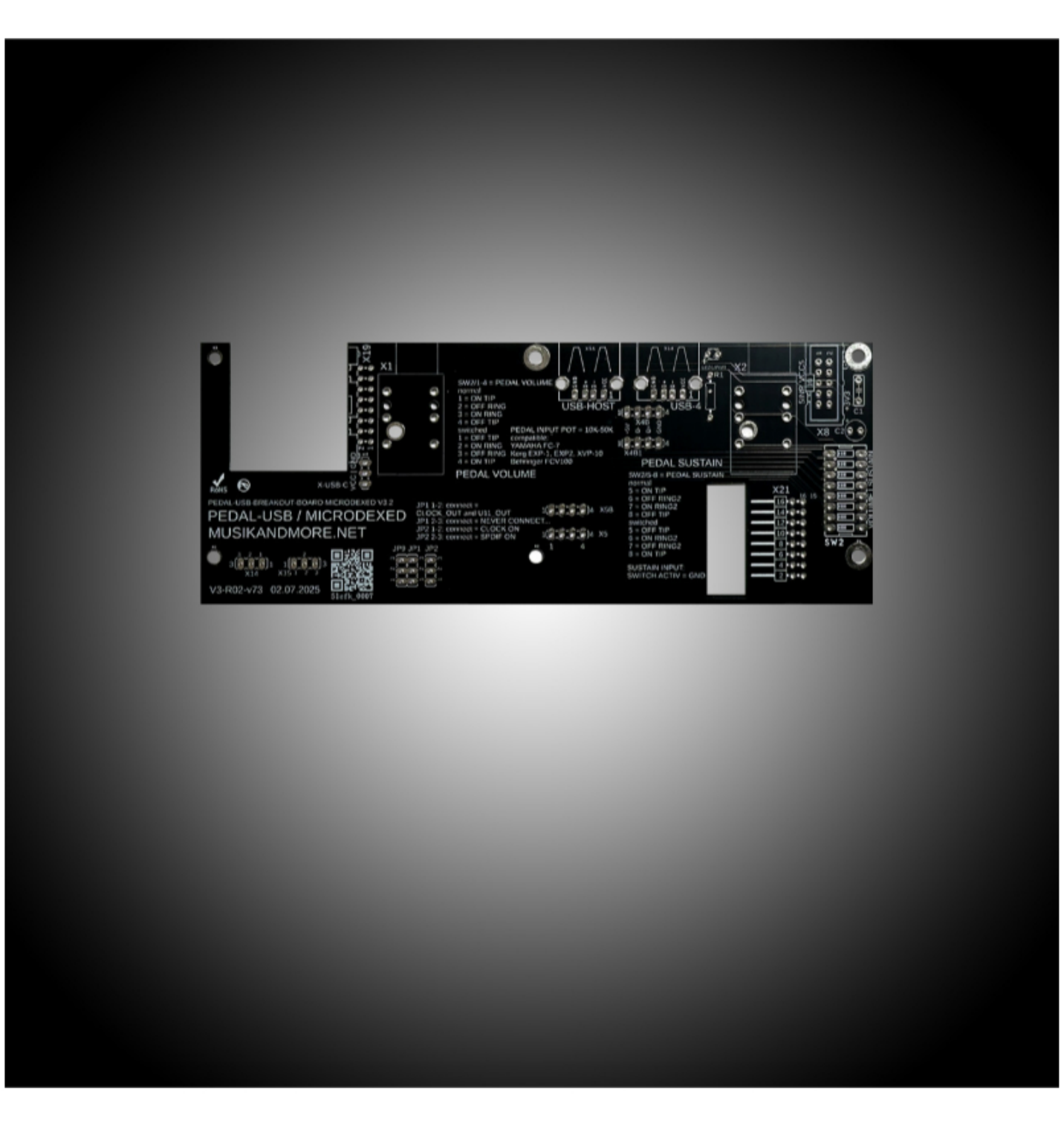
ASSEMBLY INSTRUCTIONS PEDAL-USB/ V1.0-DE

Assembly instructions / Documentation / Pedal-USB



Technical Documentation V1.0 DE / Status: 23.09.2025

- for PCB version mainboard V3-R05-v526 from May 21, 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-Pedal-USB-Breakout-September-19-2025** (PDF)
- **BOM-Part-list-for-NAVIPANEL-Pedal-USB** (PDF)

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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.

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."**

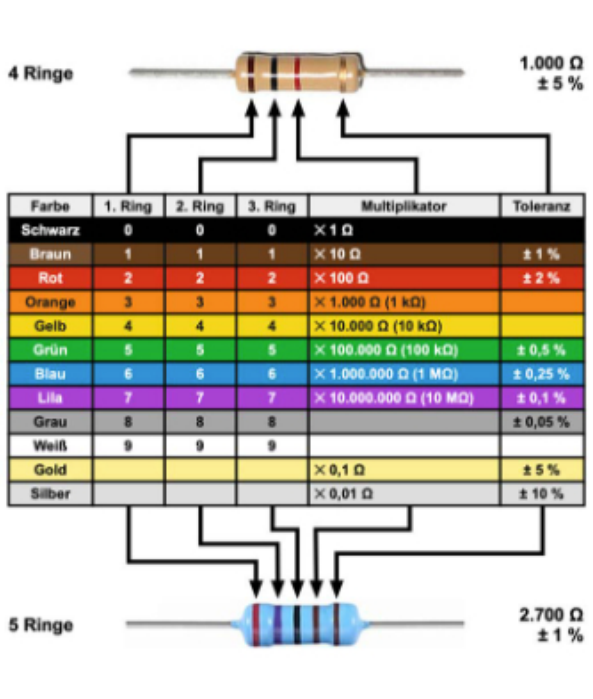
Resistance determination using the color code table

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**

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).

Example: the NAVIPANEL V3 DIY kit with 2 front panels



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

6) Equipping the Pedal-USB Breakout Board

Please decide now whether the pedal USB breakout should be configured for desktop or Eurorack!

1. The Eurorack version requires the **8HP front panel Pedal-USB** , otherwise the connectors and PWR LED are missing!
2. The **Eurorack version omits** the following components:

- LED1 PWR 5V
- R1 series resistor for LED1
- X1, X2 TRS connectors 6.35mm 1/4″ (rear pedal connectors)
- X5A USB-HOST and X4A USB-4 (USB ports at the rear)
- X19 16-pin angled header (power is supplied via the mainboard)

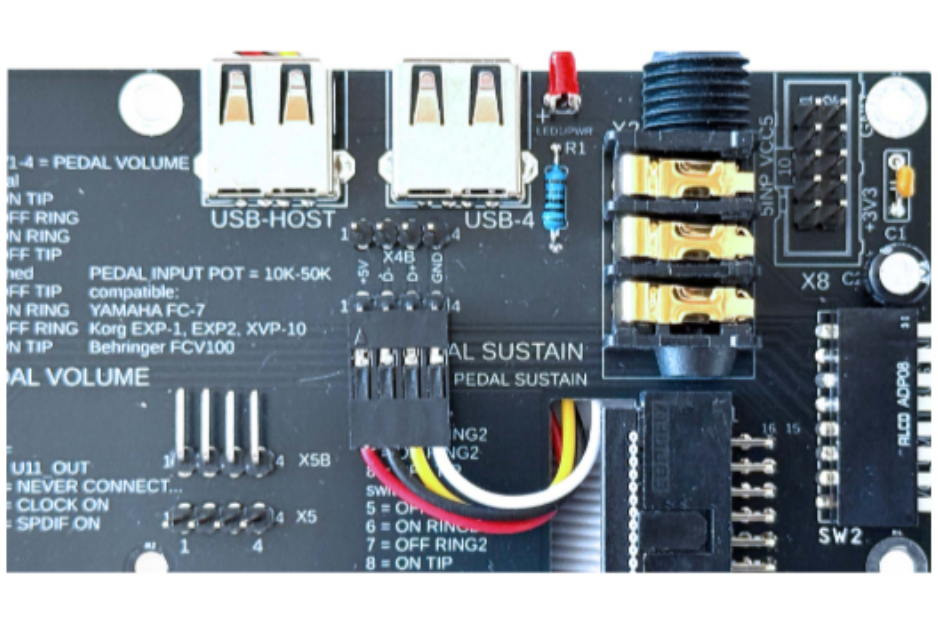
3. For the **desktop version** , proceed as described from **point 7** .

IMPORTANT: The **X19** 16-pin angled header is **not used in the desktop or Eurorack version** (power is supplied via the mainboard).

