Pause, Stop or Start playing

- While in Play: a brief press will Pause at current location
- While in Pause: a brief press will start playing from current position
- In Play or Pause: a long press will stop and "rewind" to the beginning of the take

The main screen of the Player is similar to the screen of the Recorder except that a progression bar is posted under the modulometers. This bar is a graphical representation of the "time line". While in PLAY or in PAUSE touching along the time line in the green area jump to another location in the time line.



Time Line's progression bar

Touch in the green area to play from another location in the time line

4.9.1 METADATA IN PLAYER mode:

Editing the metadata of an existing audio file implies that the take is loaded in the Player. Select the file to be edited in the [TAKE] menu; then press on the encoder wheel to load that file in the player. Once loaded, return to the Main menu and press on the [METADATA] key to edit the metadata of the played file.

4.9.2 EXIT PLAYER

Touch on the modulometer area to call the Main menu, then touch the [EXIT PLAYER] key to return in Recorder mode.

4.10 POWER INFORMATIONS

This menu displays information about the power source and has a button to activate the [DC OUT] On or Off.

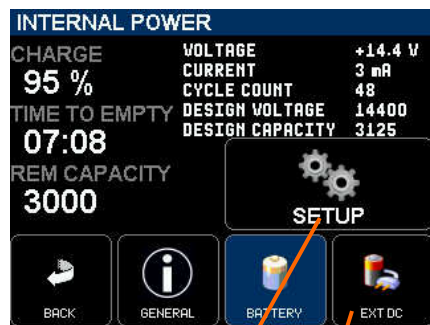
When powered from the internal battery, the SX-R4+ communicate with it through the SMBus and display all informations related to that particular battery on the [BATTERY] page.

All informations related to an external power supply are displayed on the [EXT DC] page. The [DC IN] connector is also SMBUS compatible; all battery informations will be displayed as well if a SMBus battery is connected.

<p>Indicates which source is currently powering the SX-R4+.</p> <p>Shows the current working time to empty according to the remaining capacity and current load.</p> <p>Indicates the instant power consumption.</p>		<p>Toggles the DC Out supply ON / OFF <i>See note</i></p>
<p>Return to previous page</p>		<p>Power Off the recorder</p>
		<p>Call pages to display informations related to the internal battery or the external power supply</p>

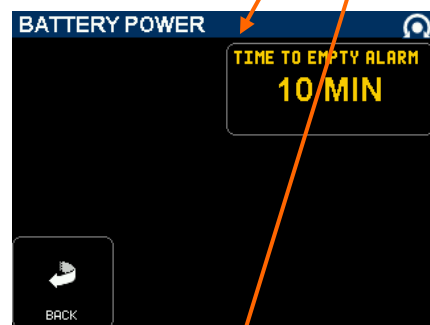
NOTE : The voltage on the Hirose 4 pin connector [DC OUT] depends on the power source of the SX-R4+ :

- if the recorder is powered from the internal battery the DC Out voltage is internally regulated to 12V
- if externally powered, the DC Out voltage is directly derived for the Hirose 4 pin [DC IN] connector.



Voltage and Current values as measured by the SX-R4+
Other informations are given by the battery through the SMBus

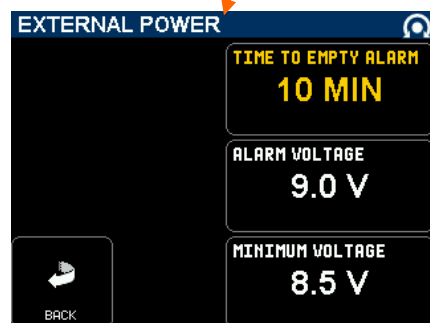
[SETUP] key calls a page to set the "Alarm" parameters



Use the encoder wheel to set the Alarm "Time to Empty" between 0 to 60 minutes

IMPORTANT NOTE:

The "TIME TO EMPTY" value posted in the previous page is given by the battery and is not calculated by the SX-R4+. Experiences have shown that the battery may shut down itself before the announced Time to Empty. It is highly advised to set the alarm at least to 10 to 15 minutes and to replace the battery as soon as the alarm is posted to avoid uncontrolled shut down.










Set the Alarm "Time to Empty"; available only if a SMBus battery is connected to the [DC IN] connector. *See note above*

Set the "Low Voltage" alarm of the external DC, set this value according to the kind of DC source being used. For example if a 12V NimH battery is used, the alarm would be set at 11,8V

Set the "Minimum Voltage" at which the SX-R4+ will either shut down or switch to its internal battery. For example if a 12V NimH battery is used, the value would be set at 11,5V to avoid a deep discharge of the battery.

5. SETUP




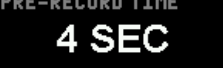

The [SETUP] page provides miscellaneous parameter's setting of the recorder

	SETUP			
Calls the Users Settings sub-menu				Calls the Meters Settings page
Calls the Record Settings sub-menu	USER SETTINGS	RECORD SETTINGS	METERS	
Calls the Time Code sub-menu				Calls the SD card sub-menu
	13:41:03.29	SD CARDS		
Return to Main Menu				Call the System Setup page
	BACK	SYSTEM		


5.1 USER SETTINGS (not yet implemented)

The [USER SETTINGS] menu allows saving, loading or updating a complete configuration. This feature is not available

5.2 RECORD SETTINGS

	RECORD SETTINGS		
Calls a sub-page to arm/unarm the tracks			Use the encoder wheel to scroll the sampling frequencies from 44,1kHz to 192kHz
	TRACK ARMING	SAMPLING FREQUENCY 48000	
Calls a sub-page to name the tracks			Use the encoder wheel to set the pre-record time from 0 to 20 seconds
	TRACK NAME	PRE-RECORD TIME 4 SEC	
Return to SETUP page			
	BACK		

5.2.1 TRACK ARMING

TRACK ARMING			
BOOM 1 1 XLR1	BOOM 2 2 XLR2	M/S M 3 XLR3	M/S S 4 XLR4
RX 1 5 LINE5	RX 2 6 LINE6	MIX L 7 MIX1	MIX R 8 MIX2
TRACK 9 9	TRACK 10 10	TRACK 11 11	TRACK 12 12
TRACK 13 13	TRACK 14 14	TRACK 15 15	TRACK 16 16
			

Touch the field of a track nr to arm / unarm a track.

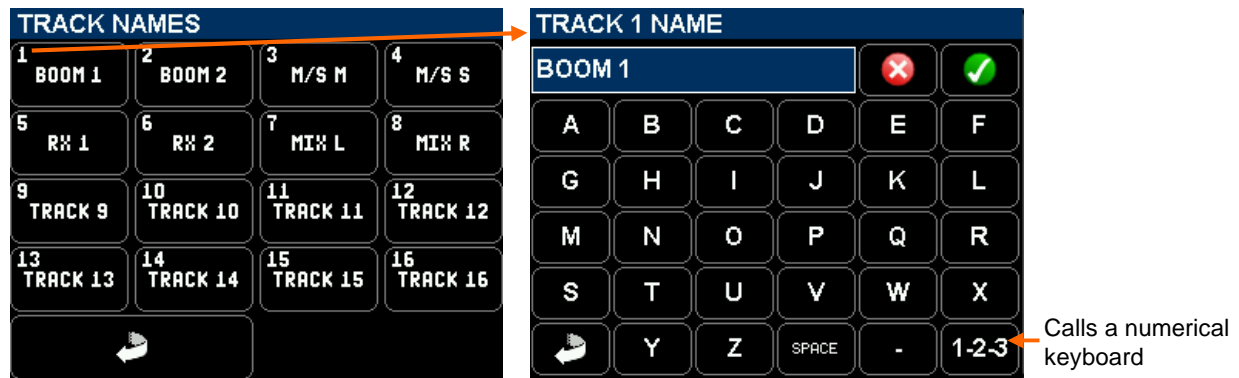
Track name

Input source currently assigned to the track

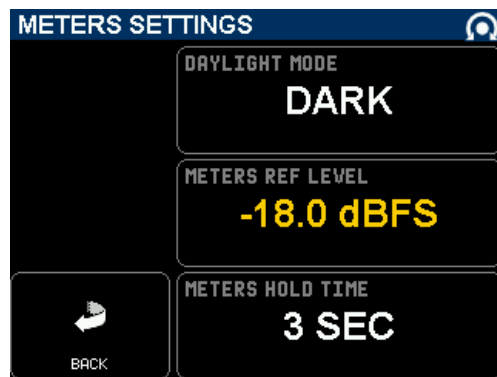
NOTE: Only armed tracks will be recorded. An input assigned to an unarmed track will not be recorded and consequently will not be contained in the audio file. The example above shows that tracks 5 & 6 are not armed; therefore the audio file will contain only 6 tracks tagged as tracks nr 1-2-3-4-7-8 in the metadatas.

5.2.2 TRACK NAME

The name of the tracks is stored in the metadatas; it can contain up to 8 characters. Touching a track field calls a keyboard to edit the track name.



5.3 METERS SETTINGS



Not yet implemented; will offer a selection of colour themes.

Set the reference level of the modulometers from 0 to -30 dBFS. Below the settled level, the modulation's level is posted in green and in orange above the reference level.

Set the time during which the peak level is posted (Peak Hold) between 0 to 600 seconds

5.4 TIMECODE SETUP

The SX-R4+ can simultaneously receive and generate Time Code at any of the conventional frame rates; following sub-menus are used to set the required TimeCode parameters.

