DUAL DOMAIN PREAMPLIFIER AND CONVERTER

SONOSAX
SX-DD2

USER MANUAL

Version 1.0
May 2021

Professional audio manufacturer

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Revision History

Version	Date	Description
1.0	March 2021	Initial release

Legal Notices

Product specifications and features are subject to change without prior notification.

Notes / Warnings

NOTE	
	A NOTE provides additional or special information to assist operation and maintenance personnel

WARNING	
	A WARNING indicates material specificity to which the reader should play close attention

Compliance

WEEE Statement

This product is classed as electrical or electronic equipment within the meaning of the Waste Electrical and Electronic Equipment (WEEE) Directive 2002 / 96 / EC and must not be disposed of in domestic household waste..

RoHS

Sonosax complies fully with Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)

1 Introduction

Congratulations! By choosing the SX-DD2, you have acquired a very high quality Preamplifier / Converter, the result of the hard work of a renowned engineers team. For more than forty years, Sonosax recorders and mixers have been recognized by professionals around the world for their outstanding technical features and unmatched musicality.

The first preamplifier/converter of the range you are proudly installing concentrates all the know-how of the brand in an ultra powerful device. It is at the same time:

- A very high quality preamplifier
- An analog-to-digital and digital-to-analog converter
- A headphone amplifier
- A control system for the different sources

A built-in matrix allows any input to be routed to any analog or digital output(s). The controls are fully digital, allowing access to all menu features with just two rotary encoders. A high-brightness graphic display shows the available options and settings. An infrared cell allows the control of the preamplifier with a remote control.

Note that, unlike many devices of this kind, the signal remains completely analog when used in analog input/output mode.

As with all SONOSAX products, the SX-DD2 is built without any compromise in quality, using only the best components available and passes stringent quality controls.

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

1.1 Key Features

AUDIO INPUTS

- 1x unbalanced stereo input Phono MM/MC
- 1x unbalanced stereo input Auxiliary
- 1x balanced stereo input XLR (Left / Right)
- 1x 3.5mm jack stereo analog input (on the front)
- 3x Optical digital inputs (TOSLINK)
- 3x COAX digital inputs (SPDIF)
- 1x AES3 digital input XLR
- 1x Ethernet audio DLNA (option)
- 1x Bluetooth input(option)
- 1x USB C stereo input / output USB 2.0 (sound card) (option)