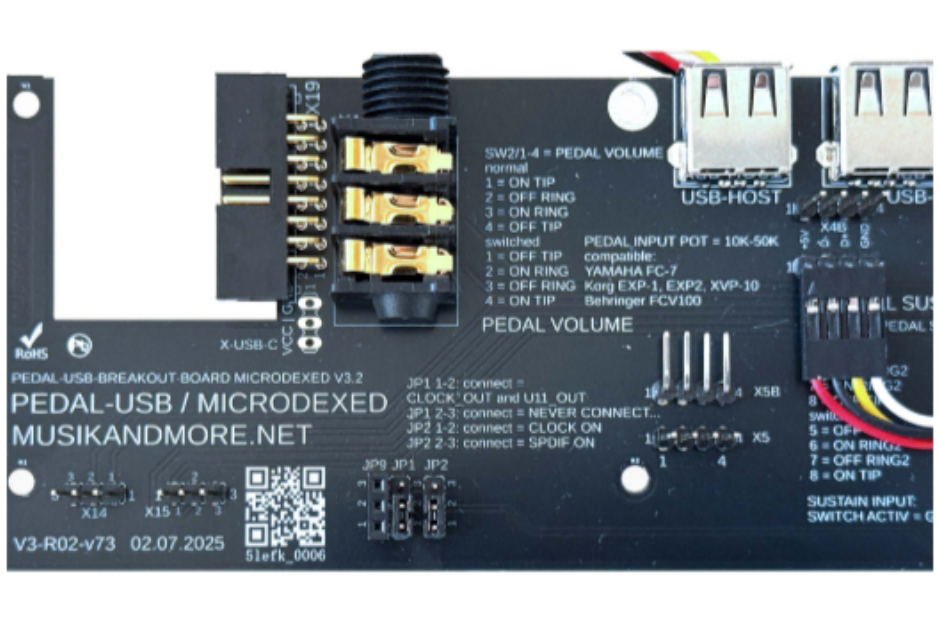
7) Assembly of components resistors, electrolytic capacitors, ceramic capacitors

Due to its design, the Pedal-USB breakout board is plugged into the back of the mainboard (solder side). Components are normally mounted on the component side. All components are then mounted and soldered according to their height:

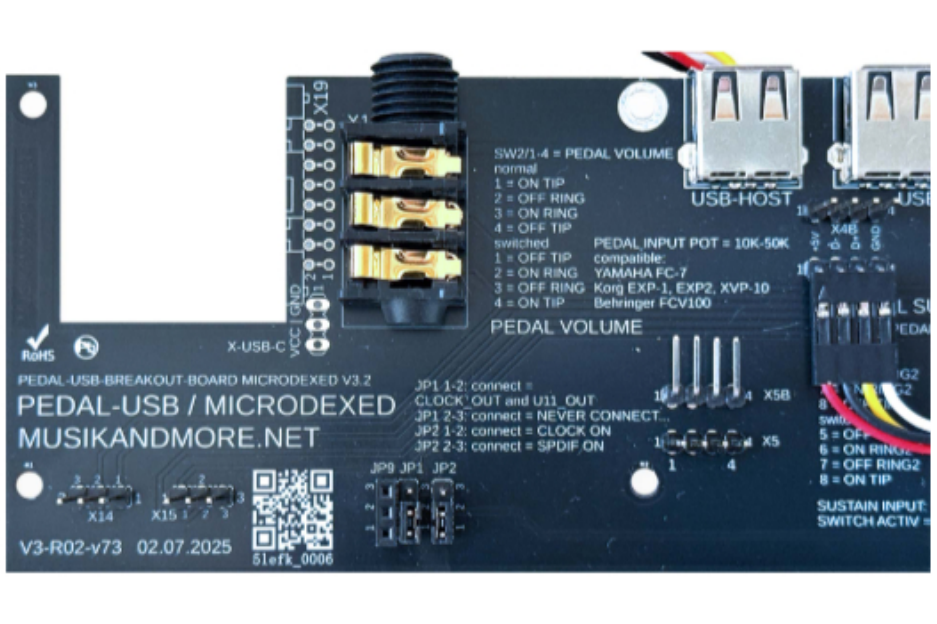
- first the metal film resistors (all labeled on the paper tape)
- first resistor R1 for LED PWR
- then C1 Kerko 100nF and C2 Elko 100µF/16V



Assembly metal film resistor R1, electrolytic capacitor C2, ceramic capacitor C1



For display only: Assembly of the X19 header for the Eurorack power supply.
IMPORTANT: The X19 16-pin angled header is not assembled (power is supplied via the motherboard).



Assembly of JP1, JP3, JP9 (3-pin female connector)
IMPORTANT: The X19 16-pin angled header is not assembled (the power supply is provided by the mainboard)

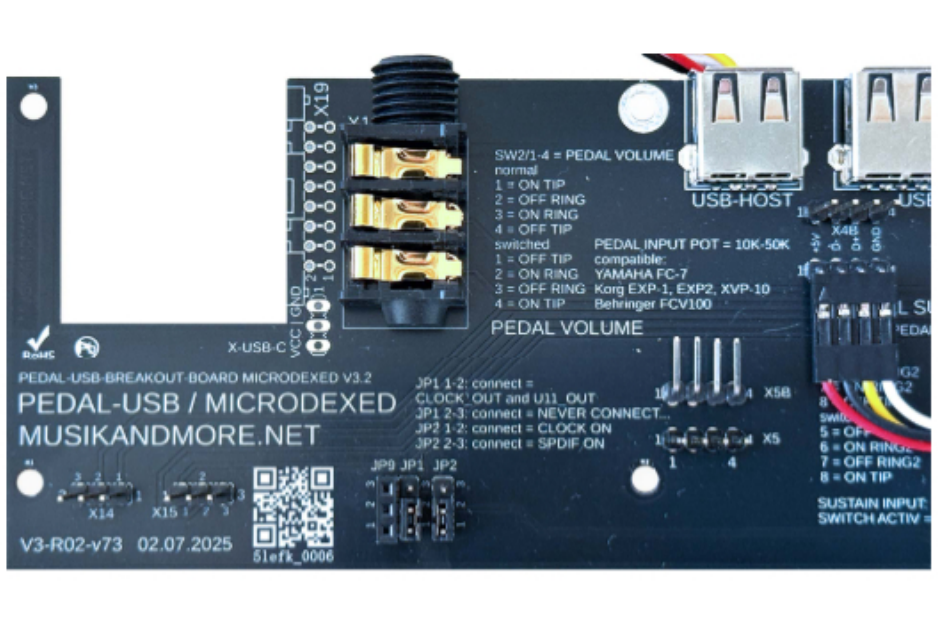
8) Assembly of components – connectors for PEDAL-USB options

- Normal Profile sockets and connector strips for the Pedal-USB Breakout
- **Mainboard** : Jumper JP9 long (14mm) connector strip 1x3-pin. 1-2 = CLOCK OUT / 2-3 = SPDIF OUT
- **Pedal-USB** : Jumper JP9 normal profile socket strip 1x3-pin. JP1 1-2 = CLOCK OUT / JP1 2-3 = SPDIF OUT
- JP3 1-2 = CLOCK OUT alternatively via 8TE front panel and JP3 2-3 = GATE OFF)

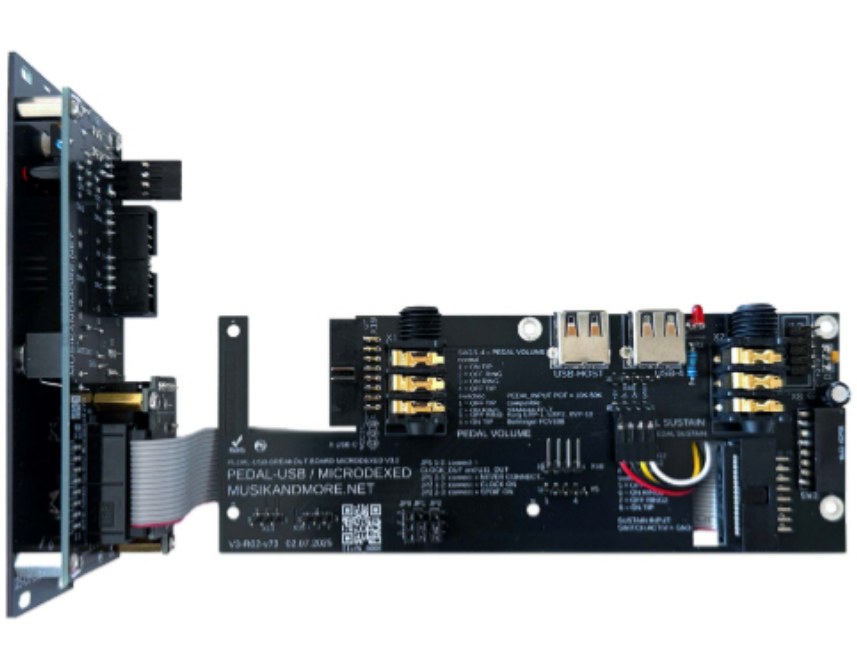
IMPORTANT: When using the **pedal USB option, JP10** ADDR 0x20 must be jumpered on the **NAVIPANEL mainboard** . If this is not done, the MCP23017 I2C chip will not initialize, and **no RGB LEDs or button LEDs will light up. See also the NAVIPANEL V3/7.0** assembly instructions, section 8.2.

