XAOC TIMISZOARA Voltage Controlled DSP Effektor User Manual

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Thank you for purchasing this Xaoc Devices product. Timiszoara is a stereo, Eurorack compatible, voltage-controlled multi-effect signal processor based on the popular Spin Semiconductor FV-1 DSP chip. It features a full stereo signal path with two adjustable audio inputs, two outputs, and a stereo voltage-controlled wet/dry mixer. In addition, there is a microSD memory card slot on the front panel that allows for loading factory and custom effects without any restrictions or copyright protection, which means you can use many effects available on the Internet and even create your own.

Effect programs are organized in banks of 8 and can be selected using a rotary encoder, as well as CV and trigger signals. Timiszoara features a crisp OLED screen that displays the program parameters and its name. It also facilitates navigating the list of banks. Up to three parameters per effect can be controlled from the front panel with illuminated slider potentiometers and dedicated CV inputs.
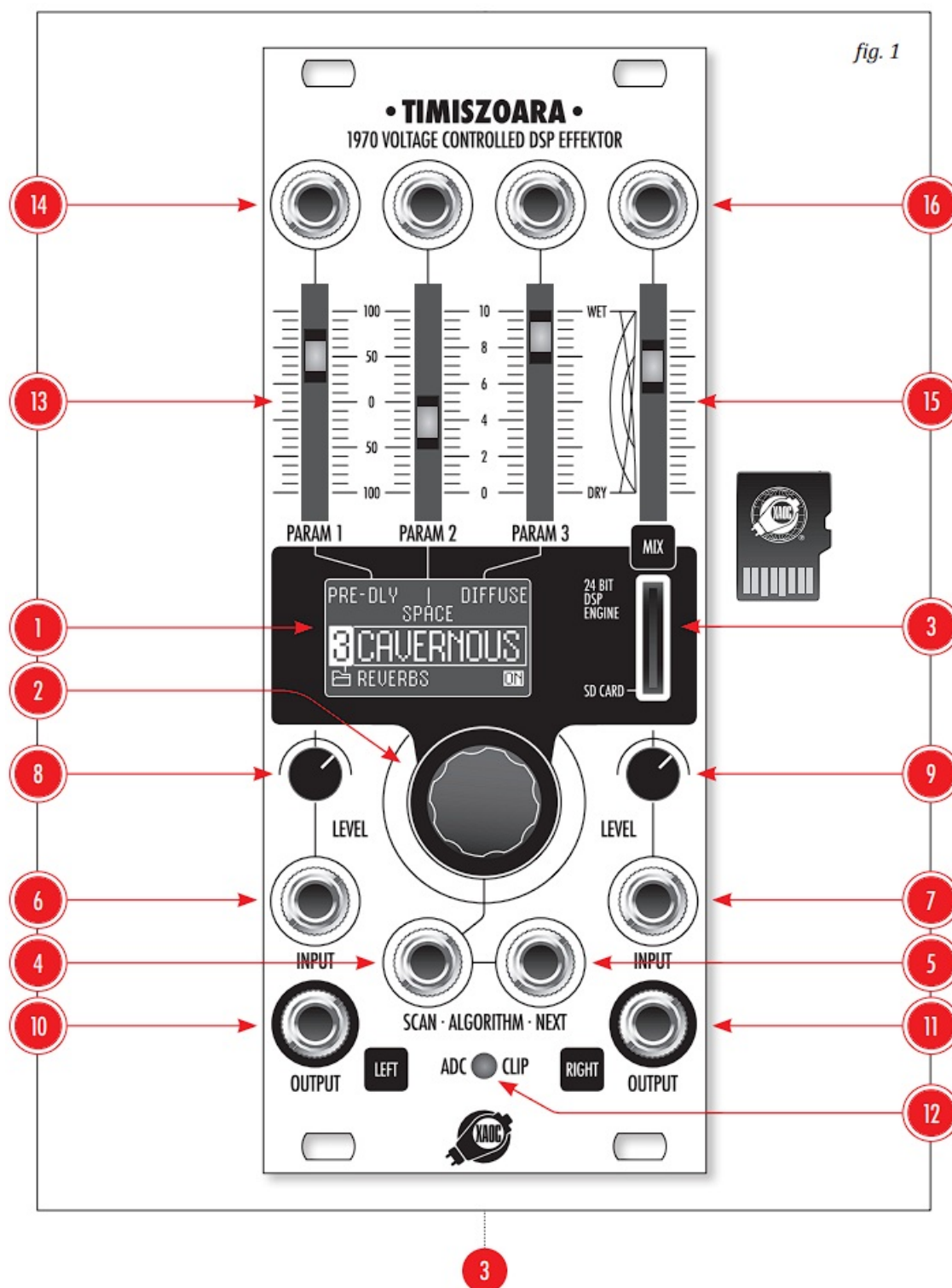
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INSTALLATION

