Captured at: 24/09/2025 19:10 URL: https://www.musikandmore.net/bauanleitung-8te-frontpanel-pedal-usb-v1-0-de/

# ASSEMBLY INSTRUCTIONS 8HP FRONT PANEL PEDAL-USB/ V1.0-DE

## Assembly instructions / Documentation / 8HP front panel PEDAL-USB

### Technical Documentation V1.0 DE / Status: 23.09.2025

- for PCB version mainboard V3-R05-v541 from July 2nd, 2025
- for PCB version mainboard V3-R06-v583 from September 19, 2025
- for PCB Midi to CV-Pedal-USB-Breakout v85 from September 21, 2025
- for PCB Amphenol-TRS-6.35mm-Breakout v46 from August 20, 2025
- for PCB 8TE-Pedal-USB-Panel-V1-v7 from May 25th, 2025
- **Technical-data-8TE-Frontpanel-Pedal-USB-September-22-2025** (PDF)
- **BOM-Part-list-for-8TE-Frontpanel-Pedal-USB** (PDF)

USB4
PWR
RACK
EXT
+12V +5V -12V
MUSIKANDMORE
VOL
CLK
CLK
OUT
VOLUME PEDAL
SUSTAIN PEDAL
NAVIPANEL

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## 1) Disclaimer

Before you begin with the kit and assembly, we have some legal information for you. Please read the disclaimer carefully. Thank you for your understanding. The right of withdrawal and return expires as soon as you have opened the DIY kit and you have soldered the included circuit boards or populated the front panels. The DIY kit can only be returned to us in an unused condition. The buyer is responsible for the return shipping costs. The warranty is limited to the components included in the DIY kit. Any warranty claims will be passed on to our suppliers (supply chain verification) in accordance with product liability law. The warranty is void in the event of improper use or application, such as soldering electronic components at excessively hot temperatures or for too long, which can inevitably lead to damage or total loss of the components.

Nicole Effendy (Designvorsprung) and Thomas Effendy (Musikandmore) are free from any legal claims that may result from injuries caused by the assembly, soldering and improper use of the NAVIPANEL V3 for Microdexed, as well as from health damage caused by inhaling soldering fumes.

This project requires **good soldering skills** and a certain degree of **soldering experience** , as well as **basic electronics knowledge** . Every electronics project depends on the tools and the care taken when soldering, including SMD soldering and soldering GND (ground) copper surfaces. Cold solder joints are the most common cause of failures in electronics. The same applies to unwanted solder bridges, e.g., caused by too much solder.

One important aspect of handling electronic components is the **ESD treatment** of semiconductor devices such as ICs, PSRAM, the Teensy 4.1, etc. We also know that not every electronics hobbyist or musician has an ESD (electrostatic discharge **) soldering** station **.** Unfortunately , such a discharge can cause irreversible damage to electronic components.

**Tip:** To avoid damage to the semiconductors, if possible, touch something metallically conductive, e.g. a radiator, before touching semiconductors in order to discharge static electricity.

This electronic circuit is designed for operation with USB 2.0, a 5V DC power supply (optionally with USB-C power), and the 16-pin Eurorack power supply (+5V and GND). Power banks and USB power supply work very well. However, the operating time depends heavily on the power bank's performance. The current consumption of the NAVIPANEL-V3 is currently approximately 250mA at 5V DC without any USB host devices connected.

A power supply with **3.7V LiPo batteries** is **not technically possible** , as the USB devices, the USB hub, and the analog components require 5V DC. Should the NaviPanel-V3 be used with LiPo batteries despite our recommendation, we will not be held responsible for any warranty claims and will not be held liable for any technical defects in the NAVIPANEL-V3 for Microdexed or other technical devices!

**LiPo 3.7V batteries** are not safe to **handle and should only be used by professionals with appropriate electronics knowledge.**

## 2) Soldering recommendations and tips

Use only **lead-free solder** with a diameter of 0.7 mm - 1.0 mm, e.g., from STANNOL KS115 Sn99.3Cu0.7 d=1.0 mm (Made in Germany). The KS115 solder wire contains a **rosin-free** flux with synthetic resins.
Source / link to the product: **https://www.conrad.de/de/p/stannol-ks115-loetzinn-bleifrei-spule-sn99-3cu0-7-rom1-100-g-1-mm-588742.html**

Another point is **soldering fume extraction** .
Inhaling soldering fumes through the mouth and nose is harmful to health. Therefore, please ensure that the soldering fumes are effectively extracted from the soldering joints and that the room is well ventilated. Soldering fumes irritate the nasal mucosa—unfortunately, this isn't immediately noticeable—and anyone who assembles and solders a lot of circuit boards should, in their own interest, ensure that they have good soldering fume extraction. A highly recommended soldering fume extraction system is the ZeroSmog Shield Pro from Weller. It's not a bargain, but it's very effective.
Source / link to the product: **https://www.reichelt.de/de/de/shop/produkt/loetrauchabsaugung_zerosmog_shield_pro-371544** ,

**The soldering iron** should have a power rating of at least 30 VA, preferably 70 VA, and, if possible, an adjustable soldering temperature setting in the range of 275°C to a maximum of 375°C. Cleaning the soldering tip with a copper mesh and a sponge (filled with water) is necessary to remove any scale residue from the soldering tip.

## 3) Work preparation – assembly and soldering

We recommend the following **electronic tools and accessories** :

- Electronic side cutters and electronic flat-nose pliers
- Small slotted or Phillips screwdriver
- Allen key (Allen) 2mm (M3x5/6 ISK screws)
- 5.5mm (M3) socket wrench or 5.5mm open-end wrench
- 8mm (M6) socket wrench for hexagon nuts for the TRS 3.5mm jacks in the front panel
- Solder (see **point 2** )
- Desoldering pump or desoldering copper wire 1.5mm wide (just in case)
- A multimeter to check the supply voltages, to adjust the DAC outputs and, if necessary, to measure the metal film resistors
- a small ESD tweezers (very useful for the PSRAMs)
- A heat-resistant silicone mat (min. DIN A4 format)
- Soldering fume extraction (see **point 2** )
- A "third hand" or electronic vice (e.g. Bernstein Spannfix Vario 9-250 ESD) or similar.
- Source / Link to the product: **https://www.bernstein-werkzeuge.de/produkte/produktdetails/9-250-esd-kugelgelenk-kombination-vario-6-tlg**

## 4) GND – Soldering of GND pads and areas

The **GND pins** require very good heat distribution for a clean soldering joint, so if possible, heat the soldering pad and the component pin at the same time and add a very small amount of solder. The soldering is "good" when the solder flows "voluntarily" into the via.

**A quick tip:** In general, less (solder) is more. The larger the solder ball, the more likely it is to have a cold solder joint! The fact that the GND pins are harder to solder than the other pins is due to the copper surfaces on both sides of the GND and their high heat dissipation on the circuit board. However, the electrical advantage of good mass distribution on the soldering and component sides outweighs this.

## 5) Preparation and sorting of components

**Note:**
We assume that you already own the NAVIPANEL V3, as this is a hardware extension for the NAVIPANEL V3 mainboard from version V3-R05-v526 or newer.

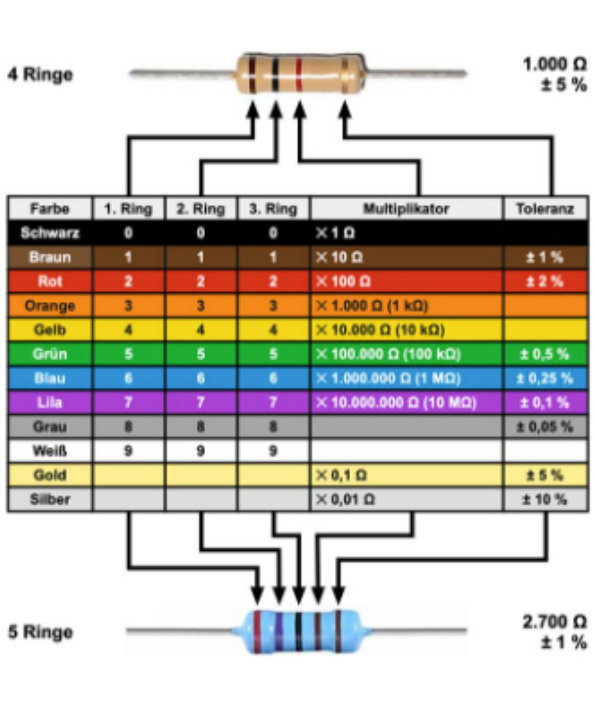
Example: the NAVIPANEL V3 DIY kit with 2 front panels

### Sort components by type:

Resistors, capacitors, electrolytic capacitors, diodes, coils, ICs, LEDs, DIP switches, USB-A sockets, other plugs and sockets, studs, screws, hex nuts, and washers. With our special **test software for the Navipanel V3 hardware,** you can test and calibrate the DAC CV outputs. The latest software available at the time of delivery can be downloaded from our website under " **Downloads."**

### Resistance determination using the color code table

The resistors are labeled on the paper tape. We only supply metal-film resistors with 1% and 0.1% tolerances. The color coding table can be found here: Source: **https://www.elektronik-kompendium.de/sites/bau/1109051.htm**


4 Ringe
1.000 Ω
± 5 %
5 Ringe
2.700 Ω
± 1 %

| Farbe | 1. Ring | 2. Ring | 3. Ring | Multiplikator | Toleranz |
|---|---|---|---|---|---|
| Schwarz | 0 | 0 | 0 | × 1 Ω | |
| Braun | 1 | 1 | 1 | × 10 Ω | ± 1 % |
| Rot | 2 | 2 | 2 | × 100 Ω | ± 2 % |
| Orange | 3 | 3 | 3 | × 1.000 Ω (1 kΩ) | |
| Gelb | 4 | 4 | 4 | × 10.000 Ω (10 kΩ) | |
| Grün | 5 | 5 | 5 | × 100.000 Ω (100 kΩ) | ± 0,5 % |
| Blau | 6 | 6 | 6 | × 1.000.000 Ω (1 MΩ) | ± 0,25 % |
| Lila | 7 | 7 | 7 | × 10.000.000 Ω (10 MΩ) | ± 0,1 % |
| Grau | 8 | 8 | 8 | | ± 0,05 % |
| Weiß | 9 | 9 | 9 | | |
| Gold | | | | × 0,1 Ω | ± 5 % |
| Silber | | | | × 0,01 Ω | ± 10 % |

Resistance determination using the color code table

### The color code table

Before you start determining the resistance, you have to count how many colored rings are applied to the resistor. Carbon film resistors usually have 4 rings. **Metal film resistors have 5 rings** . For resistors with 5 rings, the resistance value is specified a little more precisely. Then you have to determine which ring is the first. Usually you try to find out which ring is the last ring. This is the tolerance ring, which indicates how high the determined resistance value can deviate from the actual resistance value. The tolerance ring is usually gold. If this color is not available, you have to pay attention to the two outer rings. Usually one is further away from the end of the body. This is the tolerance ring. Then you start putting the resistance value together from the beginning. The colors have specific values. The first and second rings determine the resistance counter (4 rings for a carbon film resistor). The third ring acts as a multiplier. It determines how high the resistance value is. The fourth ring is the tolerance ring, which determines the deviation of the resistance value (for carbon film resistors, 4 rings).