9) Component placement on the Eurorack 16-pin X19 / USB-C / 16-pin connector strip X21

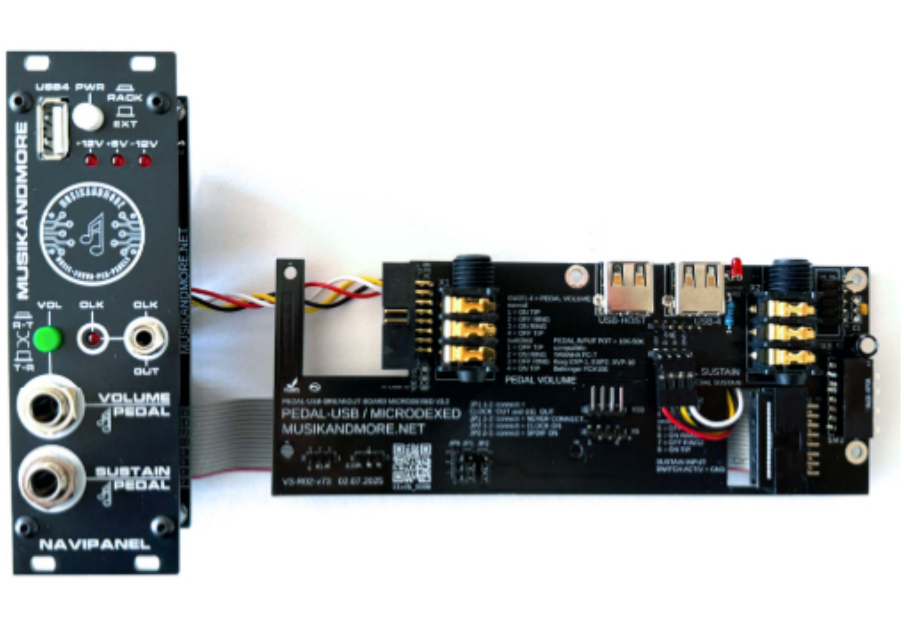
- **IMPORTANT:** The X19 16-pin angled header is **not installed** (power is supplied via the motherboard, only +5V and GND are required).
- The 16-pin (2x8-pin) 90° connector strip X21 is for the connection to the **pedal/USB front panel,** which is connected with the ribbon cable (20cm).
- The X-USB-C connector is **only** required with a USB-C PD charger. It's not required, as the power is already supplied via the NAVIPANEL V3 mainboard.



Pedal USB: Jumper JP9 normal profile socket strip 1x3-pin.
1-2 = CLOCK OUT
2-3 = SPDIF OUT



Pedal USB: Jumper JP9 normal profile socket strip 1x3-pin.
JP1 1-2 = CLOCK OUT / JP1 2-3 = SPDIF OUT
JP3 1-2 = CLOCK OUT via 8TE front panel
JP3 2-3 = CLOCK OUT OFF



Overview: Front panel for pedals and USB, jumpers, male and female headers. Connect the 4-pin connection cable for the USB-A4 port located on the 8HP front panel to the X3! Ensure the polarity is correct: Pin 1 = 5V USB / Pin 4 = GND.

10) Assembly of the TS/TRS sockets / USB-A4 / USB-HOST / DIP switch

Now the 6.35mm (1/4") TRS jacks, the USB jacks and the DIP switch SW2 are soldered in.

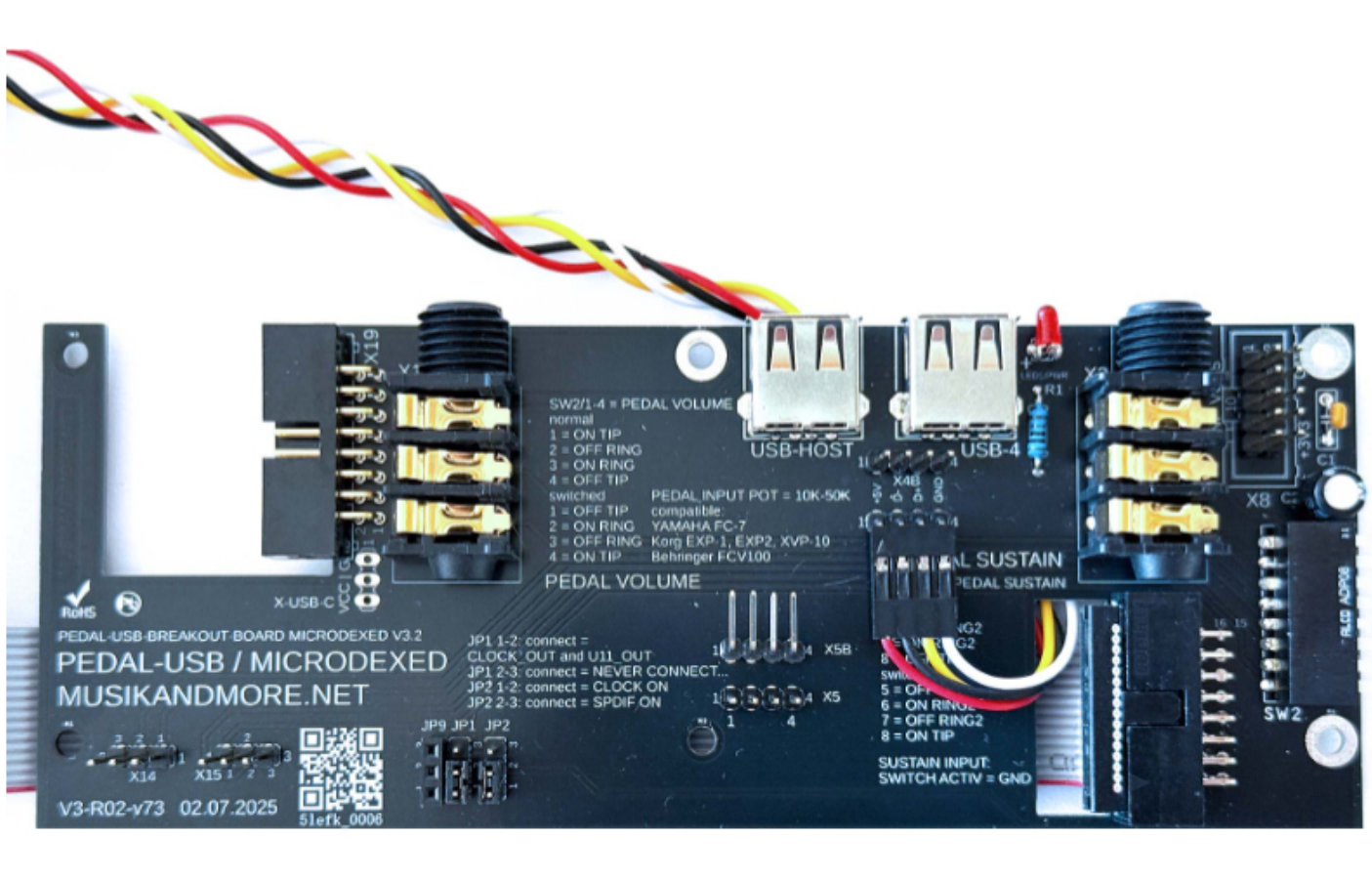
- Solder USB A4 and USB Host 90° print sockets… **DO NOT use on EURORACK and 8HP front panels!**
- Solder the SW2 DIP8 switch for the pedals configuration.
- 2x TRS- (black) 6.35mm for pedal volume and pedal sustain… **DO NOT use on EURORACK and 8HP front panel!**
- Then briefly bend the 3mm LED1 PWR 5V and ensure correct polarity. The **long leg is the + anode** . The **+ anode of the LED** is marked on the circuit board.

11) Equipping the long connector strips

Adaptation between pedal USB breakout and the Navipanel mainboard with **special 14mm long connector strip** n

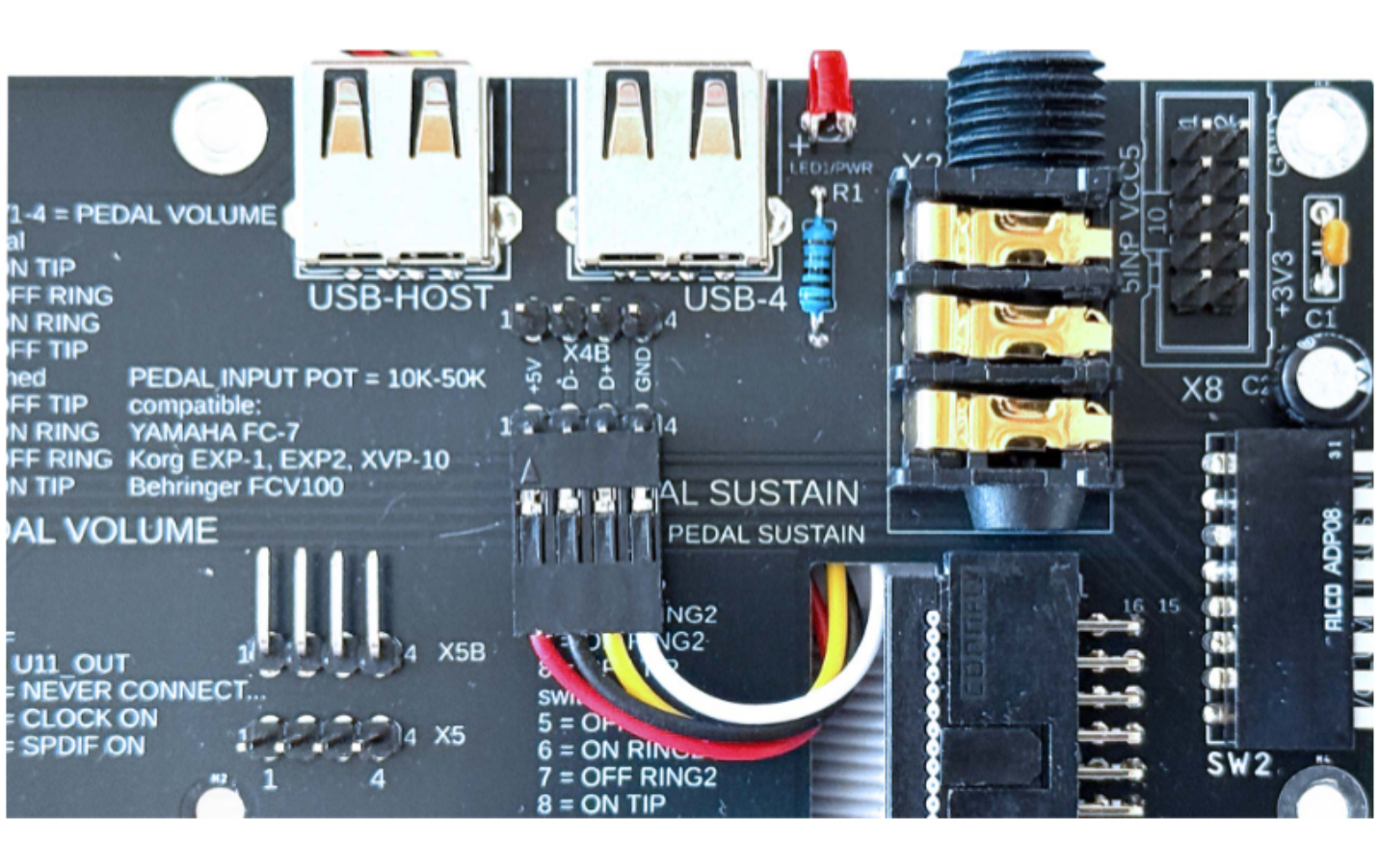
- 3-pin pins X14 and X15 (pedal volume and sustain)
- 2x 5-pin pins X8 (power supply)
- 1x 4-pin X4B USB-A4 (USB Hub Mainboard)
- 1x 4-pin X5 USB HOST (USB Hub Mainboard)

