PROFESSIONAL PORTABLE AUDIO MIXER

SONOSAX SX-M32

User manual

audio equipment manufacturer

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1. INTRODUCTION

Congratulations for choosing the SONOSAX SX-M32 professional portable audio mixer. Based on a high technology design, it has been manufactured to deliver many years of excellent performances.

As with all SONOSAX products, the SX-M32 mixer is built without any compromise in quality, using only the best components available and a severe quality control. The result of this research and development project is an ergonomic recorder with extraordinary characteristics and an excellent reliability.

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

2. GENERAL DESCRIPTION

The SONOSAX SX-M32 is an analogue audio mixer with digital output of the last generation, designed in 2008, using the latest available technologies, with the unequalled SONOSAX design and ergonomics.

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

Built in strong, rugged and anodized aluminium housing, the SONOSAX SX-M32 provides the best solution whenever top performance, versatility and small size are important. All potentiometers are especially made for SONOSAX and watertight according to IP45. All capacitors are of professional type, with low loss and a long life-span

2.1 MAIN FEATURES

- Small sized and lightweight portable audio ENG/EFP stereo mixer
- Electronically balanced (transformer less) Input and Output
- Choice of output connectors (options)
- High quality potentiometers and switches, resistant to water projection (IP45)
- Microphone preamps with semi-discrete technology, ultra low noise
- Primary passive LF-Cut (high pass) to protect the microphone preamplifier
- 48V Phantom power, 20dB PAD and phase reversal on each input
- Protection Limiter on each of the 3 inputs
- M/S decoder available on Input 1&2 and on the Monitoring selector
- LED Meter indictors on each input with level and overload indication
- Large scale level meter for Master and Monitoring
- Independent, linkable, output Limiters
- Main analogue outputs available in several format(balanced, unbalanced, mono)
- Direct channels outputs available Pre and Post fader (on optional connector)
- Digital output AES, 48 & 96kHz at 24 bits, configurable to 48/16 - 96/24 or 48/24 – 192/24
- Powered either from internal batteries or external DC voltage 6 to 18Volts
- Low power consumption

2.2 OPTIONS AND ACCESSORIES

2.2.1 External Power Supppy

SX-M32 mixer can be powered from any regulated external DC power source from 6 to18 Volts sustaining a continous power of minimum 5 Watts and a peak current of at least 1 Amp under 12Volts (1,5Amp under 6 Volts)
A universal external power supply 100-240V~, 12V DC out is available by SONOSAX your local dealer. It is recommended for an optimal DC supply of your SX-M32. Its reference nr is SX-008440

2.2.2 Optional Output connectors

Every user has its own requirements for connecting its audio devices together. Thus, a choice or output panels have been foreseen during the development of the SONOSAX SX-M32, offering different interconnecting solutions to better deserve the specific needs of each user.
Please refer to chapter 4.2 – right panel - and chapter 6 – addendum – for the possible choices of connectors and their wiring.

2.3 SAFETY INSTRUCTIONS

- Read all the safety and operation instructions before operating the SX-M32 Mixer and its external power supply.
- Keep the instructions for further reference.
- Follow all warnings, notes and instructions mentioned in this operation manual.
- Keep the SX-M32 Mixer and its external power supply away from heat sources such as radiators or other devices that produce heat.
- Connect the SX- M32 Mixer 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 WARNING 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- M32 Mixer and its power supply.
- The SX- M32 Mixer and its external power supply should be serviced only by qualified service personnel as your nearest SONOSAX authorized reseller.
- Do not defeat the grounding or polarization of the SX- M32 Mixer or its power supply.
- Line voltage selectors should only be resettled and equipped with a proper plug for alternate voltage by a qualified service technician.
- To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.
- Internal settings and adjustments must be solely executed by an authorized SONOSAX distributor or at factory.
- Damage due to wrong manipulations inside the unit cancels the SONOSAX warranty immediately.

3. OPERATING INSTRUCTIONS

3.1 BATTERY POWER

The SONOSAX SX-M32 mixer can be internally powered by 6x dry cell batteries, or by rechargeable Nickel Cadmium (NiCd) or Nickel Metal Hydride (NiMH) AA-Cells (LR6), or disposable Lithium batteries

NOTE: The running time highly depends on the battery type (Alkaline, NiCd, NiMH or Lithium), the kind and the number of microphone being used and if the 48V Phantom is turned On.

3.1.1 Opening the battery compartment

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

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

3.1.2 Closing the battery compartment

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

3.2 EXTERNAL DC POWER SUPPLY

SX-M32 can be powered from any regulated external DC power source from 6 to18 Volts. The DC source must be capable to sustain a continous power of minimum 5 Watts and to supply a peak current of at least 1 Amp under 12Volts (1,5Amp under 6 Volts) for the inrush current at power up.
When powered from an external DC source, the first Led on the Left of the upper meter is lighting steady.

3.3 SWITCHING ON THE UNIT

The power On switch is located on the upper right corner of the front panel and offers two distinct operating modes: [ECO] and [ON].
In [ECO] mode (economy mode), the meters work on a DOT mode where only one Led is active to show the level.
In [ON] mode, the meters work as a conventional Bargraph.
A previously mentioned the mixer can be powered either from its internal batteries or form an external DC source.

3.3.1 Using dry cells or rechargeable batteries

Insert six batteries in the battery compartment and set the switch to either [ECO] or [ON] to power-up the mixer. The first green Led on the Left of the upper meter must be flashing. If not:

- Check that the batteries have been correctly inserted in the battery holder according to the polarity.
- Check that the batteries are properly charged. (note that new dry cells might sometime by faulty or just too old...)

3.3.2 Battery charge indicator

When the SX-M32 is powered by its internal batteries, the first Led on the Left of the upper meter is flashing periodically, depending on the remaining battery charge:

- full charge: the Led flashes once every 2 seconds
- 30% remaining charge: the Led flashes once per seconds
- 10% remaining charge: the Led flashes twice per seconds

When the voltage reaches 1.0 Volt per cell then the SX-M32 will automatically turns Off, thus protecting your rechargeable batteries from excessive discharge.