The module requires 10hp worth of free space in the Eurorack cabinet. Always turn the power off before plugging the module to the bus board using the supplied 16-pin ribbon cable, paying close attention to power cable pinout and orientation. The red stripe indicates the negative rail and should match the **–12v** mark on the bus board and the unit. Timiszoara is internally secured against reversed power connection; however, flipping the 16- pin header **MAY CAUSE SERIOUS DAMAGE** to other components of your system because
it will short circuit the +12V and +5V power lines. Always pay particularly close attention to the proper orientation of your ribbon cable on both sides! **NOTE:** There is a second, 10-pin header at the back of the module for connecting an expander. **DO NOT PLUG POWER INTO THIS HEADER, AS IT WILL DESTROY YOUR MODULE!**
The module should be fastened by mounting the supplied screws before powering up. To better understand the device, we strongly advise the user to read through the entire manual before use.

MODULE OVERVIEW

fig. 1

• TIMISZOARA •
1970 VOLTAGE CONTROLLED DSP EFFEKTOR

PARAM 1   PARAM 2   PARAM 3   MIX

PRE-DLY | DIFFUSE
SPACE
8 CAVERNOUS
📁 REVERBS   ON

24 BIT
DSP
ENGINE

SD CARD

LEVEL   LEVEL

INPUT   INPUT

SCAN · ALGORITHM · NEXT

OUTPUT   OUTPUT

LEFT   ADC ○ CLIP   RIGHT

The front panel of Timiszoara is shown in fig. 1. The OLED screen ❶ and the single rotary encoder ❷ allow easy navigation between the effect programs organized into banks of 8. The banks are loaded from the microSD memory card inserted into the slot ❸ . During normal operation, the screen displays the name of the current effect and the names of its three parameters.

Two inputs below the rotary encoder allow for remote changing of the programs within the bank: using continuous CV plugged to the **SCAN** input ❹ and using trigger impulses via the **NEXT** input ❺ .

The **LEFT** ❻ and **RIGHT** ❼ signal inputs are associated with individual attenuators ❽ and ❾ used for adjusting the input level.

Both **INPUTS** are normalled to one another, with the normalization occurring before the input attenuators; therefore, it is necessary to adjust both input attenuators even with a single mono signal. The **LEFT** ❿ and **RIGHT** signal **OUTPUTS** are located just below. There is a single clipping detection LED at the bottom of the panel.

This LED illuminates when the inputs, outputs, or signal inside the CPU is too hot. In some PROGRAMS (e.g., in some distortion effects), it is normal for the LED to flash continually.

Above the screen, there are four slider potentiometers corresponding to the four CV inputs above. The first three **PARAM 1, 2, 3** potentiometers and jacks are direct controls for the three parameters of the current program with their names displayed just below. The final **MIX** potentiometer and CV input control the analog wet/dry mixer that combines the original signal with the processed one.