## 6) Equipping the 8HP front panel pedal USB board

### The 8HP front panel pedal USB consists of 3 modules and a NAVIPANEL V3 complete unit:

- a Eurorack version of the **Navipanel V3** with **pedal USB breakout**
- the **8HP front panel pedal USB** (only the Midi CV DAC outputs are missing)
- the **Amphenol TRS-6.35mm jack breakout** for the two 1/4" TRS volume and sustain pedals
- the **8HP MIDI-to-CV / Pedal-USB PCB** (the PCB is the same for both versions…)

**IMPORTANT:** The **X1W** 16-pin angled 2x8-pin header is **not populated!**

## 7) Assembly of components resistors, Kerko, TS socket

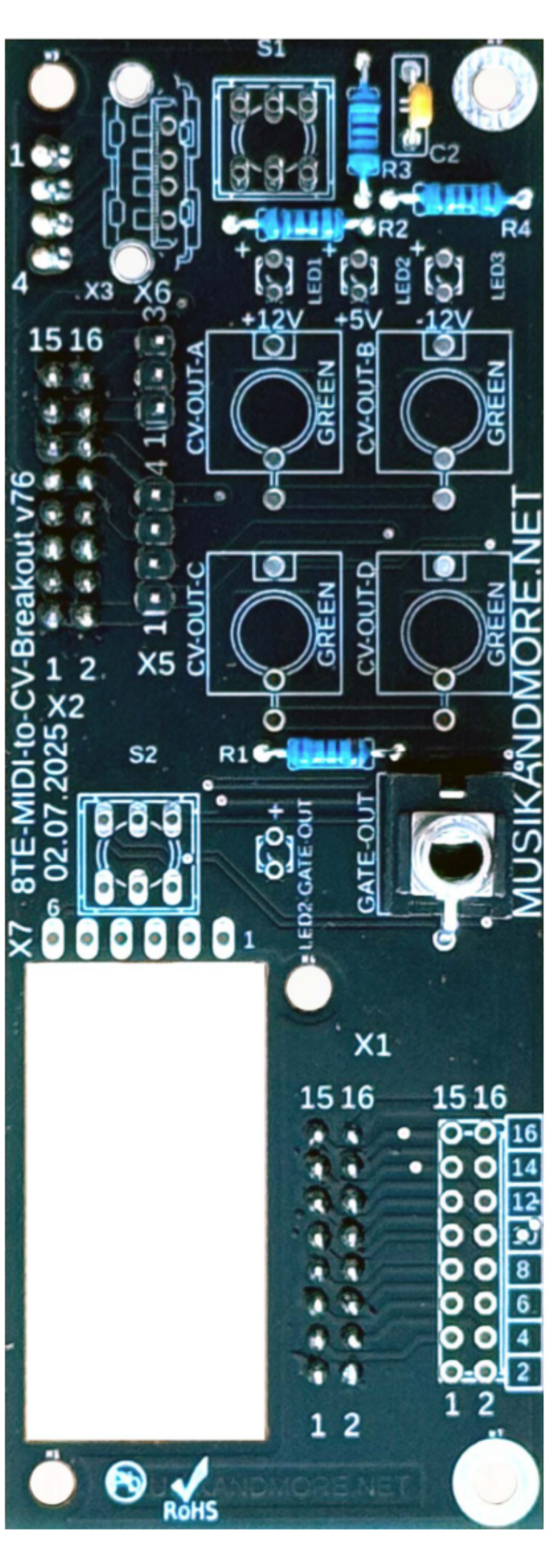
The 8HP front panel pedal USB breakout board is mounted as a sandwich, like the Navipanel V3. The components are mounted normally on the component side. All components are mounted and soldered practically according to their height:

- first the metal film resistors (all labeled on the paper tape)
- first resistor R1, R2, R3, R4 for the LEDs
- then the C2 Kerko 100nF
- TS socket (black) CLOCK-OUT (GATE-OUT)

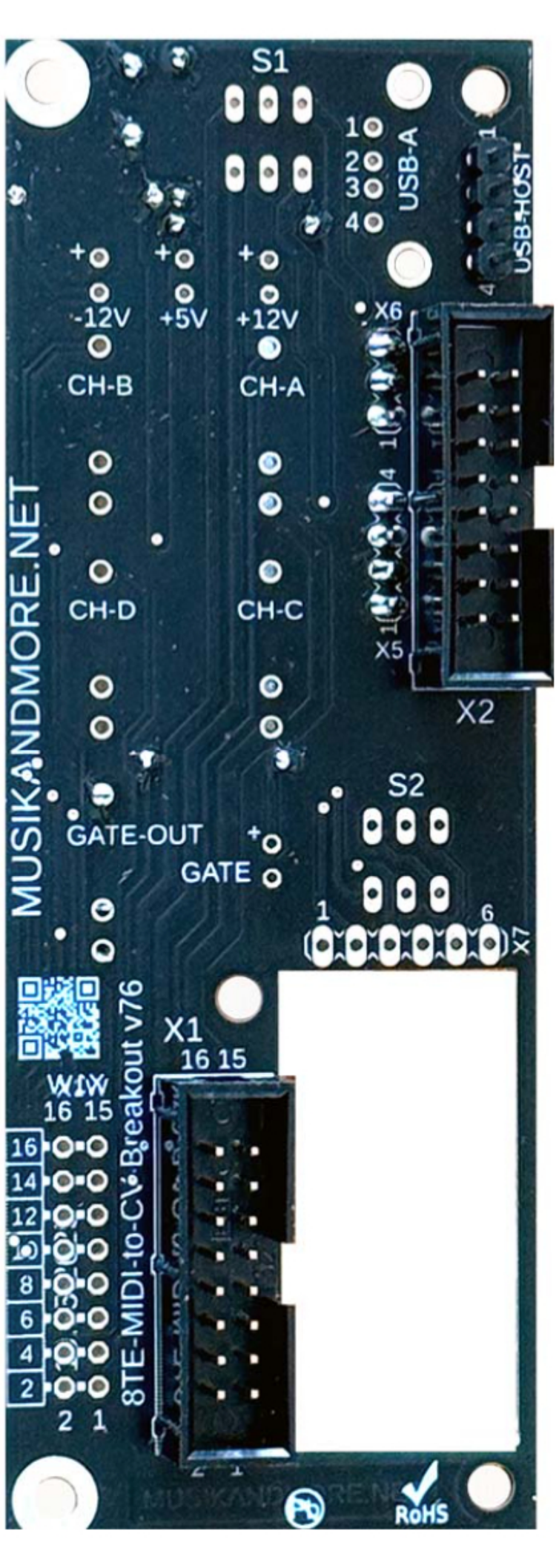
## 8) Component placement Eurorack_IN 16-pin X2 / 16-pin connector strip X1 Expa.Board 8HP

- **IMPORTANT:** The X1 and X2 are 16-pin **straight** header connectors.
- The 16-pin (2x8-pin) box connector X2 is for the connection to the **pedal/USB breakout board** , which is connected with the 20cm ribbon cable.
- The 16-pin (2x8-pin) box connector X1 is for the connection to the EURORACK with the 2nd ribbon cable (20cm)

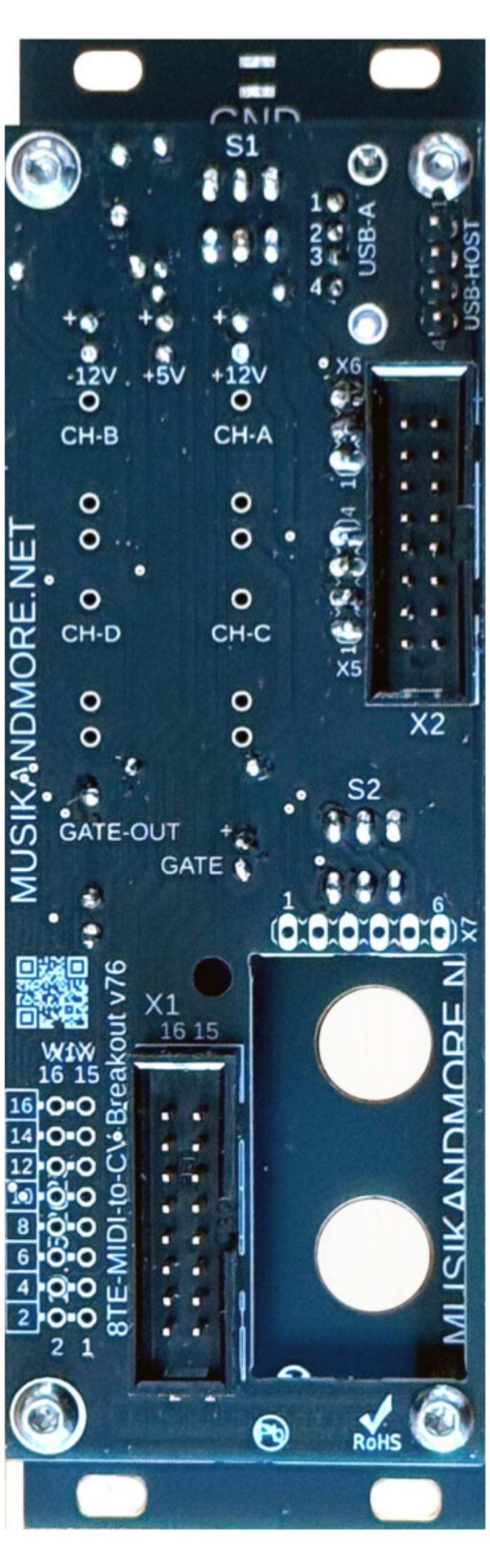
**NOTE:** The **-12V / +12V LEDs** of the Eurorack power supply are **switched via the S1-PWR /Eurorack** and are for visualization purposes only.



**Assembly view:** Assembly metal film resistor R1, electrolytic capacitor C2, ceramic capacitor C1

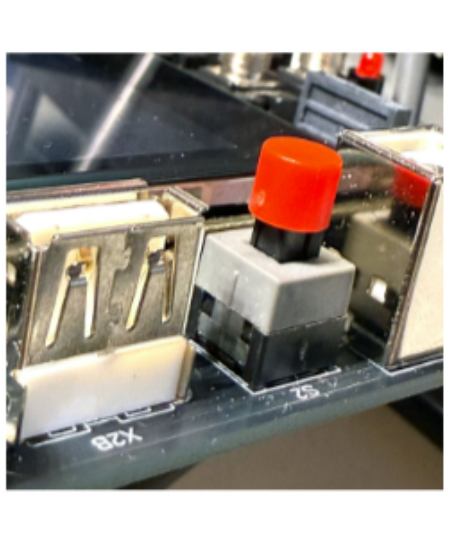


**Soldering view:** X2 16-pin (2x8-pin) header is for the connection to the **pedal / USB breakout board**
X1 16-pin (2x8-pin) header is for the connection to the **EURORACK power supply**



**Soldering view:** Complete assembly of resistors, Kerko C2, S1 and S2, X3, X4B, X5, X6, USB-A4 socket, all LEDs and CLOCK-OUT-TRS socket and 8HP front panel

## 9) Assembly of the TS/TRS sockets / USB-A4 / S1-PWR / S2 Polarization / X3-X8



Now solder the 6.35 mm (1/4") TRS jacks to the Amphenol TRS breakout, the USB jacks, and the switches. Be sure to observe the correct installation direction for the switches; the thin **notch must** be on the right. The **photo on the right is for illustrative purposes only** (NAVIPANEL V3 assembly) .

- Solder x3 USB 4 print socket vertically
- Solder plug connectors X4B, X5 and X6, and 6-pin socket connector X7
- the S1 PWR (WHITE), S2 Polarizid (GREEN) for Volume Pedal
- 2x TRS- (black) 6.35mm for pedal volume and pedal sustain, solder connector strip X8 to Amphenol TRS breakout
  **Please align the 2x TRS sockets and connector strip X8 with the front panel in the assembled state, screw them together and only then solder them in!**
- Then solder the four 3mm LEDs 1-4 with 9mm spacers. The **long leg is the + anode** . The **+ anode of the LED** is marked on the circuit board.

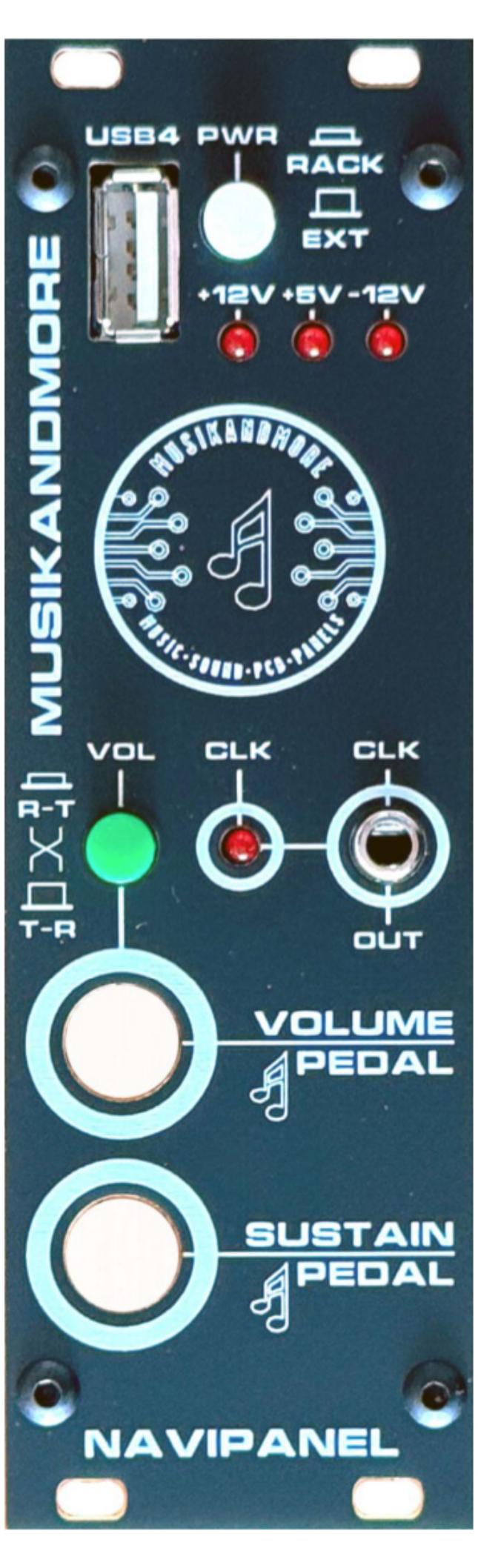


Image **without the assembly of the Amphenol TRS 6.35mm breakout board** (X8) and X7 6-pin socket strip and switches S1/S2.

