Software PreAmp-Modul

Here you will find a description of all functions of the PreAmp module. The pictures show sections of the displayed screen. The colours may differ slightly, as photographing the display in ambient light is very demanding.

The software is operated via the rotary encoder and its button. The button for input selection must be pressed once briefly (<400ms).

To select the following menus, the button must be pressed and held down. The following options are displayed one after the other:

- Balance-control
- Options Menu
- Standby

All functions are explicitly explained below.

Opening Screen

During the switch-on process, this welcome screen is displayed.

Depending on the hardware version, the corresponding outputs are now displayed.

After a restart, it takes about 4 seconds until the outputs are switched. When waking up from standby mode, it takes 3 seconds.

By setting the mute function, the start-up process can be extended up to 30 seconds.

Figure 1 - Opening Screen

However, this extension of the mute only concerns the release of the short-circuit relays for the outputs.
In this way, the switch-on noise can be avoided, for example, with tube amplifiers that have a longer preheating time.

The implemented outputs Trigger (is always present) or 230V (110V) Power On (at choice) are switched as described above.

After the outputs are enabled, the volume is smoothly raised and the main screen is displayed,

Main Screen

Figure 2 - Main Screen

The main screen is automatically displayed after the greeting.

Displayed here:

- Current volume (blue dots)
- Total rule scope (white dots)
- Volume in dB
- Position of the balance control
- Selected input
- volume increase per notch in dB

By increasing or decreasing the volume, the ring displayed in blue changes according to the set value.

The digital dB display also changes accordingly.

Input Selection / Mute

Figure 3 - Main Screen Input Selection

A short press on the Rotary Encoder puts the unit into either Input Select or Mute mode.

The volume is lowered gently. As an additional indication, the colour of the current input (green) changes and gets a frame.

By turning the rotary encoder, you can now select a new input. You have a time frame of approx. 2.5 seconds for this. Each action (turning again) resets this time to 2.5 seconds.

Once you have selected the desired input, simply let the time run out.

The new input is switched on automatically. The previously set volume is gently raised again. Any preset for the selected input is taken into account.

If you have not turned the rotary encoder, the mute symbol will appear after approx. 2.5 seconds. The volume was already turned down when you pressed the Rotary encoder.
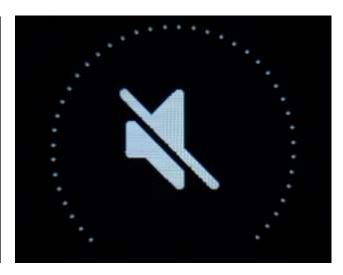

Figure 4 - Mute

Balance-settings

By turning the rotary encoder, the balance can now be changed in 0.25dB steps. The attenuation is displayed as a real value in the lower range.

At the same time, the red dot (here in the centre) moves to the corresponding place on the ring

The maximum change is 9dB in 36 steps.

In the gain version, this function is overridden as soon as a positive dB value (i.e. gain) is set. The red dot then disappears. If you return to a setting below 0dB, the previous settings are available again.

Figure 5 - Balance Settings

Options Menu

Figure 6 - Settings

From here, the possible settings of the module are carried out:

- Lowest adjustable volume
- Volume after power on
- Volume increase per notch
- Display settings
- Programming the IR-Control
- Set Gain
- individual Attenuation of inputs
- Delay of the opening time of the mute relays
- Software version

Turning the Rotary will "highlight" an entry. Pressing the button selects the corresponding entry. Turning the Rotary again now selects the values; further pressure saves the selected value permanently.

lowest Volume:

This allows the range and the lowest adjustable volume to be set between -111 and -50 dB. The intention is that the clarity is improved. If the complete control range is used with the Muses 72323, this means in the highest resolution (0.25dB). over four hundred adjustment possibilities During the practical tests, I found that perhaps 20 to 30dB of control range is actually used. Of course, this depends on the output power of the amplifiers used, as well as personal listening habits.

Start Volume

The volume selected here is permanently stored as the switch-on volume.

Step

This menu is used to set the volume increase per notch.

Muses 72320: 0.5 to 2.5dB in 0.5dB steps
Muses 72323: 0.25 to 1.5DB in 0.25dB steps

Set Display

This entry leads to the display settings, which will be explained later.

IR-Codes

This takes you to the menu for learning your remote control. This means that the module learns the commands of an existing remote control.

Set Gain

!For the _Iron Pre_ this option is not provided!

This entry allows you to set the highest possible amplification. This allows you to adapt the module to amplifiers that require a high input voltage.
To be able to use this function, the hardware must be equipped with a corresponding OPAmp, which is directly controlled by the Muses chip. If this option was not purchased/needed, the entry "Gain" is not selectable.

Muses 72320:   0 bis 31,5dB in 0,5dB-steps
Muses 72323:   0 bis 21dB in 3,0dB-steps
As soon as the Muses 72323 is in gain mode, the balance control is switched off. Only 3dB steps would still be possible. For what reason the gain on the newer Muses Chip 72323 was set to 3dB steps has not become clear to me.
If you want a finer adjustment of the gain, you should switch to the Muses 72320.