3.3.3 Using an external power source

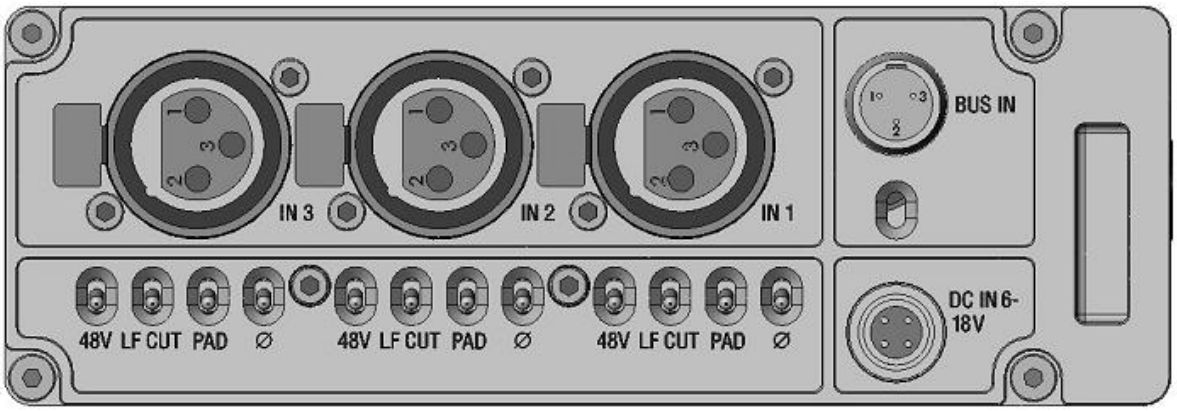
Connect the external DC power supply DC plug to the DC IN connector located on the right left of the mixer and then set the switch to either [ECO] or [ON] to power-up the mixer. The first green Led on the Left of the upper meter must light on steady. If not:

- Check that the external power supply Voltage is between 6 to 18Volts DC
- Check that your power supply sustain at least 5 Watts.
- Check that the DC plug is correctly wired.
  Pin 1 = GND or negative / Pin4 = +VDC or positive

4. DETAILLED DESCRIPTIONS

4.1 LEFT SIDE PANEL

The left side contains the three Mic/Line inputs with their respective function switches as illustrated below, and also a stereo BUS Input and the DC connector for the external power supply.



4.1.1 Mic/Line inputs [IN1 à IN3]

Each of the input channels is transformer-less, electronically balanced, and is equipped in standard with a RF Filter. They correspond to the input channels 1 to 3 on the front panel.

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

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

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

4.1.2 Phantom power [48V]

This switch turns the 48V Phantom power On or Off on the corresponding channel [IN1 à IN3]. In lower position the 48V phantom is turned On to power condenser microphone. In upper position the Phantom power is turned Off for connection of Dynamic microphone or any other analogue sources

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

NOTE: Almost all modern condenser microphones of the latest generation are operating under 48V Phantom power. Because of the excellent common mode rejection (CMRR) it has been decided to include only this kind of microphone powering on the SX-M32.

4.1.3 Pre-LF Cut Filter [LF Cut]

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

This Pre LF-Cut frequency is set at 130Hz and has a slope of –6dB/octave.

4.1.4 Input Attenuator [PAD]

In lower position, this switch activates a 20dB Line attenuator [PAD] on the corresponding channel [IN1 à IN3].

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

4.1.5 Phase reversal [Ø]

In lower position, this switch reverses the phase by 180 degree of the input signal. It can be used to correct a reversed cable wiring or to address a phase problem between two microphones due to their placement. It can also be used to progressively decode a M/S signal on a three ways decoding method.

4.1.6 Auxiliary stereo Bus Input [BUS IN]

This input lets you connect any external audio device directly on the mix busses L & R. This bus input has a unity gain without any adjustment.
It can be used for example to connect two SX-M32 mixers together to build a six channels mixer or any other analogue source at line level.

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

The mating female cable connector is available under following SONOSAX references: SX 860266
Or by Switchcraft, ref: TA3F

4.1.7 External DC input [DC IN]

The SONOSAX SX-M32 can be powered by means of an external DC supply, either a main adapter or an external high capacity battery bank. The DC voltage must be regulated between 6 to 18VDC
The average power consumption of the mixer is around 4 to 5 Watts. This represents a DC current of 400mA under a voltage of 12Volts. However, while turning On the mixer, the inrush current may reach 1A under 12V , therefore make sure that your external DC supply can sustain this peak of current

To ensure optimal performances we recommend you to use the optional main adapter available by SONOSAX or your local dealer. The reference number is SX 008440.

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

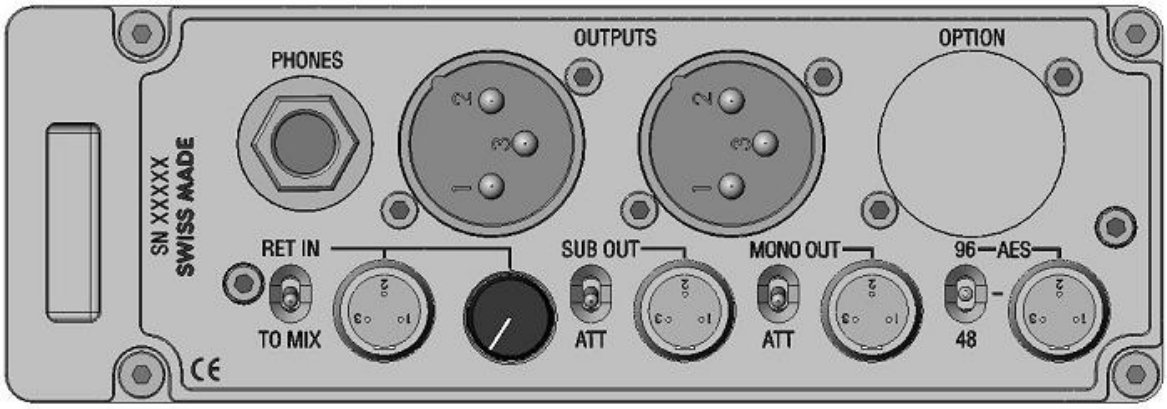
The Hirose 4 pin mating male cable connector is available by SONOSAX or by your local dealer under references:
SONOSAX part nr SX860217 or Hirose HR10-7P-4P

4.2 RIGHT SIDE PANEL

Every user has its own requirements for connecting its audio devices together. Thus, a choice or output panels have been foreseen during the development of the SONOSAX SX-M32, offering different interconnecting solutions to better deserve the specific needs of each user.
The output panel is installed at factory during the assembly of the mixer. Therefore the choice of the output panel must be specified at the order. However it can be retrofitted by qualified personal at later date.
Whatever panel is chosen it always contains following connections:

- Main outputs Left & Right, balanced, transformer-less [OUTPUTS]
- Subsidiary Stereo output [SUB OUT] with selectable line level or attenuated level [ATT]
- Subsidiary Mono output [MONO OUT] with selectable line level or attenuated level [ATT]
- Digital main output [AES] with selection of the sampling rate
- Monitor Headphone output on a 6,35mm (1/4 ") stereo jack
- Adjustable Monitor return input [RETURN] with possibility to re-inject the return on the mix bus

Depending on the chosen options, the direct outputs Pre and Post Fader of the channels are also available on these right panels.