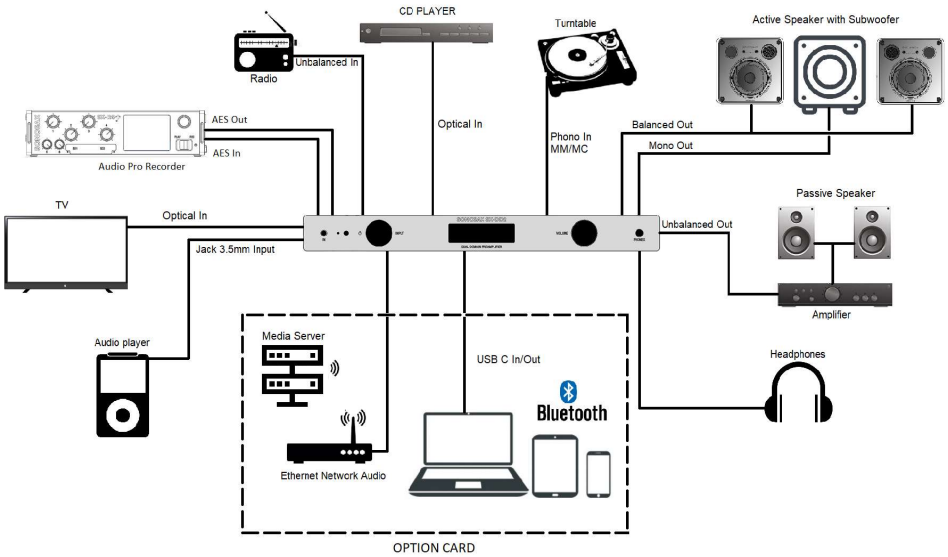
AUDIO OUTPUTS

- 1x unbalanced stereo with variable level
- 1x unbalanced stereo with fixed level
- 1x unbalanced mono with variable level (summing Left / Right)
- 1x unbalanced mono with fixed level (summing Left / Right)
- 1x Balanced XLR output (Left / Right)
- 1x 6.35mm jack stereo headphone output (on the front)
- 1x Optical digital output (TOSLINK)
- 1x COAX digital output (SPDIF)
- 1x AES3 digital output, XLR
- 1x USB C stereo input / output USB 2.0 (sound card) (option)

CONTROLS

- 2x encoders (INPUTS / VOLUME) to navigate in the menu
- 1x OLED screen
- 1x Cell for infrared remote control
- 1x standby LED
- 1x USB A for the software update, and which can supply a device with 5V (at the back)
- 1x Trig IN (switching on / off controlled by an external source)
- 1x Trig OUT (control on / off of another device)
- 1x Earth connection by a hand screw, for the Phono input

1.2 Configuration example



1.3 Powering up the SX-DD2

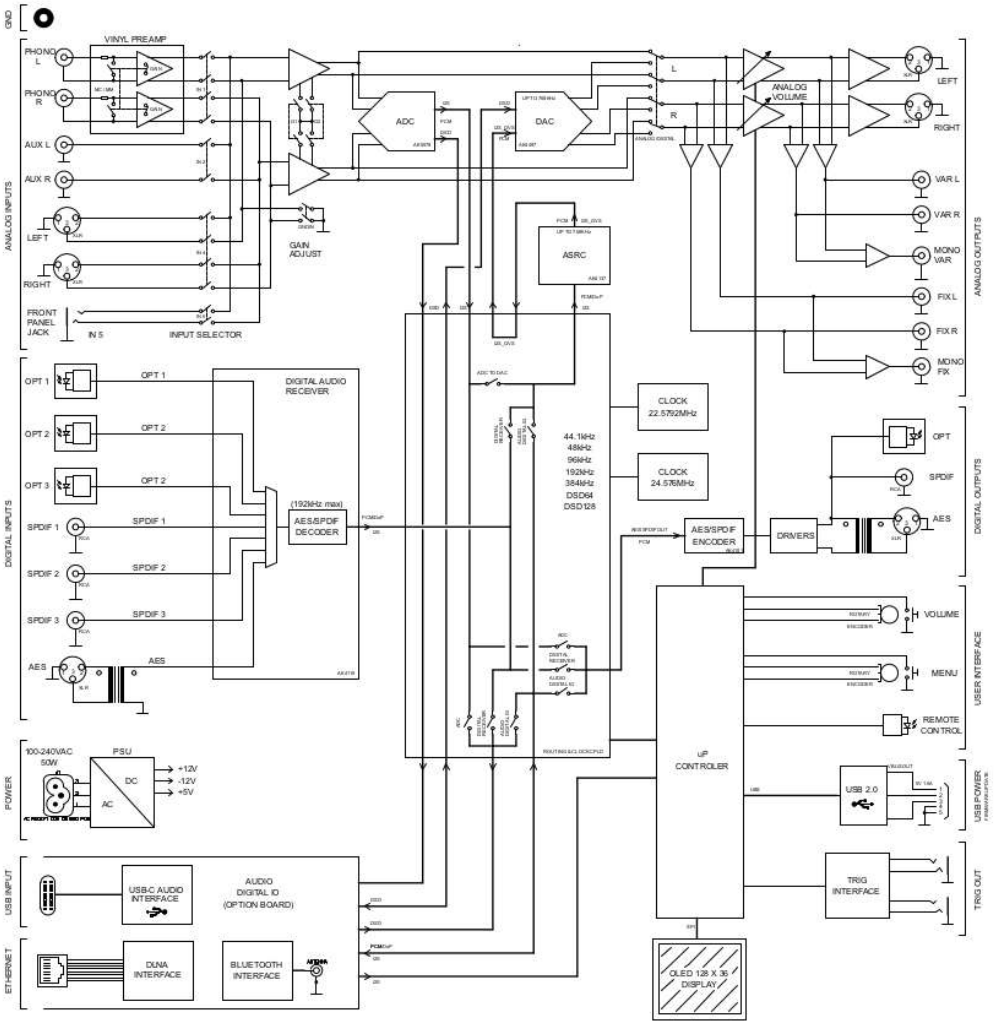
To power-up the SX-DD2, press and hold the left rotary encoder until the splash screen appears (2-3 seconds).

