MULTI STEREO LINE MIXER

Rev 1.0 – Januray 2021

INTRODUCTION

What is our ***Multi Stereo Line Mixer***?
MSLM is a professional/line level device (+4dB) thought of as the ultimate solution for the "golden rack era" lovers out there. It can be defined as a complete and very compact (only 1U rack high) overall object or central piece of your entire rack system. It can do a lot for the managing of your signal.

It's not new that, over the years, we've taken care of a lot of various systems. We started our entire career by paying homage to the most iconic object of the '80s, the Tri Stereo Chorus, on which our "The Wave – True Analog Multichorus" was based on. We spent countless hours testing and playing that amazing jem and, of course, trying to understand the specific habitat that surrounded it.

Fast forward, after a few years of many rigs and many custom line mixers built, we focused our minds in making an object that could resume the most requested features that many players asked us, and try to pack all of them in 1U rack format.
We carefully looked at all the previous requests and tried to write down all the key features of the rack systems we built, diving into three main "stages".

THE CONCEPT

To properly understand how this system works (yep, this is not a simple mixer...it's a lot more!), first of all you need to understand how a guitar rack systems was intended to work.
Most of the time, the starting point was the pre-amplified guitar signal, or a slaved signal coming from a loaded amplifier.

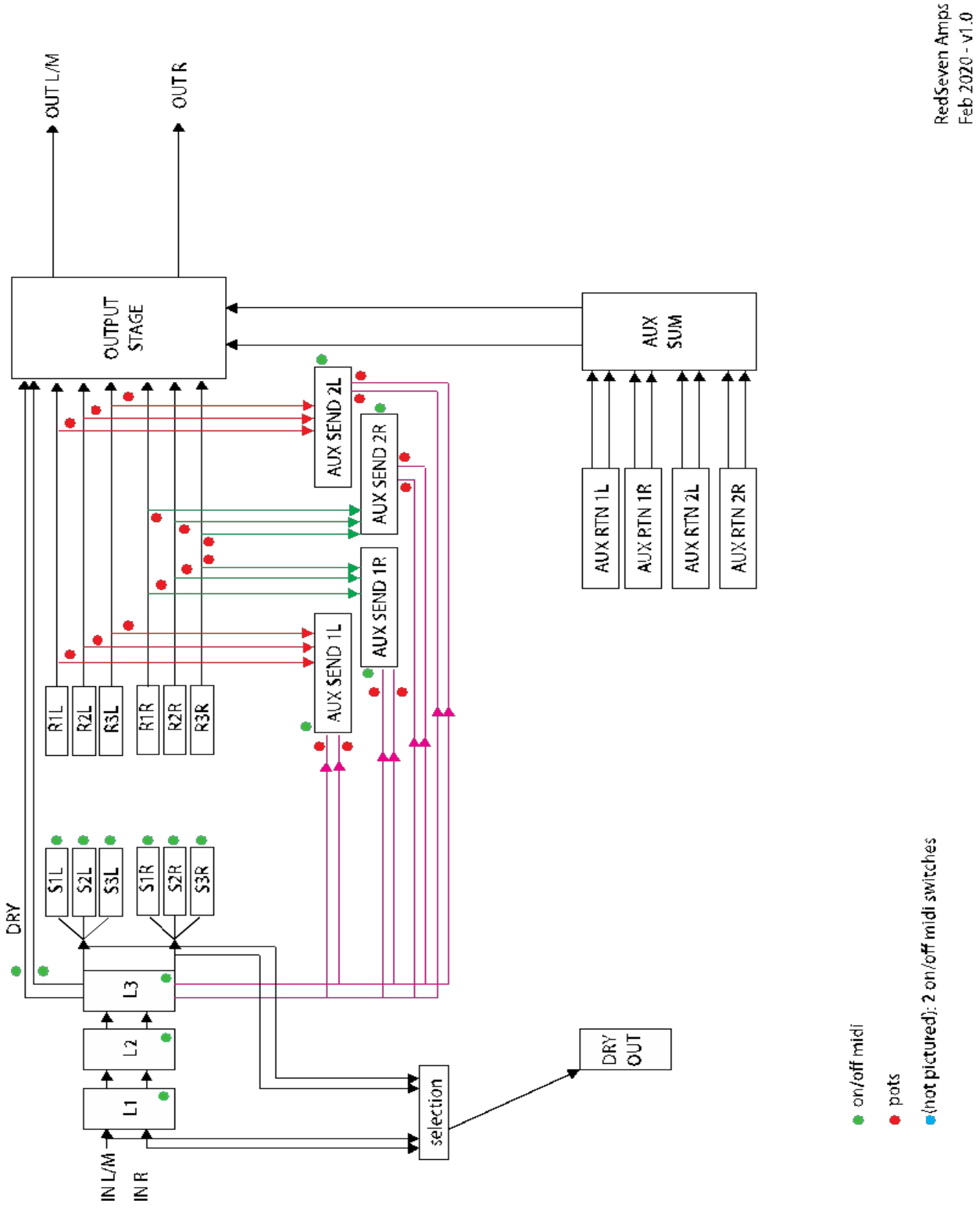
From here, people used to place an "audio looper" as the first object of the whole chain; this is a device that could turn on/off serial processors such as equalizers, compressors, chorus, etc. More often, that looper was also used as audio splitter, sending the signal into some other processors such as detuners, delays, reverbs, etc.; instead of turning the output signals of those devices back into the looper, they were sent into a mixer. This is what we usually call "parallel routing".

