S.P.A.S.

User Manual

(rev.1.5)

CONTENT

I. Features

S.P.A.S. (**S**mart **P**rogrammable **A**mp **S**elector) is a device, that can route one analog unbalanced input signal up to 1, 2 ,3 or 4 analog unbalanced outputs.
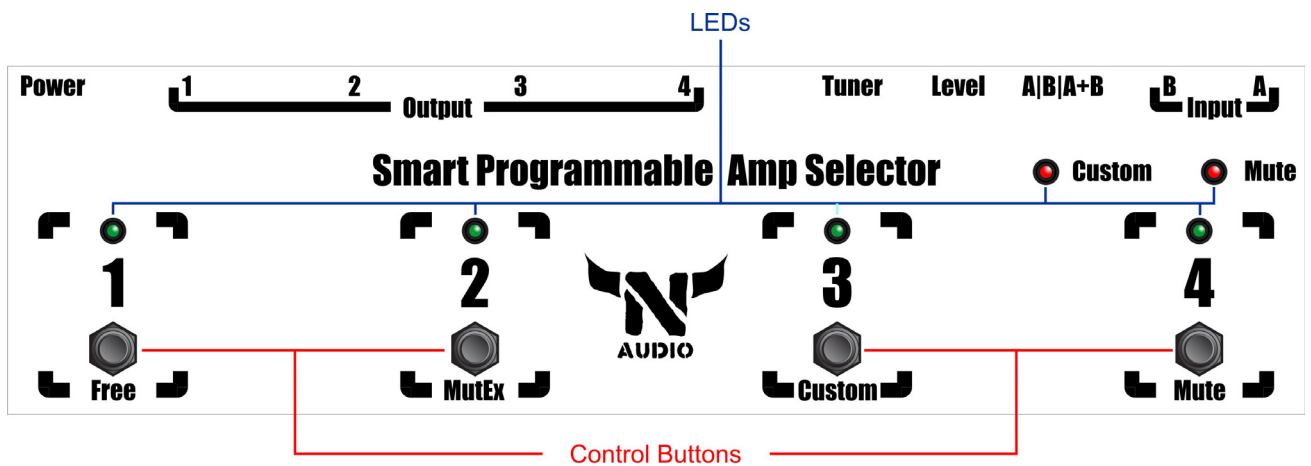
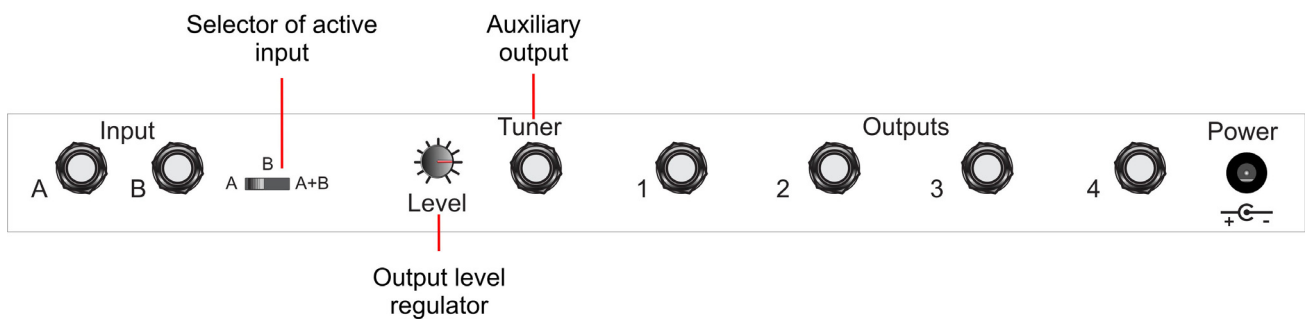## I.1   S.P.A.S. Elements

Figure 1: **Front View**

Figure 2: **Rear View**

I.2   Operating modes

S.P.A.S. can operate in three different basic modes:

I.2.1. „**FREE**" **mode**.

