

**PROFESSIONAL PORTABLE  
MULTITRACK RECORDER**

**SONOSAX  
SX-R4+**

**USER MANUAL**

HARDWARE DESCRIPTION  
*Preliminary*

**Audio equipment manufacturer**

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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

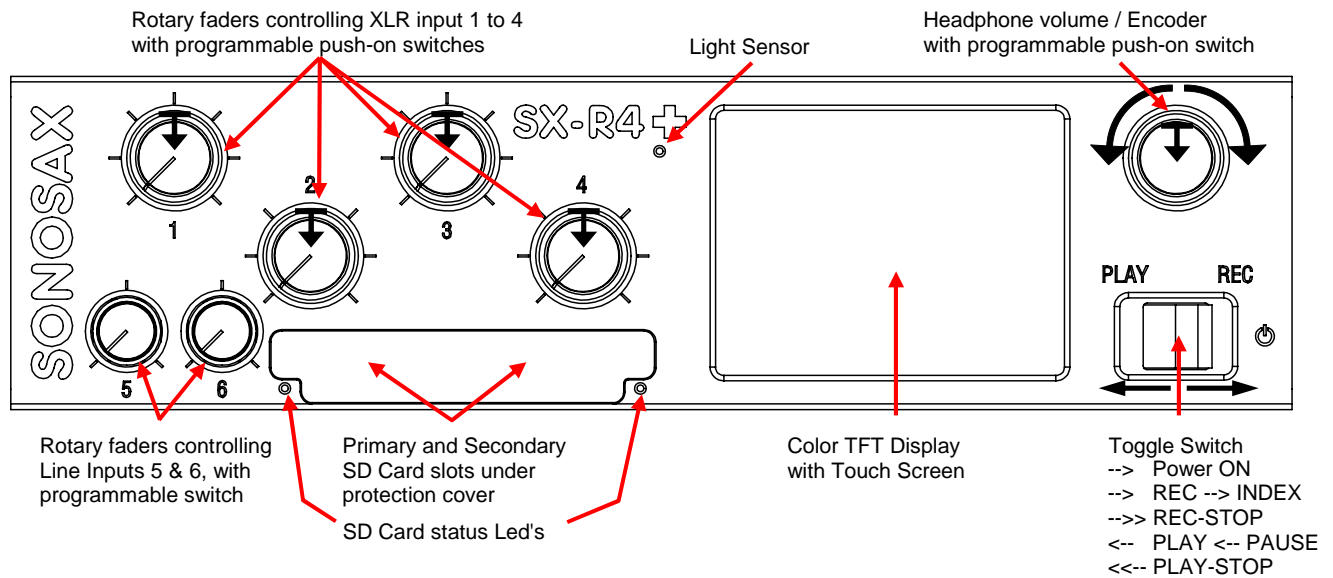
- Machined aluminium housing, hard anodized
- Overall dimension: 200 x 50 x 144.5mm (7.87" x 1.96" x 5.7")
- Weight: 0,89kg / 1,96lbs without battery -- 1.2kg / 2.64lbs with 45Wh battery fitted