The finishing touch, as some guys like Mike Landau and many others used to do, is to put other processors in series after the mixing stage (i.e. PCM42s by Lexicon), in order to add another "color" to the system.
Then, at the last stage, the stereo signal was amplified by a stereo power amplifier.

So, the average entire "classic" guitar rack system (so far) is always made at least by two pieces (but usually more than two): a looper and a mixer. Just for the control part of the system, with very limited routing possibilities indeed.

More often, those loopers and mixers were custom tailored to personal specifications and very few were made for "generic" use; so, this kind of environment wasn't so changed during the last 20 years at least (or maybe more).

LOGIC SCHEMATIC



FRONT PANEL
(left to right)

1. FX1 to FX3 red illuminated buttons: these buttons turn on/off the three parallel FXs. When red light is on, the effect is on.
2. DRY red illuminated button: this button turn on/off DRY path. When the red light is on, DRY path is on.
3. AUX 1 & 2 potentiometers: those pots let you decide how much of the respective signals to send to AUX 1, 2, or both auxiliaries loops. At maximum position, the send level is 1:1.
4. L1-L2-L3 red illuminated buttons: these buttons turn on/off the three serial loops. When red light is on, the loop is active.
5. D/OUT post: red illuminated button: this button toggle the position of the dry output. When the red light is on, DRY output is take after loop 3 (L3), when off, is taken at the very input of the mixer (before L1).
6. SW1 – SW2: red illuminated buttons: this buttons turn on/off Switch 1 and 2. When the red light is on, Switch 1, 2 or both are active.
7. AUX1 – AUX2: red illuminated buttons: this buttons turn on/off AUX1 and 2 processors. When red light is on, AUX1, 2 or both are on.
8. MAIN OUTPUT (balanced): main output of the entire mixer. Fully electronic balanced, with XLR connectors. They are a copy of back outputs and they can be used at same time (back and front pair).
9. MIDI INPUT: midi input connectors, wired in parallel to back midi input connector. They should be used one at time, to avoid any issue.
10. POWER BUTTON: it turn on/off the device. Do not turn it down when audio is running or when your amplifier is on: this can cause loud noise.