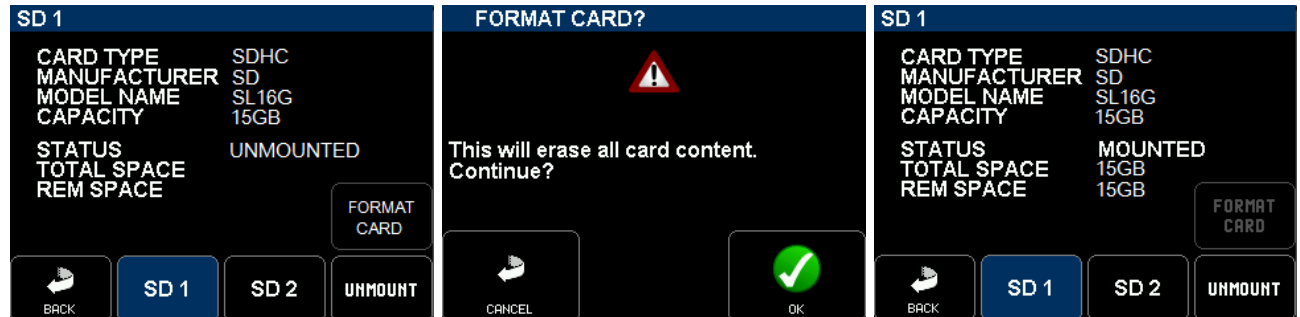
				Select the desired Frame Rate
When ON, the TC value is jammed on an external source, then it runs on its own clock				Select the desired Frame Rate
Shows the TimeCode value and is fps as received on the Lemo connector				Shows the generated TimeCode value and is fps as set in this page
Return to SETUP page				Grab the system time of the internal real time clock to set the TC value

NOTE: When the receiver locks on an external TimeCode, the time difference between the generator and the receiver is posted between the two time code values.

5.5 SD CARDS

For data safety and integrity, the SONOSAX SX-R4+ uses UDF file format. Any other file format such as FAT32, NTFS, HFS+ etc will not be recognized by the recorder. All SD cards being used with the SX-R4+ must be formatted as UDF media exclusively with the formatting tool provided in the [SD CARDS]; third party formatting tools will not necessarily be compatible and/or may lead to unrecognized card or data corruptions.

Insert card(s) in SD1 and/or SD2 slot(s); the system will display card's information such as card type, manufacturer ID, model name and total capacity.



Insert a SD card in a slot, then press the Format Card

A warning is posted press OK to proceed

Formatting completed; the card is mounted, the SD Led starts flashing

NOTES:

- When two cards are inserted, the SX-R4+ records on both cards simultaneously in "Mirroring" mode"
- SD1 and SD2 may have different capacities; e.g. SD1 could be a 64Gb or 128Gb to record all files of the same project, SD2 could be a 8 or 16Gb for the daily rushes.
- There is no limit in terms of capacity; one can use 256 or 512Gb.
- The remaining capacity is posted on the lower left corner of the mains screen by means of a progression bar.
- The remaining recording time noted in the progression bar is calculated according to the number of armed tracks and sampling frequency.
- An alarm is posted when the remaining capacity drops under 100Mb.
- When the remaining capacity drops under 5Mb, the SX-R4+ stops recording and closes the audio file; the recording continues on the second card providing it has sufficient free space.
- The SONOSAX SX-R4+ does not provide a trash bin, therefore recovering free space by trashing audio files is not possible. Deleting file using a computer is not possible.
- When a card is full, it must be un-mounted with the [UNMOUNT] key and reformatted to recover free space. *(do not forget to back-up your audio files before reformatting your card).*
- The SD cards being formatted as UDF media and being "write protected", computers can not alter the content of the card; copying, writing or deleting files on the SD card connected on a computer is not possible.
- The tiny locker switch (write protect locker) aside the SD Card is ignored by the SX-R4+; thus the SXR4+ can record on the card whatever is the switch position.

Cards limitations:

Due to some SD cards limitations, recording 16 tracks @ 96kHz is not yet guaranteed; SD cards performance tests are under course. At the time of publication, we recommend following cards:

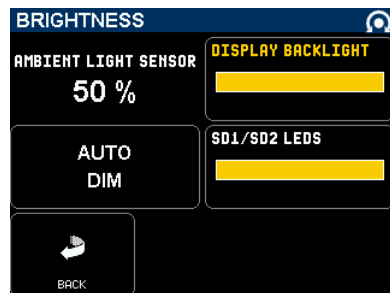
- SanDisk Ultra 16, 32 or 64Gb: 16 tracks @48kHz; 12 tracks, @96kHz with 2 seconds of pre-recording
- SandDis Extreme16, 32 or 64Gb: 16 tracks @48kHz; 16 tracks @96kHz with 2 seconds of pre-recording seems to work but not yet certified
- SandDisk ExtremePro16, 32 or 64Gb: 16 tracks @48kHz; 16 tracks @96kHz with 2 seconds of pre-recording seems to work but not yet certified

Tips: if your card seems to be slow and stop recording a few second after recording has started, try reducing the pre-record time to 2 sec only.

6. SYSTEM SETUP

The [SYSTEM] menu gives access to various system parameters, system informations and WLAN settings for the Wifi interface.

	SYSTEM	
Adjust the brightness of the TFT backlight and of the SD1& SD2 Led	 BRIGHTNESS	 FILETAG
Set the function of each push button	 PUSH BUTTON	 DATE
		 TIME
Return to SETUP page	 BACK	 SYSTEM INFO
		 WLAN
		Set system date
		Set time of the system real time clock time
		Displays system information
		Set WiFi Wlan parameters

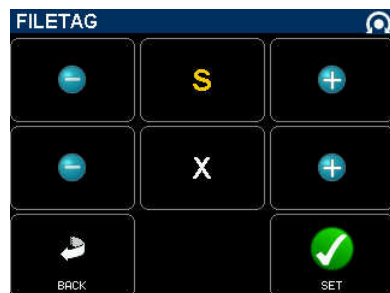


[LIGHT SENSOR] indicates the ambient light intensity

[DISPLAY BACKLIGHT] select this field and then set the backlight intensity using the encoder wheel.


[AUTO DIM] when activated the backlight and led's intensity are automatically dimmed according to the ambient light.

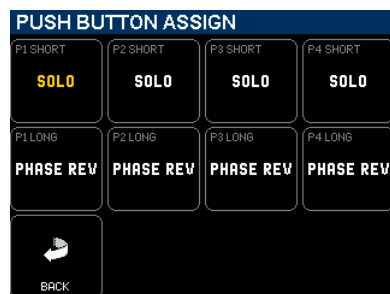
[SD1/SD2 LEDS] select this field and then set the leds intensity using the encoder wheel.



[FILETAG] is a unique identifier automatically generating the audio files name. The first 2 characters can be modified by the user, which might be useful to identify the recorder unit when multiple recorders are used on the same production.

The last 4 digits are automatically incremented by 1 at each new take. When the numbering reaches 9999 it starts again at 0000 and the alphabetic prefix is incremented to the next value (SX → SY).

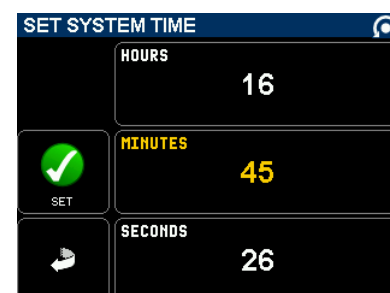
Change the values with the [+] & [-] keys or the encoder wheel then validate with the  key




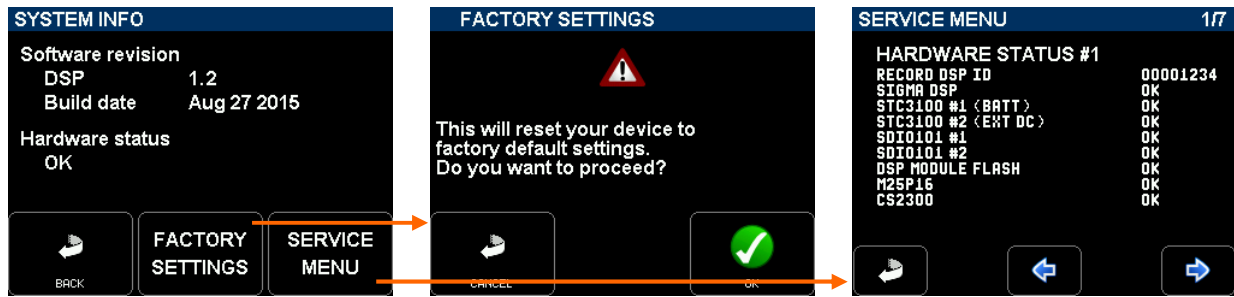
The [PUSH BUTTON ASSIGN] page allows users to program the functions of each push button; select a field - highlighted in yellow - then use the encoder wheel to select a function.

Push buttons of faders 1 to 4 have two programmable functions; the selected functions are called respectively by a short or a long pressure on the knob.

Note: the function activated by the switches of faders 5 & 6 is not yet implemented



[SYSTEM TIME] and [SYSTEM TIME] are set in a similar manner; select a field then use the encoder wheel to set the value. Validate the selection with the  key.



[SYSTEM INFO] gives access to:

Reset all parameters of the recorder with factory default settings

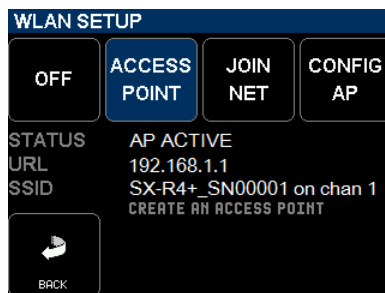
Spread hardware informations over 7 pages

6.1 WIFI WLAN SETUP

The SONOSAX SX-R4+ can communicate with a smartphone, a tablet or even a laptop through its integrated WiFi interface; for sake of clarity only "tablet" will be mentioned on following chapters.

The WiFi interface enables remote control of functionalities such as Record Start/Stop, track arming, metadatas editing and displaying the modulometers by using the web browser of a tablet.