Preset

The menu for presetting the attenuation of individual inputs is also described below.

Delay Mute

Here you can artificially extend the switch-on delay. For example, you can ensure that an amplifier switched on by the module does not make a switch-on noise.

Exit takes you back to the main screen.

Set Display

The possible settings of the display are controlled from here:

- Display the Step
- Balance indicator
- Visual indication of IR reception
- Brightness during operation
- Options for darkening the display

Exit takes you back to the options menu.

Figure 7 - Display Settings

As in the previous menu, you can select the individual settings by Rotary.

A selection/deselection has the following meaning:

- Step - the value of the set volume increase per detent is displayed/not displayed
- Balance - a red dot within the blue/white ring documents the status of the balance control; if deselected, this is not displayed
- IR codes - if the IR sensor receives an impulse from the remote control, a small green dot is displayed in the main menu screen for a short time. This can be prevented by selecting "no".

Brightness

This menu item is used to set the brightness during operation. The brightness changes immediately when the Rotary is turned. Automatic dimming can be set in the next menu item.

Disp dark

The first step is to set the time period after which the display is to be dimmed or switched off.

The time can be set between 0 and 60 seconds.

- 0 seconds means: This function "dimming the display" is switched off.
- -1 to 5 seconds - The setting is automatically changed to 6 seconds as this short period makes no sense.
- 6 to 60 seconds - after this period has elapsed, the action selected in the next menu (dimming or switching off the display) is carried out.

The selection must be confirmed with the button on the Rotary.

An action during the "bright time", operation of the module by the Rotary or the remote control, will reset the timer. The expiry of the set time always starts after the last action.

The second setting concerns the brightness that the display should assume after the set time frame has elapsed. The brightness can be set in 5 percent steps between 15% and 80%. During the setting, the brightness changes accordingly. In this way, it is possible to estimate which brightness is comfortable.

A setting of 15% causes the display to switch off after the specified time. If the value 15% is set during the setting process, the display remains switched on. Switching off the display during the switch-on process would cause irritation.

After confirmation by the Rotary, the brightness is raised again.

The function *Disp dark* only works while the main screen is displayed. After pressing the Rotary control knob or the remote control, the brightness of the display is raised again.

IR-Codes

After selecting the function IR codes, the Possible commands are displayed:

- Vol+
- Vol-
- Mute
- Input 1 – Input available inputs (here 5)
- Standby

By pressing a key on the (own existing) remote control, this key is assigned to the corresponding function.
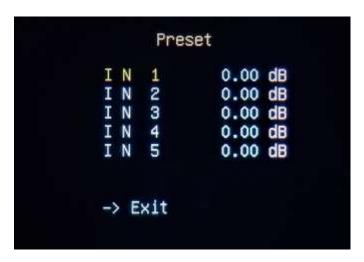

Figure 8 - Programming IR-Control

After programming the last function, in this case standby, the storage is confirmed by a short display "-> saved". The programme then automatically returns to the previous menu.

All buttons must be programmed in one go. It is not possible to select the commands individually.

Preset

In this menu, the individual attenuation of inputs can be preset.

The inputs can be selected individually. Pressing the Rotary control knob leads to the selection mode. Now the attenuation can be set in 0.5 dB steps up to -20 dB.

This function refers to the current volume when changing an input.

When restarting or switching on from standby, the unit starts with the switch-on volume.

Figure 9 - Preset

Press Exit to return to the Options menu.

Standby

Pressing the Rotary Encoder for a longer time (> 2s) or the corresponding button on the remote control takes you to standby mode. After releasing the rotary encoder, the corresponding outputs are switched off.

The volume is turned down. All inputs are locked.

The display and the analogue and digital power supply of the MC are switched off. Only the standby transformer remains live.

Figure 10 - Standby

This process takes about 4 seconds in total. After the display has been switched off, it takes approx. another 2 seconds until you can switch the unit on again.

Pressing the rotary encoder (>2s) or the corresponding button on the remote control switches the module on again.

Notes:

This is the first version of this documentation. The software was developed over many years. It was first used for volume control without input selection. Suggestions from customers and my own ideas were realised.

If you find any errors in the software or the documentation, I would be grateful for a short note. (info@audio-perfect.de).

You are also welcome to send me new ideas or improvements. However, please bear in mind that the software currently runs on a microcontroller with 32kb of memory. Despite optimised programming, 98 per cent of this has already been used. In the variant with the gain function activated, the preset option will probably not be able to be activated. Possibly, however, the balance function will be removed instead. This has not yet been decided.

Planned upgrades:

- Change to another processor, ESP32?
- So that OTA updates are possible
- Operating the module via your own smartphone
- Assigning own names for the inputs

Frank Wilker from audio-perfect.de, 07/2023