The input signal can be routed freely to any output channel by pressing its control button. If a particular channel was switched off, after pressing its button, the channel is switched on, and vice versa. Thus, you can have up to four channels on or off at one and the same time. Each one of the active channels is indicated by a solid green light above its control button.

I.2.2. "**MUTEX**" **mode**.

The input signal can be routed only to one of the four channels by pressing its control button. Switching on a channel disconnects the previously active one and etc. Thus, you can have only one active channel at once. The active channel is indicated by a solid red light above its control button.

I.2.3. "**CUSTOM**" **mode**.

You can choose among up to 4 presets, set up by you (see **chapter III**).

I.2.4. "**MUTE**" **state**.

Besides the basic modes, **S.P.A.S.** offers a feature which allows all four output channels to be muted while having one of the three basic modes active, as the indication above each one of the active channels (if there are any) remains the same. Then you are in „**MUTE**" state.

I.3   Memorizing the operating modes

The good news is that **S.P.A.S.** does this automatically without your help. At startup, **S.P.A.S.** runs in the mode of your last working session. If you check the configurations of the other modes, you will see that they are also unchanged – a valuable feature that keeps you cool in situations of accidental power shutdowns.

I.4   Startup policy

Depending on your requirements, you can set up **S.P.A.S.** to start up always in "**MUTE**" mode (independently of your last working session mode), or to resume in the mode of the last working session. In order to do this you should press the „**Mute**" button and hold it that way before switching on the device and then switch on S.P.A.S. You have to hold the button for at least **7** seconds. (While holding the button pressed, there will be a solid red light above it). If your attempt is succeessful, all the LEDs of **S.P.A.S.** (in one of the cases without "**MUTE**" LED) will be on for **7** seconds more, and after they turn off, you will get into a normal operating mode.

If you have all LED turned on (including „**MUTE**" LED) after completing the above described procedure, this is considered an indication that you have chosen the option **S.P.A.S.** to resume always in "**MUTE**" mode; otherwise, **S.P.A.S.** will resume in the mode of the last working session.

Every time when the procedure described above is accomplished, the startup policy „toggles".

II. How to choose an operating mode

II.1 Choosing an active input

Before starting to use **S.P.A.S.**, you have to choose an input to which you will connect the source signal. This is done by the **active input selector** (see **Fig. 2**). There are two options:

- input '**A**' or input '**B**'
Choose the appropriate input when you intend to connect only one source.

- input '**A+B**'
If you want to mix two sources you have to set the selector at this position.

Warning: Avoid working in '**A+B**' mode when you feed only one input signal because this will certainly lead to decreasing the level of the high-frequency spectrum of the source signal.

Note: There are no regulators for the levels of the two input signals. Therefore the balance of the level of the input signals should be set up at the previous stage of the signal chain.

II.2 Choosing an operating mode

The selection of **S.P.A.S** operating mode is is a piece of cake☺

II.2.1 Choosing "**FREE**" mode.

You can choose „**FREE**" mode by pressing and holding „**Free**" button for at least **1,7** seconds, but you have to have **S.P.A.S.** already running in "**MUTEX**" or "**CUSTOM**" mode. The state of the channels is resumed to the one of the last exit from "**FREE**" mode. The "**CUSTOM**" LED is off, and the LEDs above the active channels (if there are any) are green.

If you are already in "**FREE**" mode and hold the „**Free**" button for at least **1,7** seconds - the state of channel **#1** will just „toggle".

II.2.2 Choosing "**MUTEX**" mode.

You can enter the „**MUTEX**" mode by pressing and holding the „**MutEx**" button for at least **1,7** seconds, if **S.P.A.S.** is already running in "**FREE**" or "**CUSTOM**" mode. The state of the channels is resumed to the one of the last exit from "**MUTEX**" mode. The "**CUSTOM**" LED is off, and the LED above the active channel is red.

If You are already in "**MUTEX**" mode and hold the „**MutEx**" button for at least **1,7** seconds - you will turn on **channel #2**.

II.2.3 Choosing "**CUSTOM**" mode.