1.4 Bloc diagram

The SX-DD2 is based of an internal hybrid analog / digital architecture which includes the following elements:

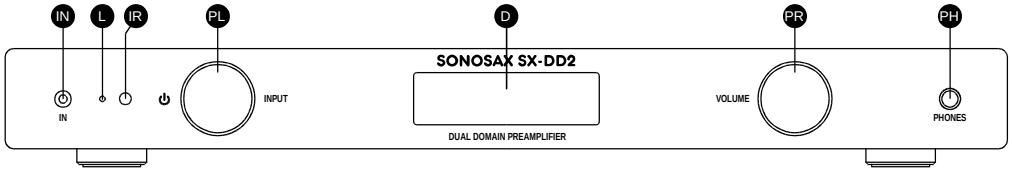
- Analog inputs with gains
- Digital inputs with digital audio receiver
- Option card inputs (Bluetooth, DLNA and USB C)
- Power supply unit (PSU)
- ADC / DAC converter
- Audio routing and CPLD
- Analog outputs and gains / Digital outputs
- "Trig" interface composed of a Trig IN and a Trig OUT to couple the on and off switching with other devices
- User Interface (UI) consists of two rotary encoders with push buttons, an OLED display and an infrared remote control system.

SONOSAX SX-DD2 (DUAL DOMAIN PREAMPLIFIER BLOCK DIAGRAM)



2 Panels description

2.1 Front panel



IN
Jack 3.5 stereo input

L
Standby LED

IR
IR cell for remote control

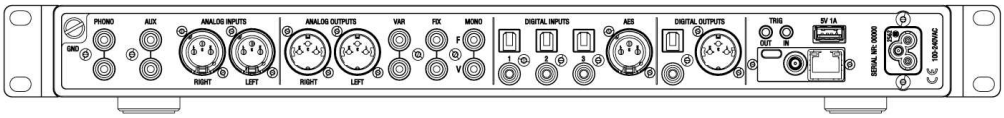
PL
Left rotary encoder with push-button: inputs selector

D
OLED display

PR
Right rotary encoder with push-button for level control

PH
Headphone jack 6.35mm

2.2 Rear panel



3 User interface

3.1 Interface overview

The user interface of the SX-DD2 consists of two rotary encoders and a 256x64 pixel OLED display. Both rotary encoders feature a push button function.
The left rotary encoder selects the input. This choice is made among the active inputs, those which are disabled will not by shown.
The right rotary encoder controls the volume.

3.2 Menu navigation

The left rotary encoder (INPUT) is used to enter menus, select parameters and change parameter values. The right encoder (VOLUME) is used to exit from menus.

3.3 Menu navigation with the remote control

Remote control Apple TV first generation :

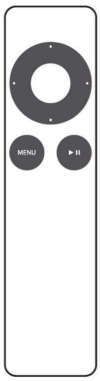
- Turn ON the SX-DD2 : press and hold (2-3 seconds) the central button until the splash screen appears.