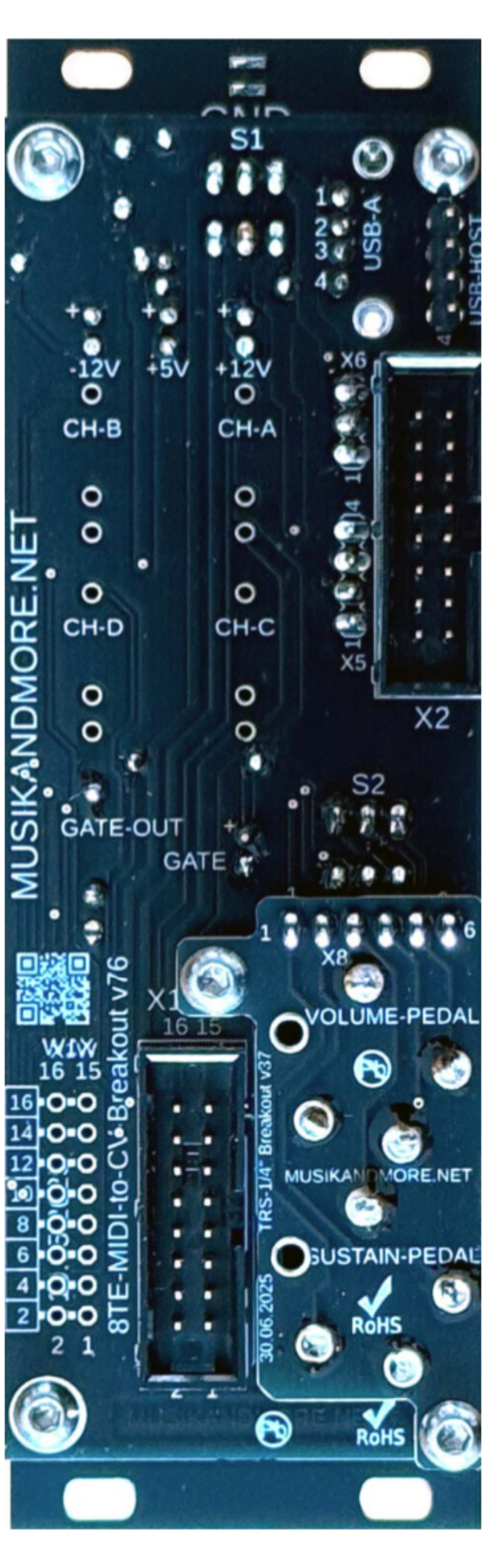
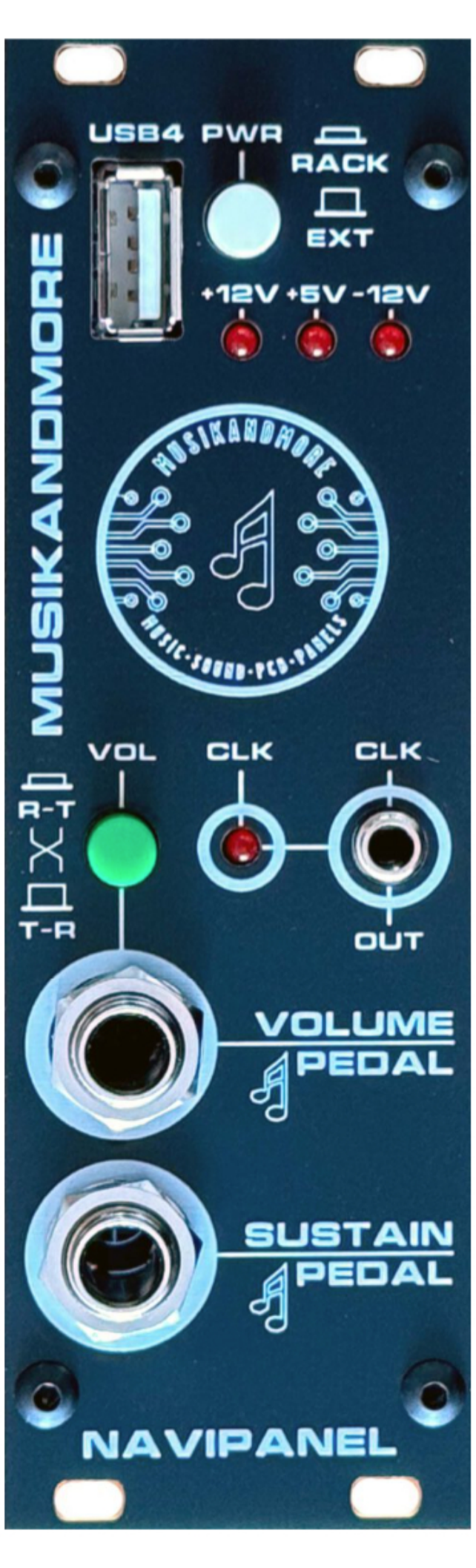
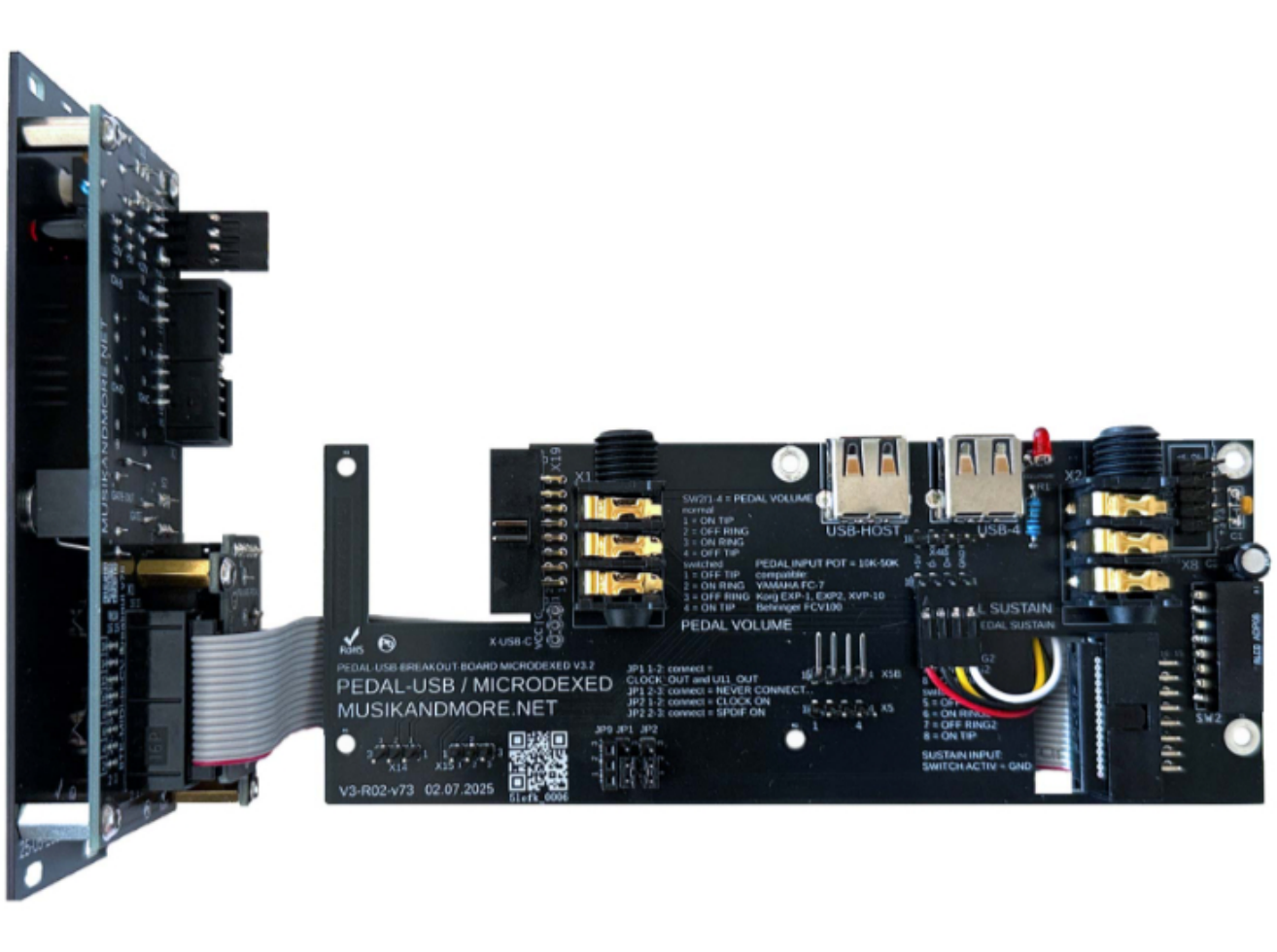


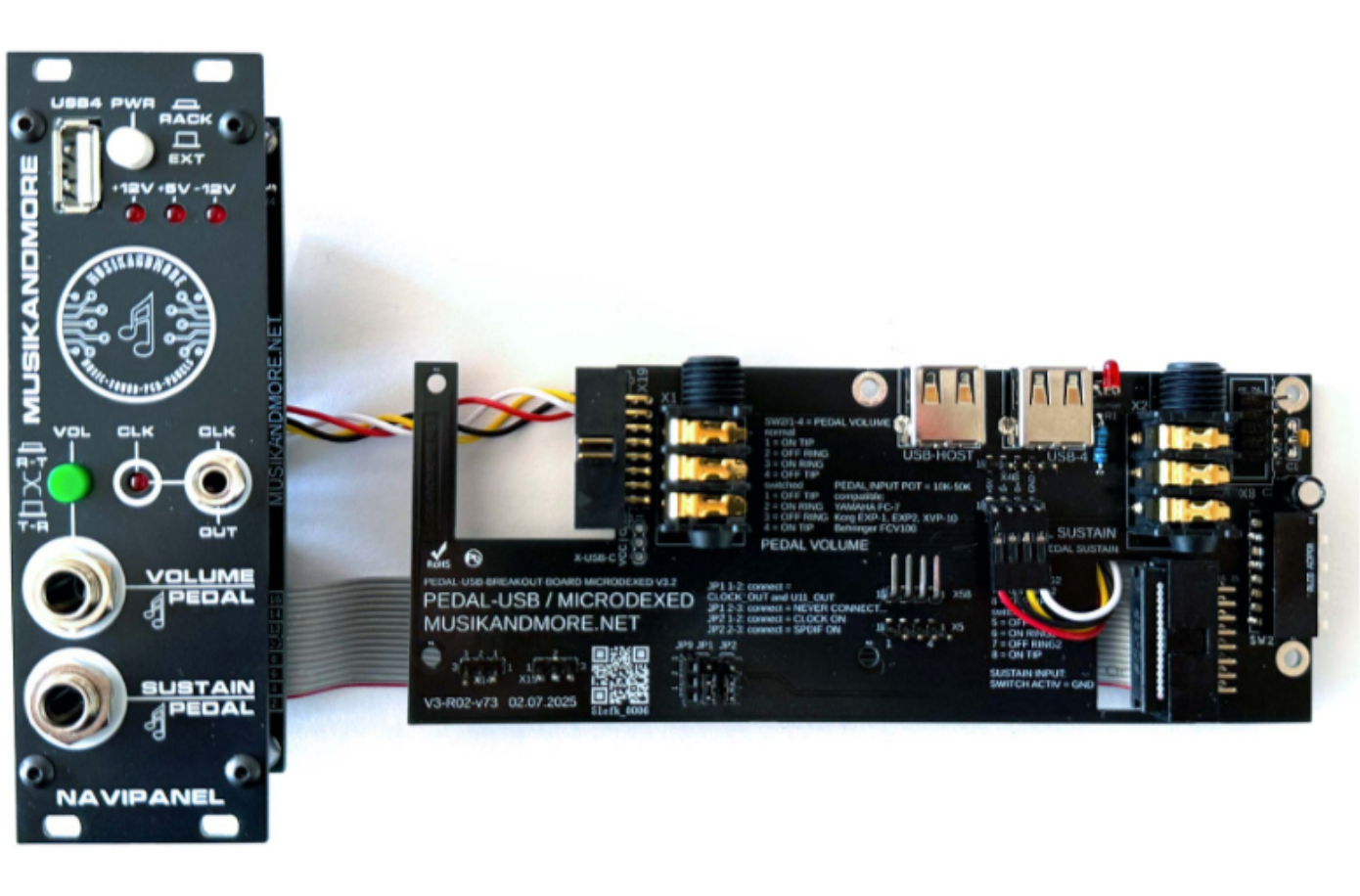
Image with assembly of the Amphenol TRS 6.35mm breakout board (X8) and X7 socket strip 6-pin.