NOTE: The mating cable connector for the Return, the stereo and mono Sub-Outs and the AES out is a mini XLR type TA-3F female, available under SONOSAX SX 860266

4.2.1 Main outputs, standard version [OUTPUTS]

The two main outputs are electronically balanced, transformer-less. Their nominal output level must be specified at the order and can be is either +6dBu or +4dBu. This output impedance is lower than 50 ohms.
The nominal output level corresponds to the "0 Peak" on the main modulometre. It is factory programmed and and not be changed by the user.

The main output connectors are XLR3-Male, where:
Pin1 = Gnd / Pin2 = High (+) / Pin3 = Low (-).

To connect the main output on an unbalanced receiver's input, pin 1 & 3 must be bridged and connected to the Gnd of the receiver's input. For an unbalanced connection it is preferable to use the Sub-Out or the Mono-Out.

NOTE: The outputs of the SX-M32 are protected against DC power. However we strongly recommend not connecting a phantom power onto the output of the mixer (for example when connecting to the input of a camera, make sure that the phantom power of the camera is turned off)

4.2.2 Subsidiary Stereo output [SUB OUT]

The SX-M32 offers a subsidiary unbalanced stereo output. It is foreseen to connect the SX-M32 to any analogue apparel such as a camera, an external recorder, a wireless transmitter etc.
Its output level depend on the switch located beside the connector; in upper position the output level is at 0dBu, in lower position the level can be internally adjusted from –24dBu up to +6dBu, respectively –26 to +4dBu depending on the peak-meters programming.
This adjustment can only be done by a qualified technician.

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

4.2.3 Subsidiary Mono output [MONO OUT]

A Mono subsidiary unbalanced output is also available. It offers the Mono sum of the Left and Right main outputs. This Mono output is foreseen to connect the SX-M32 to any analogue apparel such as a camera, an external recorder, a wireless transmitter etc
Its output level depend on the switch located beside the connector; in upper position the output level is at 0dBu, in lower position the level can be internally adjusted from –24dBu up to +6dBu, , respectively –26 to +4dBu depending on the peak-meters programming.
This adjustment can only be done by a qualified technician.

The [SUB OUT] connector is a mini-XLR type TA-3 where:
Pin 1 & Pin 3 = Gnd / Pin 2 = Mono sum

4.2.4 Digital Output [AES]

A high quality Analogue to Digital converter is part of the SX-M32 mixer. The ADC is outputting the main Left & Right mixes. This digital output is foreseen to digitally connect the SX-M32 to any external apparel having an AES digital input such as a digital camera, a digital recorder, a computer's sound card etc.
The resolution is 24 bits and the sample frequency can be set at either 48kHz or 96kHz by means of the switch located beside to digital output connector.
In centre position, the ADC is tuned Off to save on batteries when the digital output is not used.

The digital audio level is factory set and depends on the nominal output level, this means of the analogue output level corresponding to a reading of "0 Peak" on the modulometre:

- the digital level is -18dBFS if the SX-M32 is set for a nominal output of +6dBu when reading "0 Peak"
- the digital level is -20dBFS if the SX-M32 is set for a nominal output of +4dBu when reading "0 Peak"

the [AES] output connector is a mini-XLR TA-3 where:
Pin1 = Gnd / Pin2 = High (+) / Pin3 = Low (-)

NOTE: - by default, the ADC offers the choice of 48kHz and 96kHz at 24bits and outputs an AES-31 signal. Internal soldering jumpers offer following choices:
- FS at 192kHz/24bits instead of 96kHz (the 48kHz position remain unchanged)
- 48kHz at 16 bits instead of 24bits (the 96kHz position remain unchanged)
- SPDIF format instead of AES-31

WARNING: Any modification of the default settings must be done by a qualified technician.
Please contact SONOSAX our your nearest Sonosax dealer

4.2.5 Monitor return [RETURN]

This stereo input is commonly used for confident monitoring of a camera or any external apparel such as a recorder, the output of another mixer, a wireless system for example. Listening to this return input is done by setting the monitor selector located on the front panel to the [RET] position.

This return is an unbalanced stereo input. The retractable potentiometer controls the input sensibility (or the return level) from –20dBu à +6dBu respectively from –22dBu to +4dBu.

When the switch is set to the [RETURN] position, then the return signal is assigned only to the monitoring selector. When in lower position [TO MIX], then the return signal is assigned simultaneously to the monitoring and to the L&R mix busses. Thus, this functionality offers an additional stereo input immediately available at any time to feed any external source.

The [RETURN] input connector is mini-XLR TA3 where:
Pin1 = Gnd, Pin 2 = Left in, Pin3 = Right In

NOTE: to connect a mono source to the RETURN input and to send it to both L & R mixes, bridge pin 2&3 together in the cable connector

4.2.6 Headphone outputs[PHONES]

The headphones jacks output the signal selected on the Monitor Selector located on the front panel. They allow you to plug any headphone mono or stereo, having a minimum impedance of 35 ohms.
The 6,35mm (1/4") jack is internally wired in parallel with the 3,2mm (1/8") headphone jack located on the front panel. Thus, it is possible to connect two headphones simultaneously on the SX-M32 mixer. The headphone level is common for both headphones outputs.

WARNING: the headphone amplifier of the SX-M32 is quite powerful. It is recommended to set the headphone level for a reasonable loudness to protect your precious ears.

4.2.7 Direct outputs 1 to 3 [OPTION]

As an option, a 7 pin XLR can be installed to provide with to the direct output of the channels 1 to 3 (see the addendum for the choice of the optional connectors). Usually the optional connectors are installed at factory and must be specified at the order. It is possible however to retrofit the optional connector at a later date.

The direct outputs are unbalanced and their nominal output level is 0dBu. Both Pre-Fader and Post-Fader are available on the optional XLR7-Male so the user can freely chose the signal by wiring the mating connector according to his needs.

The wiring of the direct outputs is as follow:

Pin 1 = Gnd, common to all outputs
Pin 2 = CH1 Pre fader
Pin 3 = CH1 Post fader
Pin 4 = CH 2 Pre fader
Pin 5 = CH 2 Post fader
Pin 6 = CH 3 Pre fader
Pin 7 = CH 3 Post fader

4.2.8 Other optional connectors [OPTION]

A choice of optional connectors such as multipin Tajimi 12pin, Hirose 10 or 12 pin, Neutricon etc is available.
All these connectors are wired to be compatible with existing cables that the user may already have.
See the ordering form and the addendum for the full list of connectors and their respective wiring.