On the main screen :

- the key "play/pause" cut the audio signal (muting)
- Left and Right keys change the input selection
- Up and Down keys adjust the output level

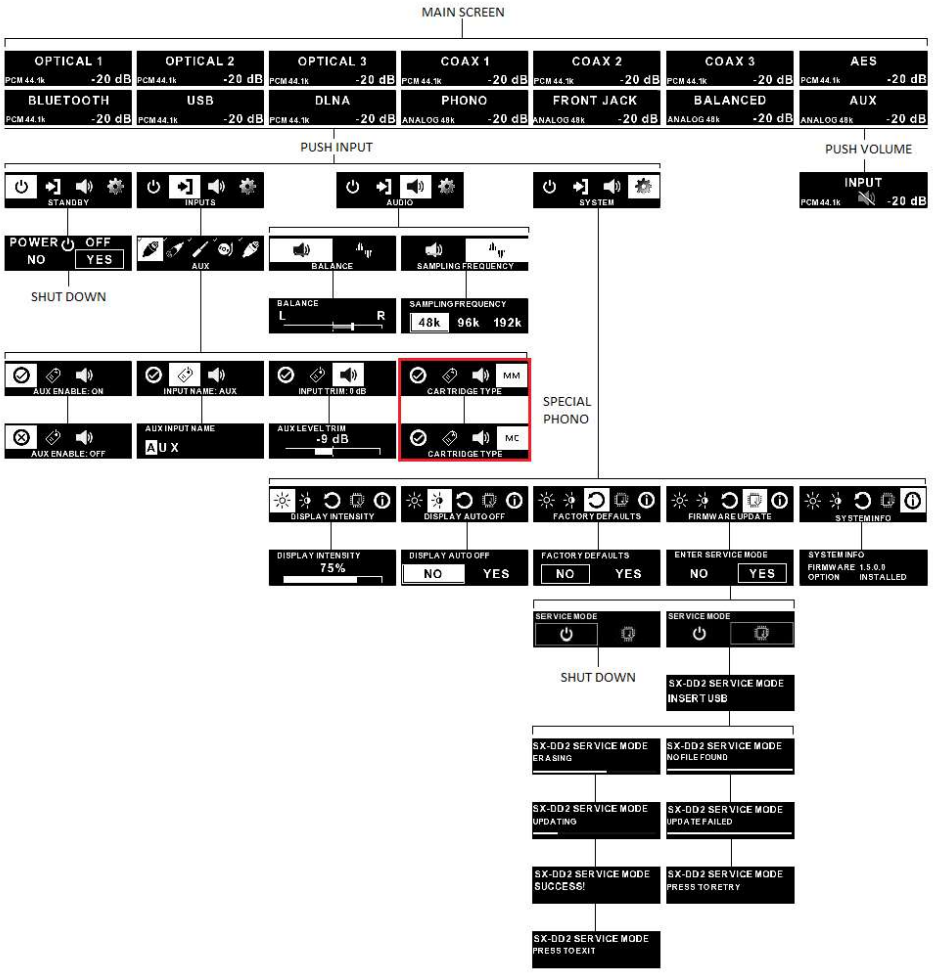
Acces to the Main menu with the MENU key

- Left and Right keys : navigate on the menu
- Center key : confirm
- Menu key : go back to the main menu



3.4 Menu Tree

The following figure summarizes the SX-DD2 menu tree :

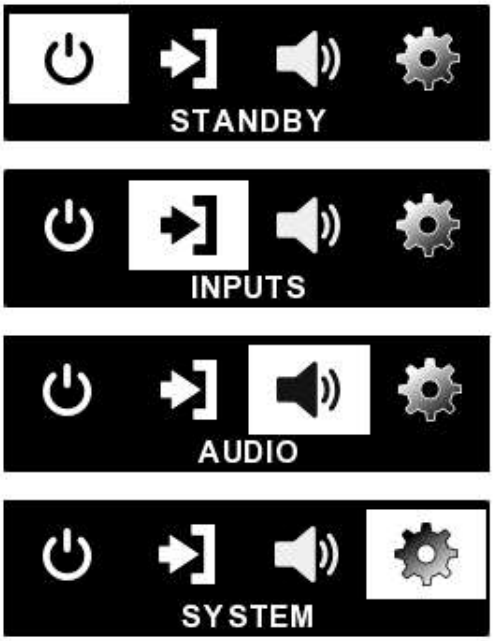


3.5 Main screen

The main screen allows to select one of the inputs made visible in the input parameters