**Front view:** Complete assembly with S1, S2, X1, X2, USB-A4 socket, all LEDs and CLOCK-OUT-TRS socket and 8HP front panel



**Side view:** 8HP front panel complete with TRS breakout and the pedal USB breakout board.
Jumper JP9 normal profile female header 1x3-pin connection to the mainboard.
JP1 1-2 = CLOCK OUT / JP1 2-3 = SPDIF OUT
JP3 1-2 = CLOCK OUT via 8HP front panel
JP3 2-3 = CLOCK OUT OFF



**Front view / overview:** Front panel for pedals and USB, jumpers, plug and socket headers. Connect the 4-pin connection cable for the USB-A4 port X3 located on the 8HP front panel to the X4B port! Ensure the correct polarity: Pin 1 = 5V USB / Pin 4 = GND.

## 10) Commissioning / Functional test

We assume that a functioning **mainboard V3-R05-v541** and a **pedal USB breakout board** are already available.

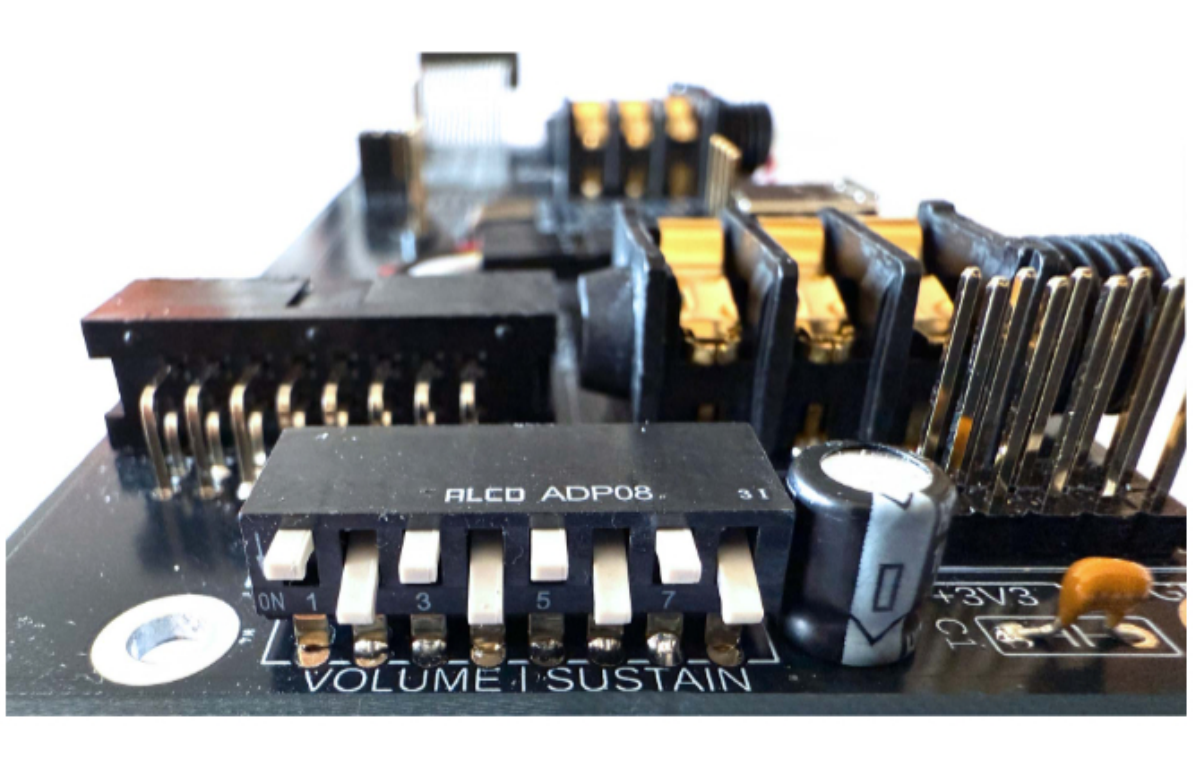
Before plugging in the mainboard, set the following jumpers:

- JP1 = 1-2 CLOCK_OUT loop through to the TRS output on the mainboard.
- JP3 = 2-3 to loop through the SPDIF_OUT as CLOCK-OUT (GATE-OUT).
- Please download the **correct software** from **Downloads** and install it on the Teensy 4.1.

## 10.1) DIP-Switch SW2 Setup for Pedals (for information only!)

| **SW2/1-4 = PEDAL VOLUME** | **SW2/5-8 = PEDAL SUSTAIN** |
|---|---|
| normal | normal |
| 1 = ON TIP | 5 = ON TIP |
| 2 = OFF RING | 6 = OFF RING2 |
| 3 = ON RING | 7 = ON RING2 |
| 4 = OFF TIP | 8 = OFF TIP |
| switched | switched |
| 1 = OFF TIP | 5 = OFF TIP |
| 2 = ON RING | 6 = ON RING2 |
| 3 = OFF RING | 7 = OFF RING2 |
| 4 = ON TIP | 8 = ON TIP |

**SW2 DIP8-Switch Setup Pedals:**



## 10.2) short functional test:

- USB B connector and supply power to the **NAVIPANEL V3 mainboard**
- **S1 PWR Mainboard NAVIPANEL V3** press " **ON"** = LED 5V lights up
- **LED1 PWR/+5V** on the **8HP front panel pedal USB board** is lit
- Press **S1 PWR " OFF"** = LED 5V does **NOT light up**
- **LED1 PWR/+5V** on the **8HP front panel pedal USB board is NOT** lit

If this is successful, use a multimeter to check the supply voltage ( **S1 ON** ) for +5V VCC5 and GND on the 8HP front panel pedal USB breakout board. The voltage level depends on the USB interface of the PC, MAC, or USB hub. However, the voltage should be between 4.8V and 5.2V. We generally recommend an external power supply for the mainboard.

### Test program for NAVIPANEL V3 and 8TE front panel / PEDAL-USB

We have already flashed our test program onto the Teensy at the time of delivery. (This only applies to customers who purchased the complete DIY kit!)
The test program tests the LEDs, the buttons, the RGB encoder LEDs and encoder buttons, and the TRS USB MIDI interface, provided you have a keyboard connected to the MIDI input. MIDI IN is looped through to MIDI OUT via software. Both LEDs flash synchronously when a MIDI signal is received.
The SUSTAIN IN and LED inputs, as well as the volume pedal, are also tested. CLOCK OUT (internal and external) is also tested.

Detailed functional description of the test software under " **Downloads** "

If the alignment was successful, you can flash the MICRODEXED software onto the Teensy 4.1 again.

Now switch the white switch on the **NAVIPANEL V3** back to **S1 PWR "OFF"** .

### The setup for the pedals and USB

Now it's time to set up the Microdexed. Please read the very detailed user manual from **@positionhigh** at the following link: **https://codeberg.org/positionhigh/MicroDexed-touch/raw/branch/main/doc/MicroDexed-touch-manual.pdf**

PRGM
USB-2
USB-3
USB-1
USB PWR
PWR ON-OFF
micro DEXED
MICRO-SD-CARD
SYSTEM SETTINGS
TOUCH TEST
SELECT PARAMETER
CLK-IN
VOL-PEDAL
CLK-OUT
PEDAL
SPDIF-OUT
3.3V 5V
MIDI IN
MIDI OUT
TYP A-B
PHONES
LINE OUT
PUSH
UP
LEFT
RIGHT
DOWN
B
A
SELECT
START
MUSIKANDMORE
NAVIPANEL V3
L
R

Microdexed with Midi-to-CV **SYSTEM SETTINGS** (assembly shows NAVIPANEL V3 demo device!)

PRGM
USB-2
USB-3
USB-1
USB PWR
PWR ON-OFF
micro DEXED
MICRO-SD-CARD
SMF/MIDI Player
Load/Save
File Manager
System
Extras/Test
Info
DEXED VOICE
SONG EDITOR
PATT EDITOR
LIVE SEQ
SEQ. START
LOAD PERF
SAVE PERF
MULTI BAND
MAIN MIXER
PUSH
UP
LEFT
RIGHT
DOWN
B
A
SELECT
START
MUSIKANDMORE
NAVIPANEL V3
L
R

Microdexed with Midi-to-CV **Extras/Test** (assembly shows NAVIPANEL V3 demo device!)

SYSTEM SETTINGS
SELECT PARAMETER
MUSIKANDMORE
NAVIPANEL V3
L
R

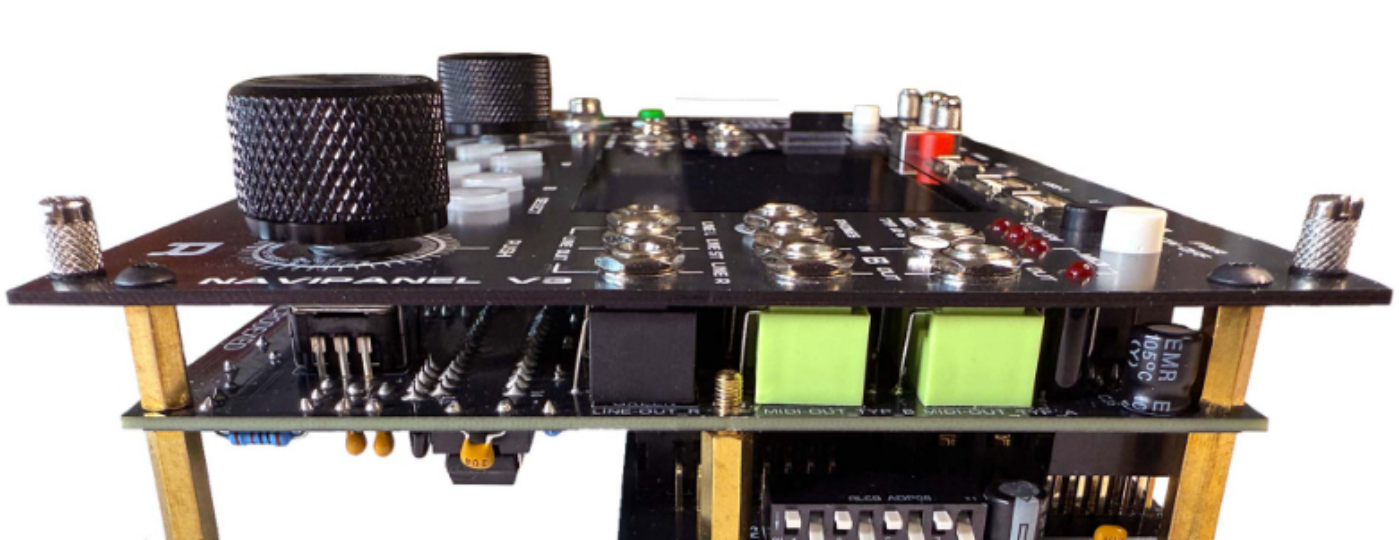
Microdexed with Midi-to-CV **SYSTEM SETTINGS** (assembly shows NAVIPANEL V3 demo device!)

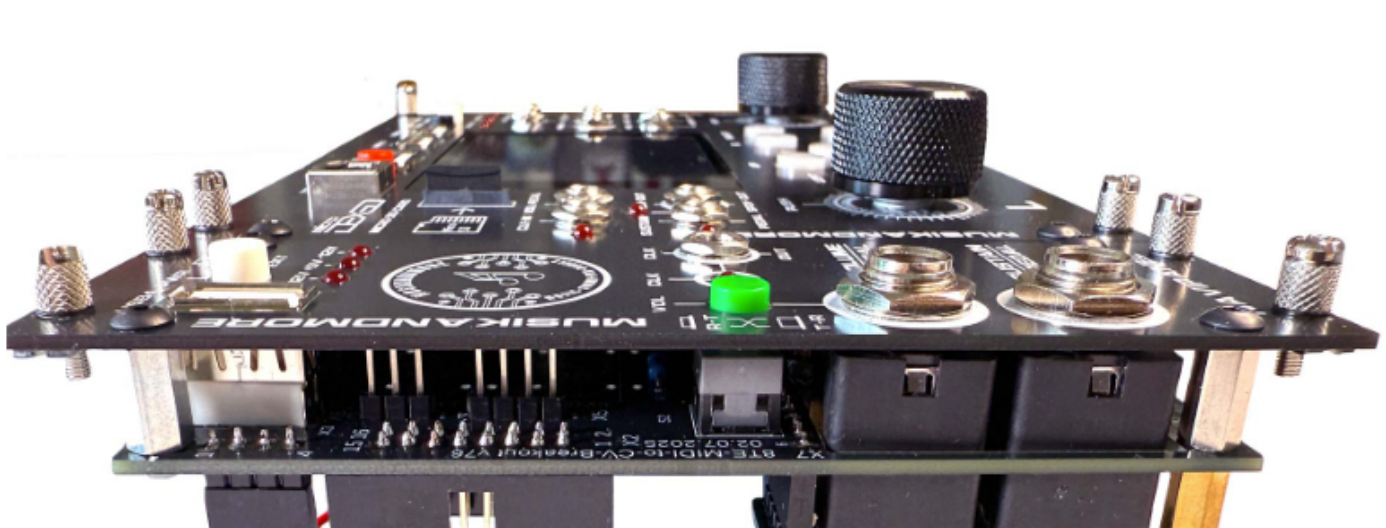
SMF/MIDI Player
Load/Save
File Manager
System
Extras/Test
Info
MUSIKANDMORE
NAVIPANEL V3
L
R

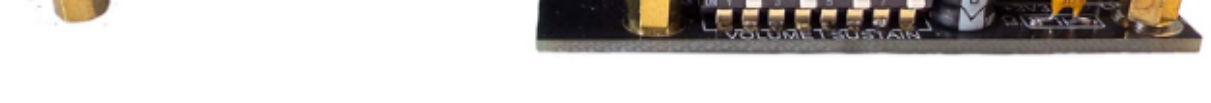
Microdexed with Midi-to-CV **Extras/Test** (assembly shows NAVIPANEL V3 demo device!)