4.3 FRONT PANEL

The front panel of the SX-M32 provides with all functionalities commonly used during a recording session such as the Gain control of the input channels, the mix bus assignment L-C-R, the mixing of the channels, the monitoring etc. Each function is fully explained in the following chapters.

INPUT SECTION [IN 1 to IN 3]

This section treats all functionalities concerning the input channels such as the input gain, the sweep LF-Cut, the mixing level and the assignment to the mix bus. It also contains a small modulometer to control the modulation level and to indicate eventual overload

4.3.1 Input Gain control [GAIN]

The gain potentiometers are retractable. A light pressure the [GAIN] knob releases the gain potentiometer.
It progressively controls the gain of the Mic/Line preamplifier of the corresponding channel [IN1 to IN3] within a range of 12dB to 78dB.

NOTE: the overall gain range is quite wide and therefore the gain must be carefully adjusted. An excessive gain will reduce the available headroom and may lead to an overload. A gain being set too low degrades the signal to noise ratio.

4.3.2 Input Limiters

Each of the 3 input channels has its own Limiter. It is part of the microphone pre-amplifier design and it acts as a protection Limiter. The threshold is set 2 dB below the clipping level and can not be modified.
When the modulation level reaches the threshold, the Yellow and the Red Leds are lighting simultaneously.

4.3.3 Sweep LF-Cut [LF CUT]

The sweep LF-Cut potentiometers are retractable. They progressively adjust the LF-Cut frequency of the corresponding channel [IN1 to IN3] and also automatically activates the PFL (pre-fader listening) as soon as the knob is released.
The LF-Cut is adjustable from 25Hz to 340Hz with a slope of 12dB per octave

NOTE: The LF-Cut circuitry is located right after the microphone preamplifier and is independent from the "Pre LF-Cut" which is located before the microphone preamplifier

4.3.4 Pre-Fader Listening [PFL] or [AFL]

As mentioned above, then Pre-Fader Listening function [PFL] is automatically activated when the [LF CUT] knob is released. As soon as a PFL is activated, it is signalled by the PFL Led located beside the headphone connector. The corresponding channel is then audible in the headphone outputs in place of the current monitor selection, and the modulation level of that channel is displayed on the main peak-meters.
Thus the gain and/or the LF Cut frequency can be precisely and individually adjusted, as its listening is not being affected by the other channels. More than one channel can be summed in PFL mode by simply releasing additional [PFL] knobs. When the LF-CUT knob is recessed, the PFL is turned Off and the monitor is audible again as previously selected. When recessed, the Gain and the LF Cut are protected of any inadvertent miss-adjustment.

NOTES: - by default the PFL is activated only by the [LF CUT] knob. By means of an internal soldering jumper, the PFL can also be activated with the [GAIN] knob. *(must be specified at the order)*

- by default the pre-listening functions is taken PRE-Fader (PFL), by means of an internal soldering jumper it can be changed to AFTER-Fader (AFL). *(must be specified at the order)*

WARNING: Any modification of the internal settings must be done by a qualified technician. Please contact SONOSAX or your nearest SONOSAX dealer for any change.

4.3.5 3 Led modulometer

These small modulometers indicate the input level of the corresponding channel and also indicate the eventual overloads and the Limiter's activity. The modulation is located after the microphone preamplifier but before the fader of the channel. Thus it allows controlling the modulation level even if the fader is closed.
The modulomètres works either in DOT mode or as a Bargraph, depending on the Power On mode ECO or ON

Level indications: YELLOW: lights on as soon as the modulation reaches approx –18dB.
GREEN: lights on as soon as the modulation reaches the nominal level 0dB
RED: lights on when the modulation reaches 9dB above the nominal level

Input Limiters: when the modulation reaches the threshold level of the limiter, both the Yellow and the Red leds light on simultaneously.

Overloads: The overload is indicated 2 dB before the clipping is reached.
When in Bargraph mode, only the upper red led is lighting
When in DOT mode, all leds light on simultaneously,

NOTE: the brightness of the leds varies automatically depending on the ambient light.

4.3.6 Channel fader (Mix Volume)

The channel's faders [IN1 to IN3] controls the level of the modulation sent to the mix busses (Mix Volume).
Its range goes from minus infinite to +20dB.

The unity gain (0dB) is reached when the potentiometers is in vertical position (line at 12 o'clock)

4.3.7 Panning [L C R]

The PAN switch routes the modulation of the corresponding channel [IN1 to IN3] to the stereo mix busses and consequently to the main outputs as follow:

Position L: the modulation is routed to the Left output channel only.
Position C: the modulation is routed to both the Left and Right output channels simultaneously.
Position R: the modulation is routed to the Right output channel only.

4.3.8 Linking channels 1 & 2 [- / LINK / MS]

Channel's Fader 1 can be linked with channel's Fader 2 by means of this switch, thus only one fader nr 2 controls both input channels which ensure to keep the same mixing level on these 2 channels. This is useful to keep the balance of a stereo microphone, an M/S pair or any other stereo source.
When channel 1 is linked to channel2, only the fader nr 2 is active.

Upper position:	no linking, both channels are independent.
Position LINK:	channel's fader 1 is linked to channel's fader 2, only fader 2 is active
Position MS:	same as LINK, but decodes the M/S signal sent to the mix bus. The channel 1 is the M signal; the channel 2 is the S signal

Decoding M/S

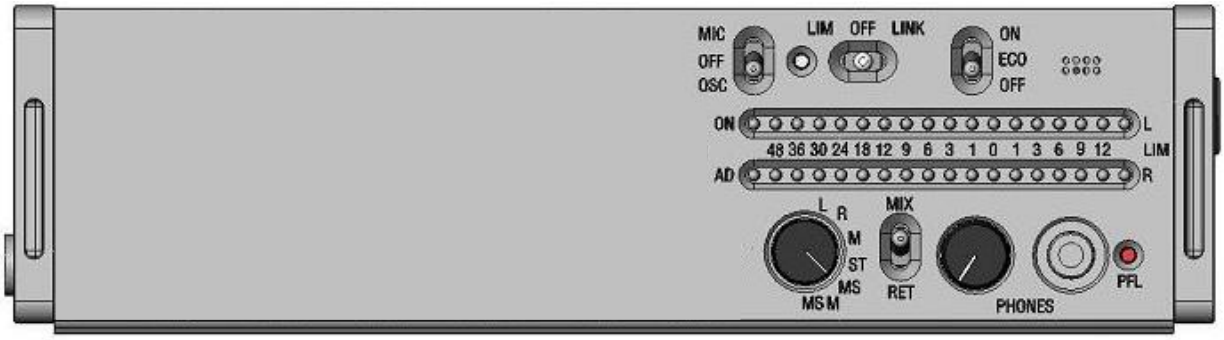
While decoding an MS modulation, the M channel is routed to both Left and Right outputs through the mix busses; the S channel is sent in phase to the Left output and phase reversed to the Right output

The M channel must be connected to input [IN1]
The S channel must be connected to input [IN2]
When MS is selected, the panning switches L-C-R of channels 1 & 2 are automatically deactivated and have no longer any influence on the routing.