3.6 Main menu

The main menu allows to select the following actions :



STANDBY
Set the SX-DD2 in stand by mode

INPUTS
Configuration of the inputs parameters

AUDIO
Configuration of the audio parameters

SYSTEM
Configuration of the system parameters

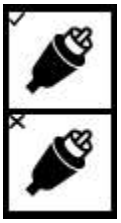
3.7 Inputs Menu

The inputs menu lists the available inputs and indicates if the input is visible in the choice of sources. *(main screen)*

The available inputs are:

Aux / Balanced / Front Jack / Phono / 3x Coax / 3x Optical / AES / Bluetooth / USB / DLNA

The pictogram indicates if the corresponding input is enabled or disable :

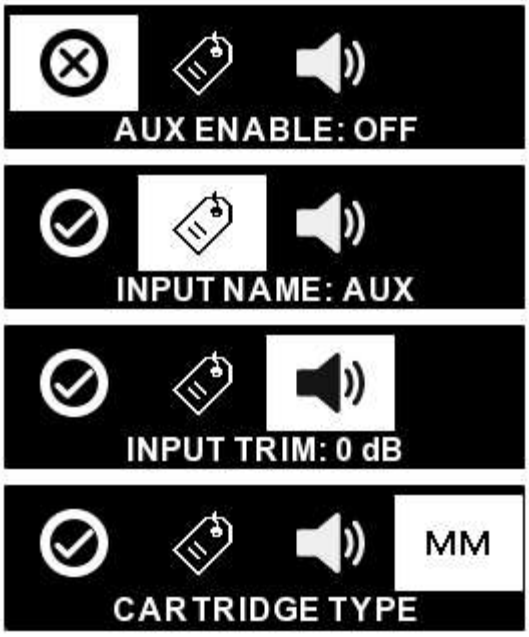


Input enabled, appears on the main screen

Input disabled, do not appear on the main screen

Input parameters

The parameters of each input can be changed by pressing the INPUT encoder. The following menu allows you to change the settings for each source individually.



INPUT ENABLE
Enable / disable the selected input

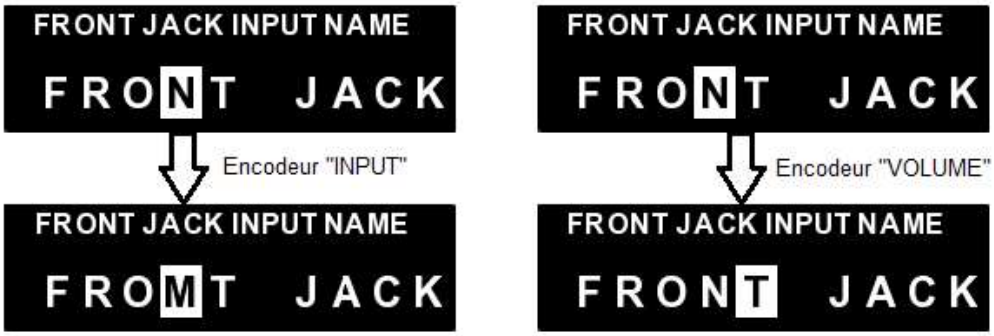
INPUT NAME
To rename the Input

INPUT TRIM
Adjust the selected Input

CARTRIDGE TYPE
Choice between MC (moving coil) and MM (moving magnet)

Naming the Inputs

To change the name of a source, the INPUT encoder is used to change the letter at the current cursor location, and the VOLUME encoder moves the cursor from letter to letter. The name of a source can contain up to 10 characters.