## 10.3) It's almost done!

- the white switch on the mainboard to **S1-PWR "OFF"**
- then the final assembly can take place… Install the NAVIPANEL V3 front panel
- the white switch on the mainboard back to **S1-PWR "ON"**
- Connect the volume pedal and sustain pedal. The 3.5mm TRS jacks on the mainboard's front panel for SUSTAIN and VOL PEDAL are wired in parallel with the 6.35mm TRS jacks on the MIDI to CV / Pedal-USB breakout board.
- e.g. connect CLOCK OUT / CLOCK IN to an external synthesizer or Microdexed and test.
- The current software version can be found under **Downloads** from @positionhigh has implemented the necessary functions.
- CLOCK IN 0/5V (optocoupler separated)
- CLOCK OUT 0/5V (optocoupler separated)
- SUSTAIN PEDAL IN 0/5V
- VOLUME PEDAL IN 0-3.3V







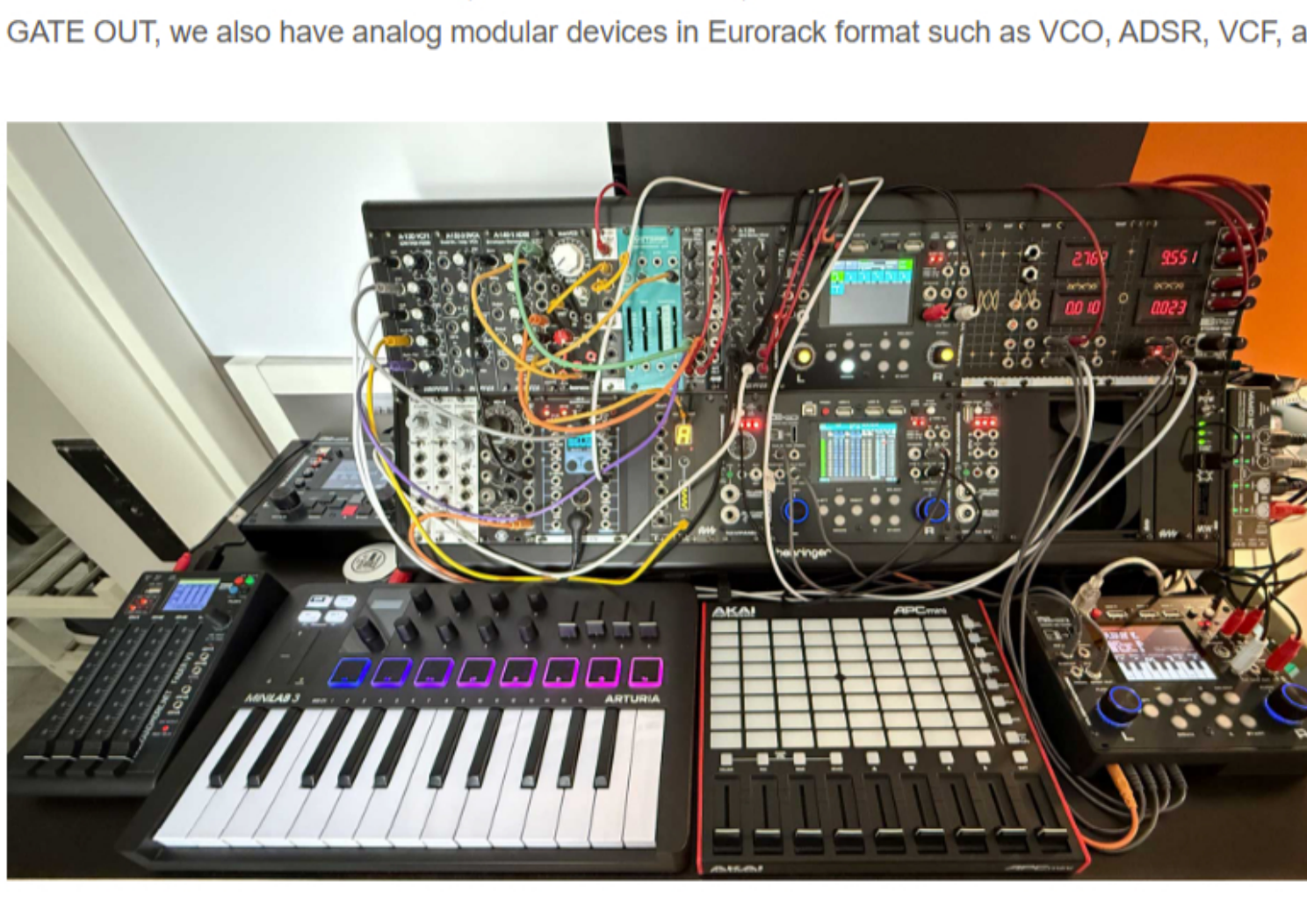
Pedal-USB breakout board view from the right with mainboard (desktop or Eurorack version)
**Note:** please set the DIP8 switch SW2 (bottom right in the photo) as described above in **point 13.1 .**

Pedal-USB breakout board, view from the left and mainboard (desktop and Eurorack version) with **8HP front panel for Pedal-USB**

## 11) Test environment with 4 Microdexed / USB devices / Midi CC-Fader V3

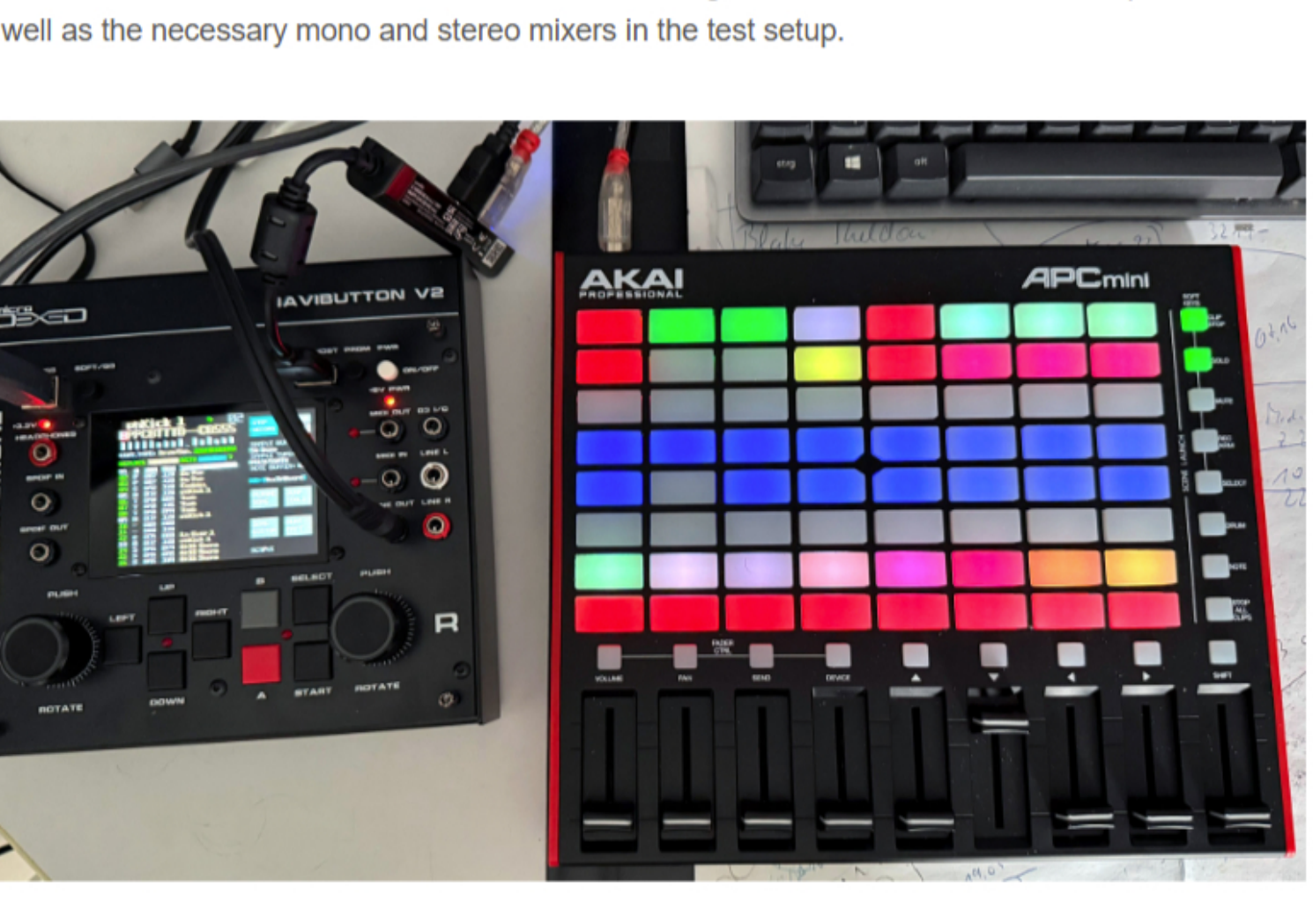
We tested in the following configuration:

**Test environment:** AKAI MPCmini, ARTURIA MiniLab3, and 1x Microdexed NAVIPANEL V2 4MS – 3x Microdexed NAVIPANEL V3 and **MIDI FADER V3** . For testing CLOCK IN/OUT or the CV outputs and GATE OUT, we also have analog modular devices in Eurorack format such as VCO, ADSR, VCF, and VCA, as well as the necessary mono and stereo mixers in the test setup.



**Test environment:** AKAI MPCmini, ARTURIA MiniLab3 and 1x Microdexed NAVIPANEL V2 4MS - 3x Microdexed NAVIPANEL V3 and **MIDI FADER V3** .

The entire setup is powered by the **Behringer Eurorack Go** with an external 95VA power supply and USB plug-in power supplies.



AKAI MPCmini via USB host on the Microdexed **NAVIPANEL V2 4MS**

**Test environment** : We tested the following configuration with the USB hub 1-4 on 3 of 4 possible USB-A ports

- AKAI MPC mini (Midi via USB)
- AKAI MPD 218 (Midi via USB)
- ARTURIA MiniLab3 (Midi via TRS MIDI IN)

The total current consumption was in the range of 390mA – 410mA, so still well under 500mA.

### A notice:

If the black push button **S3 USB PWR is not set to " ON ,"** USB ports 1-4 of the U6 USB hub cannot be used, e.g., for USB MIDI data transfer. In general, using USB for audio and MIDI is a tricky issue. Many ports don't even have 4.4V under load (instead of the required 5V USB). Another issue is potential noise on the audio outputs when using USB audio and/or audio line outputs. In the studio, galvanic USB isolation is very helpful for eliminating ground loops and USB "interference." We use several of these USB isolation modules in our studio.
Link to the product: ARCELI USB Isolator Module, Industrial Isolator Protection Against Audio Noise, 1500V Digital Module: **https://www.amazon.de/dp/B07SJD86TD?ref=ppx_yo2ov_dt_b_fed_asin_title**

## 12) External power supply and Eurorack NAVIPANEL and options

An external 5V power supply (J1), either via the 5V/1A DC connector or via an external (USB) 5V power adapter, is also helpful to prevent any noise or hum. The new version, released in April 2025, now also includes a USB-C power connector (J2P_POWER-IN).