Now loosen the M3x5mm ISO7380-1 mounting screws located on the back of the mainboard and screw them through the M3x15 studs for mounting the connector strips **without the 3.2mm washers** to the M3x5mm ISO7380-1 mounting screws removed from the mainboard. The connector strips will then sit tightly in the socket strips on the mainboard, and everything will fit. Solder all connector strips on the pedal USB breakout board with the mainboard plugged in and screwed in place.



(top left) Socket connector X19 for Eurorack power supply (**do not use X19!**)
(bottom right) Socket connector X21 connection to the **8HP front panel pedal USB**

Complete desktop setup:
USB A Host | USB A4 | both TRS 6.35mm pedal jacks, DIP8 switch SW2



Example shows: PEDAL-USB PCB with the box connector and TRS 6.35mm for PEDAL Volume.

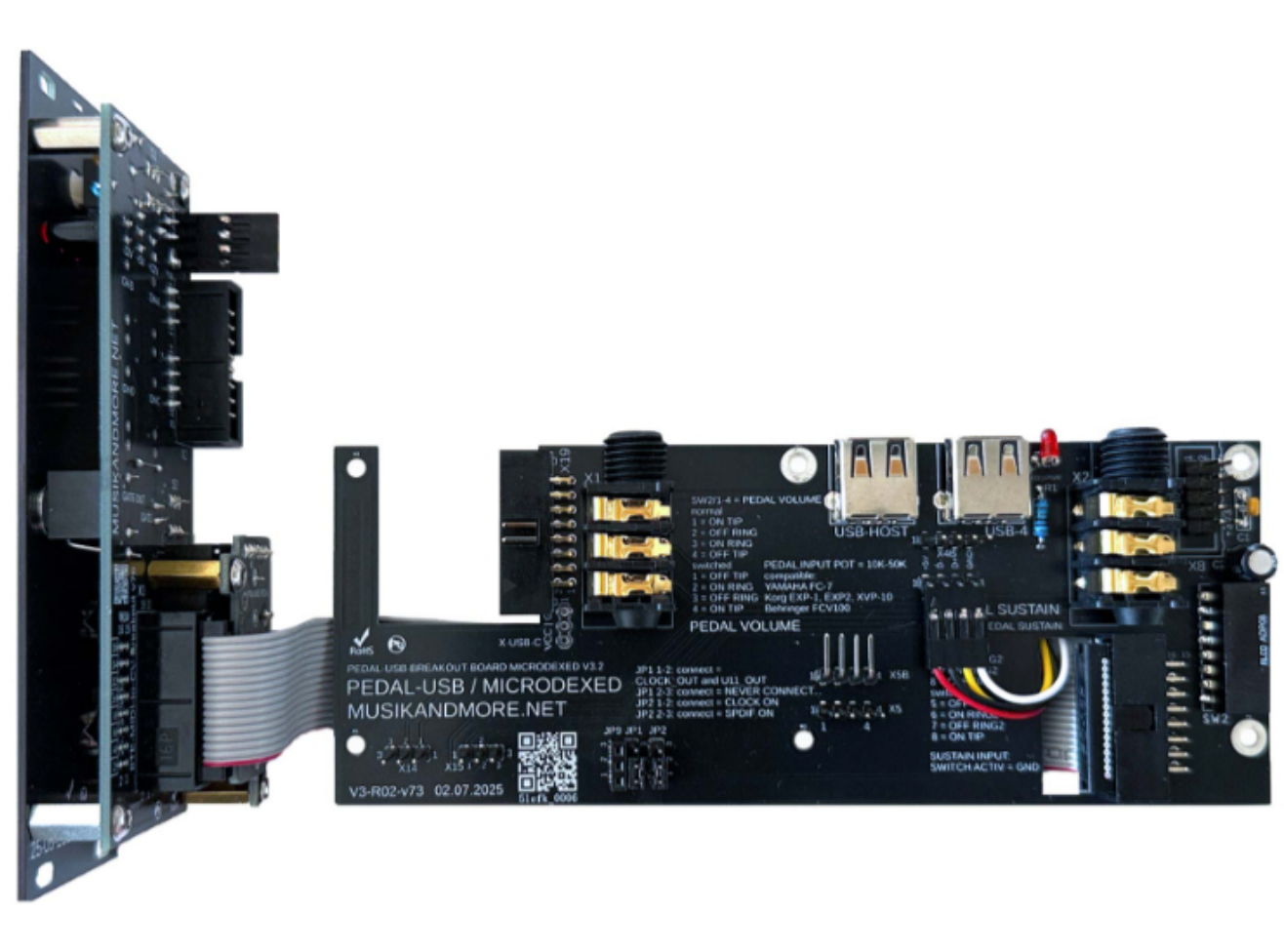
USB-A4 X4B1 = 4-pin 90° connector for cable to the 8HP front panel connector
. USB-HOST X5B = 4-pin 90° connector for cable to the 8HP front panel connector.
Note: Only one of the two USB ports is provided in the 8HP front panel!

12) Check the pedal USB breakout board assembly

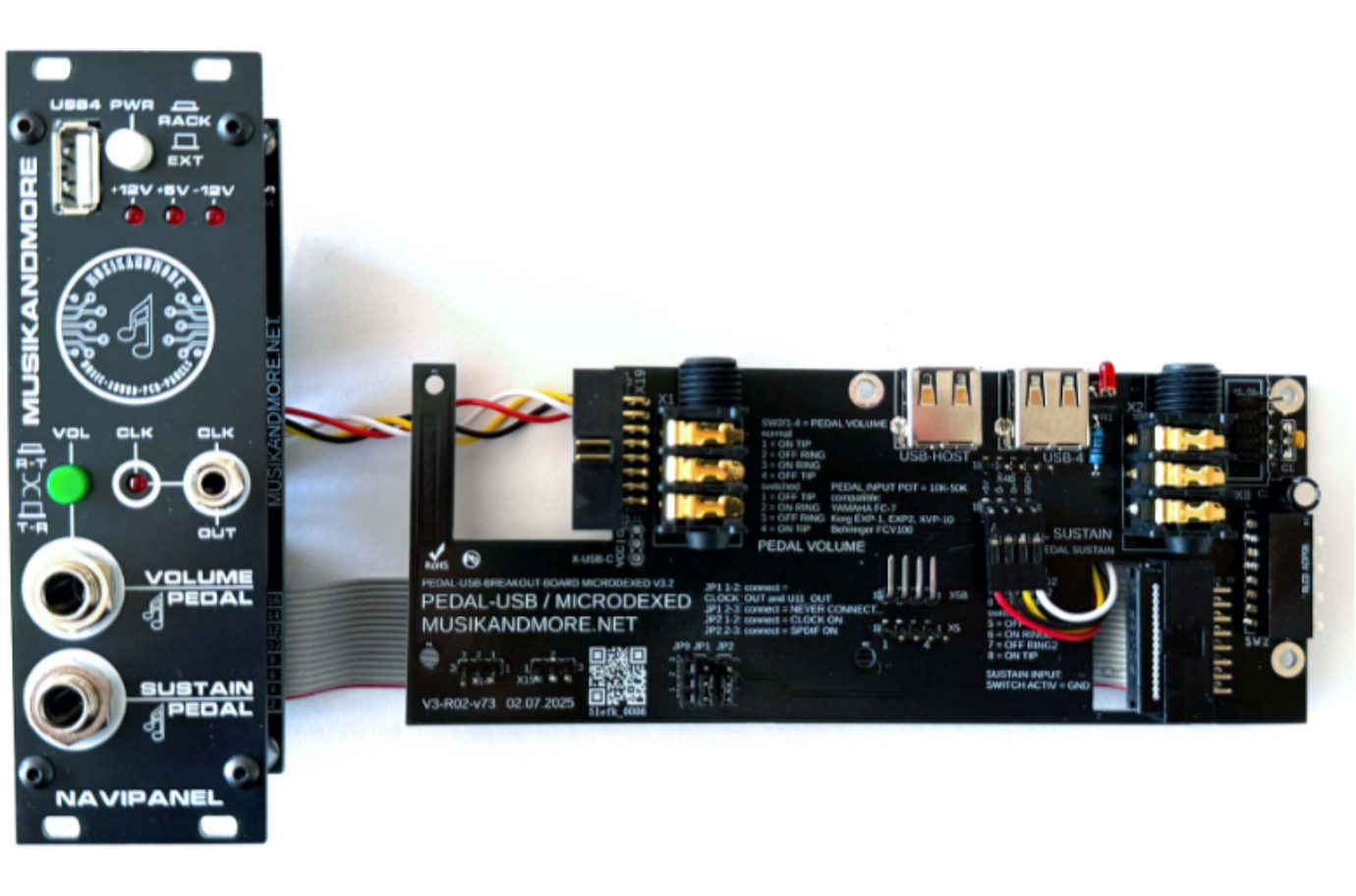
We're nearing the end of the assembly. There shouldn't be any components left except for the 6x M3x15 I/O hex bolts and 6x 3.2mm washers as spacers. These should then be inserted onto the threaded side of the 6x hex bolts before the final assembly of the mainboard / pedal USB. This will slightly increase the distance between the two boards. Now, all solder joints will be checked again and re-soldered if necessary.