BACK PANEL
(left to right)

1. POWER CONNECTOR: 90V to 240V AC accepted. MSLM can be powered worldwide without any issue. Be sure to use a proper grounded cable.
2. MIDI INPUT/THRU: midi input and output socket. Midi input is wired in parallel to front midi input connector. They should be used one at time, to avoid any issue. Midi thru is a buffered copy of midi input, so the midi signal is let thru without any modification.
3. SW1/2: stereo connector for switch 1 and 2. You need a proper Y cable to use both of them.
4. D-OUT: dedicated dry path output.
5. OUTPUTS (L/Mono and R): main outputs of the mixer, done by a un balanced mono jack connectors.
6. AX2R (Right and Left): Return of AUX2 loop, both right and left.
7. AX1R (Right and Left): Return of AUX1 loop, both right and left.
8. AX2S (Right and Left): Send of AUX2 loop, both right and left.
9. AX1S (Right and Left): Send of AUX1 loop, both right and left.
10. FX3R (Right and Left): Return of FX3 loop, both right and left.
11. FX2R (Right and Left): Return of FX2 loop, both right and left.
12. FX2R (Right and Left): Return of FX1 loop, both right and left.
13. FX3S (Right and Left): Send of FX3 loop, both right and left.
14. FX2S (Right and Left): Send of FX2 loop, both right and left.
15. FX1S (Right and Left): Send of FX1 loop, both right and left.
16. L3R and L3S: Send and Return for Loop 3 (L3).
17. L2R and L2S: Send and Return for Loop 2 (L2).
18. L1R and L1S: Send and Return for Loop 1 (L1).
19. IN L/Mono and R: main input of MSLM.

INPUT SECTION

The input section is on the back of the mixer, on the right. The mixer can accept both mono or stereo signals. If you're facing a mono input signal ingoing to MSLM, you must use L/Mono input. From this point forward, once you decided to split from a mono signal to a stereo one, we HIGHLY suggest to keep your signal stereo, in order to avoid the crash of stereo image.
You need to be very careful in making your cables in order to perform your system at the best of its possibilities.

THREE MAIN STAGES

Our MSLM is based on the reissue of three main sections:

1 – Serial processing (Loops L1 – L2 – L3)

A serial audio loop is a very simple passive circuit act to bypass/put in line a particular object into the signal path.
We placed three mono/stereo loops at the very beginning of the signal chain, after the input stage. You can hit the mixer with both a mono or stereo signal. Electric guitar always has a monophonic signal, usually.
All three audio loops (L1 – L2 – L3) can be used both in mono or in stereo, they are able to auto split signal from a mono input/stereo output devices, making the signal from mono to stereo.
You need to understand once you split the signal into a stereo one, you can't go back to mono, cause you'll crash the stereo image.
IMPONTANT! There's only one way to do this in a compact format as MSLM, and it's to always use TRS jack, equally as if you're using both mono or stereo devices. This is a mandatory feature.
By using mono jack connectors (also if in presence of mono signal) in this part of MSLM, you'll cause some improper use and you'll not be pleasured with sonic results.
Please, always keep in mind this point.

How to wire those connectors? It's very simple (drawing in the next page):

A. If you want to use a **MONO** signal, you just need to use a cable made of one MONO (TS) jack and one STEREO (TRS) jack. You need to solder the TS jack as standard mono jack, while the TRS jack with the TIP and RING together as the HOT portion of the signal, and SLEEVE as ground.
B. If you want to use a **STEREO** signal, you just need to use an Y cable made of two MONO (TS) jack ends and one STEREO (TRS) jack. You need to solder TS jacks as standard mono jacks, while the TRS end just soldering the TIP as LEFT and RING as LEFT of the signal, SLEEVE as ground.

That's all.