As mentioned above, both fader 1 & 2 are linked, but not the [GAIN] potentiometers. So you can still vary the input gain which allows you to change the stereo image (spread). When both input channels have the same gain, then the M/S decoding ration is 50/50. If the gain of the S channel is reduced, then the stereo image is narrowing (more centred), and conversely if the gain of the S channel is increased, the stereo is widening.

5. MASTERS & MONITORING SECTION

This section groups all functionalities related to the main outputs (Master) such as the summing amplifiers, the output Limiters, the reference tone and the Slate microphone as well as the Monitoring which groups the monitor selector, the headphone level and the main peak-meters.



5.1.1 Summing amplifiers [Master]

The summing amplifiers are mixing the modulation coming from the three input channels, from the [BUS IN] input and from the [RETURN] input if its switch is set to [TO MIX].
Given its small size and the fact that it has only three inputs channels, the SONOSAX SX-M32 mixer does not have any fader to control the level on the Main outputs. The output level is controlled solely by the mixing level on the input channels.
The Left and Right mix busses are then sent to the main outs on the XLR's, to the Sub-Out and the Mono-Out and also to the A/D Converter. Where appropriate the main are also sent to the connector [OPTION].

5.1.2 Limiters [LINK OFF ON]

The Masters of the SX-M32 are each fitted with a high quality Limiter, located before the analogue outputs and before the A/D converter. The Limiters are acting independently but they can be linked to keep the balance of a stereo mix. The threshold of the main Limiter is set at factory either at nominal line level or alternatively 3 dB below the clipping level of the A/D Converter (at -3dBFS). On demand, the threshold can be adjusted at a different level.

Position LINK: both Limiters are engaged and linked together (stereo mode).
Position OFF: both Limiters are disengaged.
Position ON: both Limiters are engaged but are acting independently

NOTE: When using the Limiter in a stereo mix, make sure that you set the switch to the [LINK] position to keep the stereo balance of your mix.

5.1.3 Ref Tone and Slate Mic [MIC OFF OSC]

The SONOSAX SX-M32 is equipped with a Slate microphone, located in the upper right corner on the front panel, and also provide with a reference tone generator. This 3 positions switch lets choose which if these two sources will be fed to the mix L & R busses as follow:

Position MIC: the Slate microphone is sent to the L & R mix busses
Position OFF: both the Slate mic and the Reference tone generator are turned Off.
Position OSC: the reference tone generator sends a 1kHz sine wave to the L & R mix busses at nominal line level. This Ref Tone is generally used for level calibration of for test procedures.

NOTE: The nominal line level at the output is either +6dBu or +4dBu (must be specified at the order)
At nominal line level the peak-meters indicate 0dB.

5.1.4 Turning ON the unit [OFF ECO ON]

- When the power on switch is set to [ECO] the SX-M32 turns On in a a power saving mode in order to reduce its power consumption, thus improving its running time when powered from batteries. In this mode, all the led meters are working in DOT mode which means that only the led corresponding to the highest modulation level will lights on.
- When the power on switch is set to [ON] the SX-M32 turns On and in a normal mode and all the led meters are working in Bargraph mode.

5.1.5 Led modulometers [Peak-Meters]

The two main modulometres indicates the audio level over a very wide scale, from -48dB up to +12dB. They are also indicating other status and information such as the powering mode, the main Limiters activity, the eventual overloads and also the eventual clipping of the A/D converter. As mentioned above, the work either in Dot mode or as Bargraph depending on the power on switch.

The modulomètres are factory programmed to behave as Peak Meters. The 0dB reference represent the nominal output level that is either +6dBu or +4dBu. The upper row shows the level of the Left channel and the lower row shows the level of the Right channel.

The intensity of modulomètre is adjusted automatically according to ambient light. The light sensor is located between the switch Mic / Osc and Limiter's switch.

The first led, at left on the upper meter, indicates that the SX-M32 is turned On. When powered from an external DC source the led is lighting on. When powered from the internal batteries the Led is flashing and it also indicates the battery remaining capacity (please refer to section 3.3.2).

The first led, at left on the lower meter, indicates the eventual clipping of the A/D Converter.

The last leds on both rows indicates the activity of the Limiters, the upper led for the Left channel, the lower led for the Right channel. As soon as the modulation reaches the threshold level the leds turn On.

The peak-meters also indicate the eventual overloads. This indication depends on the power on mode:

As Bargraph [ON]:	only the last led on the right lights on
In DOT mode [ECO]:	all leds turn on

5.1.6 Led [PFL]

The led located beside the headphone jack indicates the PFL activity.

5.1.7 Monitor source selector [MIX RET]

This switch lets you choose to listen to the main mix (Main outs L & R) or to the return monitor signal fed back from a camera or a recorder for example, when connected to the [RET IN] connector.

Position MIX:	the modulation heard in the headphone is coming from the main L & R mix busses.
Position RET:	the modulation heard in the headphone is coming from the [RET IN] connector.

5.1.8 Monitor mode selector [L R M ST MS MS/M]

This six positions switch is located right after the source selector and selects the monitoring mode as per following table:

Position L:	the Left channel only is heard in mono the headphones
Position R:	the Right channel only is heard in mono the headphones
Position M:	both Left and Right channels are summed and heard in mono the headphones.
Position ST:	Left and Right channels are in stereo in the headphones
Position MS:	a M/S signal is decoded in stereo and sent to the headphones.
Position MS-M:	a M/S signal is decoded, then summed in mono and sent to the headphones

NOTE: The M/S decoding on the Monitoring mode selector has no influence on the mix bus.

5.1.9 Headphone level [PHONE]

This retractable potentiometer adjust the monitor level of the headphone output [PHONES] located on the right side panel and on the front panel.

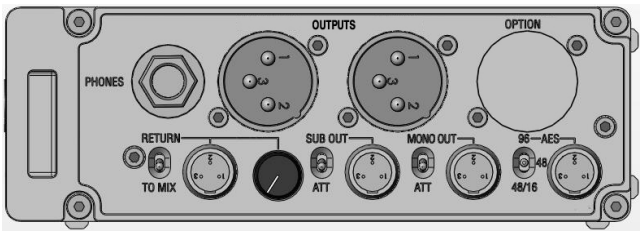
WARNING: The headphone amplifier of the SONOSAX SX-M32 is quite powerful. It is strongly recommended to set the headphone level at a reasonable level to protect our precious ears.