**IMPORTANT:** The **X19** 16-pin angled box connector on the Midi-toCV breakout board and Pedal-USB breakout board is **not populated** (the power supply is via the mainboard; only +5V and GND are used). The external power supply only makes sense if the USB PC or MAC connection is not used for data transfer. So decentralized without a notebook or similar, e.g. during live performances. But both external +5V and USB on PC or MAC also work.

**IMPORTANT:** The power switch of the NAVIPANEL V3, **S1 PWR** (white cap) must then be set to " **OFF" when using external power supply .**

## 13) Additional hardware functions and sockets

The **SPDIF OUT output** is fully functional and integrated into the Microdexed software. It delivers a 44 kHz/16-bit digital signal to the 3.5 mm jack (TS) connector (SPDIF OUT). For connection, a standard SPDIF cable adapter from a mono 3.5 mm TRS jack to an RCA connector is required.

**The CLOCK OUT** output (same jack as SPDIF OUT) is fully integrated into the current software. Two software versions are available for operation with **SPDIF** or **CLOCK OUT** (current version under " **Downloads** ").

The **TRS jacks VOLUME PEDAL/CV-IN, CLOCK-IN, and SUSTAIN PEDAL/GATE-IN** are hardware and software functional.
Information on voltage levels can be found under " **Technical Specifications** ."

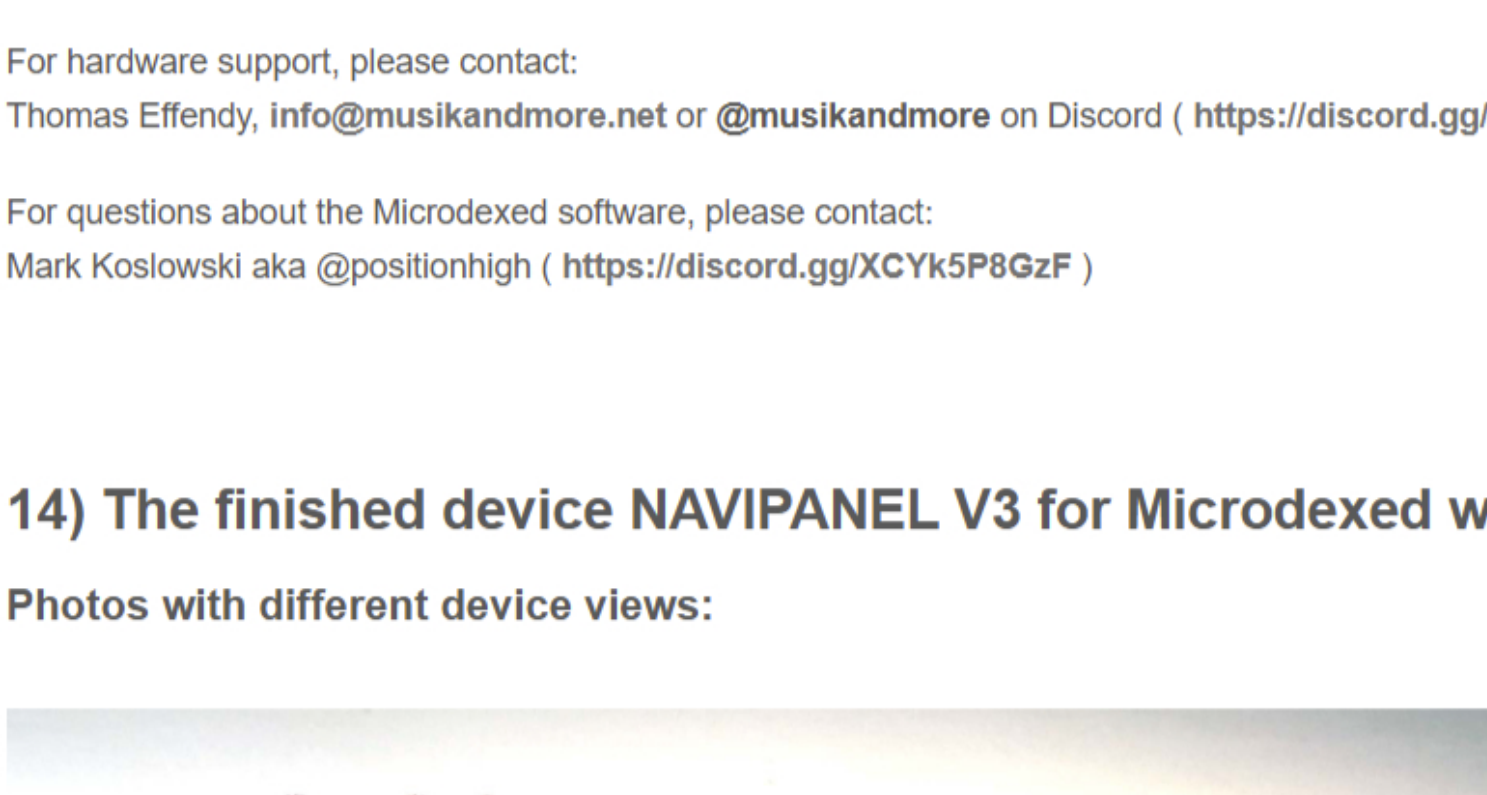
The functionality and use of the USB HOST, USB-1, USB-2, USB-3, and the USB4 port (USB-HOST) on the rear panel are described in **section 11.** The Teensy 4.1 micro-USB port can be switched **ON/OFF using S1 PWR** and is no longer accessible from the front panel.

For hardware support, please contact:
Thomas Effendy, **info@musikandmore.net** or **@musikandmore** on Discord ( **https://discord.gg/XCYk5P8GzF** )

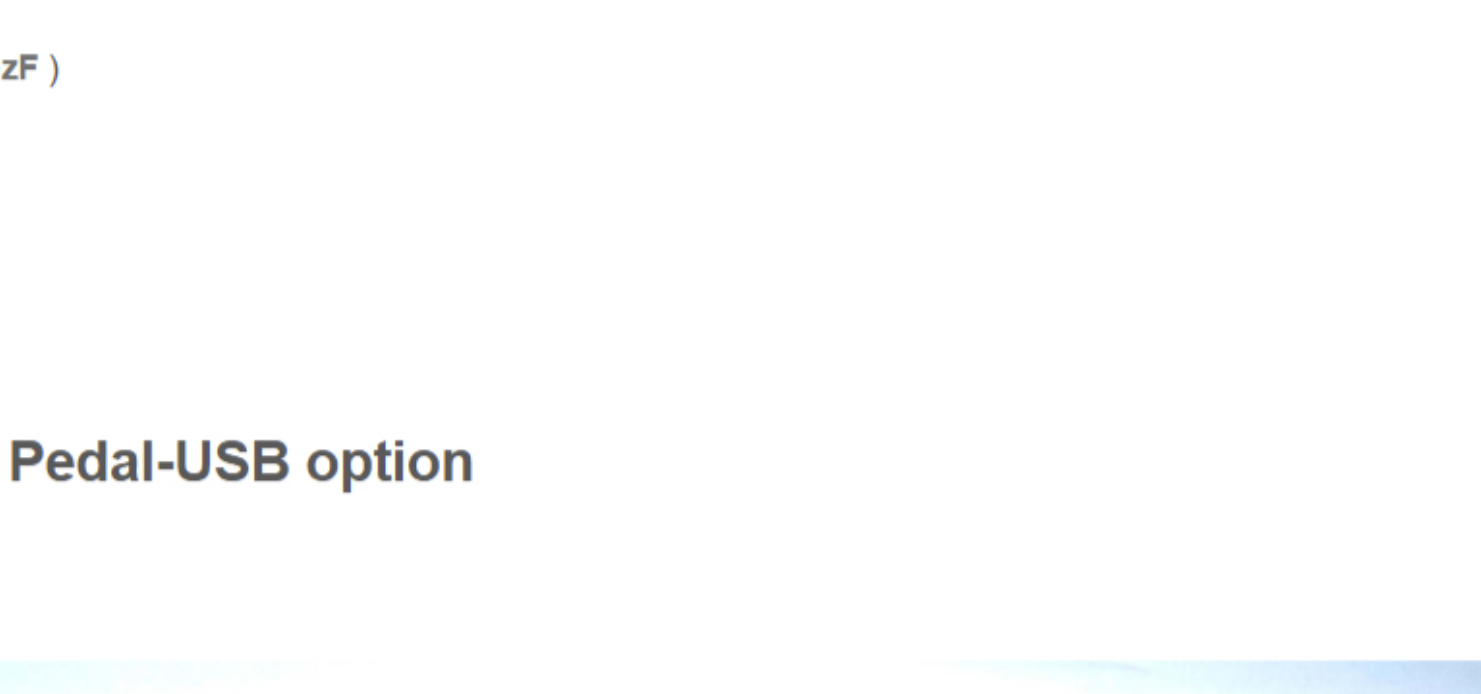
For questions about the Microdexed software, please contact:
Mark Koslowski aka @positionhigh ( **https://discord.gg/XCYk5P8GzF** )

## 14) The finished device NAVIPANEL V3 for Microdexed with the Pedal-USB option

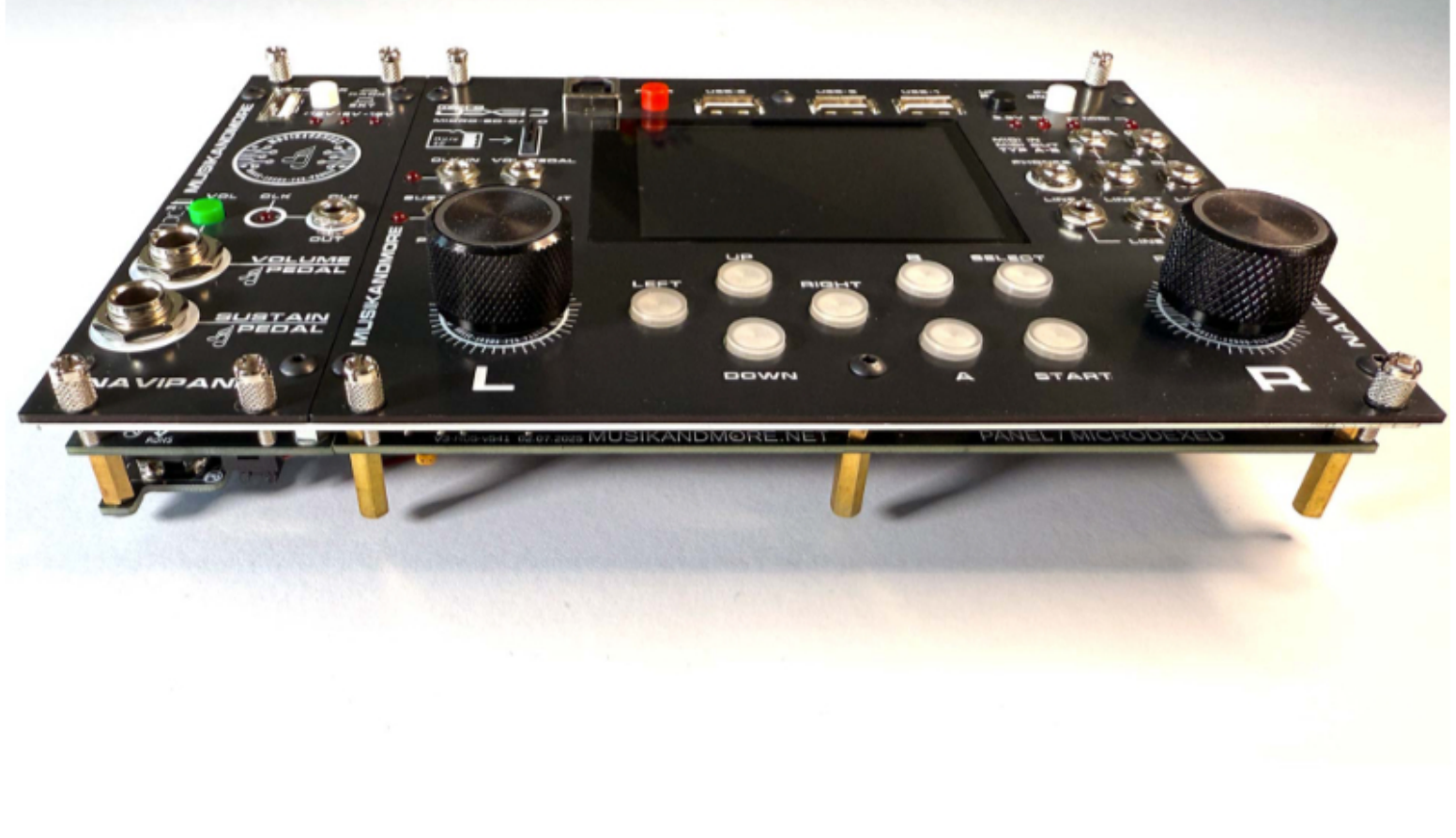
### Photos with different device views:



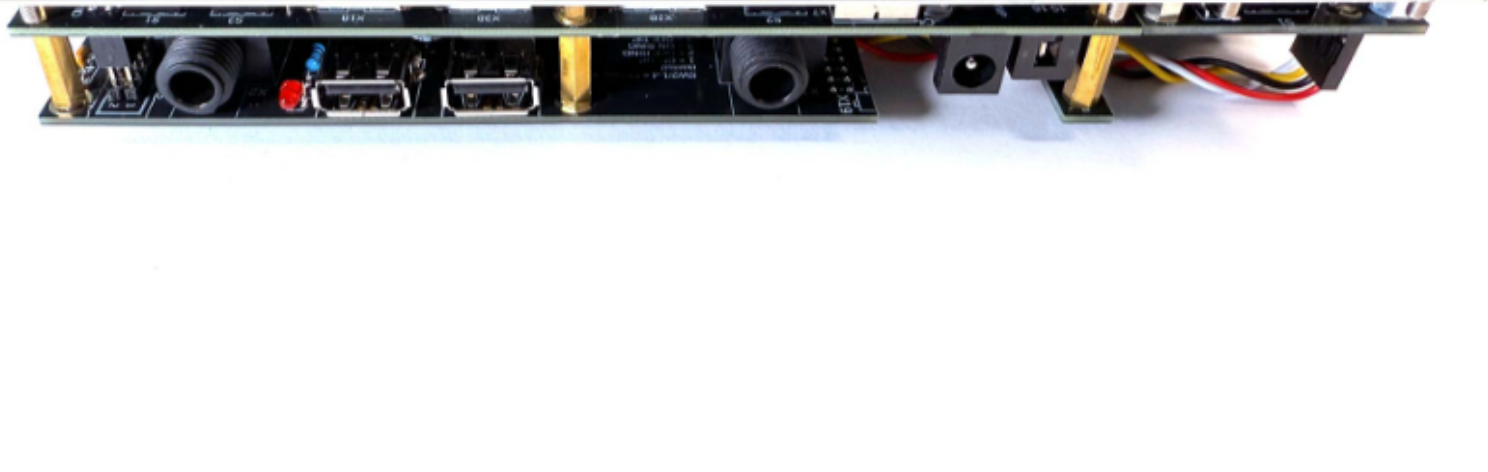
Device variant front **Eurorack 3U/40HP** with 8HP front panel pedal USB



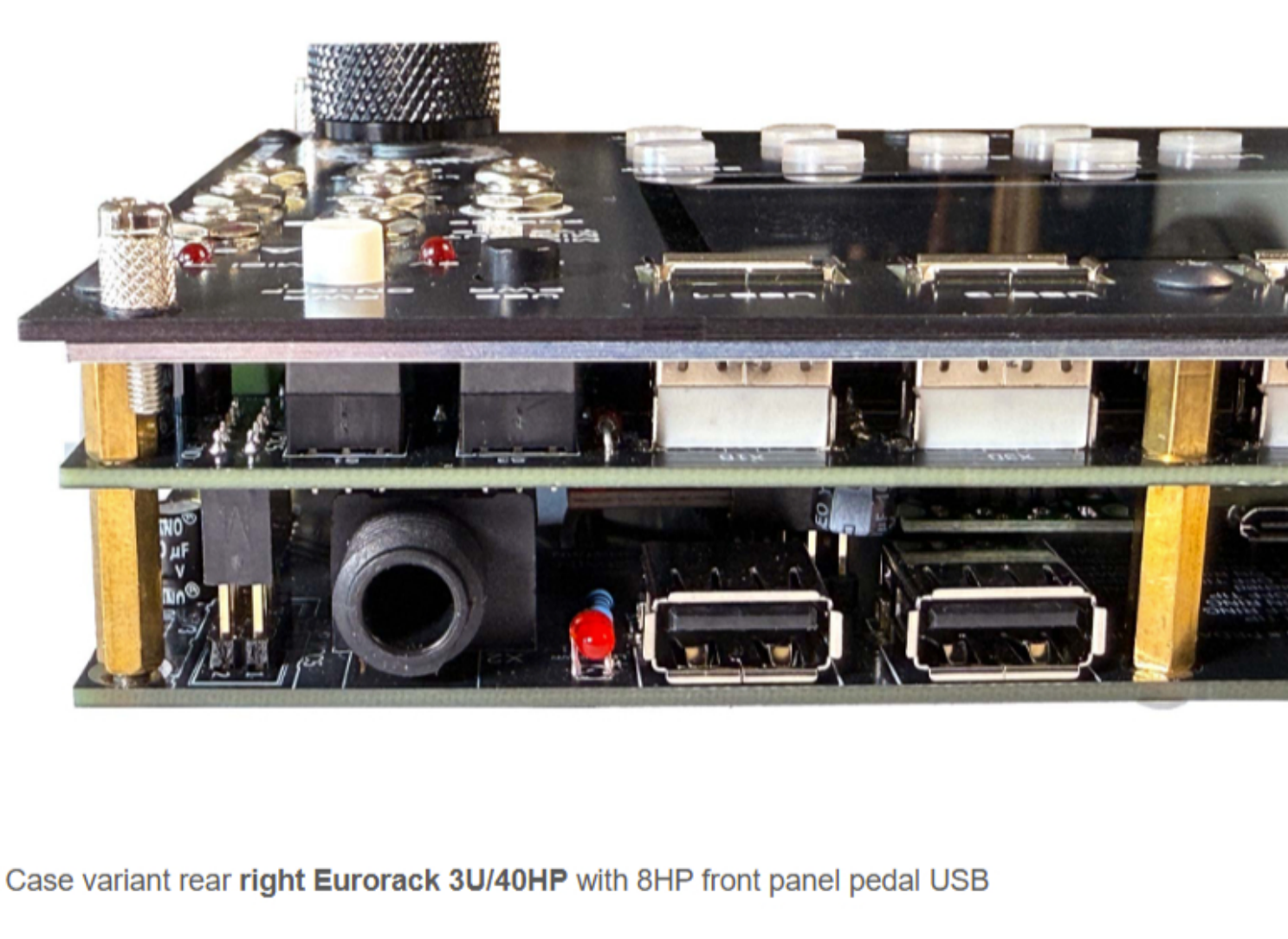
Device variant rear **Eurorack 3U/40HP** with 8HP front panel pedal USB



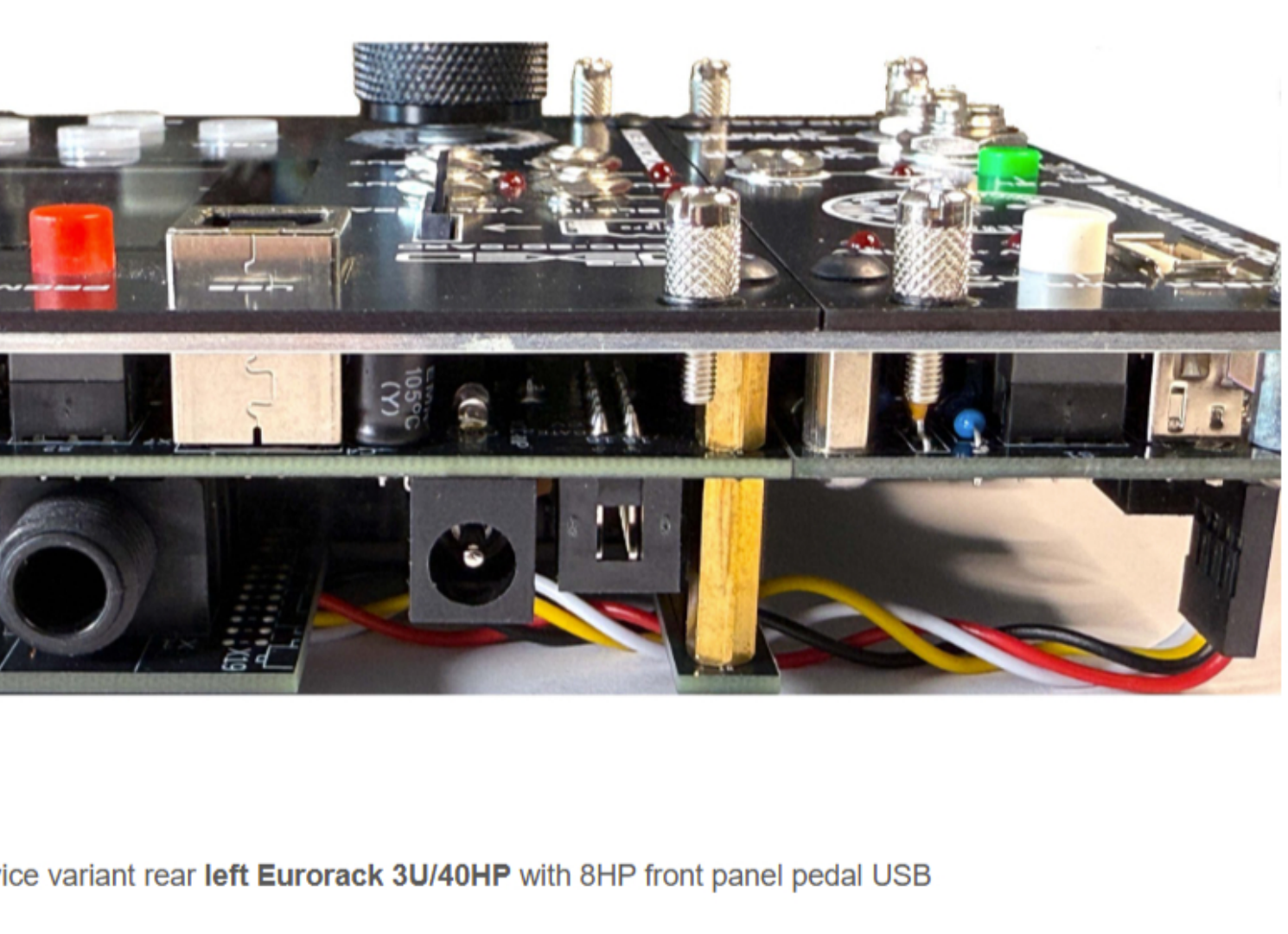
Case variant rear **right Eurorack 3U/40HP** with 8HP front panel pedal USB



Device variant rear **left Eurorack 3U/40HP** with 8HP front panel pedal USB



**Eurorack 3U/40HP** case variant with 8HP front panel pedal USB



Device variant solder side **Eurorack 3U/40HP** with 8HP front panel pedal USB

## 15) Appendix A.

### As of: September 18, 2025

### Sources / Links / Product recommendations

- Bernstein ball joint tool holder / Link to the product:
  **https://www.bernstein-werkzeuge.de/produkte/produktdetails/9-250-esd-kugelgelenk-kombination-vario-6-tlg**
- Solder / Link to the product:
  **https://www.conrad.de/de/p/stannol-ks115-loetzinn-bleifrei-spule-sn99-3cu0-7-rom1-100-g-1-mm-588742.html**
- Soldering extraction system / Link to the product:
  **https://www.reichelt.de/de/de/shop/produkt/loetrauchabsaugung_zerosmog_shield_pro-371544**
- USB host adapter from prjc.com / Link to the product:
  **https://www.pjrc.com/store/cable_usb_host_t36.html**
- Resistor color code table: **https://www.elektronik-kompendium.de/sites/bau/1109051.htm**
- Current software for NaviPanel-V3 is available at: **https://codeberg.org/positionhigh/MicroDexed-touch/releases**
- Current original manual from Microdexed @positionhigh:
  **https://codeberg.org/positionhigh/MicroDexed-touch/raw/branch/main/doc/MicroDexed-touch-manual.pdf**
- prjc.com Teensy Software: **https://www.pjrc.com/teensy/loader.html**
- Discord Channel @positionhigh: **https://discord.gg/XCYk5P8GzF**
- Link to the Web Remote Console: **https://positionhigh.codeberg.page/**
- ARCELI USB Isolator Module, Industrial Isolator Protection Against Audio Noise, 1500V Digital Module:
  **https://www.amazon.de/dp/B07SJD86TD?ref=ppx_yo2ov_dt_b_fed_asin_title**
- Midi cable red pack of 3 classification TYPE A
  **https://www.thomann.de/de/befaco_trs_midi_cable_a.htm**
- Midi cable grey 3-pack classification TYPE B
  **https://www.thomann.de/de/befaco_trs_midi_cable_b.htm**
- 4MS pod32 cabinet 32HP (powered)
  **https://www.thomann.de/de/4ms_pod32_powered.htm**
- **4MS pod32 enclosure 32HP (powered)** (musikandmore.net)
- 4MS pod32 cabinet 32HP (unpowered) ( **special purchase via Thomann)**
  **https://www.thomann.de/de/4ms.html**
- Power supply for Eurorack enclosure 4MS pod32 / maximum output power: 15 V / 3 A 45W
  **https://www.thomann.de/de/4ms_power_brick_45w.htm**
- **3D case / housing 32HP for NAVIPANEL V1 from mainboard v380** (musikandmore.net)
- **3D case / housing 32TE for NAVIPANEL V2 from mainboard v526** (musikandmore.net)
- **3D case / housing 32HP for NAVIPANEL V3 from mainboard v541** (musikandmore.net)
- USB C Charger/Power Supply Breakout U9 (Amazon)
  **https://www.amazon.de/dp/B0CQNCFYGV?ref=ppx_yo2ov_dt_b_fed_asin_title**

## 16) Appendix B. Credit

### Contributors

Mark Koslowski aka @positionhigh ( **https://discord.gg/XCYk5P8GzF** )
for the excellent software and hardware base.