The SX-R4+ can be configured as a single Access Point to communicate directly to one WiFi device or can be configured to join an existing WiFi network. Press on the [WLAN] key on the [SYSTEM] page to access the WiFi configuration's page.



[OFF] turns the WiFi interface off to save on battery.

[ACCESS POINT] activates the WiFi interface as single Access Point with its unique SSID.

[JOIN NET] activates the WiFi interface and join an existing network once the SX-R4+ has been configured with the. [CONFIG AP]

[CONFIG AP] a special web page is broadcasted so that the WiFi interface of the SX-R4+ can be configured using an external WiFi device - such as a tablet - to join an existing WiFi network .

6.1.1 Set the SX-R4+ as [ACCESS POINT]

The [ACCESS POINT] key turns the WiFi interface on and configures the SX-R4+ as a single access point. In this mode, the SX-R4+ broadcasts a WiFi network with its own SSID; only one external device such as a tablet can be connected to the SX-R4+ network.

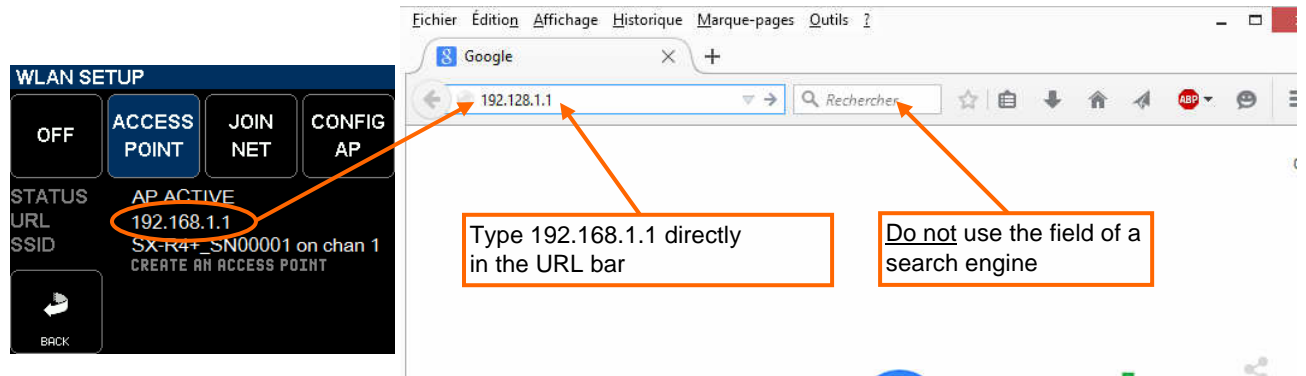
Connecting your tablet to the SX-R4+:

- open the WiFi manager of the tablet; all available WiFi network will be listed
- locate and select the SX-R4+ network named [SX-R4+_ _SNxxxxxx] (*xxxxxx denotes the serial nr of your SX-R4+*)
- confirm with "connect" to join the WiFi network of your SX-R4+
- open the web browser of the tablet and type directly on the URL bar: 192.168.1.1
- wait a few seconds until the SX-R4+ webpage appears on the web browser

6.1.2 SX-R4+ on your web browser

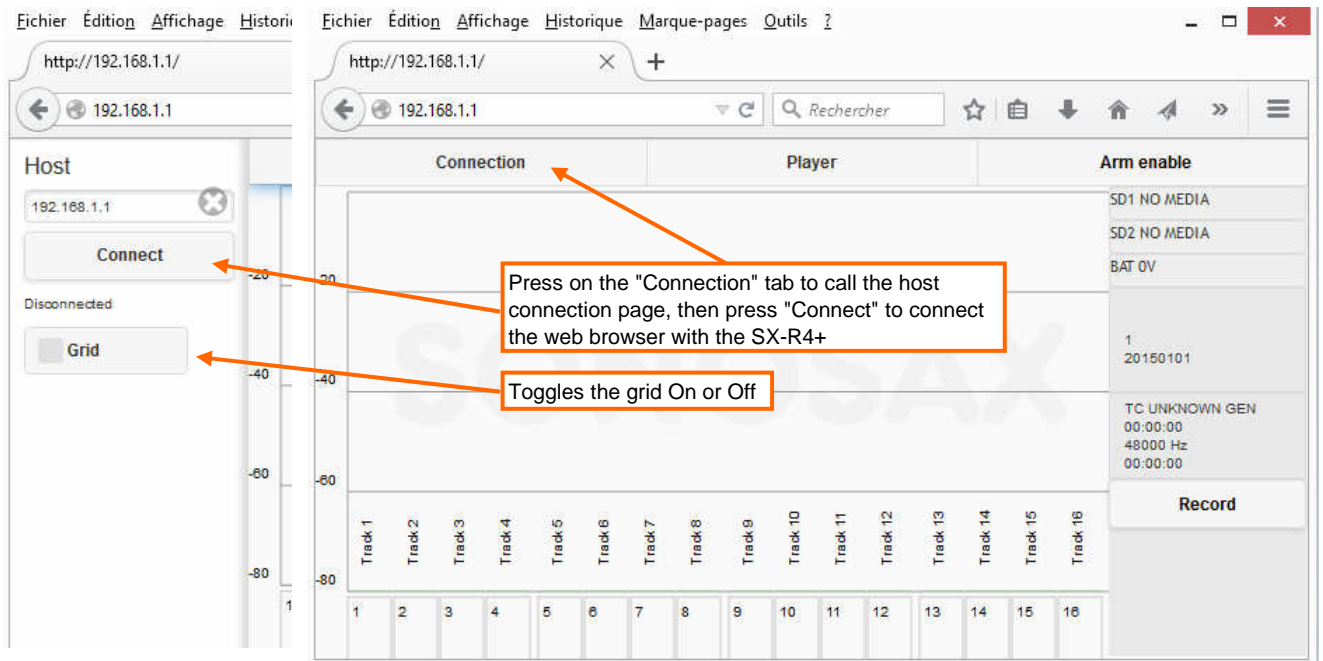
Once your tablet, or other WiFi device, is connected to the SX-R4+ network, open the web browser of the tablet and type the URL: 192.168.1.1 directly in the URL bar (*not in the search field of the browser !*)

Wait until the SX-R4+ web page is displayed in the web browser as illustrated below; depending on the WiFi interface and the web browser of the tablet it may take several seconds to load.



Once the page is loaded, the web browser must be connected with the SX-R4+ interface. Press on the "Connection" button on the web page, a new window appears on the left; press the "Connect" button to connect the web browser with the SX-R4+.

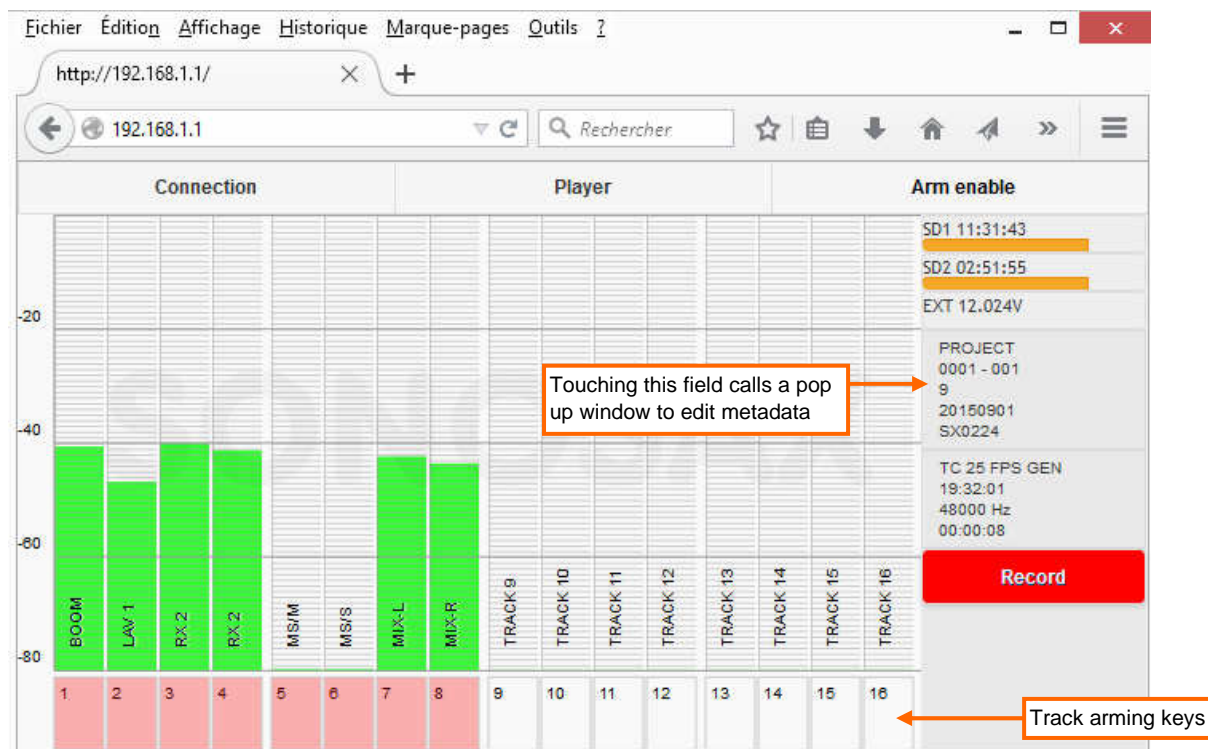
User can also chose to display a grid in the modulometers area.



IMPORTANT NOTE: the web pages of the SX-R4+ are coded in HTML5; not all web browsers fully support HTML5 encoding. At the time of this release only **Safari** (MacOS) and **Firefox** (Windows or Android) are properly displaying the web page.