- Check components for correct position…
- Pay attention to the correct polarity of Elko C2
- Are all long power strips in the correct positions?

The Pedal-USB breakout board (component side / solder side) should now look like this:



Midi to CV breakout board assembly side (desktop version)



Midi to CV breakout board solder side without front panel (desktop version).

13) Commissioning / Functional test

We assume that a functioning **mainboard V3-R05-v541** is already available , as described in **point 10 .**

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 GATE-OUT.

13.1) DIP Switch SW2 Setup for Pedals

SW2/1-4 = PEDAL VOLUME

normal
1 = ON TIP
2 = OFF RING
3 = ON RING
4 = OFF TIP

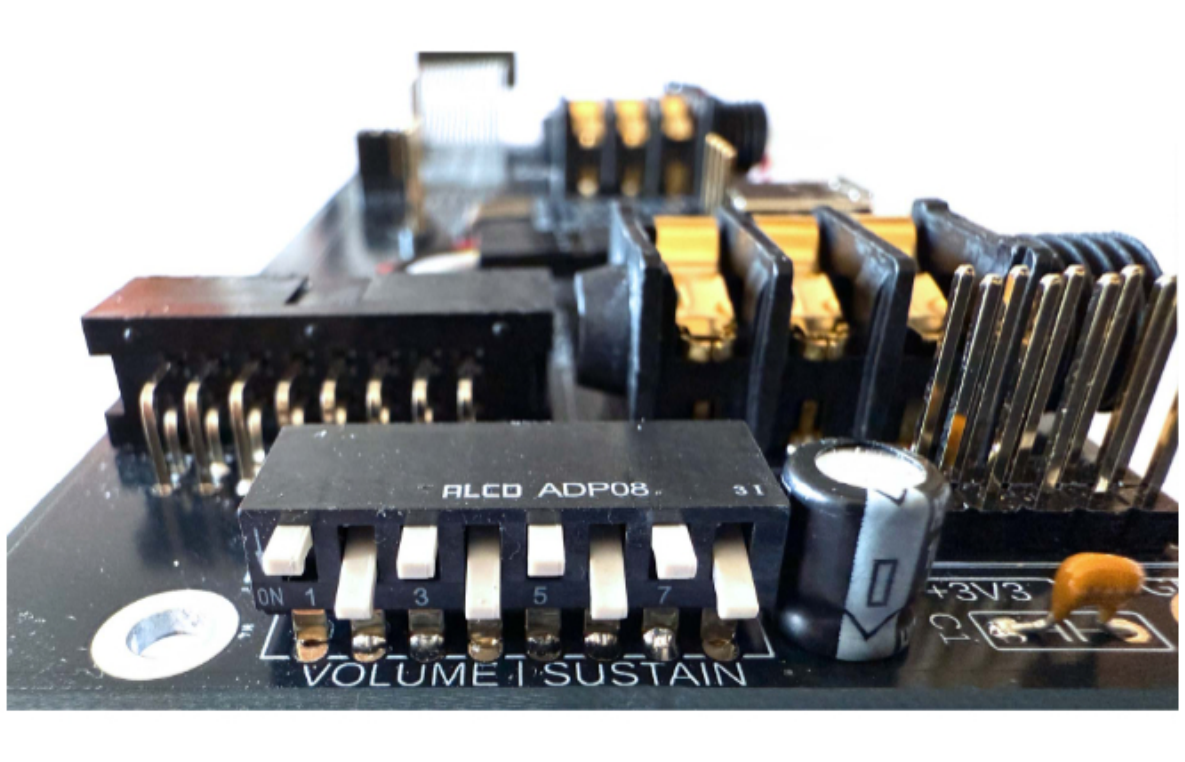
switched
1 = OFF TIP
2 = ON RING
3 = OFF RING
4 = ON TIP

SW2/5-8 = PEDAL SUSTAIN

normal
5 = ON TIP
6 = OFF RING2
7 = ON RING2
8 = OFF TIP

switched
5 = OFF TIP
6 = ON RING2
7 = OFF RING2
8 = ON TIP

SW2 DIP8-Switch Setup Pedals:



13.2) short functional test:

- USB B connector and supply power to the mainboard
- **S1 PWR Mainboard** press “ **ON”** = LED 5V lights up
- **LED1 PWR** on the **Pedal-USB board** (rear) lights up
- Press **S1 PWR “ OFF”** = LED 5V does **NOT light up**
- **LED1 PWR** on the **Pedal-USB Board** (rear) is **NOT lit**

If this is successful, use a multimeter to check the voltages (**S1 ON**) for the +5V VCC5 and GND supply voltages on the 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 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 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 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**

SYSTEM SETTINGS
NAVIPANEL V3
MUSIKANDMORE

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

SMF/MIDI Player
Load/Save
File Manager
System
Extras/Test
Info

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

SYSTEM SETTINGS
NAVIPANEL V3
MUSIKANDMORE

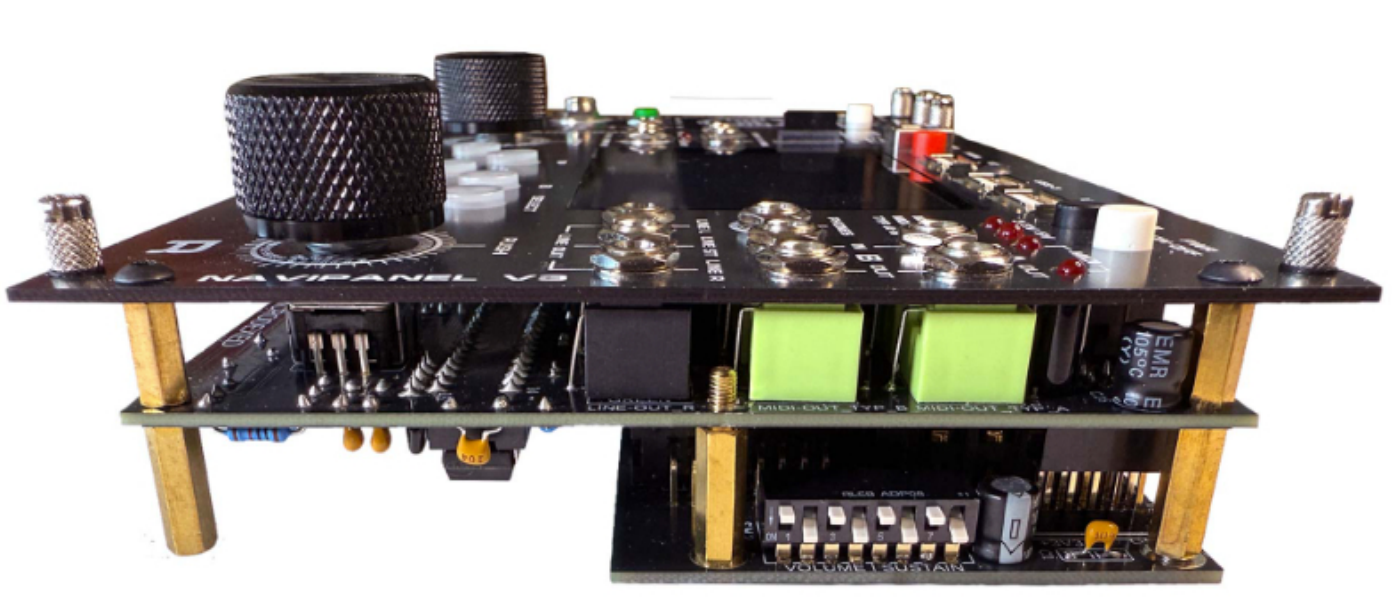
Microdexed with Midi-to-CV **SYSTEM SETTINGS** (assembly shows NAVIPANEL V3 demo device!)