Holger Wirtz for the original port of the DEXED PC/Desktop OS to the Teensy 4.1 MICRODEXED – Microcontroller

Thomas Effendy **https://musikandmore.net** Hardware development and panel / PCB design

Nicole Effendy – **https://designvorsprung.de** for her patience with the seemingly endless proofreading of the assembly instructions and technical documentation.

## 17) Appendix C.

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**Project:** NAVIPANEL V3 for Microdexed
**Author:** Thomas Effendy (all hardware versions V3-R04-v380 -V3-R05-v541, V3-R02-v286, V3-R03-v309, V3-R01-v64, V3-R02-v73, V3-R02-v84)
**Author:** Mark Koslowski (Software Microdexed Version 1.9.8.4-1.9.9.9)
**Email:** **info@musikandmore.net**
**Date:** 23.09.2025
**Version:** V.1.0-DE (this document)
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## 18) Appendix D.

## Technical data 8TE front panel pedal USB / September 22, 2025

8TE front panel for Pedal USB / Navipanel mainboard from V3-R05-v541

Print PDF

| NAVIPANEL V3 8TE front panel pedal USB \| Date: September 22, 2025 | Technical data sheet | ID-(BOM) | X1/X1W PINs |
|---|---|---|---|
| 01) Modular rack 3U / 40HP / Dimensions (W x L x H) 206x127x33mm | Eurorack | optional… 1*) | |
| 02) Desktop Eurorack Behringer 104TE / Dimensions (W x L x H) 546x133x84mm | Metal housing | optional… 1*) | |
| 03) Desktop aluminum case 4MS pod40 powered / Dimensions (W x L x H) 206x159x40mm | Metal housing | optional… 1*) | |
| 04) power supply (USB-C Power Supply Breakout and 4MS 45W Power Brick) | Power supply | optional… 1*) | |
| 05) 16-pin box connector with 20cm ribbon cable | for modular (+5V) | Eurorack cable | |
| 06) 16-pin box connector with 20cm ribbon cable | for 8HP Eurorack front panel | Eurorack cable | 1-16 |
| 07) internal / external supply for USB hub | switchable | included | |
| 08) from USB-HOST Hub Port 4, 1x USB-A of which are NOT in the front panel | from active USB hub U6 | U6 (Mainboard) | |
| 09) 1x USB A connectors on the back via 4-pin connector | USB-A 2.0 | X5B HOST-X4B | |
| 10) 1x S1 Switch Eurorack Power LEDs WHITE | S1 Switch Eurorack PWR | S1 Switch | |
| 11) 1x S2 Switch Polarized for Volume TR /RT GREEN | S2 Switch Polarized | S2 Switch | |
| 12) CLOCK OUT TRS 3.5mm 0/5V optocouplers | modular connection | TRS 3.5mm | 5 |
| 13) PEDAL Volume Input 1/4 inch TRS +3.3V /Signal /GND (Amphenol Conn.) | modular connection | TRS 6.35mm | 6/4 |
| 14) CV IN / alternative 0-5VDC / 0-10VDC input (protected with suppressor diodes) | modular connection | TRS 6.35mm | 6/4 |
| 15) PEDAL SUSTAIN IN = SUSTAIN 0/+3.3V= LOW/HIGH (Amphenol Conn.) | modular connection | TRS 6.35mm | 12/10 |
| 16) LED2 CLOCK OUT (front panel) | LED 3mm low current RED | LED2 | 7 |
| 17) LED1 5V Power | LED 3mm low current RED | LED1 | 14 (VCC +5V) |
| 18) LED3 +12V Eurorack power | LED 3mm low current RED | LED3 | |
| 19) LED4 -12V Eurorack power | LED 3mm low current RED | LED4 | |
| 20) NOT USED Expansion connector 16pol for 8TE front panel with 90° 2x8pol. | MIDI to CV / Pedals / LEDs | X1W | 1/2/8 (GND) |
| 21) Expansion connector 16pol for 8TE front panel with Eurorack compatible | MIDI to CV / Pedals / LEDs | X1 | 1/2/8 (GND) |
| 22) Expansion connector 16-pin | | X1/X1W | 3 (AGND) |
| 23) Expansion connector 16-pin | | X1/X1W | 16 (VDD +12V) |
| Note 1*): the technical data apply from motherboard version and the Navipanel V3 mainboard is necessary! Used Eurorack min. 40TE/3U | V3-R05-v541, July 02, 2025 | | |
| Midi to CV PCB version (Breakout Board V3.3) with CV and Gate, Pedals and USB-A4 | V3-R03-v309, August 21, 2025 | | |
| Note 2*) only on the smaller pedal / USB PCB version (PEDAL-USB-Breakout-Board) without Midi to CV and Gate OUT | V3-R02-v73, July 02, 2025 | | |

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## 19) Appendix E.

## BOM Part-list for NAVIPANEL 8TE-Frontpanel-Pedal-USB

Pedal / USB /V2-R02-v84 / 09-22-2025

Print PDF

Show entries

Seek

| part | Value | Detailed Description |
|---|---|---|
| C2 | 100nF | CAPACITOR |
| CLOCK OUT | WQP518MA-MONO | Black Thonkiconn Mono 3.5mm Audio Jacks |
| EURORACK_CABLE | Flatcable_16pol_20cm | Flatcable_16pol_20cm |
| H1 | STANDOFF_M3X11mm_I/I_V2A | STANDOFF_M3X11mm_I/I_V2A |
| H2 | STANDOFF_M3X11mm_I/I_V2A | STANDOFF_M3X11mm_I/I_V2A |
| H3 | STANDOFF_M3X11mm_I/I_V2A | STANDOFF_M3X11mm_I/I_V2A |
| H30-H31 | 2x_WASHER_DIN125A_3.2mm_for_distance | 2x_WASHER_DIN125A_3.2mm_for_distance |
| H4 | STANDOFF_M3X11mm_I/I_V2A | STANDOFF_M3X11mm_I/I_V2A |
| H40- | 1x_NUTS_DIN127_M3_for_Standoff_M3x1… | 1x_NUTS_DIN127_M3_for_Standoff_M3x15mm |
| H5 | STANDOFF_M3X12mm_I/A_brass | STANDOFF_M3X12mm_I/A_brass |
| H50-H54 | 5x_SCREWS_M3x5mm_ISO7380-1_V2A | 5x_SCREWS_M3x5mm_ISO7380-1_V2A |
| JUMPER | JUMPER 2-pin | JUMPER 2-pin |
| LED1 | LED1/+5V | 3mm_red_low_current |
| LED1-4_STANDOFF | 4x_LED3mm-STANDOFF_d5x9mm | 4x_LED3mm-STANDOFF_d5x9mm (000183421) |
| LED2-CLOCK-OUT | LED2-CLOCK-OUT | 3mm_red_low_current |
| LED3 | LED3/+12V | 3mm_red_low_current |
| LED4 | LED4/-12V | 3mm_red_low_current |
| PCB_BREAKOUT | 8TE-Midi-to-CV-Pedal-USB_V3-R02-v76_02-07-2025 | 8TE-Midi-to-CV-Pedal-USB_V3-R02-v76_02-07-2025 |
| PCB_BREAKOUT1 | Amphenol-TRS-6-35-Breakout-v46_20-08-2025 | Amphenol-TRS-6-35-Breakout-v46_20-08-2025 |
| PCB_BREAKOUT2 | 8TE-Frontpanel-Pedal-USB_V1-v7_25-05-2025 | 8TE-Frontpanel-Pedal-USB_V1-v7_25-05-2025 |
| R1 | 680R | RESISTOR, European symbol |
| R2 | 680R | RESISTOR, European symbol |
| R3 | 1K8 | RESISTOR, European symbol |
| R4 | 1K8 | RESISTOR, European symbol |
| S1 | PWR Eurorack / DPDT Latching Push Button WHITE | DPDT Latching Push Button WHITE thonk.co.uk |
| S2 | Polarzid Volume/DPDT Latching Push Button GREEN | DPDT Latching Push Button GREEN thonk.co.uk |
| TRS SUSTAIN | 1x Amphenol-TRS-6.35mm_Jacks-vertical | 1x Amphenol-TRS-6.35mm_Jacks-vertical ASJS-MV-3 |
| TRS VOLUME | 1x Amphenol-TRS-6.35mm_Jacks-vertical | 1x Amphenol-TRS-6.35mm_Jacks-vertical ASJS-MV-3 |
| TRS-X8 | 1x pin header 6pol for TRS breakout | 1x pin header 6pol for TRS breakout |
| USB-4-CABLE | 1x USB4_Cable_20cm_4pin | 1x USB4_Cable_20cm_4pin |
| X1 | Expa.Board 8TE | HARTING |
| X1W not used | Expa.Board 8TE not used | PIN HEADER 2x 8pol 90° not used |
| X2 | EURORACK_IN | HARTING |
| X3 | Vertical,Top Entry USB Connector KUSBVX Series | Vertical,Top Entry USB Connector KUSBVX Series |
| X4B | USB-4 | PIN HEADER 1x4pin |
| X5 | EURORACK POWER | PIN HEADER 1x4pin |
| X6 | EURORACK GATE/CV | PIN HEADER 1x3pin |
| X7 | TRS breakout female 6-pin | FEMALE HEADER 6-pin |

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## 20) Appendix F

## Changes:

**Changelog: from May 21, 2025 to July 2, 2025**

**8TE front panel pedal USB / PCB version V1-R01-v7 from May 25th, 2025**
**8TE front panel midi-to-CV / pedal USB - PCB version V1-R01-v11 from May 21st, 2025**
**8TE main PCB - midi-to-CV / pedal USB - PCB version V2-R02-v76 from July 2, 2025**

- PCB bridge left for Amphenol-TRS-6-35mm widespread
- Plug strip X1W changed to socket strip

## 21) Appendix F

## Changes:

**Changelog: from 02.07.2025**

**8TE front panel pedal USB – PCB version V3-R02-v84 from September 21, 2025**

- Parts lists as subpages for components that are included in the scope of delivery but are not directly located on the PCBs
- minimal corrections to the PCB labeling

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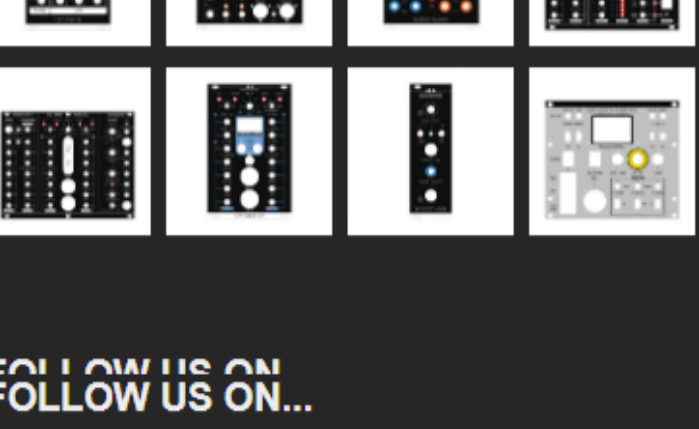
- Construction instructions NAVIPANEL-V3/ V7.0-DE
- Construction instructions NAVIPANEL-V3/ V6.8-DE
- Assembly instructions MIDI-to-CV-PEDAL-USB/ V1.0-DE
- Assembly instructions for the 8HP front panel MIDI-to-CV/ V1.0-DE
- Assembly instructions PEDAL-USB/ V1.0-DE
- Assembly instructions for the 8HP front panel PEDAL-USB/ V1.0-DE
- mdt_PSRAM-CAP_TOUCH-MAM-CV-1.9.9.9
- mdt_PSRAM-CAP_TOUCH-MAM-APC-1.9.9.9
- mdt_PSRAM-CAP_TOUCH-MAM_SPDIF-1.9.9.9
- MicroDexed-touch-manual-version-0.57.pdf
- codeberg.org/positionhigh/MicroDexed-touch
- Web Microdexed MDT remote

NAVIPANEL V3 | NAVIBUTTON V2



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