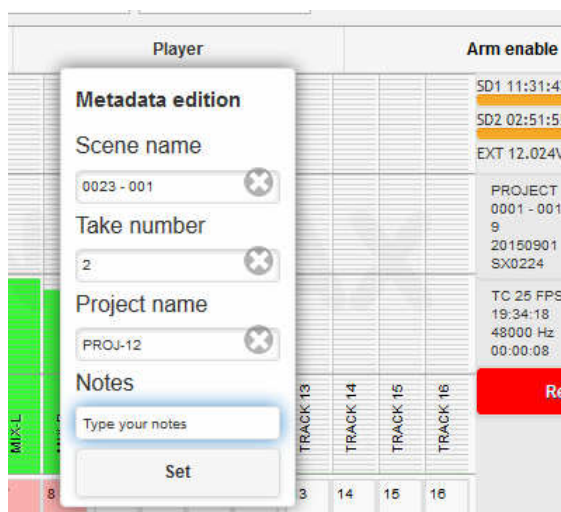
On web browsers such as Opera, Internet Explorer or Google Chrome the SX-R4+ web pages appears shifted and/or incomplete.

Once the connection between the web browser and the SX-R4+ interface is established, the web page appears as illustrated below. All informations posted in the SX-R4+ main screen are displayed in the webpage.



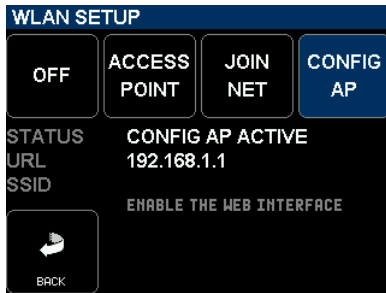
The three tabs on the top of the page, the "record" button and the metadata field provide with following functionalities:

- **Connection:** post a page to connect/disconnect the browser to the SX-R4+ and toggle the grids On or Off.
- **Player:** not yet implemented
- **Arm enable:** Enable / disable the track arming keys at the bottom of the page. The tab turns red when the keys are enabled (active). When enabled, press on a "Track arming key" at the bottom of the page to arm or disarm a track. Once the tracks are armed it is advisable to disable the keys to avoid arming/disarming a track inadvertently.
- **Record:** press the button to Start / Stop recording; button is flashing in record ready mode and steady in red when recording
- **Metadata:** touching the metadata field calls a pop up window in which metadatas can be edited. Select a field then type data using the keypad of your tablet. When the editing is completed, validate the changes with the [SET] key.



6.1.3 Set the SX-R4+ as WiFi client

The SX-R4+ can join an existing WiFi network as "client". However, as the SX-R4+ can not browse through available WiFi network, its interface must be manually configured to join a network.

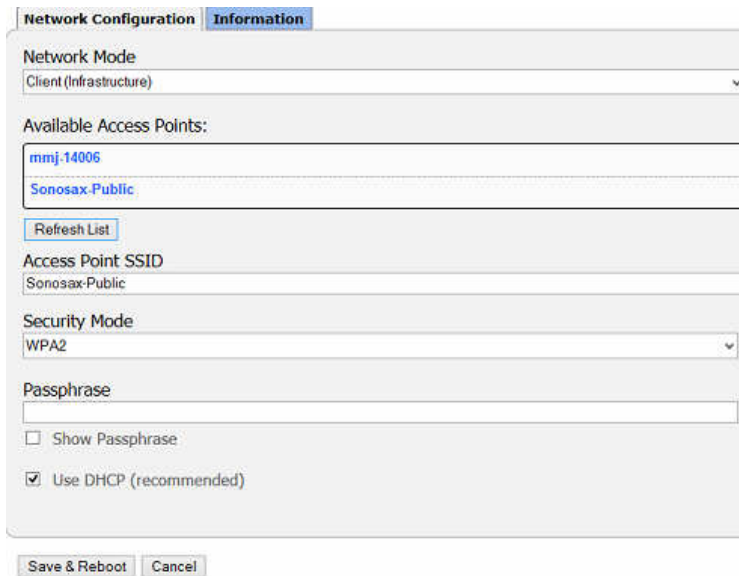


Press on the [CONFIG AP] key to turns the WiFi interface on; message is posted confirming that the access point configuration page is active.

A network configuration page is broadcasted by the SX-R4+ and must be loaded in the web browser of the tablet to configure the WiFi module of the SX-R4+.

Connect your tablet to the WiFi configuration page of the SX-R4+ as follow :

- open the WiFi manager of the tablet; all available WiFi network will be listed
- locate and select the SX-R4+ network named [SX-R4+_ _SNxxxxxx]
- confirm with "connect" to join your SX-R4+
- open the web browser of the tablet and type directly on the URL bar: 192.168.1.1
- wait a few seconds until the "WiFi Module Configuration" page appears on the web browser



- Select "Client infrastructure"

- Click on the "Refresh List" button to list available network

- Chose the WiFi network to be accessed by the SX-R4+ in the available list

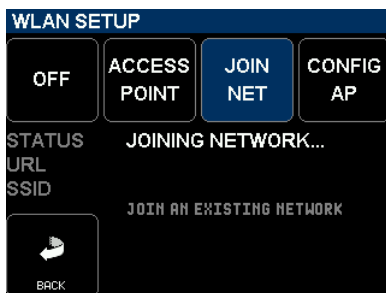
- The selected SSID appears in this field

- Select the security mode as defined by the existing network

- Eventually type the password to access the chosen WiFi network

- Confirm with "Save & Reboot"

Once the WiFi module of the SX-R4+ is configured as client, press on the [JOIN] button to join the chosen network.



NOTE: When the WiFi interface is turned On, a WiFi icon is flashing on the upper right corner on the main screen, once the WiFi communication is established the WiFi icon is posted steadily

7. APPENDIX



7.1.1 iXML implementation chart

VENDOR MODEL		SONOSAX Recorders version 4.0 and greater		DATE	01.06.2011	
IXML MASTER TAG		IXML SUB TAGS		WRITTEN	READ	REMARKS
<PROJECT>				O	O	Max 8 chars
<SCENE>				O	O	Max 8 chars
<TAKE>				O	O	Range: 001..999
<TAPE>				O	O	Working day: YYYYMMDD
<CIRCLED>				O	O	
<WILD TRACK>				O	O	
<FALSE START>				O	O	
<NO GOOD>				O	O	
<FILE_UID>				O	O	= BWF Originator Reference
<UBITS>				X	X	
<NOTE>				O	O	Max 32 chars
<BEXT>				O	X	
<USER>				X	X	
<SPEED>						
<SPEED>				O	O	
<SPEED>	<NOTE>			X	X	
<SPEED>	<MASTER_SPEED>			X	X	
<SPEED>	<CURRENT_SPEED>			X	X	
<SPEED>	<TIMECODE_RATE>			O	O	
<SPEED>	<TIMECODE_FLAG>			O	O	
<SPEED>	<FILE_SAMPLE_RATE>			O	X	
<SPEED>	<AUDIO_BIT_DEPTH>			O	O	
<SPEED>	<DIGITIZER_SAMPLE_RATE>			O	O	
<SPEED>	<TIMESTAMP_SAMPLES_SINCE_MIDNIGHT_HI>			O	O	
<SPEED>	<TIMESTAMP_SAMPLES_SINCE_MIDNIGHT_LO>			O	O	
<SPEED>	<TIMESTAMP_SAMPLE_RATE>			O	X	
<SYNC_POINT_LIST>						
<SYNC_POINT_LIST>				X	X	
<SYNC_POINT>	<SYNC_POINT_TYPE>			X	X	
<SYNC_POINT>	<SYNC_POINT_FUNCTION>			X	X	
<SYNC_POINT>	<SYNC_POINT_COMMENT>			X	X	
<SYNC_POINT>	<SYNC_POINT_LOW>			X	X	
<SYNC_POINT>	<SYNC_POINT_HIGH>			X	X	
<SYNC_POINT>	<SYNC_POINT_EVENT_DURATION>			X	X	
<HISTORY>						
<HISTORY>				X	X	
<HISTORY>	<ORIGINAL_FILENAME>			X	X	
<HISTORY>	<PARENT_FILENAME>			X	X	
<HISTORY>	<PARENT_UID>			X	X	
<FILE_SET>						
<FILE_SET>				O	O	
<FILE_SET>	<TOTAL_FILES>			O	O	
<FILE_SET>	<FAMILY_UID>			O	O	= BWF Originator Reference
<FILE_SET>	<FAMILY_NAME>			O	O	
<FILE_SET>	<FILE_SET_INDEX>			O	O	
<TRACK_LIST>						
<TRACK_LIST>				O	O	
<TRACK_LIST>	<TRACK_COUNT>			O	O	
<TRACK>	<CHANNEL_INDEX>			O	O	
<TRACK>	<INTERLEAVE_INDEX>			O	O	
<TRACK>	<NAME>			O	O	
<TRACK>	<FUNCTION>			X	X	
						O = YES
						X = NO
NOTES:						
Not all Sonosax recorders support track naming and NOTE						

SX-R4+ SD CARD TESTING PROCEDURE

Document revision 1.0, April 2019

SD card testing procedure to ensure seamless recordings

Format your SD card while inserted the recorder using exclusively the SX-R4+ formatting utility in the SD card menu.

Prepare a specific configuration to test your SD Cards as below:

- Route an input to all 16 tracks such as XLR1 to all tracks (no need to feed any audio signal)
- Arm all 16 tracks
- Turn the Generator ON in the Output menu (any level can be chosen) and check that all tracks display the modulation level
- If you wish to test both cards at the same time, make sure the “SD2 Rec Tracks” is set to MIRROR
- Set the sampling freq to 96k and a pre-record time of 4 seconds
- On the main screen check the two orange bars just under each of the SD1 and SD2 cards remaining time indicator, these two bars indicate by how much the internal RAM buffer is filled

Start recording and witness these two orange bars, they must drop rapidly to almost to zero as soon as the recording has started, indicating that the RAM buffer is flushing correctly.