6. ADDENDUM

6.1.1 Output panel configurations

The SX-M32 mixer was designed to offer different output panels in order to accommodate with the different user's requirements.

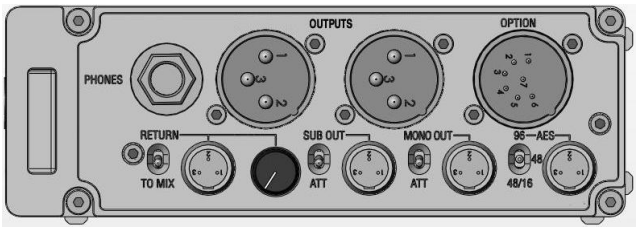
STANDARD VERSION



XLR3-M: Left Main Out on the left connector & Right Main Out on the right connector
OPTION: see optional connectors hereafter

XLR-3 / Main Outputs	TA-3 / Return & Sub-Out	TA-3 / Mono Out	TA-3 / AES Out
Pin 1 = GND	Pin 1 = GND	Pin 1 = GND	Pin 1 = GND
Pin 2 = Hi +	Pin 2 = Left	Pin 2 = Mono Out	Pin 2 = Hi +
Pin 3 = Lo -	Pin 3 = Right	Pin 3 = GND	Pin 3 = Lo -

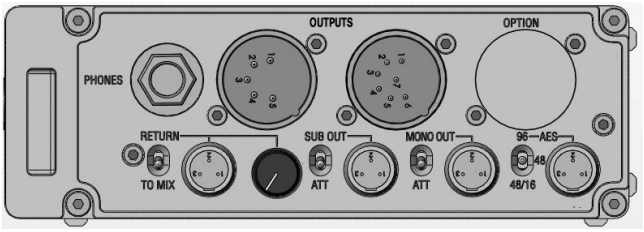
DIRECT OUTPUTS VERSION "A"



XLR3-M: Main Out Left & Main Out Right
XLR7-M: Channel's Direct Outs, Pre and Post Fader

XLR-5M – Main outputs:
1 = GND
2 = Left Hi +
3 = Left Low -
4 = Right Hi +
5 = Right Lo -

DIRECT OUTPUTS VERSION "B"



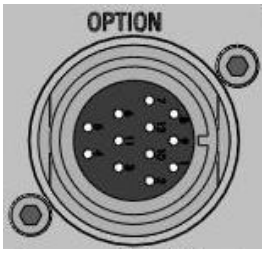
XLR5-M: Main Outs Left & Right
XLR7-M: Channel's Direct Outs, Pre and Post Fader
OPTION: see optional connectors hereafter

XLR-7M – Direct channels outputs :
1 = GND
2 = CH1 Pre-Fader Out
3 = CH1 Post-Fader Out
4 = CH2 Pre-Fader Out
5 = CH2 Post-Fader Out
6 = CH3 Pre-Fader Out
7 = CH3 Post-Fader Out

6.1.2 Option CONNECTORS

HIROSE 10 PIN
RM15TRD-10SB

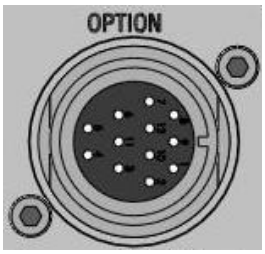
pin out compatible with: AudioDevelopment / SQN / SOUND DEVICES / COOPER / MIXY
mating connector: RM15TPD-10P



Pin 1 = Out LEFT Hi +
Pin 2 = Out LEFT Lo -
Pin 3 = Out RIGHT Hi +
Pin 4 = Out RIGHT Lo -
Pin 5 = Return LEFT +
Pin 6 = Return LEFT Gnd
Pin 7 = Return RIGHT +
Pin 8 = Return RIGHT Gnd
Pin 9 = GND
Pin 10 = GND

HIROSE 12 PIN
HR10A-10R-12S

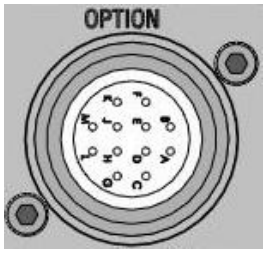
pin out compatible with: SQN-5S
mating connector: HR10-10P12P



Pin 1 = Sub-Out LEFT
Pin 2 = Sub-Out RIGHT
Pin 3 = GND
Pin 4 = Mix Bus In LEFT
Pin 5 = Mix Bus In RIGHT
Pin 6 = GND
Pin 7 = CH1 Post-Fader Out (can be changed to PRE fader)
Pin 8 = CH2 Post-Fader Out "
Pin 9 = CH3 Post-Fader Out "
Pin 10 = ---
Pin 11 = ---
Pin 12 = ---

TAJIMI 12 PIN
PRC 05R 12F

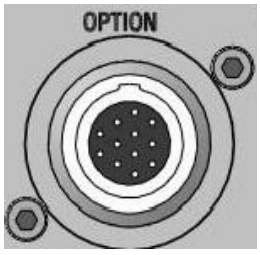
pin out compatible with: SQN / Mixy / Sony
mating connector: PRC05P12M



Pin A = Out LEFT Hi +
Pin B = Out LEFT Lo -
Pin C = Out RIGHT Hi +
Pin D = Out RIGHT Lo -
Pin E = Return LEFT +
Pin F = Return LEFT Gnd
Pin G = Return RIGHT +
Pin H = Return RIGHT Gnd
Pin J= GND
Pin K = GND
Pin L = Sub-Out LEFT
Pin M = Sub-Out Right

NEUTRIK MINICON MRF12
MRF12

pin out compatible with: Mixy
mating connector:



Pin 1 = Sub-Out LEFT (to HF transmitter)
Pin 2 = DC IN Power / 6 to 18VDC
Pin 3 = GND
Pin 4 = GND
Pin 5 = Sub-Out RIGHT (to HF transmitter)
Pin 6 = IN 3 Hi +(from HF receiver)
Pin 7 = IN 3 Lo -(from HF receiver)
Pin 8 = DC OUT 6 to 8,2VDC (max xxmA)
Pin 9 = IN 2 Hi +(from HF receiver)
Pin 10 = GND
Pin 11 = IN 2 Lo -(from HF receiver)
Pin 12 = ---

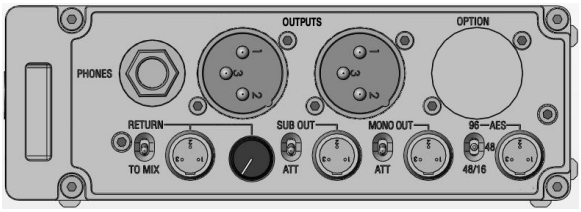
6.1.3 Purchase order form

Distributor / Dealer: …… **P.O. nr :** …..…… **Date of order :** ……..