NAVIGATING THROUGH THE CARD

During normal operation, turning the encoder selects the effect program from the currently loaded bank of up to eight programs (fig. 2). The program is only loaded when the selection is confirmed by pressing the encoder. Pressing and holding the encoder knob for one second displays the content of the memory card as a folder list, with each folder corresponding to a single bank (fig. 3).
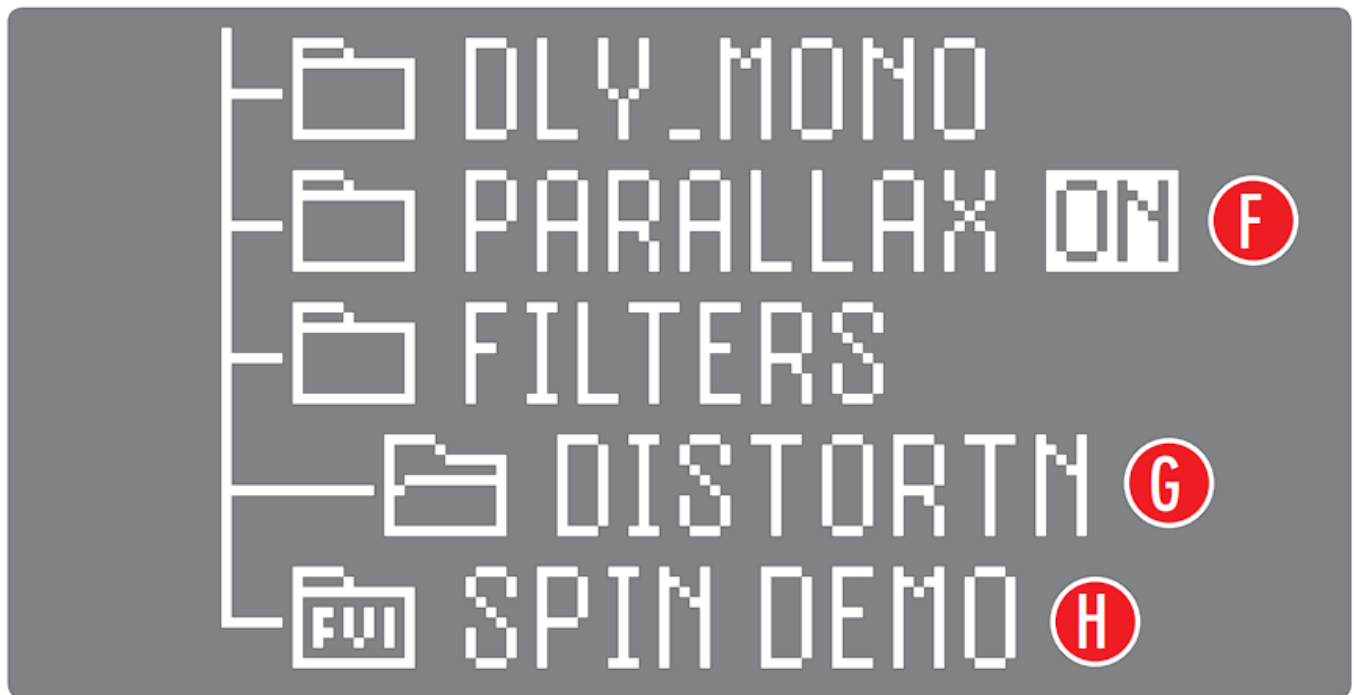

fig. 2: MAIN SCREEN

fig. 3: BANK LIBRARY SCREEN

There is a **CANCEL** option at the end of the list for returning to the last loaded bank. Press the encoder knob to confirm the selection. If there is no card present, only two options are available: **SPIN DEMO** (the internal bank of the Spin chip) and **CANCEL**. The **SPIN DEMO BANK** is also available with the card inserted in the module. Although the **PROGRAMS** included in this **BANK** are nothing spectacular, they are more than adequate in an emergency such as a faulty or lost memory card.

Once a particular **BANK** has been selected and confirmed by a short encoder press, it is loaded into memory. Even if the card is removed, all eight **PROGRAMS** from the loaded **BANK** are still accessible.

Legend:

Ⓐ**PROGRAMS** position within the **BANK**

Ⓑ**PROGRAMS**name

Ⓒ**PROGRAMS**parameter names

Ⓓ**ON** icon indicates whether the program is currently active

ⒺCurrent **BANK** name

Ⓕ**ON** icon indicates whether the bank is currently active

ⒼEntering the **BANK**

ⒽFixed Spin FV-1 internal **BANK**

CV CONTROLS

The three parameters of the current effect program may be controlled manually or with control voltage patched into a jack above each corresponding **PARAM** slider potentiometer. The CV inputs accept 10Vpp. With the slider in the middle position, an incoming ±5V LFO sweeps the entire range. Likewise, with the slider set at minimum, a

10V envelope sweeps the entire range. The same rule applies to the **MIX** potentiometer and its CV input.

Selecting **PROGRAMS** from the current **BANK** is performed either with the rotary encoder knob, or externally with CV and/or trigger

Feeding a trigger to the **NEXT** input has the same effect as turning the encoder CW and pressing it. In other words, the next **PROGRAMS** in the list will be loaded and confirmed automatically. The list is arranged in a loop to switch back to 1 after the 8th position.

Patching a voltage to the **SCAN** input allows shifting from the currently loaded program backward and forward (to the following or preceding **PROGRAMS**). This input accepts voltages in the range of -5V to +8V, and each change by 1V causes a switch to the next position above or below the current one. Removing the cable is equivalent to plugging 0V which means the selection returns to the state from before the application of CV control.