- A bar staying high or continuously raising indicate that the SD card is too slow for that particular setting
- A bar raising high occasionally, then dropping again may indicate that the SD card may have some issues

Continue recording until the SD Card is full, at which point the recorder will stop automatically. If the recording stop earlier and the SPEED warning is flashing, then your SD card is too slow for that setting. It usually happens within a minute after the recording has started. If this happen later at any moment, then one can assume that the card is slow in writing on some sectors.

Testing your cards for 192kHz recordings

Once your SD Cards have successfully passed the test described above, reformat them and then set the sampling frequency to 192kHz.

The maximum number of tracks that can be safely and seamlessly recorded at 192kHz may vary from 8 to 12 tracks depending on your SD cards.

The number of recordable tracks decreases when using both cards simultaneously, therefore use only one card at a time to record a higher count of tracks @ 192kHz.

To check the maximum number of tracks your SD Cards is capable to record, use the same procedure as above but arming 8 tracks only. Check that the RAM buffer is flushing properly, then successively increase the number of armed track by 1 until the RAM buffer no longer flushes, which will lead to a SPEED error. At this point you know that the maximum number of track is one count below the SPEED error.

OPTIMIZATION OF WIRING AND CONNECTIONS AROUND THE SONOSAX SX-R4+

The SONOSAX SX-R4 + features a very wide audio bandwidth and an extremely low noise floor; therefore it does not hide or "mask" any parasitic noise that may possibly be induced when connecting peripheral equipments, even if these parasitic noises are below the noise floor of the SX-R4 +.

If these noises occur, they can be heard on the headphone output of the SX-R4 + but by no means they are recorded in the audio files of the recorder.

This document explains how to optimize your wirings and connections to avoid these noises.

1. **Mini XLR connection** (*Input 5 & 6 and Line Out*)

Never bridge the cable shielding (pin 1 = Gnd) with the housing of the TA3 connector.

2. **AES I/O**

If an analogue connection already exists between the SX-R4 + and a peripheral equipment and a digital connection must also be established between these two devices, then the shielding of the AES cable must not be connected to pin 1 of the TA3 connector "AES I/O" on the SX-R4 + side. (*Balanced & Floating*)

3. **Power cable DC IN SX-R4+**

Add a ferrite 320 Ω at 100 MHz (SX811327) to the power cable, as close as possible to the SX-R4+.

In case this ferrite does not cancel all the parasitic noises, make a loop with the cable around the ferrite as illustrated in the figure below.

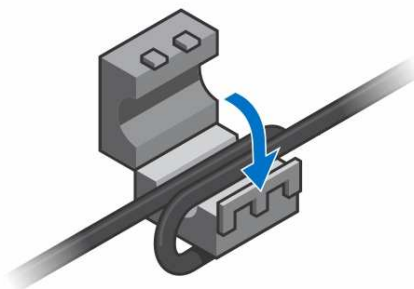
For larger cable diameter use a 220 Ω at 100 MHz (SX811229)

4. **Headphone cable**

If parasitic noises still persist, add a 240 Ω^* or 320 Ω^{**} @ 100MHz ferrite to the Phone cable as close as possible to the SX-R4+. If this ferrite does not cancel all the parasitic noises, make a loop with the cable around the ferrite as illustrated in the figure below.

5. **Power cable DC OUT SX-R4+ to DC IN SX-AD8+**

Always add a ferrite 320 Ω at 100 MHz, SX811327 (DIGIKEY 240-2075) to the power cable



NOTE: As a general rule, the ferrites should be placed as close as possible to the disturbing element.



SX811229 (DIGIKEY 240-2124)
220 @ 100MHz
Cable \varnothing 9mm max

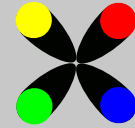


* SX811244 (DIGIKEY 240-2233)
240 @ 100MHz
Cable \varnothing 3.5mm max



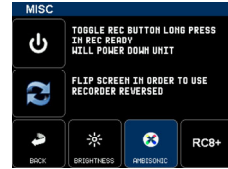
**SX811327 (DIGIKEY240-2075)
320 @ 100MHz
Cable \varnothing 6.5mm max

AMBISONIC MIC



AMBISONIC MODE ACTIVATION

Ambisonic mode must be activated in the menu SETUP/SYSTEM/MISC, button 'AMBISONIC'.
Once activated, the ambisonic decoder replaces inputs LINE5-6 and AUX AES in the INPUTS menu.



AMBISONIC DECODER

The Ambisonic decoder transforms format A to format B.
Format A must be present in the 4 XLR inputs. They can be assigned to tracks if format A needs to be recorded.

The menu INPUTS/AMBISONIC is the decoder interface:

- Select mic position using the three upper buttons
- Select format B target tracks
- Select Format B channels ordering: AmbiX or Fuma.

The decoder can then be enabled by pressing the 'RUN' button. Multiple actions will take place:

- All XLR inputs are enabled (with 48V, no phase, no delay, 60Hz LF cut filter)
- All gain are linked to P1
- If assigned to tracks, format A channels (XLR inputs) are renamed
- Format B tracks are assigned, armed and renamed



AMBISONIC MONITORING

Ambisonic monitoring can be done for headphones, any output and mix tracks.

Both format A & B can be monitored, in record and playback mode.

To enable ambisonic monitor:

1. go to the corresponding monitoring/output/mix menu
2. apply a long press in the first track pair where ambisonic tracks are routed (5-6 on screenshot)
3. Choose AMBI-A or AMBI-B depending on the track format
4. The monitoring is applied automatically to the 4 ambisonic tracks



AUDIO INPUTS



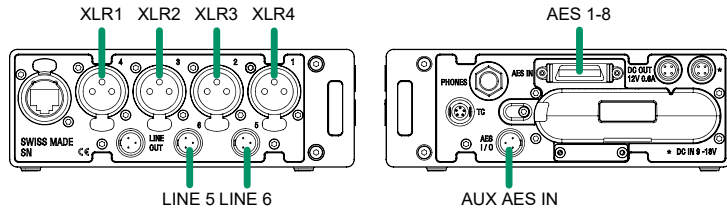
PHYSICAL

XLR1-4: balanced mic/line or AES/AES42 (max 192k)

LINE 5-6 (TA3): balanced line level inputs

AUX AES IN (TA3): digital AES (max 96k)

AES1-8 (3M accessory): 4x AES3 (8 channels, max 192k)

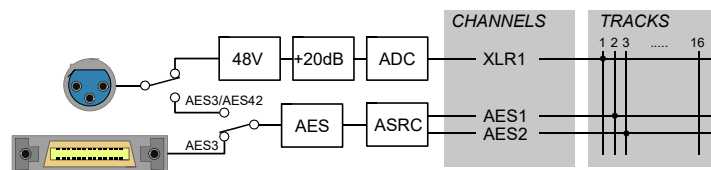


LOGICAL

All inputs must be assigned to tracks in order to be recorded.

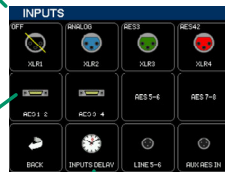
XLR inputs share digital receiver and asynchronous sample rate converters with accessory AES inputs.

Diagram thereagainst shows XLR1 and AES12 resource sharing.



INPUTS MENU

Touch any button to access input configuration
XLR inputs configuration is shown using colors:



AES INPUTS

3M multipin connector icon is displayed only when input is not used by XLR input

INPUT DELAY

Each input can be delayed from 0 to 60ms, step 0.1 ms.

INPUT MENU

Headphones monitor a solo on that input in this menu

An input have one or two channels. Each channel have the following parameters:

- LF CUT (OFF, 60 Hz, 120 Hz)
- Phase reversal
- Level
- Track assignation

AMBISONIC MIC

The Ambisonic decoder is described in another specific chapter, see Ambisonic Mic documentation.

POT INPUT GAIN MENU

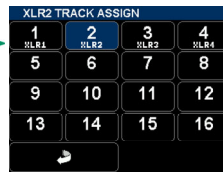
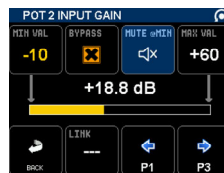
XLR inputs only - POT as input gains only

MIN/MAX values define pot gain range

When BYPASS is set, input level is fixed to 0dB

When MUTE @MIN is set, input is mute when pot is closed

LINK allow an input level to be linked to another pot



INPUT TRACK ASSIGN

Buttons 1 to 16 represent tracks. Assignment is active when button is blue. Multiple assignment is possible.



XLR INPUT TYPE - XLR inputs only

Configure XLR input type

For US version: GAIN has 3 positions: 0, +20 and +40 dB

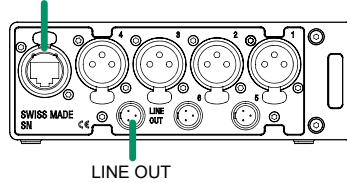
AUDIO OUTPUTS



PHYSICAL

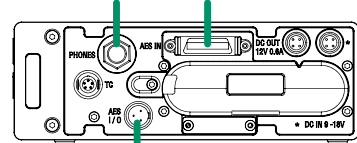
HEADPHONES: 2 channel 1/4" jack and accessory
 LINE OUT: 2 channels unbalanced line output (TA3)
 AUX AES OUT: 2 channels digital AES (TA3)
 OPTION CARD: 2 channels balanced or 4 channels unbalanced or 4 channels AES (XLR5)

OPTION CARD



LINE OUT

HEADPHONES

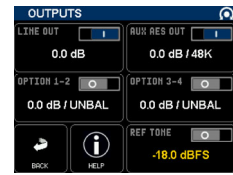
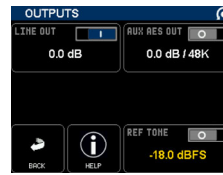


AUX AES OUT

OUTPUTS MENU

All outputs are listed in that menu.