Customer, end user: ……..... *Serial Nr:* …….. *Expected delivery date:* ……..

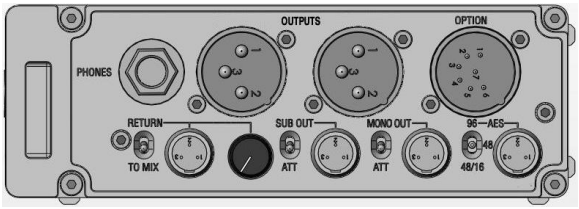
Communications / Notes: ……..
……
……

STANDARD VERSION ☐



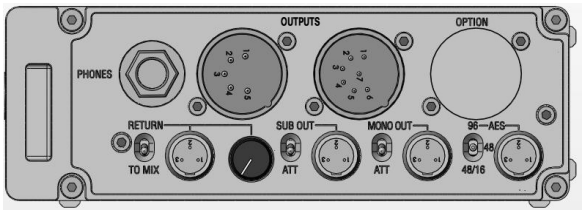
2 x XLR3-M and one blank panel

DIRECT OUTPUTS VERSION "A" ☐



2 x XLR-3M and 1 x XLR-7-M for direct out

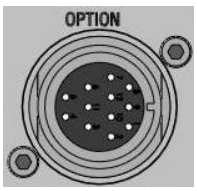
DIRECT OUTPUTS VERSION "B" ☐



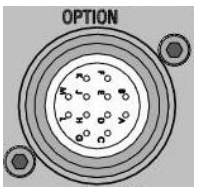
1 x XLR-5M for Main L&R, 1 x XLR-7-M for direct out and 1 x Blank panel

OPTION PANELS

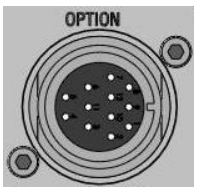
HIROSE 10 Pin ☐
RM15TRD-10S



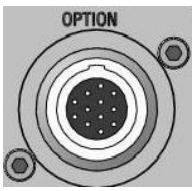
TAJIMI 12 Pin ☐
PRC 05R 12F



HIROSE 12 Pin ☐
HR10A-10R-12S



NEUTRIK MINICON ☐
MRF12



OTHER ☐
Please specify

TECHNICAL SET-UP ** denotes standard factory set-up

Nominal output Line Level: ☐ +4dBu ☐ +6dBu** *Line Level at balanced outputs, for 0 reading on peak-meter*

SUB-OUT ATT Output level: ☐ …….. dBu *In ATT position the output level can be adjusted from -24dBu** to +6dBu*

MONO-OUT ATT Output level: ☐ …..… dBu *In ATT position the output level can be adjusted from -24dBu** to +6dBu*

MASTER LIMITER: ☐ Set at Nominal Line Level**
☐ Set at -3dBFS for protection of the A/D Converter

PFL Activation : ☐ activated with LF Cut knob only** ☐ activated with either LF CUT or GAIN

PFL or AFL monitoring ☐ PFL monitoring** (Pre Fader) ☐ AFL Monitoring (After Fader)

Modulometers: ☐ Follow the Monitor selector** ☐ Always indicates Main Out Levels

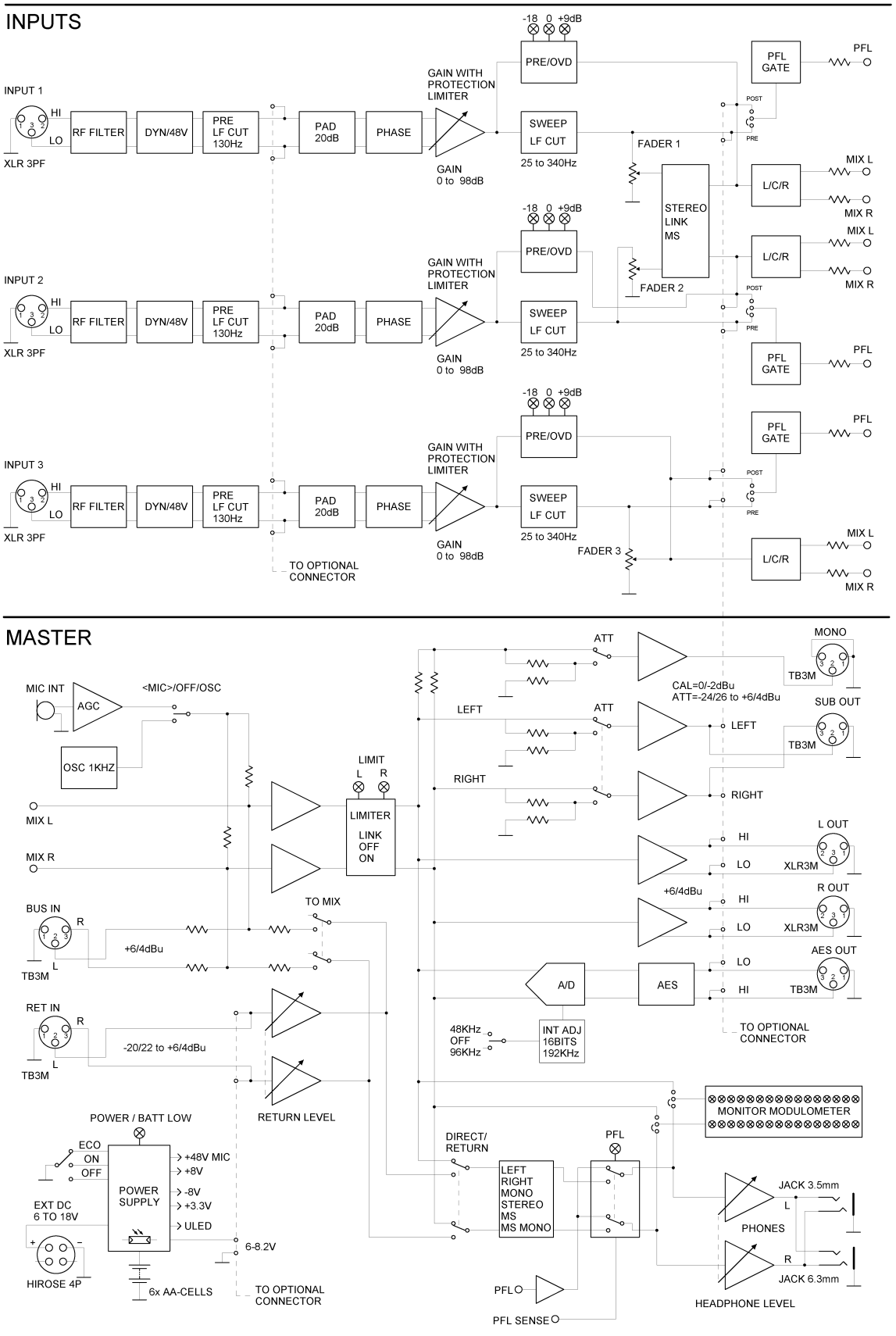
A/D Converter, Fs and bit rates: ☐ 48 / 96 kHz at 24 bits**
☐ 48 kHz dithered to 16 bits / 96kHz at 24 bits