## 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.

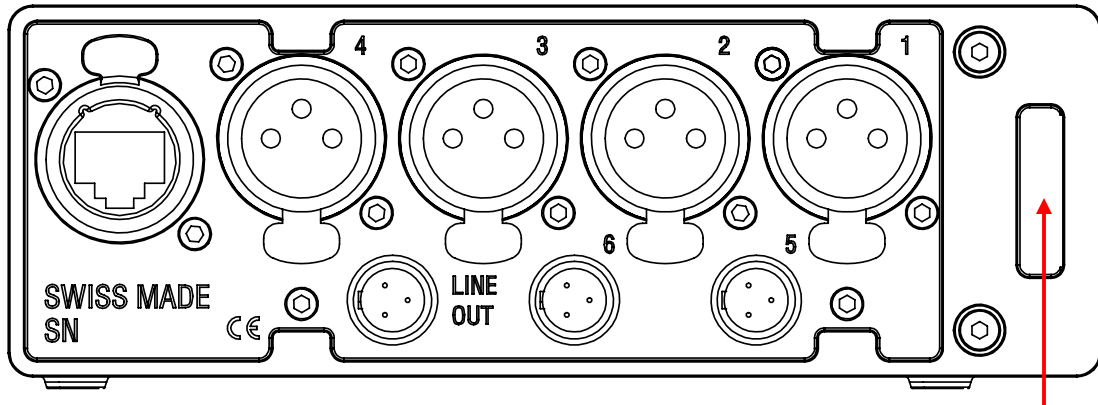
### 3. HARDWARE DESCRIPTIONS

#### 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"> <li>Primarily assigned to XLR inputs 1 to 4, either set as analogue or digital input</li> <li>Fader range adjustable by menu</li> </ul>
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"> <li>Read the User interface manual for further information</li> </ul>
Faders 5 & 6	Retractable potentiometer with a function switch <ul style="list-style-type: none"> <li>Analogue volume control dedicated to Line inputs 5 &amp; 6 on TA-3</li> <li>Read the User interface manual for further</li> </ul>
Headphone Encoder	Multifunction encoder with push-on switch, <ul style="list-style-type: none"> <li>Primarily controls the headphones volume</li> <li>Scroll specific functions or values according to displayed contextual menu</li> </ul>
Push-On switch	Switches with two programmable functions selected by a short press or a long press <ul style="list-style-type: none"> <li>Read the User interface manual for further information</li> </ul>
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"> <li>Read the User interface manual for further information</li> </ul>
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"> <li>• Analogue: electronically balanced Mic/Line input</li> <li>• AES42: transformer balanced digital Mic input with 10V Phantom (mode 1)</li> <li>• AES3: transformer balanced digital input</li> </ul> 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"> <li>• Two independent line inputs, electronically balanced</li> </ul> Pin 1 = Ground / Pin 2 = High (+) / Pin 3 = Low (-)
Line outputs – TA-3	Configured in the [OUTPUTS] menu: <ul style="list-style-type: none"> <li>• Stereo or 2 channels unbalanced analogue line outputs</li> </ul> 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 ]

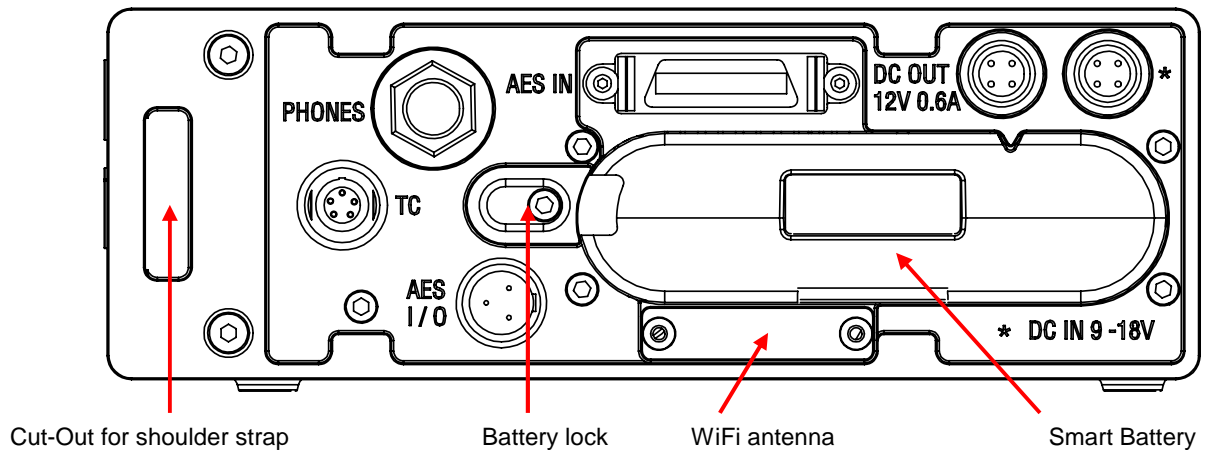
The [LINE OUT] TA-3 connector outputs two unbalanced analogue channels. Through the [OUTPUTS] menu any combination of tracks can be routed to output either a stereo mix or two independent mono mixes to feed cameras, external recorders, wireless systems or any other destination whenever a sub-mix is required. 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"> <li>The output selection is configured in the [HEADPHONES] menu</li> <li>Minimum headphone impedance: 30 Ohms</li> </ul> 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"> <li>Each AES3 input has its own ASRC (Asynchronous Sample Rate Converter)</li> <li>RS422 Tx/Rx are used to control external units such as SONOSAX SX-AD8+ and the mixing control surface</li> </ul> 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"> <li>An internally regulated 12V, max 0,6A → 7,2 Watts, if the SX-R4+ is power from its battery</li> <li>Or a DC Voltage derived from the DC Input connector when the SX-R4+ is powered from an external DC source</li> </ul> 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"> <li>The selection is configured in the [INPUTS] and [OUTPUTS] menu</li> </ul> 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 ]

