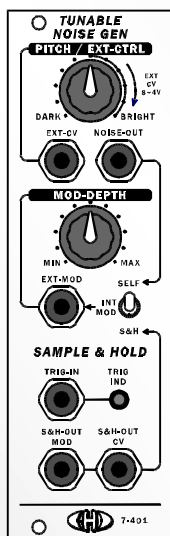


Modular system

Tunable Noise

S&H Generator

Module 7-401 v. 1.0



USER GUIDE





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This manual and other documentation are also available at : www.chd-el.cz

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1. MAIN FEATURES

- ❑ Noise signal is tunable from white noise, through pink noise up to harsh digital sound.
- ❑ The tuning is not based on usual noise filtering - special circuit is used.
- ❑ Noise spectrum is controllable manually or by external CV (e.g. keyboard CV, envelope generator, etc.)
- ❑ Noise spectrum can be also modulated by external (LFO) or internal modulation source (the noise itself or Sample & Hold).
- ❑ Independent Sample & Hold generator with external triggering.
- ❑ Stainless steel front panel.
- ❑ Pure analogue circuitry (no DSP technology is used).
- ❑ Fully hand-made - each module is tested and adjusted individually.



OUR MISSION

Do things different

Always offer something unique and innovative not available on the market so far.

No compromises in the circuitry design

Don't give up the sound quality for cost driven compromises.

Classic design and hi-end components

For long life and better serviceability of the devices.

Hand made in Europe

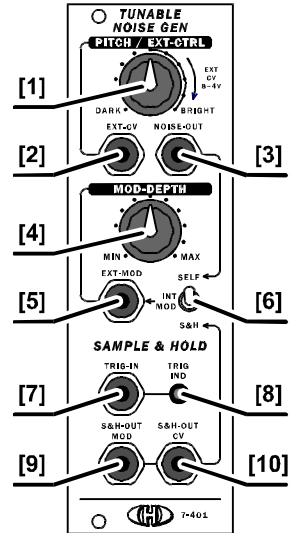
Each unit is hand made and individually adjusted for highest quality control.

2. MODULE FUNCTIONS

Tunable Noise + S&H Generator is designed for Eurorack modular synthesizer systems. All controls, signal inputs and outputs are located on the front panel (see Fig. 1). Inputs and outputs use standard mono 3,5 mm (1/8") mini-jack patch connectors.

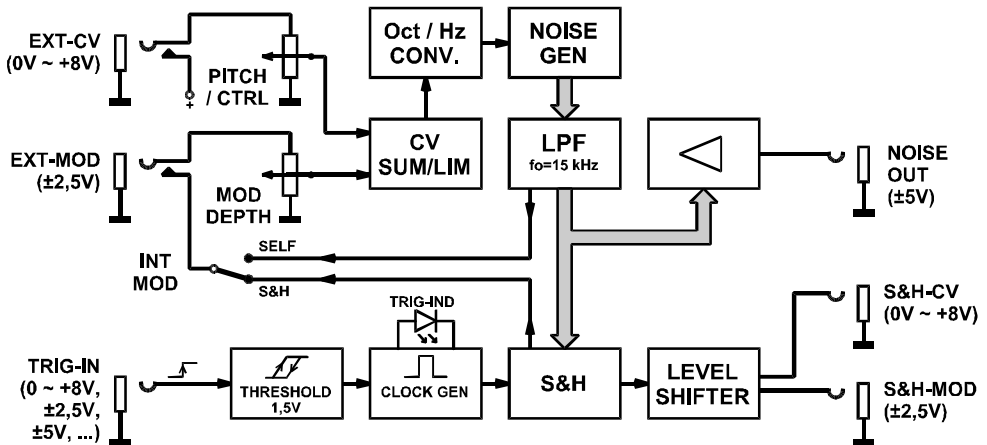
- [1] PITCH / EXT-CTRL - noise spectrum control / ext CV level control
- [2] EXT-CV - external control voltage input
- [3] NOISE-OUT - noise generator audio output
- [4] MOD-DEPTH - noise modulation depth control
- [5] EXT-MOD - external modulation control voltage input
- [6] INT-MOD - internal modulation source switch
- [7] TRIG-IN - trigger signal input for S&H
- [8] TRIG-IND - S&H trigger indicator
- [9] S&H-OUT-MOD - S&H output - modulation signal
- [10] S&H-OUT-CV - S&H output - CV signal

Fig. 1 - module front panel



The module includes two individual function blocks: tunable noise generator and S&H (see Fig. 2).