Digital Ouptut: ☐ AES-31** transformer balanced ☐ SPDIF output

For any purchase order of SONOSAX SX-M32, Please check the appropriate boxes and return this form to SONOSAX
by e-mail : sonosax@sonosax.ch or by Fax.: +41 21 651 01 09

6.2 BLOC DIAGRAMM

SONOSAX SX-M32 BLOCK DIAGRAM



SONOSAX SAS SA Ch de la Naz 38 CH-1052 Le Mont s/Lausanne SWITZERLAND Tel +4121 651 01 01 Fax +4121 651 01 09

7. SPECIFICATIONS

All specifications mentioned below are given for standard models. SONOSAX SAS SA reserves the right to change these data at any time without notice

For measurements and/or adjustment, the reference is: 0dBu = 0.775V (+6dBu = 1.55V, +4dBu = 1,23V)

7.1.1 Summary of characteristics

Frequency response:	25Hz to 250kHz
Maximal Gain:	78dB on the Gain plus 20dB on the Fader = total 98dB of gain
Overall dynamic:	119dB
Crosstalk:	>60dB
Modulometre:	Fast Peak meter
Working temperature:	-25°C [-13°F] to 70°C [158°F]

GAIN	98dB Fader at max	78dB Fader at 0	58dB Fader at 0	38dB Fader at 0	18dB Fader at 0	0dB PAD -20dB
Nominal level:	-92dBu	-72dBu	-52dBu	-32dBu	-12dBu	+6dBu
Maximum level:	-45dBu	-25dBu	-10dBu	+2dBu	+14dBu	+34dBu
THD+N*	<0.08%	<0.08%	<0.02%	<0.01%	<0.01%	<0.01%
CMRR**	>100dB	>100dB	>100dB	>90dB	>65dB	>60dB
Noise LIN**	-127.6dBu	-127.6dBu	-126.5dBu	-120.8dBu	-108.8dBu	-90.5dBu

* 22 Hz to 22 kHz, at maximum input level
** Equivalent input noise from a 150Ω source

Output noise

Channel Faders at 0dB:	-92,0dBu
Channel fader closed:	-98,8dBu

7.1.2 Input

MIC/LINE Input

Input type:	electronically balanced, transformer-less
Input Impedance:	2.5kΩ
RF Filters:	built in standard
PAD attenuation:	-20dB
Pre-LF Cut:	passive filter, 130Hz / 6dB per octave
Sweep LF Cut:	active filter, adjustable from 25 to 340Hz, 12dB per octave
Alimentation micro:	+48V [phantom power]

BUS IN Input

Input type:	unbalanced, stereo
Sensivity:	nominal line level, direct feed on the mix busses (+6dBu or +4dBu)
Bus In impedance:	9kΩ

RETURN Input

Input type:	unbalanced, stereo
Sensivity:	adjustable form -20 to +6dBu or –22 to +4dBu according to peak meters
Return impedance:	2kΩ to 12kΩ depending on sensivity adjustment

7.1.3 Outputs

MAIN outputs

Output type:	electronically balanced, transformer-less
Oupput impedance:	<50Ω
Nominal output level:	+6dBu or +4 dBu as specified at the order
Maximal output level:	+19dBu @600Ω / +21dBu @10kΩ

DIGITAL output

Output type:	AES/EBU , transformer balanced, 3Volts pp under 110 ohms internally switchable to SPDIF format
Sampling:	48kHz and 96Khz at 24 bits internally switchable to 48Khz/16 bits and 96kHz/24bits or 48kHz/24bits and 192kHz/24bits
Dynamic range:	119dB

SUB-OUT Outputs

Stereo Sub-Out:	unbalanced, stereo
Nominal output level:	0dBu / -2dBu according to peak meters programming
ATT output level:	internally adjustable from -24dBu to +6dBu / -26dBu to +4dBu
Output impedance:	<50Ω
Mono Sub-Out:	unbalanced, mono
Nominal output level:	0dBu / -2dBu according to peak meters programming
ATT output level:	internally adjustable from -24dBu to +6dBu / -26dBu to +4dBu
Output impedance:	<50Ω

HEADPHONE output

Output type:	unbalanced, stereo, on Jack 6,25mm (1/4") and 3,5mm (1/8")
Output level:	adjustable from - infinite to +15dBu
Output impedance:	<5Ω
Minimum load impedance:	>30Ω

Output Limiters

Limiter Threshold:	internally adjustable
Attack time:	0.1 ms
Release time:	0.3 s
Compression ration:	1 / 15

Oscillator

Frequency:	1kHz
THD:	< 3%

7.1.4 Powering

Batteries:	6x alkaline batteries or rechargeable cells NiCd or NiMh LR6 (AA)
External DC supply:	6V to 18V DC,
Power consumption:	average 4 Watts without phantom powered microphones
Running time:	approx. 5h with six alkaline batteries LR6 (AA)

7.1.5 Dimensions and weight

Dimensions [W*D*H]:	176 x 46 x 138 mm / 6,93" x 1,75" x 5,43"
Net weight without batteries:	0,78 kg (1,72 lbs)
Weight with batteries:	approx 0.9 kg [1,98 lbs] with six alkaline batteries AA

8. TIPS ON USING YOUR MIXER

The SONOSAX SX-M32 has been designed to ensure unsurpassed performance. However, bear in mind that a good sound recording greatly depends on microphone placement and on dynamics.

We therefore recommend the following:

- Adjust the input gain level at maximum possible level, reading between 0 dB and +6 dB on the main meters, but keep a reasonable headroom.
- Input rotary faders should act between 0dB and +10dB.
- Preferably try to operate at highest possible levels at the first amplification stage or at microphone pre-amp levels.
- Make sure that interconnections between your SX-M32 mixer and other equipments are correct and optimal.
- Optimize operating conditions (location, quality of microphones, etc.)

Considering the extensive possibilities offered by your SONOSAX SX-M32 mixer, this instruction manual may not answer all questions that may arise during normal operation of your equipment. Please contact your nearest SONOSAX dealer for any further information.