Ex. A - cable for a MONO connection with MSLM

Ex. B - cable for a STEREO connection with MSLM

(NOTE: if a ground loop is experienced, you can cut one ground wire form left or right mono connector, on the effect side)

Let's assume we want to patch in our MSLM few common units, like:

- DBX160 compressor in L1 (mono in / mono out);
- TC electronic 1140 equalizer in L2 (mono in / mono out);
- Tri Stereo Chorus in L3 (mono in /stereo outs);

In this particular situation, we will use following methodology, keeping in mind we must use ONLY TRS CONNECTORS for MSLM side:

- DBX160 in L. We'll use A method for both input and output connector;
- TC1140 in L2. We'll use A method for both input and output connector;
- Tri Stereo Chorus in L3. We'll use A method for both input and output connector.

Once the connectors are made, if you turn on your three loops (L1 – L2 – L3) you should listening at the compressor and equalizer from both left and right output of the mixer, indiscriminately, while you should listen at the chorus in stereo, facing different audio processing from left to right, as the machine is intended to work.

2 – Parallel processing (FX1 – FX2 – FX3)

These are the three main parallel processors. Everything is coming from the return jacks of L3 (mono or stereo) will be split into three mono or stereo sends, in order to feed FX1/2/3 inputs plus a dedicated fourth pat, for the dry signal (this last one is internal).
These three processors are connected in parallel, one to each other.
The returns of these four audio paths (three processors plus the dry path) will be directly summed to the output stage.

How to wire (FX1 – FX2 – FX3)?
No more special cable needed, from this point on, you can use standard ¼' or 6.3mm MONO jack. Each device has the ability the be connected in full stereo mode (stereo input/stereo output) into the mixer.

Let's dig a bit deeper. Scenarios at this point can be quite a few.

1 – All three serial loops are mono (L1 – L2 – L3), but my first parallel processor has stereo input (FX1). How do I split a mono signal into a stereo one?
MSLM will do it for you. You only just need to connect both of FX1 send jacks to the input jacks of your device, MSLM will send an exact copy to both inputs of what is coming from the mono output of L3.

2 – First two serial loops are mono (L1 – L2) but third loop is stereo (L3), my first parallel processor has stereo input (FX1). How do I connect my parallel processors?
Self-answering question. The devices putted in L3 will split the signal for you, you only just need to connect both of FX send jacks to the input jacks of your device.
This is configuration can be also applied if two or all three loops (L1 – L2 – L3) are wired in stereo.

3 – One or more of the serial loop (L1 – L2 – L3) or at least the last one (L3) are stereo, but my first parallel processor FX1 has mono input, how do I need to connect it?
There're two possible ways to do it. If you are ok to send only one side of L3 to the the mono input of FX1, you can use the left side, with a simple mono cable.
If you want to send the entire stereo signal, collapsing what is coming out of L3 into a mono send, you need to create a special Y cable, with three mono jacks. Two jack will be placed into FX1 sends, the third one with both cables soldered together, will be insert into your processors' input jack.
NOTE: by collapsing both FX1 sends into a mono signal, will NOT affect FX2 and FX3 sends. You will maintain the stereo image intact.

3 – Auxiliary processing (AUX 1 – AUX 2)

We gave the possibility to the final user to go even more "deeply into the hole" with two full stereo auxiliary loops. These two loops (processors) can be fed by the returns of each one of the three main parallel processors (FX1/2/3), or even by dedicated internal dry signal coming out of L3.
Doing this way, the mixer can be configured into two different modes (without touching a cable!):

- 5 parallels: five full stereo processors can be placed in parallel, one to each other;
- 3 + 2 (dual mode): three full stereo processors, connected in parallel one to each other, can be also placed into other two other stereo processors, connected in parallel one to each other as well.

Again, you can switch from these two modes in real time, by selecting them from the front panel and without touching any cable.