NOTE: The FV-1 chip needs a moment to load each new **PROGRAMS** and re-initialize its internal state; thus, **PROGRAMS** cannot be scanned instantaneously.

SOUND QUALITY CONSIDERATIONS

Timiszoara has been designed with great care taken to provide high audio quality. Audiophile-grade op-amps handle the entire signal path while the digital section is separated from the analog one. The FV-1 DSP features 24-bit converters and operates with a 32.768kHz sampling rate which means the effective signal bandwidth is slightly limited. Since modular signals often contain very high frequencies, special care has been taken to avoid aliasing by using additional input and output filters.

Please note that FV-1 operates on a low level signal; hence a particular gain staging had to be applied. The signal must be strongly attenuated internally before the DSP and then amplified after processing. Such amplification always brings up some noise, and if your power supply is very dirty, it may affect the output audio. We do not recommend using switching-type regulators as a linear PSU is always the best solution, and hybrid (switching+linear) is a good compromise. Also, some digital modules introduce digital noise to the GND rail of the bus board, so its quality is critical (i.e., keeping the common resistance as low as possible). Finally, avoid using "flying bus" cables as they invite noise and interference between modules.

Avoid feeding very quiet signals to your Timiszoara and amplifying the output signal to compensate. Conversely, observe the **ADC CLIP** indicator to avoid overdriving the unit. Use input attenuators to adjust the signal's amplitude and keep in mind that some program algorithms may cause internal clipping. In general, it is physically impossible to prevent distortion when a loud continuous signal is fed to a process with very deep feedback (not to mention one set at 100%) because the internal energy will increase infinitely. In addition, when signal quality is important, many long reverb and delay effects are unsuitable for drone-like input, especially raw waveforms from oscillators.

FILE STRUCTURE & NAMING

You can use the factory card included with the module, or a different card to add more effect programs. Remember to format a new card to a FAT file system (FAT16 or FAT32). Effects can be written in the assembler language of the FV-1 chip or designed visually using the SpinCAD Designer, and they must be compiled to binary form (e.g., using the ASFV1 compiler). Please consider the hardware constraints: each program may have no more than 128 instructions, use no more than 32 internal registers, and no more than 32768 words of delay memory. **NOTE:** Xaoc Devices do not offer technical support for third-party software.

Timiszoara requires that each compiled binary (i.e., a bank of eight programs) is located in a separate folder with the same name and associated with a text file containing the names of all eight programs together with the three names of their parameters, separated with commas (but no spaces).

Each effect program can have up to three parameters controlled by the three **PARAM** slider potentiometers and their corresponding CV inputs. bank names may be up to eight characters long. The same goes for parameter names. program names may be up to nine characters long. When preparing custom files for Timiszoara, we recommend following the structure and naming convention of the factory files.

FACTORY PROGRAMS

Timiszoara comes with a microSD card holding factory programs covering a wide range of effects: delays, reverbs, modulations, filters, pitch shifters, distortions, glitching, and stuttering. Many of these effects perform in stereo (i.e., they consist of two nearly independent signal paths). However, certain effects benefit from utilizing most of the resources for a single signal path. In such a case, the program downmixes the stereo signal to mono before processing. Keep in mind that the total amount of memory in the FV-1 chip allows for only one second of delay, which must be split between channels. Though, some included combo feature a different effect in each channel.

FACTORY PROGRAMS HIGHLIGHTS

We have prepared quite a few banks of algorithms that cover most effects needs: delays, reverbs, filters, modulation effects (such as choruses and flangers), pitch shifters, and, of course, shimmers (no multi-effects unit would be complete without its share of those). However, we wanted to ensure that users had access to some more adventurous **PROGRAMS**, so we created the following **BANKS** to allow you to take a walk on the wild side.