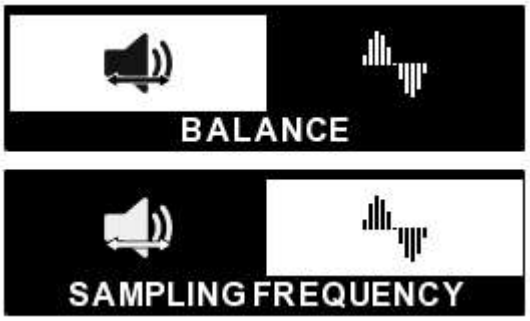


Trimming the Inputs level

The "TRIM" adjusts the gain of the selected input, so that the level of different sources can be equal. This adjustment prevents sudden volume changes when switching the sources.
For example, the Phono source comes in with a much lower signal than the Aux source, so we can match it with the other sources.

3.8 AUDIO menu

The audio menu controls the BALANCE of output signals and the sampling frequency .



Balance control

The balance setting affects all analog outputs.

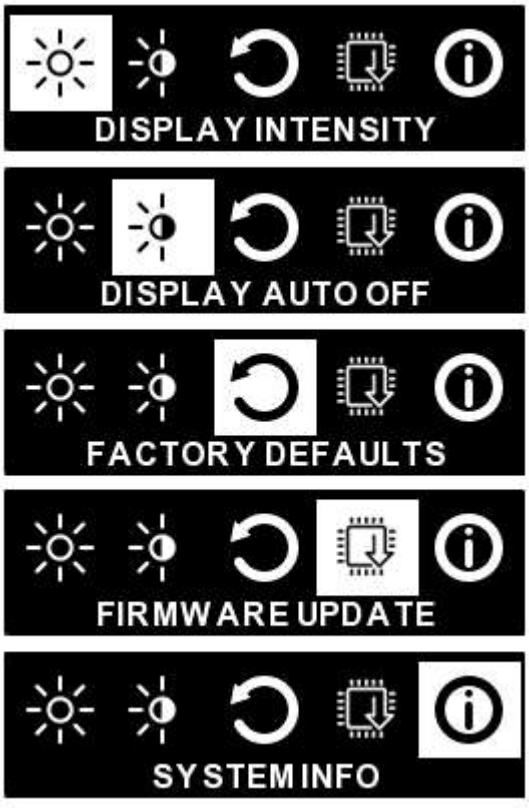
Adjusting the sampling frequency

The sampling frequency of the digital outputs is set in the SAMPLING FREQUENCY menu. Three sample rates are available: 48kHz, 96kHz and 192kHz.

NOTE	
	The sample rate is only valid for an analog input to digital output. For a digital input to digital output the input sampling frequency is kept.

3.9 SYSTEM Menu

The SYSTEM menu is used to mofiy the screen parameters, to reset the device to factory settings, to enter the software update menu and to show the current software version.



DISPLAY INTENSITY
Adjust the brightness of the screen.

DISPLAY AUTO OFF
Setting the screen standby mode

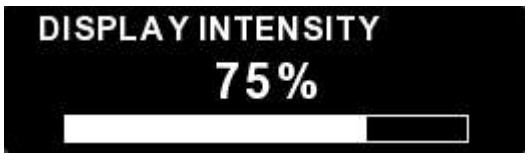
FACTORY DEFAULTS
Restore Default Settings

FIRMWARE UPDATE

SYSTEM INFO
System information, firmware version, presence of the option card

Screen brightness

The brightness can be adjusted in four stages: 25 % - 50 % - 75 % - 100 %.



Setting the screen saver

A screen saver can be enabled or disabled. When enabled, the screen turns off 4 seconds after the last manipulation of the interface. If disabled, the screen remain ON as long as the unit is in operation.

Restoring Default Settings

All software settings can be restored to factory default. The name of the sources, gains setting and all variables will then revert to their initial values.

Firmware Update

Activate the SERVICE MODE to update the firmware of your SX-DD2.
Latest firmware can be downloaded from our website: www.sonosax.ch
then must be copied on a USB stick.