What are the advantages of using AUX processing?
Well, they're multiple. Most of the iconic sounds back in the days were obtained by placing one particular devices into another, and not in parallel. By upping the game, also group of effects in parallel to each other were placed in series into another group of effects.
This is also a very creative processing. Let's talk about a stereo delay and a stereo reverb for example. What's the most correct way to wire them? The most correct answer is to wire them in parallel, since they are both time based effect, so their processing should start from the same exact moment. But, why not to be a little more creative? Why, for example, to hear the reverb coming only on delay repeats and not on dry signal, giving a wired sense of space and depth?

Let's try to configure this, by having:
- Our standard dry signal;
- Stereo Delay into FX1;
- Stereo Reverb into AUX1.

What can I do from now?

Well, by always keeping our dry signal active (DRY), we can procced in two different ways:
DELAY // REVERB:
- We turn on DRY button (we let the dry signal coming to the speakers);
- we turn FX1 button on (we activate the parallel send to our delay devices);
- we turn AUX1 button on and we increase AUX1 pot near corresponding DRY button (we're sending the dry signal into reverb, for a parallel processing, like we've done for FX1)

What I should expect to hear? A nice regular ambient, where delay's repeats and reverb's reflections start from the exact same time, give us an all around classis space.

DELAY -> REVERB:
- We turn on DRY button (we let the dry signal coming to the speakers);
- we turn FX1 button on (we activate the parallel send to our delay devices);
- we turn AUX1 and we increase AUX1 pot near corresponding FX1 button (we're sending the output of delayed signal into reverb, for a two stages serial processing).

What I should expect to hear? A bit more wired effect, since you're experienced a wired thing, such the reverb is listened only on delays repeats and not on dry signal.
Saying we set our delay at 500ms, you're hearing nothing for 500ms, then the very first delay repeat and then only from that moment the reverberation. By increasing delay feedback, you will hit more and more reverb always later, like 1000, 1500, 2000ms later than your dry signal, so a "bouncing" reverb is what you're experiencing.

You wanna go deeper?
Try to patch a pitch based effect into AUX2, and play with a delay, a reveb and a pitch shifting with all this possibilities.

DIRECT OUTPUT or D-OUT (selectable)
A dedicated dry output is available for an easy Wet/Dry/Wet application of the mixer in such as situation, or if you'd like to have an unprocessed dry path to be recorded in your DAW or sent wherever you need.
We also gave you the ability to select where this dry output is taken: PRE (D/OUT button off) is right at the input of the mixer. You will have a copy of the signal coming from the inputs. POST (D/OUT button on) this will take your signal after L3. Very useful if you'd like to have the serial processing in your center cabinet. No gain or attenuation applied, the output from D/OUT is 1:1 in volume, compared to main input signal.

SWITCH 1/2
A couple function switches are available, in order to turn on/off the features of some external devices (amps, preamps, fx, etc.) These switches are latching, with HOT to ground with activated. They can be both activated by front panel or via MIDI CC.
SW1/2 is the jack on the back, to use them in a proper way, you'll need a Y cable, mono from two ends, stereo from the other. TIP is SW1, RING is SW2, SLEEVE is ground.

DEDICATED DRY PATH
We've taken care of the dry signal, placing a dedicated audio bus only for the dry signal coming after L3, right into the output stage. Your signal will never sound better than this, especially when mixing other 5 units together. This dedicated dry path is also useful for a quick "kill dry" selection, if you don't want any dry signal in your L/R speakers.

BALANCED OUTPUTS
Two balanced outputs are available on the front panel. They are specular copies of the back outputs and they can be used at same time. They are very convenient if you want to quick wire your system to your DAW/mixer devices while leaving back outputs connected to you power amp for example.

MIDI (MIDI CHANNEL AND MIDI Control Changes)
The mixer has couple MIDI INPUT and a MIDI TRHU port.
One midi INPUT connector is placed on the back of the mixer, the other on the front panel out of convenience of connection. They are internally wired in parallel, so they must be used only one at time.