- **GLITCH** includes algorithms emulating various dirt-inducing glitching behaviors such as a skipping CD, bit reduction, dropouts, and other digital signal degradation gems.
- **DECONSTR** and **RECONSTR** are two banks especially suited for the brutal destruction of your signal (the former) and creating soundscapes based on it (the latter). Cleverly interwoven feedback paths, extreme gain values, oscillations responding to the dynamics of the incoming audio—all that and more.
- **REVERBS 2** is a **BANK** of of reverb effects with a twist. These programs are much more 'out there' than the customary programs included in the **REVERBS 1 BANK**, which means more modulation, more size, and even more modulation!
- **PARALLAX** is a bank of delays featuring two parallel delay lines with various feedback paths, thus offering different time-mangling flavors. Besides the usual controls over delay time and feedback, our parallax delays have a third parameter called **SKEW** that adjusts the time displacement of the two delay lines with regard to one another.
- **RESONATOR** is a set of resonator algorithms covering all the bases, from subtle to overboard, including filtered, unfiltered, single- voice and minor/major chord varieties.
- **RINGMOD** does what it says and includes stereo, controlled by an envelope follower, modulated by an LFO, 2-band, Mid/Side (!), and cross-modulation—we've got you covered. Release your inner Dalek!

For a complete list of factory programs and their parameters, please visit **xaocdevices.com**.

FIRMWARE UPDATES

Updating Timiszoara's firmware is a simple procedure (see fig. 4) and details will be included with any firmware updates available on our website.

fig. 4: SERVICE MENU SCREEN

EXPANDABILITY

We are planning an expander module for Timiszoara.
The complete specification will be announced.

ACCESSORY

Our Coal Mine black panels are available for all of Xaoc Devices modules. Sold separately.
Ask your favorite retailer: •

MAIN FEATURES

- 24–bit stereo
- DSP engine
- Up to three parameters can be voltage controlled
- Low-noise, voltage-controlled analog wet/dry crossfader
- Voltage-controlled effects selection
- Programs stored on standard Micro
- SD card
- OLED screen
- Open architecture for adding and organizing user–designed programs.

TECHNICAL DETAILS

- Eurorack synth compatible 10hp, skiff friendly
- Current draw: +120/-45 mA

- Reverse power protection

WARRANTY TERMS

XAOC DEVICES WARRANTS THIS PRODUCT TO BE FREE OF DEFECTS IN MATERIALS OR WORKMANSHIP AND TO CONFORM WITH THE SPECIFICATIONS AT THE TIME OF SHIPMENT FOR ONE YEAR FROM THE DATE OF PURCHASE. DURING THAT PERIOD, ANY MALFUNCTIONING OR DAMAGED UNITS WILL BE REPAIRED, SERVICED, AND CALIBRATED ON A RETURN-TO-FACTORY BASIS. THIS WARRANTY DOES NOT COVER ANY PROBLEMS RESULTING FROM DAMAGES DURING SHIPPING, INCORRECT INSTALLATION OR POWER SUPPLY, IMPROPER WORKING ENVIRONMENT, ABUSIVE TREATMENT, OR ANY OTHER OBVIOUS USER-INFLICTED FAULT.

LEGACY SUPPORT

IF SOMETHING GOES WRONG WITH A XAOC PRODUCT AFTER THE WARRANTY PERIOD IS OVER, NO NEED TO WORRY, AS WE'RE STILL HAPPY TO HELP! THIS APPLIES TO ANY DEVICE, WHEREVER, AND WHENEVER ORIGINALLY ACQUIRED. HOWEVER, IN SPECIFIC CASES, WE RESERVE THE RIGHT TO CHARGE FOR LABOR, PARTS, AND TRANSIT EXPENSES WHERE APPLICABLE.

RETURN POLICY

THE DEVICE INTENDED FOR REPAIR OR REPLACEMENT UNDER WARRANTY NEEDS TO BE SHIPPED IN THE ORIGINAL PACKAGING ONLY AND MUST INCLUDE A COMPLETED RMA FORM. XAOC DEVICES CAN NOT TAKE ANY RESPONSIBILITY FOR DAMAGES CAUSED DURING TRANSPORT. SO BEFORE SENDING US ANYTHING, PLEASE CONTACT US AT **SUPPORT@XAOCDEVICES.COM**. NOTE THAT ANY UNSOLICITED PARCEL WILL BE REJECTED AND RETURNED!

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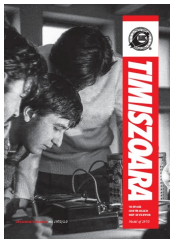
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Documents / Resources

XAOC TIMISZOARA Voltage Controlled DSP Effektor [pdf] User Manual
TIMISZOARA, Voltage Controlled DSP Effektor, TIMISZOARA Voltage Controlled DSP Effektor, Controlled DSP Effektor, DSP Effektor, Effektor

References

- Ⓦ **Xaoc Modular Devices**

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