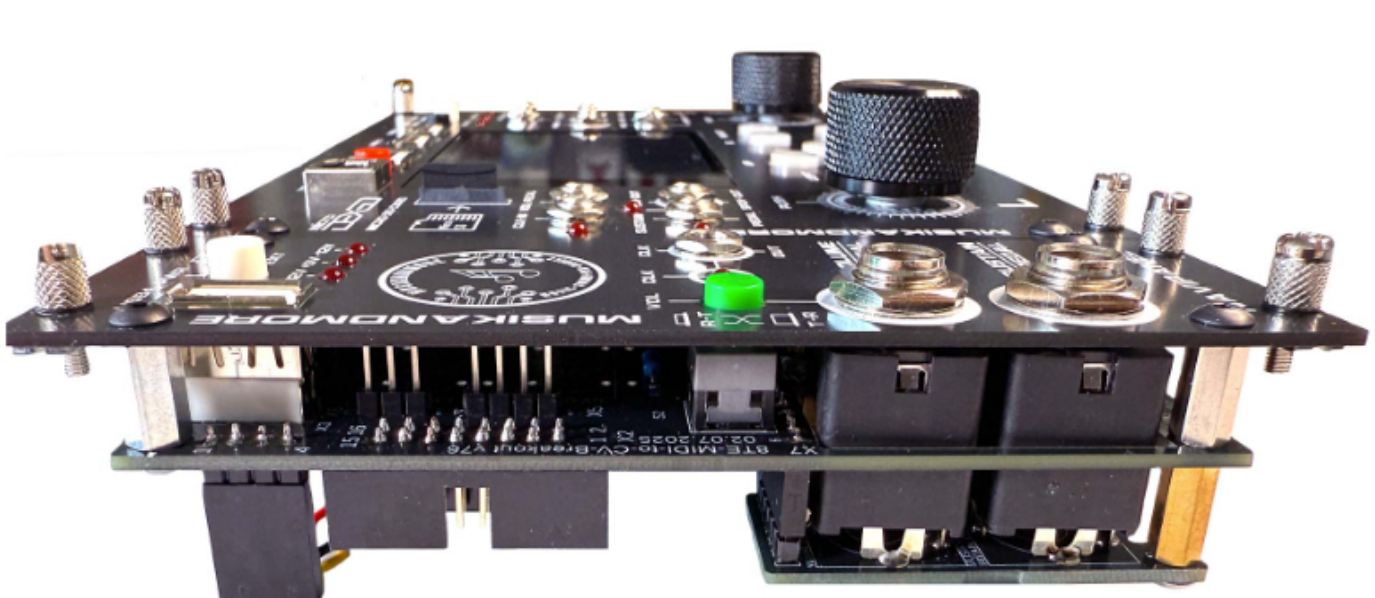
SMF/MIDI Player
Load/Save
File Manager
System
Extras/Test
Info

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

13.3) 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 software version 1.9.9.8 (under **Downloads**) of @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





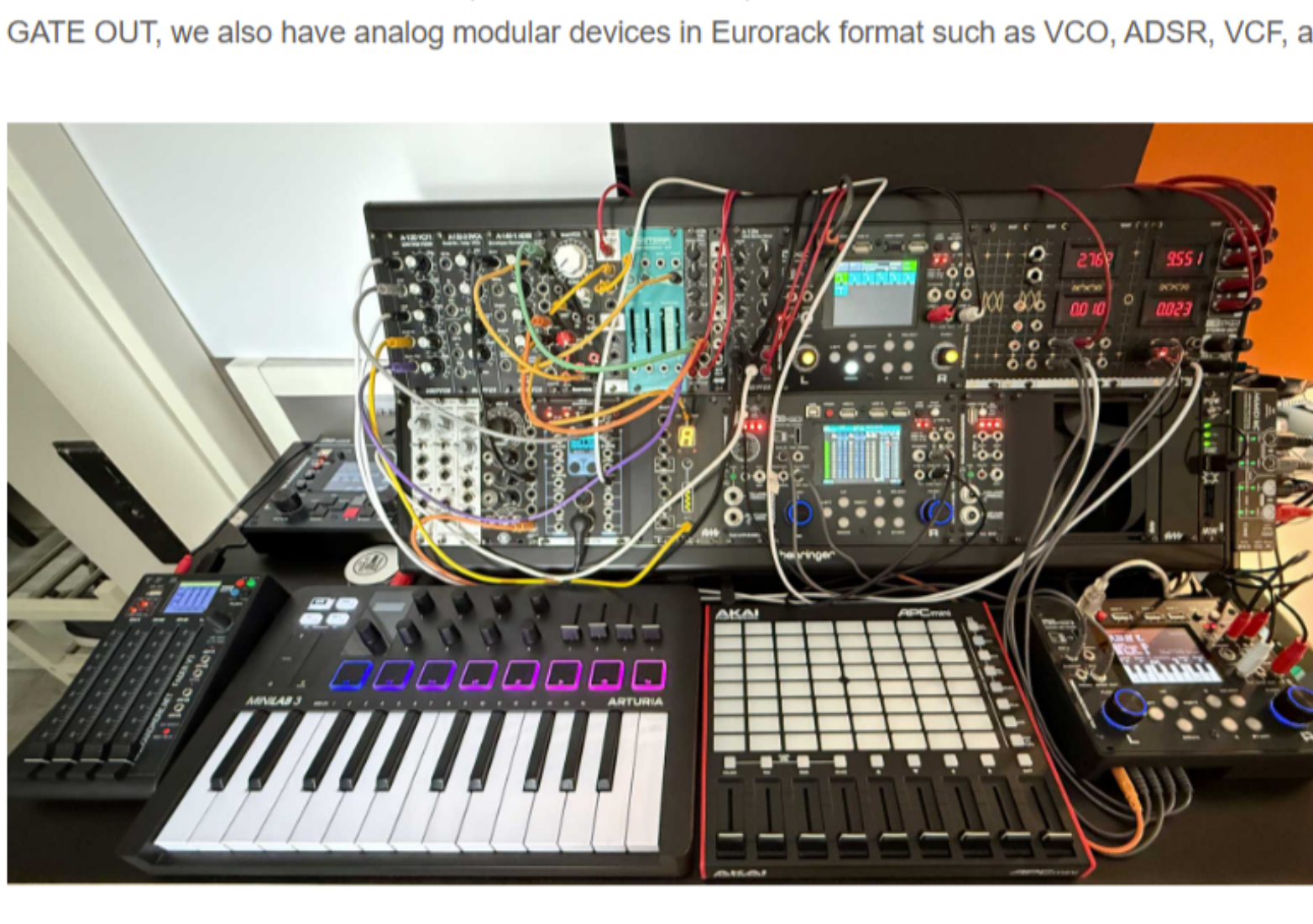
Pedal-USB breakout board view from the right with mainboard (desktop or Eurorack version)
Note: please set the DIP8 switch SW2 (bottom right in the photo) as described above in **point 13.1 .**

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

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

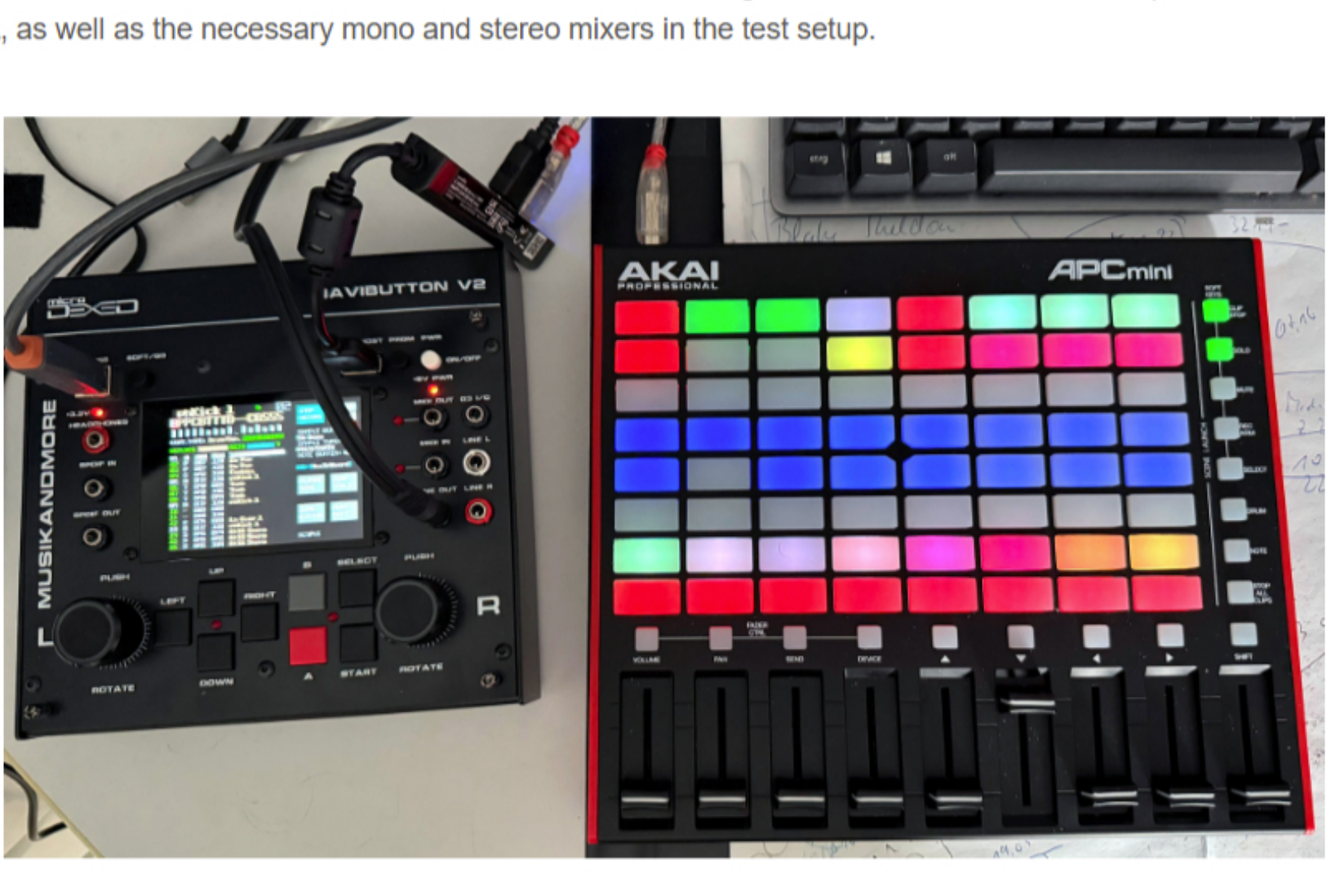
We tested in the following configuration:

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**

15) 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 header on the **Midi-to-CV breakout board** and **Pedal-USB breakout board is not equipped** (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 .**

16) 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** ."