Fig. 2 - Block Scheme

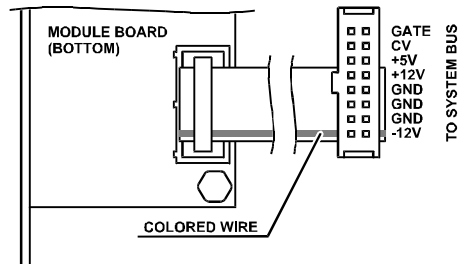


3. CONNECTION THE MODULE TO THE SYSTEM

To connect the module, plug carefully the supplied ribbon cable into the bus socket of your modular case. The colored marking of the ribbon cable must be at the bottom of the bus connector! Failure to check this may result in the module or case PSU damage! (module is not protected against permanent incorrect polarity).

The module uses $\pm 12V$ of the system only (pins Nr. 1 to 10), GATE, CV and +5V signals are not used (see Fig. 3).

Fig. 3 - Bus board connection

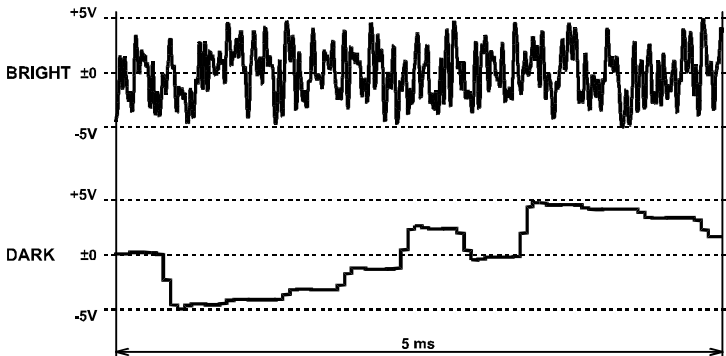


4. NOISE GENERATOR

The noise generator is tunable - i.e. various noise color (spectrum) can be set (see Fig. 4). This can be manually set by PITCH / EXT-CTRL [1] potentiometer or by external control voltage (CV) from EXT-CV [2] input. The noise basic tuning can be further modulated by internal or external control voltage modulation source. The noise spectrum can be continuously adjusted from white noise (BRIGHT) through pink to harsh digital interference-like sound (DARK) - see Fig. 4.

Note: Control voltage for noise generator (V/oct) is converted by exponential amplifier (to V/Hz), so the noise color change is balanced and continuous for human ears in the entire tune range.

Fig. 4 - Noise signal tune range



Noise generator output audio-signal is available at NOISE-OUT [3] output. The output voltage amplitude is in range of $\pm 5 V$.

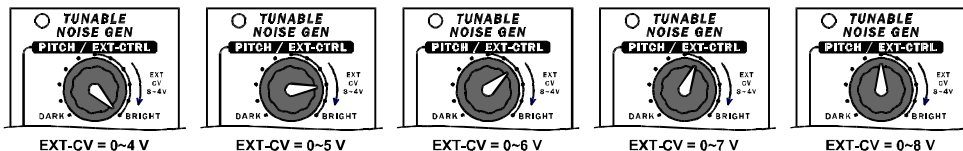
4.1. NOISE SPECTRUM MANUAL CONTROL

If the EXT-CV [2] input is not used, the generator can be tuned manually in the whole range (DARK to BRIGHT) by PITCH / EXT-CTRL [1] potentiometer.

4.2. NOISE SPECTRUM EXTERNAL CONTROL

External control voltage (CV) is connected to EXT-CV [2] connector. For full tune range 0 to +4V minimal control voltage is required. To adjust the tune range to actually used control voltage use PITCH / EXT-CTRL [1] potentiometer (see Fig. 5).