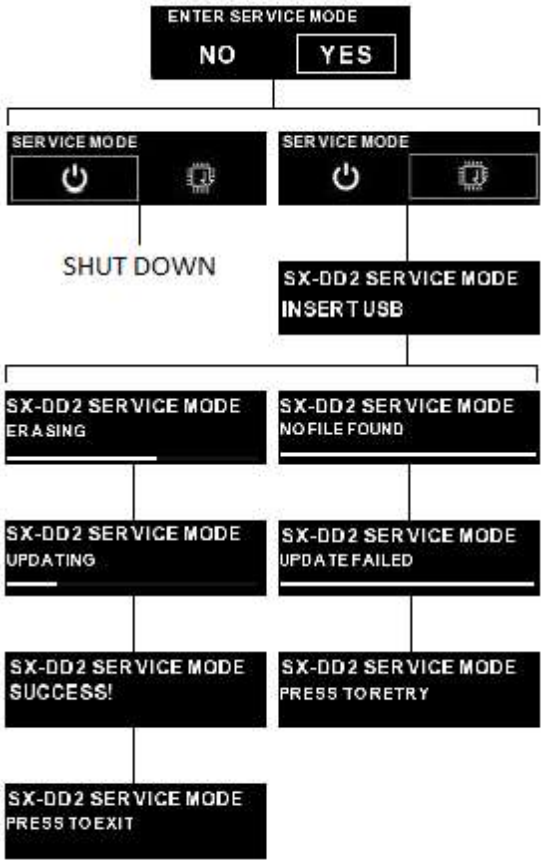
System Information

This menu displays the software version and the hardware status.

3.10 Service Mode

The Service Mode allows to update the firmware of your SX-DD2 with the latest version. Once in the service mode, follow the procedure described below.

NOTE	
	A conventional USB stick is necessary. Format the USB stick, copy the firmware from your computer on the USB stick



Enter the service Mode (SYSTEM → FIRMWARE UPDATE)

Select the firmware icon

Insert the USB stick containing the new firmware

The SX-DD2 proceed with the update(ERASING → UPDATING → SUCCESS)

If the update failed, reformat your USB stick, copy the file from your computer then proceed with the procedure again.

Once completed, remove the USB stick et reboot the SX-DD2

4 Audio USB interface

The Audio USB interface of the SX-DD2 supports Audio USB Class 2.0 of the USB 2.0 with sample frequencies up to 192kHz and supports the asynchronous mode.

Most of recent mobile phones, tabets and notebooks (iPhone, iPad, Android) and workstations (Apple Osx, Windows10, Linux) support Audio USB Class 2.0

These USB interface allows to play audio files from a mobile device or a computer and also to record audio onto a computer, a smartphone or a tablet.

Very usefull for digitizing vinlyl records for example.

5 Specifications

5.1 Inputs / Outputs

Volume setting	-80dB to +20dB in 0.5dB steps
Level References	0dBFS = 4Vrms (14.2dBu) on balanced XLR outputs 0dBFS = 2Vrms (8.2dBu) on unbalanced RCA outputs
Maximum Input levels	XLR Balanced input : 8.7Vrms (+21dBu) AUX unbalanced input on RCA: 3.2Vrms (+12dBu) Front Input on Mini-jack : 2.8Vrms (+11dBu) MM phono input on RCA : 90mV 1kHz MC phono input on RCA : 9mVrms 1kHz
Maximum Output levels	XLR Balanced output : 7.1Vrms (+19dBu) RCA outputs VAR, FIX, MONO : 3.8Vrms (+14dBu)

5.2 Digital to Analog

Balanced XLR ouput	Output level : 4Vrms @ 0dBFS THD + N, 20Hz to 20kHz @ 0dBFS 1kHz : 0.0005% THD + N, 20Hz to 20kHz @ -3dBFS 1kHz : 0.0003% Bandwidth 0.5 Hz to 90kHz : +-0.2dB Dynamic unweighted 20Hz to 20kHz : 124dB Dynamic weighted ASA A : 126dB Crosstalk 20Hz to 20kHz : > 120dB
Variables (VAR) and fixed (FIX) outputs	Output level : 2Vrms @ 0dBFS THD + N, 20Hz to 20kHz @ 0dBFS 1kHz : 0.0005% Bandwidth 0.5 Hz to 90kHz : +-0.2dB Dynamic unweighted 20Hz to 20kHz : 120dB Dynamic weighted ASA A : 122dB Crosstalk 20Hz to 20kHz : > 110dB