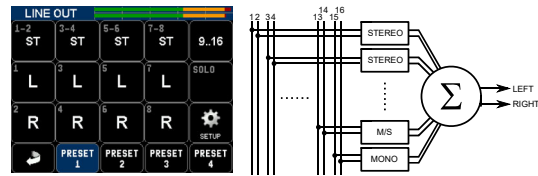
To enable/disable an output, keep the button pressed until power icon change. Push the button to enter routing setup. When Reference tone generator is enabled, a 1kHz sinus wave is injected in all tracks and outputs. This means that output routing is disabled, but output level is still working.



4 CHANNELS OUTPUT
 OPTION CARD INSTALLED

OUTPUT ROUTING SETUP MENU

The routing selection is identical to headphones monitoring, see headphones monitoring for detailed instructions. Solo button enable a solo of the selected track to the output channels (and not in the headphones). Presets are independant from all other outputs or headphones. Press setup to enter OUTPUT SETUP menu.



OUTPUT SETUP MENU

Level: output level [dB]
 Mixing Level: attenuation to be applied to each track when summing (mixing) multiple tracks. 0dB: no attenuation, -1.5db (default): sources have no phase coincidence, -3dB: recommended for phase coincident sources, -6dB: only used if the sources may be absolutely in phase.
 ALARM, REC TONES: level and enable status

AUX AES OUT SPECIFIC

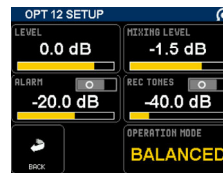
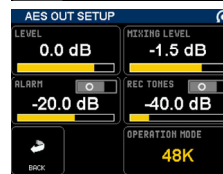
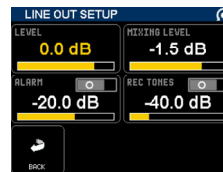
OPERATION MODE: 48K, 96K, 192K. That output sampling frequency follows recorder sampling: if sampling is set to 44.1, 88.2 or 176.4k, output frequencies become 44.1, 88.2 or 176.4k.

OPTION 1-2 SPECIFIC

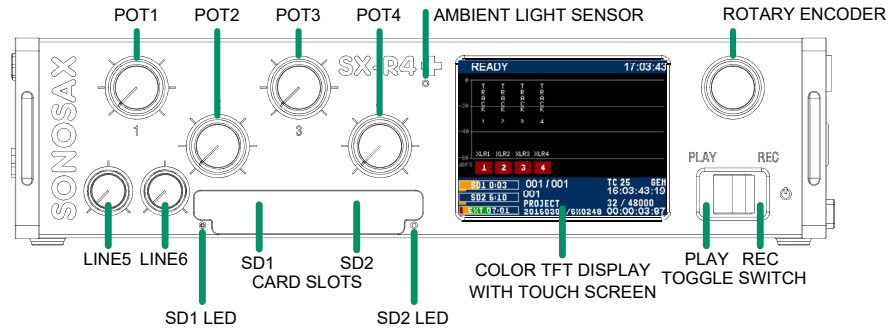
OPERATION MODE: BALANCED, UNBAL, AES

OPTION 3-4 SPECIFIC

OPERATION MODE: UNBAL, AES
 Not available when option 1-2 is enabled and configured as BALANCED.



FRONT PANEL

**POTs 1-4**

Potentiometers with push-on switches, can be used as input gain or faders.

Push-on switches actions (short/long presses) are user-programmable, see SETUP/SYSTEM/PUSH BUTTONS menu.

LINE 5 & 6

Retractable potentiometers with a function switch.

Analog volume control dedicated to Line input 5 & 6.

Function switch actions (push in, release) are user-programmable, see SETUP/SYSTEM/PUSH BUTTONS menu.

ROTARY ENCODER

Multifunction encoder with push-on switch. Primary usage is to control the headphones volume, but when the icon is displayed on top right of the screen, rotary encoder is used to scroll specific functions or values.

In PLAY state, rotary encoder is used to move playback position.

Push-on switch actions (short/long presses) are user-programmable, see SETUP/SYSTEM/PUSH BUTTONS menu.

TOGGLE SWITCH REC

In standby state, used to power on the recorder. In all other state, the switch is dedicated to control record start/stop:

- READY/PLAY/PAUSE/STOP states: short press starts record, long press can power off unit (see SETUP/SYSTEM/MISC)
- RECORD state: short press adds an index, long press stops record

TOGGLE SWITCH PLAY

In READY/RECORD states, use this switch to return to main screen. In playback mode:

- PLAY state: short press pauses/resumes playback, long press stops playback
- RECORD state: short press adds an index, long press stops record

SD CARD SLOTS

SDHC/SDXC cards only, class 10 and higher recommended. However, do not use high end cards with extreme byte rate enhanced for video recording.

Press to insert with notched corner oriented toward the right. Press again to eject.

LEDs indicates the following status:

- BLINKING: ready to record on this media
- ON: recording in progress
- OFF: SD card not present, not formatted or no track armed on this media

MAIN SCREEN



RECORDING (Red circle icon)

ALARM (Red triangle icon)

RECORDER STATUS (Vertical bar icon)

AT LEAST ONE INPUT IS PHASE REVERSED (Circle with slash icon)

TOUCH SCREEN IS LOCKED (Lock icon)

REFERENCE TONE GENERATOR IS ENABLED (Waveform icon)

METADATA WILD TRACK (Yellow diamond icon)

WIFI (BLINK UNTIL A HOST IS CONNECTED) (Wi-Fi icon)

DATE / TIME 16:02:13

METERS AREA (Vertical scale from 0 to -80 dBFS)

TRACK NAME (Labels: HOB, R1, R2, R3, MIX, TR)

INPUT SOURCE (Labels: XLR1, XLR2, XLR3, XLR4, MIX1, MIX2)

TRACK NUMBER (Labels: 1, 2, 3, 4, 7, 8)

AVAILABLE COLORS:

1	2	3	4
5	6	7	8

SD1 8:16	001 / 001	TC 25	GEN
SD2 2:04	001	15:02:13:00	
EXT 07:01	PROJECT	32 / 48000	
	20160226/SX0238	00:00:03:99	

MEDIA & POWER STATUS

MEDIA RELATIVE USED SPACE (Bar chart)

PRE-RECORD BUFFER STATUS (Bar chart)

POWER SOURCE (Bar chart)

SD1 8:16

SD2 2:04

EXT 07:01

REMAINING TIME HH:MM

REMAINING TIME HH:MM

TIMECODE & PROGRAM TIME

TIMECODE FORMAT TC 25 GEN

TIMECODE VALUE HH:MM:SS:FF 15:02:13:00

BITS PER SAMPLE 32 / 48000

PROGRAM TIME HH:MM:SS:DD 00:00:03:99

TIMECODE SOURCE:

- GEN (WHITE): GENERATOR
- GEN (RED): WAITING FOR JAM
- JAM: JAMMING TO EXT SIGNAL
- JMD: GENERATOR JAMMED

SAMPLING FREQUENCY YELLOW WHEN USING PULL-UP @48048 Hz

METADATA

SCENE 001 / 001

TAKE 001

PROJECT PROJECT

WORKING DAY 20160226/SX0238

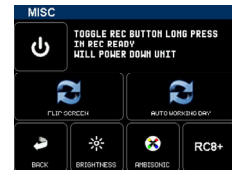
FILETAG
(WAV FILE NAME FORMAT IS:
<FILETAG>Sn.WAV
WHERE n IS THE TRACK COUNT)

MENU MISC



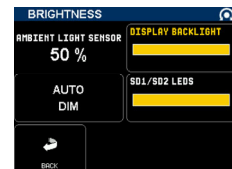
SYSTEM MENU

First power icon button: when enabled, user can power off unit by long pressing REC button in ready state
 FLIP SCREEN: 180° screen rotation, used for left-handed or if you prefer that way
 AUTO WORKING DAY: when set, do not ask for a new working day at startup, automatically set it
 AMBISONIC menu is described into another page



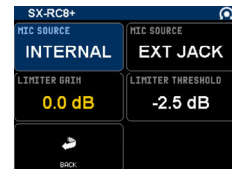
BRIGHTNESS

AMBIENT LIGHT SENSOR: indicates the front panel ambient light sensor (located near the SX-R4+ engraving)
 AUTO DIM: when enabled, the backlight and leds intensity are automatically dimmed between minimum and selected intensity according to ambient light.
 DISPLAY BACKLIGHT: select this field then set the backlight intensity using the rotary encoder.
 SD1/SD2 LEDES: select this field then set the LEDs intensity using the rotary encoder.



SX-RC8+

SX-RC8+ setup page. All parameters concerns the microphone input, which have a gain stage with an automatic level control
 MIC SOURCE: internal or external jack
 LIMITER GAIN: -54 to +36 dB
 LIMITER THRESHOLD:



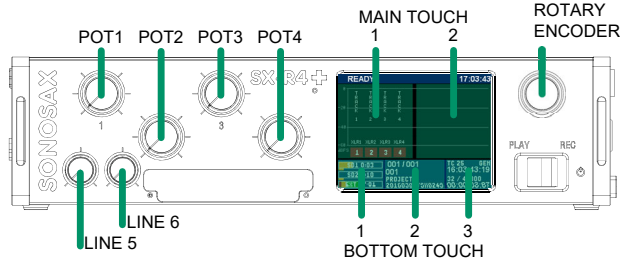
PUSH BUTTONS



The PUSH BUTTONS menu let you select an action to be executed when a button is pressed. There are two press events: short push (first line) and long push (second line), except for LINE 5/6 knobs, where the events are button push in and release.