You may decide to use your own presets. In this case you will need this mode. You can get into it by pressing and holding the „**Custom**" button for at least **1,7** seconds, but you have to have **S.P.A.S.** already running in "**FREE**" or "**MUTEX**" mode. The state of the channels at the last exit from "**CUSTOM**" mode is resumed. The "**CUSTOM**" LED is on, and the LEDs above the active channels (if there are ant) is green.

If you are already running in "**CUSTOM**" mode and hold the „**Custom**" button for at least **1,7** seconds you will load the preset, which is stored on **channel #3** (see **Chapter III**).

II.2.4 Selecting "**MUTE**" state.

You can select the "**MUTE**" state regardless of the current operating mode by pressing and holding the „**MUTE**" button for at least **1,6** seconds. In this case all channels will mute but the LEDs above, corresponding to the particular channels, will stay the same as they were before entering the "**MUTE**" mode, and the „**MUTE**" LED begins to flash.

You can exit the „**MUTE**" state following the same steps – press and hold the „**MUTE**" button for at least **1,6** seconds. If there have been active outputs before entering the "**MUTE**" state – they will resume.

III. How to store user's channel configurations (presets)

S.P.A.S. can store up to four of your channel configurations (presets). All you have to do is to follow the next simple steps:

1. Enter „**FREE**" mode.
2. Turn on or off the channels you wish and release all buttons.
3. Press and hold a button (**#1** to **#4**), at which you wish to store the preset;
4. While you are still holding the button from the previous item, press another button (any available from the remaining 3 ones), while **1,7** seconds are still not elapsed.
5. Release the two pressed buttons.

A successful programming is indicated by 5-time blinking of both "**CUSTOM**" LED and the LED, which points where the preset is stored.

Note: The pressing the button from item **4** has to be done not later than **1,7** seconds after the button from item **3** was pressed. Otherwise the state of the channel will just "toggle".

You can apply the same procedure for the rest 3 channels, if necessary. You can use your presets immediately after entering the „**CUSTOM**" mode.

Note: Every new stored preset overwrites the preset stored at the particular location.