5.3 Analog to Digital

Balanced XLR input	4Vrms (14.2dBu) => 0dbFS THD + N 20Hz to 20kHz @ 2Vrms, 1kHz : < 0.0008% Dynamic unweighted 20Hz to 20kHz : 123dB Dynamic weighted ASA A : 125dB Crosstalk 20Hz to 20kHz : > 100dB
AUX input	2Vrms (8.2dBu) => 0dbFS THD + N, 20Hz to 20kHz @ 1Vrms 1kHz : < 0.0005% Dynamic unweighted 20Hz to 20kHz : 123dB Dynamic weighted ASA A : 125dB Crosstalk 20Hz to 20kHz : > 110dB
Front mini-jack	0.775Vrms (0dBu) => 0dBFS THD + N, 20Hz to 20kHz @ -6dBu, 1kHz : < 0.0005% Dynamic unweighted 20Hz to 20kHz : 120dB Dynamic weighted ASA A : 122dB Crosstalk 20Hz to 20kHz : > 100dB
Phono	Equalization error in respect to the RIAA curve : +/- 0.5dB from 20Hz to 20kHz
MM	MM Phono input : 44mV = 0dBFS : THD + N, 20Hz to 20kHz, 1kHz < 0.001% @ 44mV, 20Hz < 0.001% @ 4.4mV

	Dynamic unweighted 20Hz to 20kHz : 106dB Dynamic weighted ASA A : 112dB Crosstalk 20Hz to 20kHz : > 106dB
MC	MC Phono input : 4.4mV 1kHz => 0dBFS THD + N, 20Hz to 20kHz, 1kHz < 0.005% @ 4.4mV 20Hz < 0.05% @ 440uV Dynamic unweighted 20Hz to 20kHz : 86dB Dynamic weighted ASA A : 92dB Crosstalk 20Hz to 20kHz : > 96dB

5.4 Analog to analog

Balanced inputs to balanced outputs	4Vrms (14.2dBu) THD + N, 20Hz to 20kHz @ 4Vrms, 1kHz : 0.0005% @ 2Vrms, 1kHz : 0.0003% Bandwidth, 2Hz – 300kHz : +0 / -0.5dB Dynamic unweighted 20Hz to 20kHz : 124dB Dynamic weighted ASA A : 126dB Crosstalk 20Hz to 20kHz : < 105dB
Phone output	Max. output level @ 300 Ohms load = 6.7Vrms (+18dBu) 150mW Max. output level @ 33 Ohms load = 6.7Vrms (+18dBu) 1.1W Ouput impedance : < 0.15Ohms THD + N, 20Hz to 20kHz, 1kHz < 0.002% Bandwidth : 10Hz to 200kHz +/- 0.2dB Dynamic unweighted 20Hz à 20kHz : 110dB Dynamic weighted ASA A : 113dB Crosstalk 20Hz to 20kHz : < 100dB

5.5 Power Supply

Main voltage	85-264VAC, 47-63Hz
Power consumption in standby	0.5W
Power consumption in use	Approx. 10W
Max.output current USB A	1A

5.6 Mechanical dimensions

Standard version (L x H x P)	434 x 230 x 44 mm 17.08 x 9.05 x 1.74 ‘’
19’’ rack version (L x H x P)	482.6 x 230 x 44 mm 19 x 9.05 x 1.74 ‘’
Weight	5.1kg 11.25 lbs

WARNING	
	Use M3 screws when attaching an accessory. The length of the screws in the device **must never exceed 5mm**.