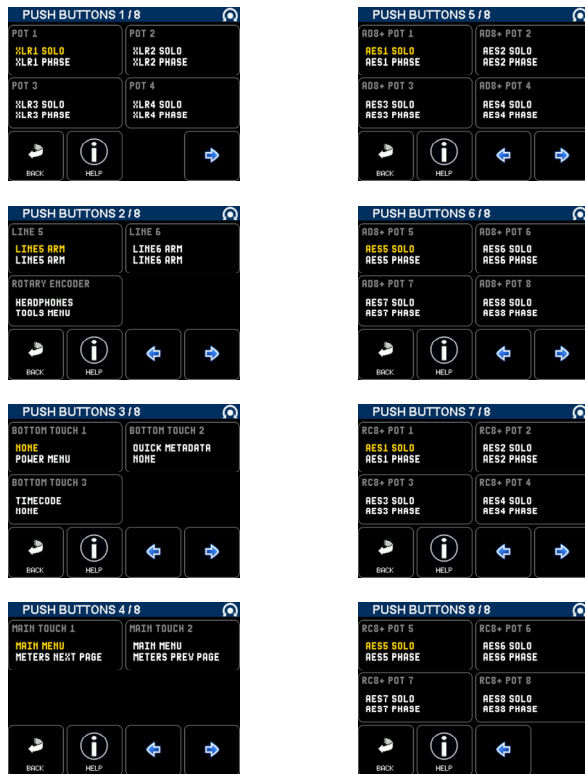
AVAILABLE ACTIONS

NONE	NO ACTION, EVENT IGNORED
XLR1 SOLO XLR2 SOLO XLR3 SOLO XLR4 SOLO AES1 SOLO AES2 SOLO .. AUX AES2 SOLO	ENTER INPUT MENU, SOLO ON THAT INPUT
XLR1 PHASE .. XLR4 PHASE AES1 PHASE ... AUX AES 2 PHASE	TOGGLE INPUT PHASE
XLR1 ARM XLR2 ARM XLR3 ARM XLR4 ARM AES1 ARM ... AES8 ARM LINE5 ARM LINE6 ARM AUX AES ARM	TOGGLE INPUT TRACK ARMING STATUS
USER SETTING 1 USER SETTING 2 ... USER SETTING 8	RECALL USER SETTING 1 RECALL USER SETTING 2 ... RECALL USER SETTING 8
METADATA QUICK METADATA HEADPHONES TOOLS MENU TIMECODE POWER MENU TAG LAST TAKE TRACK ARMING TRACK SOURCE TRACK NAME TRACK COLOR MIX SETUP	METADATA MENU METADATA EDIT IN MAIN MENU HEADPHONES MENU TOOLS MENU TIMECODE MENU POWER MENU TAG LAST TAKE REC TRACKS MENU (ARMING) REC TRACKS MENU (SOURCE) REC TRACKS MENU (NAME) REC TRACKS MENU (COLOR) MIX SETUP MENU
DAY / NIGHT MAIN MENU SX-RC8+ MIC METERS NEXT PAGE METERS PREV PAGE	TOGGLE MAIN SCREEN DAY / NIGHT MAIN MENU SX-RC8+ MICROPHONE ENABLE DISPLAY NEXT METER PAGE DISPLAY PREVIOUS METER PAGE



PUSH BUTTON MENU

The menu is split into 8 pages, navigation is done using left/right arrows buttons. Screens below show factory defaults.



NOTE

The TOOLS menu should not be assigned on a touch button (due to touch lock feature).
The MAIN MENU should always be assigned to a button.
The MAIN SCREEN upper bar touch area always enter MAIN MENU.
TOGGLE PLAY/REC buttons are not customizable.

RECORD TRACKS



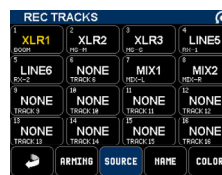
TRACK ARMING

Select track to arm/unarm.
 Not available during record or playback.
 Button upper-left: track name.
 Button lower-left: track source .



TRACK SOURCE

Select track source using rotary encoder.
 Not available during playback.
 Button lower-left: track name.



TRACK NAME

View and edit all track names. Edition open the track name screen, which is also available in the metadata menu.
 Button lower-left: track source.



TRACK COLOR

View and edit track colors.
 Use the rotary encoder to select over the 8 available colors.



SETUP MENU



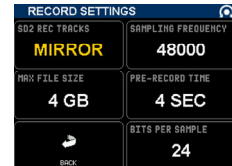
SETUP MENU

User Settings and System menus is not described in that page as it has a dedicated one.



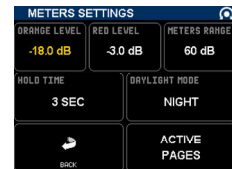
RECORD SETTINGS

SD2 REC TRACKS: MIRROR records all armed tracks to both SD1 & SD2; MIX ONLY records only MIX into SD2.
SAMPLING FREQUENCY: 44.1, 48, 48.048, 88.2, 96, 176.4 or 192k
MAX FILE SIZE: maximum size of the WAV file. When a record reaches that size, an index is added. By defining more than 4GB automatically enable RF64 file format when file size reaches 4GB.
PRE-RECORD TIME: 0 to 20 seconds, not always respected (best effort)
BITS PER SAMPLE: select either 32 or 24 bits. 24 bits is the compatibility mode.



METERS SETTINGS

ORANGE LEVEL: select the level where meters will start to be displayed in orange.
RED LEVEL: select the level where meters will start to be displayed in red (must be < orange level).
RANGE: select main screen meters range.
HOLD TIME: set the time during which the peak level is posted (peak hold) (0 to disable).
DAYLIGHT MODE: with NIGHT, main screen background color is black, with DAY background color is white.
ACTIVE PAGES is a main screen pages selection. Use METERS NEXT/PREV PAGE push-button event to change page.



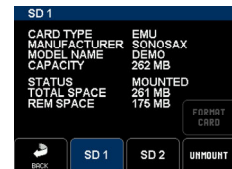
TIMECODE

The SX-R4+ can simultaneously receive and generate timecode at any conventional frame rates.
 When EXT JAM SYNC is selected, the generator jams its internal generator to the incoming signal.
 When a frame rate is selected, generator will use the selected frame rate.
RECEIVER (left side) shows incoming timecode value and frame rate.
GENERATOR (right side) shows current timecode value and frame rate.
SET FROM TIME enters a menu allowing user to sync timecode generator to real time clock time.
SET MANUAL enters a menu allowing user to set manually the timecode.



SD CARDS

The SX-R4+ uses UDF as file system for SD cards. All SD cards must be formatted by the SX-R4+ to be used by the recorder. This menu provides information about SD card medias and allow user to format SD cards.
 To format a card, insert it in a slot and select either SD1 or SD2. If mounted, unmount it and press the **FORMAT CARD** button. All information on the card will be erased. After format, card is automatically mounted.



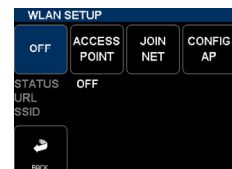
POT SETUP

SX-R4+, SX-AD8+ and SX-RC8+ pots setup page:
 - **INPUT GAINS** configures POTs 1 to 4 as input gains.
 - **FADERS -60..+12 dB** button enable POTs 1 to 4 as faders, with a -60 to +12dB level curve.
 - **FADERS -60..+24 dB** button enable POTs 1 to 4 as faders, with a -60 to +24dB level curve.
 In fader operation, closing the fader always mutes the signal.



WLAN SETUP

OFF: WiFi module is disabled.
ACCESS POINT: enable an access point where wireless client can connect with. Network name (SSID) is SX-R4+_SN where SN is the SX-R4 serial number (written on left panel), no password is required. Once connected to it, open a web browser and use http://192.168.1.1 as URL.
JOIN NET: let the SX-R4+ connects to an existing network. Network name and password must be configured using **CONFIG AP**.
CONFIG AP enables the SX-R4+ as an access point with a configuration page. Network name (SSID) is SX-R4+_SN where SN is the SX-R4 serial number (written on left panel), no password is required. Once connected to it, open a web browser and use http://192.168.1.1 as URL. Follow instruction to connect to your network.



MENU SYSTEM



SYSTEM MENU

PUSH BUTTONS and MISC menus are not described in that page as they have a dedicated one.



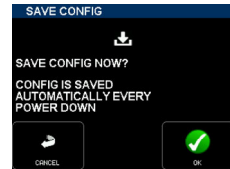
CONFIG BACKUP/RESTORE

Allow to backup & restore current configuration (or part of it) into a SD card.
 Select CREATE NEW to create a new configuration file, then choose a filename.
 SAVE OPTIONS menu allow to choose configuration to store.



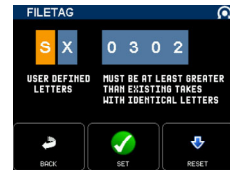
SAVE CONFIG

Allow user to save the recorder config.
 Configuration is always saved every power down.



FILETAG

The filetag is a unique identifier automatically generating the audio WAV filenames.
 The two letters can be freely modified by the user, which might be useful to identify the recorder unit or the production.
 The 4 digits are automatically incremented each new take. When the number reaches 9999 it starts again to 0001 and the letters prefix is incremented to the next value (SX -> SY).
 User can modify the 4 digits but the number must be at least greater than existing takes with identical letter prefix.