MSLM can operate with all 16 midi channels available, one at time (not OMNI mode). It will be shipped with MIDI CH1 already stored, but you can change it with following procedure.
Once MSLM is turned on and no midi signal is coming thru it, you need to:

- Press together SW1 and AUX2 for couple seconds. All the illuminated pushbutton will start to blink from left to right, as confirm you entered the setup mode;
- FX1 button will now blink, as confirm MSLM is waiting to receive the instructions;
- Now, you need to look at top row of illuminated red buttons named **L1 – L2 – L3 – D/OUT POST. The on/off status combination of these buttons, will determinate which midi channel are you going to save. To change the status of a button, you just need to press it, until it turns red, or the light will turn off.**

Consulting the following chart, you will be able to select whatever MIDI CHANNEL you like to use:

MIDI CHANNEL	***L1***	***L2***	***L3***	***D/OUT POST***
1	OFF	OFF	OFF	OFF
2	OFF	OFF	OFF	ON
3	OFF	OFF	ON	OFF
4	OFF	OFF	ON	ON
5	OFF	ON	OFF	OFF
6	OFF	ON	OFF	ON
7	OFF	ON	ON	OFF
8	OFF	ON	ON	ON
9	ON	OFF	OFF	OFF
10	ON	OFF	OFF	ON
11	ON	OFF	ON	OFF
12	ON	OFF	ON	ON
13	ON	ON	OFF	OFF
14	ON	ON	OFF	ON
15	ON	ON	ON	OFF
16	ON	ON	ON	ON

Let's say you want to use MIDI CH9, you need to set up:

- L1 button = ON
- L2 button = OFF
- L3 button = OFF
- D/OUT POST button = OFF

- Once you selected the exact combination of buttons corresponding to the desired MIDI CHANNEL, you need to press the blinking FX1 button;
- At this point, all the illuminated red pushbutton will start to blink from left to right, as confirm you stored and exit setup mode.
-

Now you're ready to receive MIDI messages on your desired MIDI CHANNEL.

MSLM is able to receive a series of MIDI Control Changes messages to turn on or off the status of each function.

All CC numbers available are in the following list, by keeping in mind we consider the single value of each CC like 0 = off, 127 = on.

FX1: CC100
FX2: CC101
FX3: CC102
DRY: CC103
L1: CC104
L2: CC105
L2: CC106

AUX1: CC107
AUX2: CC108
SWITCH1: CC109
SWITCH2: CC110
D-OUT: CC111

TROUBLESHOTTING

- MSLM IS NOT TURNING ON
  Check the power cord, sometimes it will be loose and cannot make good contact with IEC socket. Replace it. You possibly don't turn on the power button on the front. Be sure to turn it into "positon 1".

- MSLM IS TURNING ON BUT WITH NO SOUND
  The first thing to make sure is to turn on the "DRY" red illuminated button on the front panel. If all the buttons are off, you won't hear any sound. We highly suggest to turn everything off beside DRY at the very beginning.

- I'M NOT ABLE TO MAKE MT MSLM COMMUNICATE WITH MY MIDI SENDING DEVICES
  Be sure to use a proper working standard 5 DIN midi connectors. Check two or three cables at least, most of the time the problem is a defective one.

- MIDI CABLE IS FINE BUT I CAN'T STILL USING MIDI IN A PROPER WAY
  There're multiple operation to make before using MSLM with a midi devices. We suggest to check "MIDI" section of this manual, you will find a point by point operations to make the experience as quick as possibile.

For any problem and in any moment you can contact a qualified tech at: info@redeven-amplification.com
We will replay to you as soon as possibile.

WARRANTY DESCLAMER

Please, do not try to open the device in any case. For any problem contact your seller or write to us. Any inexpert person should not even think of do anything inside this unit. RedSeven Amplification offer a standard two year fully warranty for any component (except to wear subjects). By removing the top or by making any modification to the original state will violate standard warranty and RedSeven Amplification will not responsible for any damage to people, things or animals.

Revision 1.0
January 2020