IV. Technical parameters

Inputs   : **2 x Unbalanced TRS ¼"**
Outputs   : **4 x Unbalanced TRS ¼"**
Overall dimensions   : **430 x 115 x 36 mm**
Weight   : **210 g**
Supply Voltage   : **12V DC**
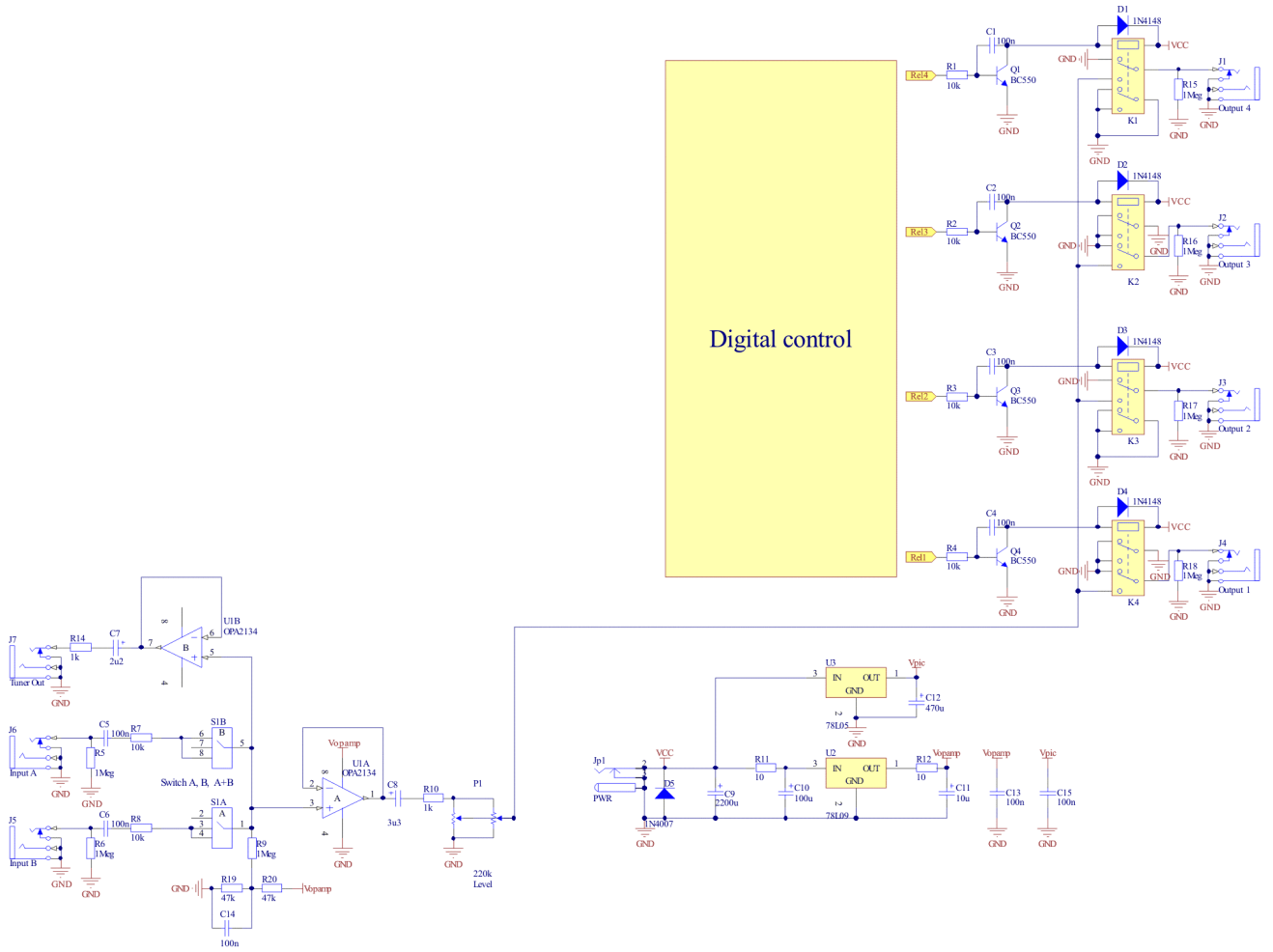Current consumption   : **200 mA max**

Analog part:
- All Wima capacitors trough signal path
- OPA2134 high quality operational amplifier
- Output relay control
- Stabilized operational amplifier's power supply

Digital part:
- Flashable PIC microcontroller for a new software version
- Ability to save parameters of your last working session mode

Schematics

Digital control

Rel4 R1 10k Q1 BC550 C1 100n D1 1N4148 GND VCC K1 R15 1Meg GND GND J1 Output 4 GND

Rel3 R2 10k Q2 BC550 C2 100n D2 1N4148 GND VCC K2 R16 1Meg GND GND J2 Output 3 GND

Rel2 R3 10k Q3 BC550 C3 100n D3 1N4148 GND VCC K3 R17 1Meg GND GND J3 Output 2 GND

Rel1 R4 10k Q4 BC550 C4 100n D4 1N4148 GND VCC K4 R18 1Meg GND GND J4 Output 1 GND

J7 Tuner Out R14 1k C7 2u2 U1B OPA2134 B GND

J6 Input A C5 100n R5 1Meg R7 10k S1B B GND Switch A, B, A+B

J5 Input B C6 100n R6 1Meg R8 10k S1A A GND R9 1Meg Vopamp U1A OPA2134 A C8 3u3 R10 1k P1 220k Level GND

R19 47k R20 47k Vopamp GND C14 100n GND

U3 IN OUT GND 78L05 Vpic C12 470u

Jp1 PWR VCC D5 1N4007 GND C9 2200u R11 10 C10 100u U2 IN OUT GND 78L09 R12 10 Vopamp C11 10u Vopamp C13 100n GND Vpic C15 100n GND

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