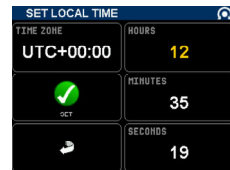
SYSTEM DATE

Set local date



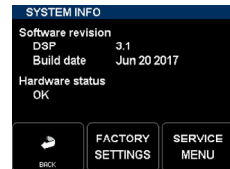
SYSTEM TIME

Set local time and time zone.
 If you don't know your time offset, visit https://en.wikipedia.org/wiki/List_of_UTC_time_offsets



SYSTEM INFO

Software revision and hardware status is displayed on that menu.
 FACTORY SETTINGS button resets the recorder to factory settings, except for user settings and filetag.
 SERVICE MENU spreads hardware and service information over multiple pages.



TAKE LIST



TAKE LIST MENU

This menu list all takes found in media SD1 & SD2, last recorded first.
 Use rotary encoder to scroll up/down.
 Encoder push: opens the take, stops.
 PLAY: opens the take, start playback.

Annotations for TAKE LIST menu:

- TRACK COUNT: C: CIRCLED, F: NO GOOD
- TAKE NUMBER
- DURATION LENGTH: HH:MM:SS
- SCENE
- START TIME: HH:MM:SS
- WHITE: NORMAL TAKES
- YELLOW: CIRCLED TAKES
- RED: NO GOOD
- SHOW/HIDE FALSE START TAKES

SCENE	TAKE	TR	TRG	LENGTH	START
001 / 002	003	4	C	00:00:03	15:39:59
001 / 002	002	4		00:00:04	15:39:55
001 / 002	001	4		00:00:06	16:39:41
001 / 001	007	4		00:00:05	15:39:45
001 / 001	005	4		00:00:05	15:39:25
001 / 001	004	4		00:00:07	15:39:19
SHOW/HIDE FALSE START TAKES					
SD1 SD2 TC13:39:41					

Lower-left blue area show additional information about the selected take:

Information about the selected take:

- FILETAG: SX0305
- WORKING DAY OR TAPE: 20170621
- MEDIA WHERE THE TAKE IS RECORDED: SD1 SD2
- SAMPLING FREQUENCY: 48000 Hz
- FILE SIZE: 3.4 MB
- START TIMECODE: TC13:39:41

USER SETTINGS



USER SETTINGS MENU

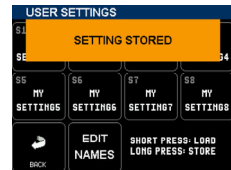
User settings allows user to store & recall a recorder configuration. There are 8 user settings available.

Factory settings (SETUP/SYSTEM/SYSTEM INFO/FACTORY SETTINGS) does not erase user settings.



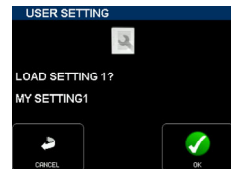
STORE A USER SETTING

To store a user setting, apply a long press to the selected user setting button until the message "SETTING STORED" is posted.



RECALL A USER SETTING

To recall a user setting, apply a short press to the desired user setting. A confirm window will appear.



MODIFY USER SETTING NAMES

Both lines can be edited.

Press the EDIT NAME to edit first line, press again to edit second line.



USER SETTING CONTENT:

- sampling frequency, bits per sample
- pre-record time
- reference tone level
- SD2 record source (mirror/mix only)
- inputs configuration (type, gain, phase, filter)
- tracks configuration (source, name, arm state, color)
- Phones monitoring
- Outputs monitoring
- Pot configuration (input gain: pot min/max, mute@min, bypass, link or fader curve & assign)
- Meters: reference level (orange, red), range, hold time
- Main screen daylight mode
- WiFi mode
- External power setup: DC out enable, DC in alarm, DC in min, time to empty
- Battery power setup: time to empty
- Push buttons assign

SX-R4+

MENUS OVERVIEWS



TAKE LIST



INPUTS



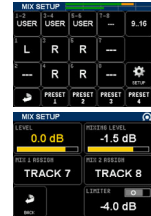
OUTPUTS



REC TRACKS



MIX



METADATA



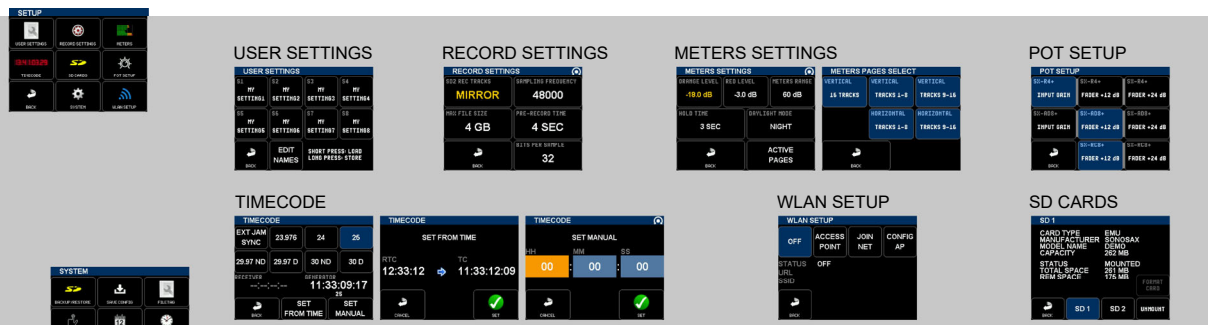
HEADPHONES



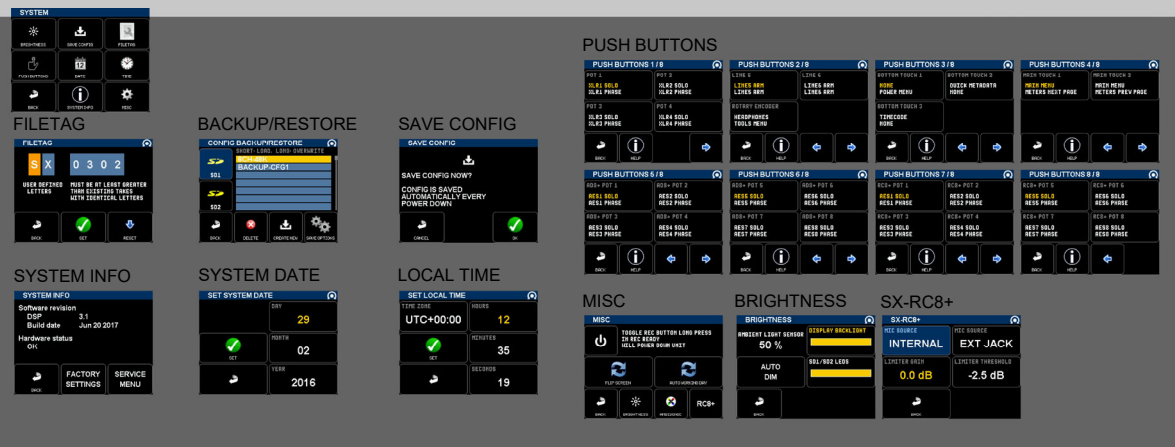
POWER



SETUP



SETUP / SYSTEM



AUDIO MONITORING

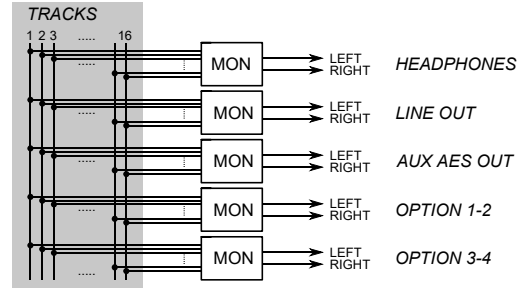


OVERVIEW

There are 3 main monitoring processes in the SX-R4+: HEADPHONES, LINE OUT, AUX AES OUT

There are 2 additional monitoring processes if the 4-channel option card is installed.

All monitoring are independant from each others.



MONITORING PROCESS

A monitoring process combines 16 tracks, alarms, rec tones and the reference tone generator to 2 output channels.

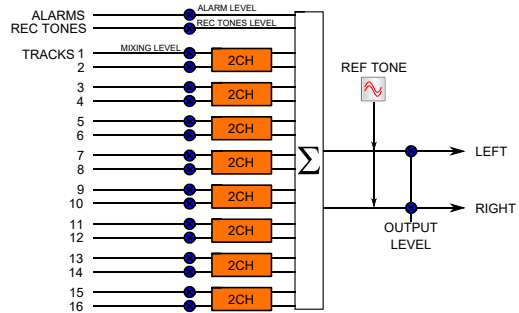
The main computation concerns the 16 tracks, which are processed by 8 track pair processes. For each track pair process, user choose among 5 pre-defined process:



However, process can also be defined at the channel level: it can be sent to the left (L), right (R) or center (C), which is L + R.

Alarms and rec tones are optionally added to the output.

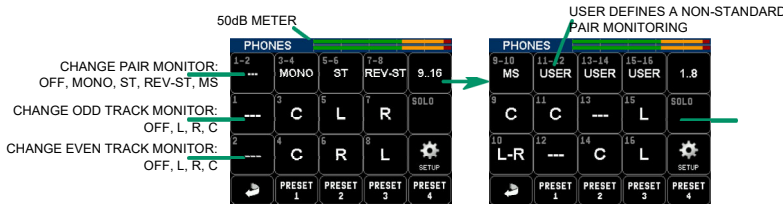
When enabled, the reference tone generator replaces the computed signal. Only output level is still active in that case.



USER INTERFACE

The 16 tracks are split into two pages: tracks 1 to 8, tracks 9 to 16.

In the screens below, Tracks 1-2 are not monitored, track 3-4 are monitored as mono, track 5-6 as stereo, track 7-8 as reverse stereo, tracks 9-10 as M/S, track 11 as mono, track 14 as mono and tracks 15-16 are sent on left output.



SETUP MENU

Push parameter to select it, use rotary encoder to modify values.