Fig. 5 - PITCH / EXT-CTRL settings for various control voltages



Note: The above described adjustment of the external control voltage range is suitable e.g. for MIDI / CV converters with output voltage 0 to 4 V.

4.3. NOISE SPECTRUM MODULATION

The noise spectrum can be modulated. The required modulation depth is set by MOD-DEPTH [4] potentiometer. The modulation source can be either internal or external.

If the EXT-MOD [5] input is not used, the internal modulation is used then. The noise signal (self modulation) or S&H output can be set as an internal modulation source by INT-MOD [6] switch.

If there is a patch lead inserted in EXT-MOD [5] connector, internal modulation source is automatically disconnected and the noise is modulated by the external control voltage source. Minimal required modulation signal level for full modulation range is $\pm 2,5 V_{pp}$. External modulation source can have any shape and frequency up to ca 4 kHz.

5. SAMPLE / HOLD GENERATOR

Random signal S&H (Sample / Hold) is derived from the noise generator. Triggering (change frequency) is controlled by external signal connected to EXT-TRIG [7] input. The frequency is indicated by red LED TRIG-IND [8] blinking.

External trigger signal can be of any shape and its level can be in full control voltage range (e.i.. $\pm 12 V_{pp}$). Clock impulses, LFO signals or even acoustic signal (with frequency up to ca 4 kHz) can be used thus. The change event at the S&H-OUT outputs is defined by achieving the + 1,5 V threshold level of the lead-in edge of the trigger signal.

The S&H generator has two independent outputs. Both outputs provide same signal, each with different level. S&H-OUT-MOD [9] output (Modulation) generates $\pm 2,5 V_{pp}$. S&H-OUT-CV [10] output (Control Voltage) generates 0 to +8 V voltage levels.

Note: The S&H-OUT-MOD [9] output can be also used as audio output. Very atypical sound is produced if an acoustic signal is used as trigger signal.



6. TECHNICAL PARAMETERS

Mechanical dimensions

Module width : 8 HU (40,3 mm)
Module height : 3 U (128,5 mm)
Module site depth : 53 mm (without power supply cable)

Power supply

Supply voltage : ± 12 V from the system bus
Current requirement : max +45 mA / +12 V
max -25 mA / -12 V

Inputs / outputs

Inputs : EXT-CV \rightarrow 0 to min +4 V pro for full driving / $Z_{IN} = 10$ k Ω
EXT-MOD \rightarrow min $\pm 2,5$ V_{PP} for full driving / $Z_{IN} = 100$ k Ω
TRIG-IN \rightarrow max ± 12 V_{PP}, threshold +1,5 V, hysteresis 0,3V / $Z_{IN} = 40$ k Ω
Outputs : NOISE-OUT \rightarrow ± 5 V_{PP} / $Z_{OUT} = 200$ Ω
S&H-MOD \rightarrow $\pm 2,5$ V_{PP} / $Z_{OUT} = 200$ Ω
S&H-CV \rightarrow 0 to +8 V / $Z_{OUT} = 200$ Ω

Accessory

Ribbon power supply cable with 10 / 16 pin connectors, length ca 200 mm

7. WARRANTY CONDITIONS

The equipment is provided with **thirty-month warranty** starting from the date of the equipment take-over by the customer. This date must be specified on warranty list together with dealer's confirmation. During this period of time, all defects of equipment or its accessories, caused by defective material or faulty manufacturing, will be removed free of charge. Warranty repair is asserted by the customer against the dealer. Warranty period is to be extended for the time period, during which the product was under the warranty repair. The relevant legal regulations take effect in case of cancellation of purchase contract.

The customer will lose the right for free warranty repair, if he will not be able to submit properly filled out warranty list or if the defects of the product had been caused by:

- unavoidable event (natural disaster),
- connecting the device to the incorrect supply voltage,
- inputs or outputs overloading by connecting the signals source or load source with not-corresponding characteristics etc.,
- faulty equipment operation, which is at variance with the instructions referred-to in the operating manual,
- mechanical damage caused by consumer during transportation or usage of equipment,
- unprofessional interference with the equipment or by equipment modification without manufacturer's approval.