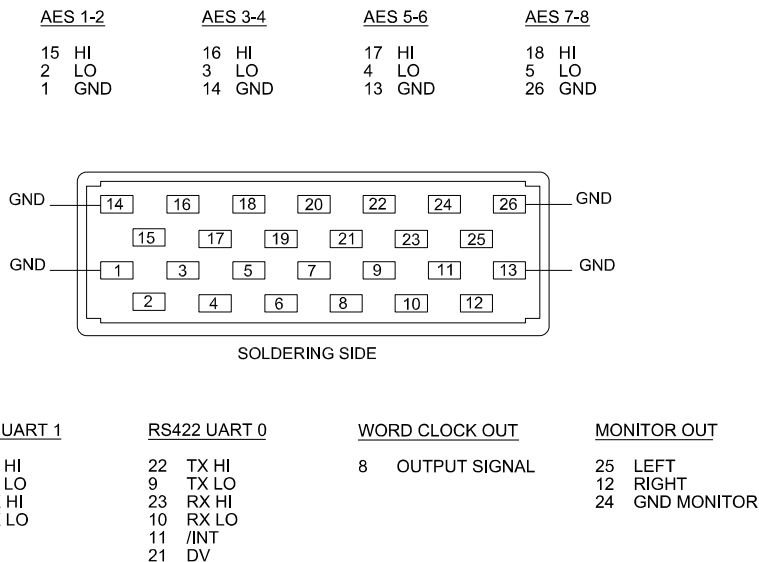
The [AES IN] 26 pin connector provides 4x independent AES3 inputs (8 audio channels). Each of these 4 inputs has its own ASRC circuitries allowing connection of independent asynchronous sources. Configuration and settings are available in the [INPUTS] menu.

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

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### 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:

<b>Inspired Energy 2050 series:</b>	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
<b>RRC 2050 series:</b>	RRC2054 / 14,4V - 3,2Ah - 46Wh NH 2054 / 14,4V - 6,8Ah - 98Wh - extended version**
Chargers:	PMC02A or PMC10A or RRC-SMB-UBC
<b>AudioRoot eSmart series:</b>	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.

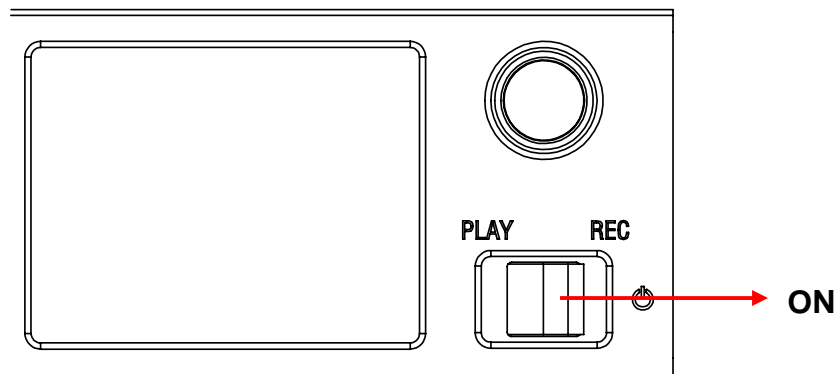
DC OUT wiring:

- 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



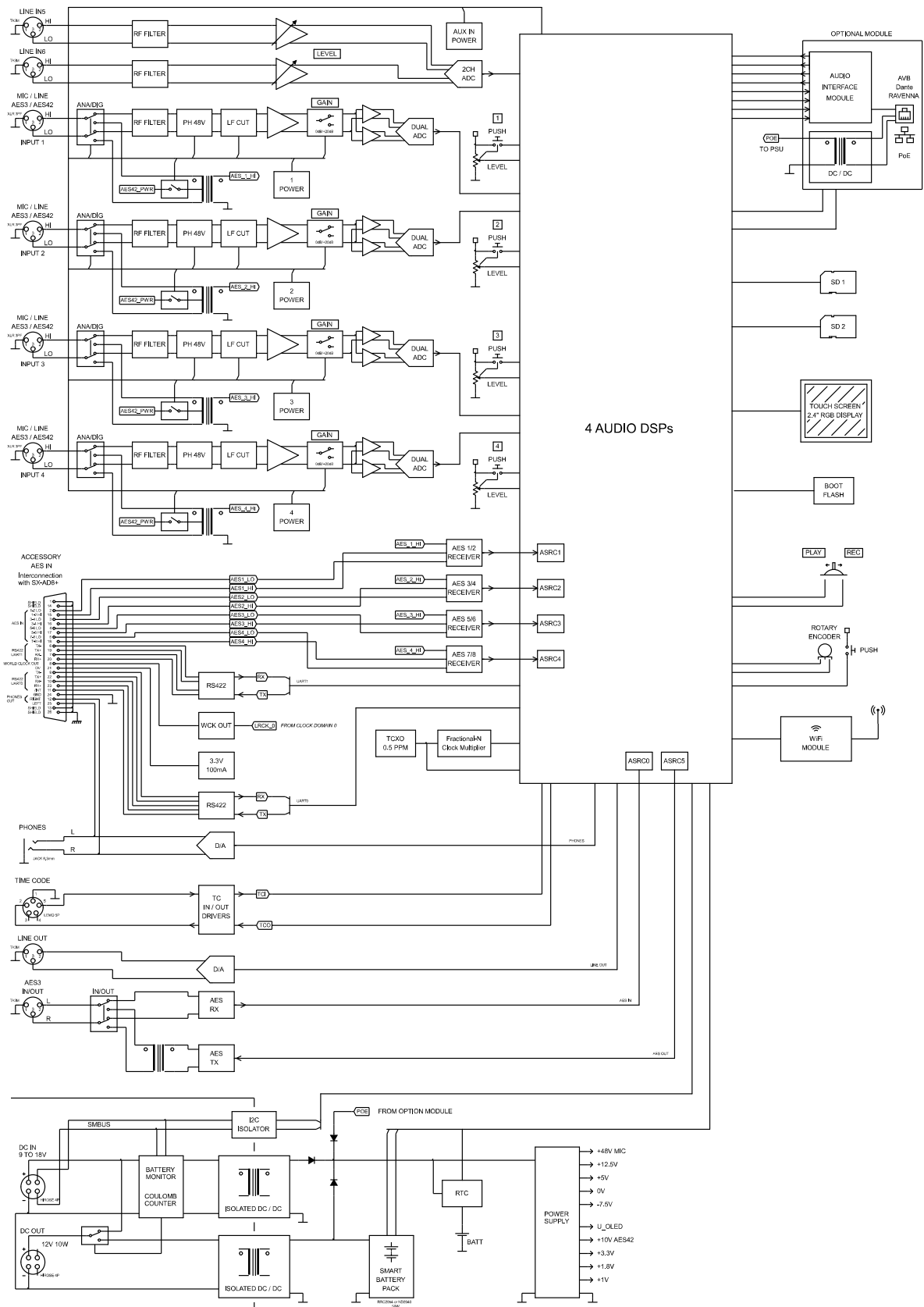
Power On the SX-R4+ by pressing the Toggle switch to the right  
A boot up screen is displayed for a couple of seconds, followed by the main metering display.

### 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

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The information contained in this manual is subject to change without notice.  
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