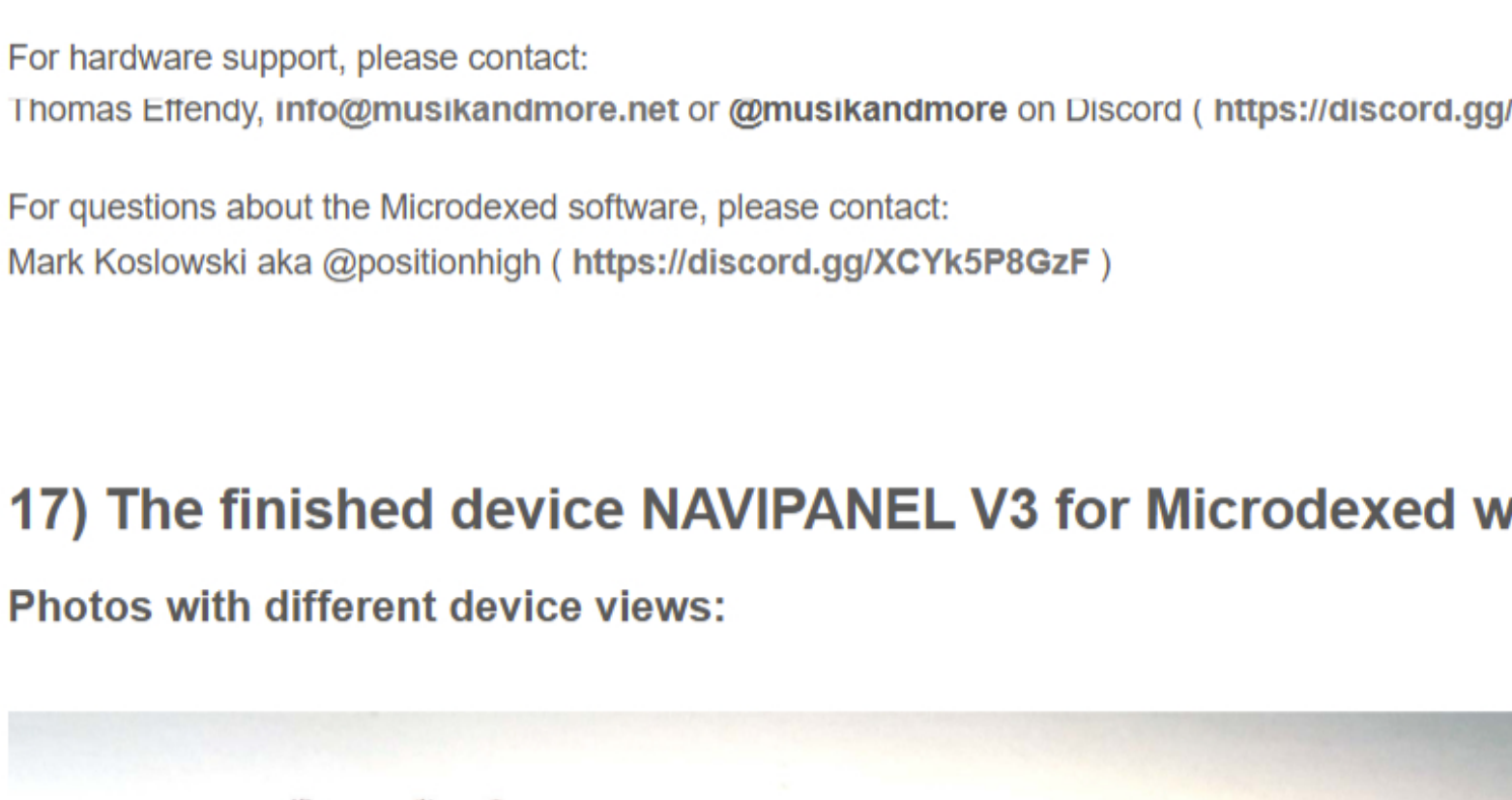
The functionality and use of the USB HOST, USB-1, USB-2, USB-3, and the USB4 port (USB-HOST) on the rear panel are described in **section 11.** The Teensy 4.1 micro-USB port can be switched **ON/OFF using S1 PWR** and is no longer accessible from the front panel.

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

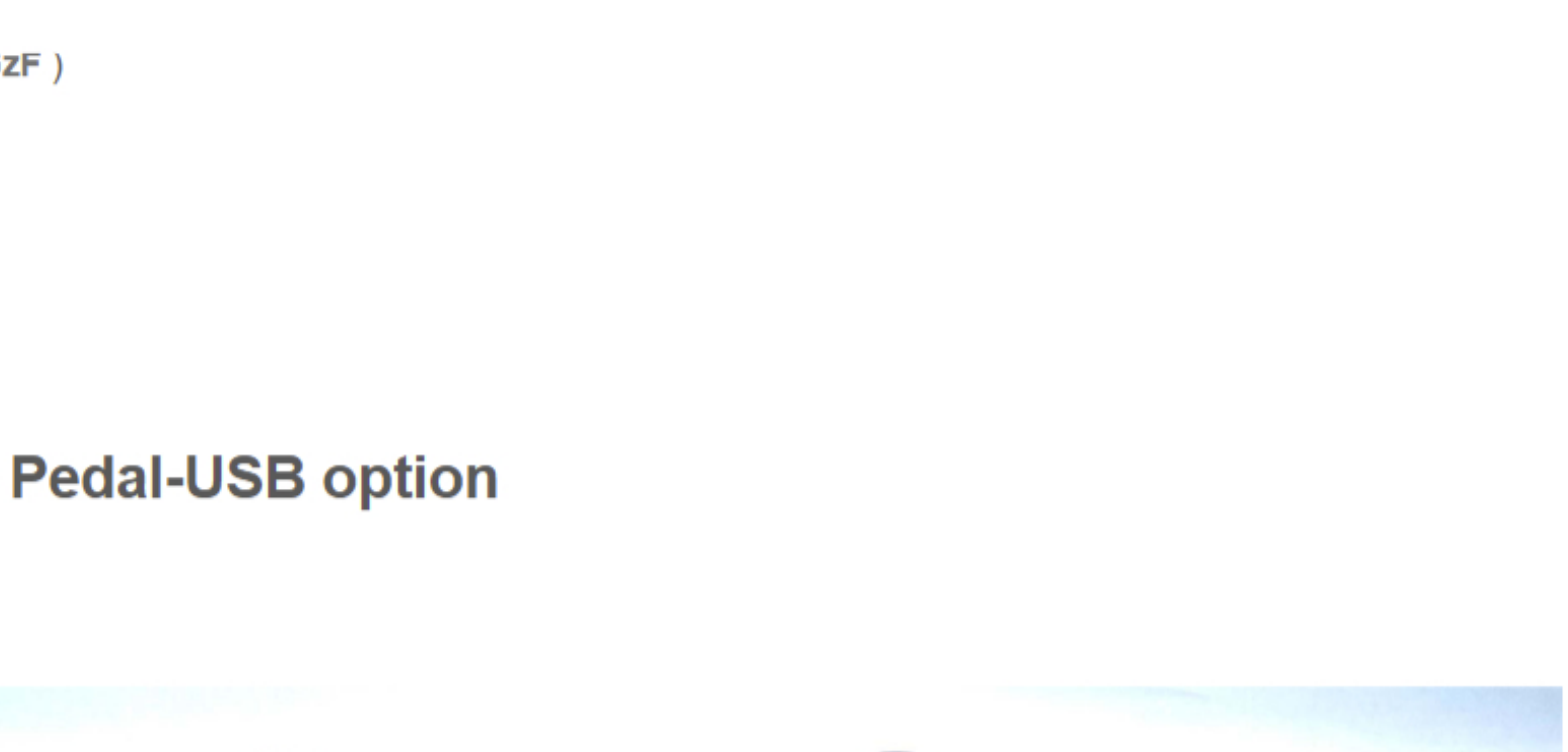
For questions about the Microdexed software, please contact:
Mark Koslowski aka @positionhigh (**https://discord.gg/XCYk5P8GzF**)

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

Photos with different device views:

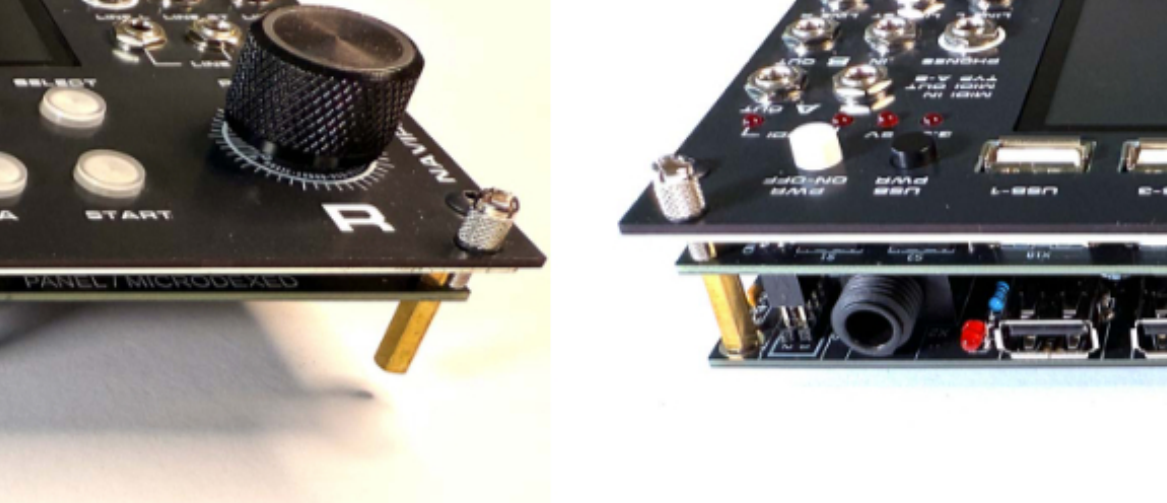


Device variant front **Eurorack 3U/32HP** with **8HP front panel pedal USB**

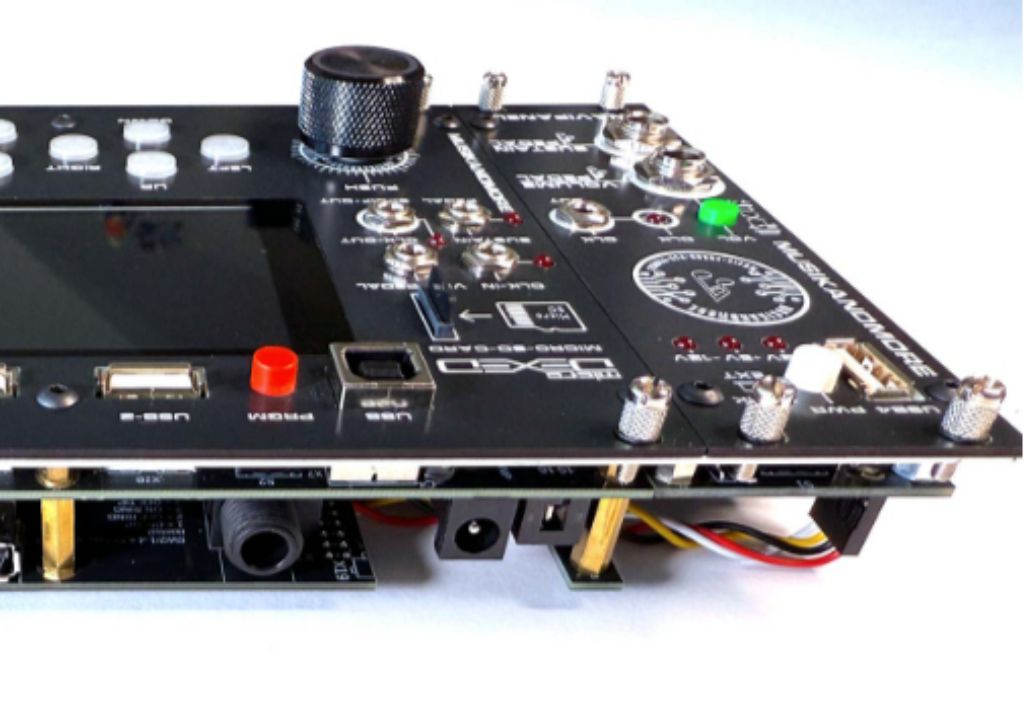


Device variant rear **Eurorack 3U/32HP** with **8HP front panel pedal USB**

Case variant rear right **Eurorack 3U/32HP** with **8HP front panel pedal USB**



Device variant rear left **Eurorack 3U/32HP** with **8HP front panel pedal USB**



Device variant solder side **Eurorack 3U/32HP** with **8HP front panel pedal USB**

18) 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 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 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

19) 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.

20) Appendix C.

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Project: NAVIPANEL V3 for Microdexed
Author: Thomas Effendy (Hardware Version V3-R04-v380 -V3-R05-v541, V3-R02-v286, V3-R03-v309, V3-R01-v64, V3-R02-v73)
Author: Mark Koslowski (Software Microdexed Version 1.9.8.4-1.9.9.8)
Email: **info@musikandmore.net**
Date: September 22, 2025
Version: V.1.0-DE (this document)
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21) Appendix D.

Technical data Pedal-USB Breakout / September 19, 2025

Pedal USB for Microdexed Navipanel Mainboard from V3-R05-v541

Print PDF

NAVIPANEL V3 Pedal USB | Date: September 19, 2025	Technical data sheet	ID-(BOM)	X21 PINs
01) Modular rack 3U / 32HP / Dimensions (W x L x H) 163x127x33mm	Eurorack	optional… 1*)	
02) 3D printed Desktop Case 3HE / 32TE / Dimensions (W x L x H) 169x134x38mm	Desktop	optional… 1*)	
03) Desktop aluminum case 4MS pod32 powered / Dimensions (W x L x H) 166x159x40mm	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 10cm ribbon cable	for 8HP Eurorack front panel	Eurorack cable	1-16
06) internal / external supply for USB hub	switchable	included	
07) from USB-HOST Hub Port 4, 1x USB-A of which are NOT in the front panel	from active USB hub U6	U6 (Mainboard)	
08) 1x USB A connectors on the back via 4-pin connector	USB-A 2.0	X5B HOST-X4B	
09) alternative CLOCK OUT TRS 3.5mm 0/5V optocouplers	modular connection	TRS 3.5mm	(5) 2*)
10) PEDAL Volume Input 1/4 inch TRS +3.3V /Signal /GND (Backside)	modular connection	TRS 6.35mm	6/4
11) CV IN / alternative 0-5VDC / 0-10VDC input (protected with suppressor diodes)	modular connection	TRS 6.35mm	6/4
12) PEDAL SUSTAIN IN = SUSTAIN 0/+3.3V= LOW/HIGH (Backside)	modular connection	TRS 6.35mm	12/10
13) GATE IN = PEDAL SUSTAIN IN 0/+3.3V= LOW/HIGH	modular connection	TRS 6.35mm	12/10
14) LED1 5V Power (Backside)	LED 3mm low current RED	LED1	14 (VCC +5V)
15) Expansion connector 16pol for 8TE front panel with Eurorack compatible	MIDI to CV / Pedals / LEDs	X21	1/2/8 (GND)
15) Expansion connector 16-pin			3 (AGND)
15) Expansion connector 16-pin			16 (VDD +12V)
Note 1*): the technical data apply from motherboard version and the Navipanel V3 mainboard is necessary!	V3-R05-v541, July 02, 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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22) Appendix E.

BOM Part list for NAVIPANEL Pedal-USB

Pedal / USB /V2-R3-v84 / 09-21-2025

Print PDF

Show entries

Seek

part ▲	Value ▲	Detailed Description ▲
C1	100nF	CAPACITOR
C2	10uF tantalum/16V	Capacitor Polarised - Generic
EURORACK_CABLE	Flatcable_16pol_20cm	Flatcable_16pol_20cm
H1	STANDOFF_M3X15mm_I/A	STANDOFF_M3X15mm_I/A
H2	STANDOFF_M3X15mm_I/A	STANDOFF_M3X15mm_I/A
H3	STANDOFF_M3X15mm_I/A	STANDOFF_M3X15mm_I/A
H30-H35	6x_WASHER_DIN125A_3.2mm_for_distance	6x_WASHER_DIN125A_3.2mm_for_distance
H4	STANDOFF_M3X15mm_I/A	STANDOFF_M3X15mm_I/A
H40-H42	3x_NUTS_DIN127_M3_for_Standoff M3x15mm	3x_NUTS_DIN127_M3_for_Standoff M3x15mm
H5	STANDOFF_M3X15mm_I/A	STANDOFF_M3X15mm_I/A
H50-H55	6x_SCREWS_M3x5mm_ISO7380-1_V2A	6x_SCREWS_M3x5mm_ISO7380-1_V2A
H6	STANDOFF_M3X15mm_I/A	STANDOFF_M3X15mm_I/A
JP1	CLK/SPDIF/OUT	PIN HEADER 1x3-pin jumper
JP2	SW_CKL/SPDIF-OUT	PIN HEADER 1x3-pin jumper
JP9	CLK-SPDIF-OUT	FEMALE HEADER 3-pin
JUMPER	JUMPER 2-pin	2x JUMPER 2-pin
LED1/PWR	3mm_red_low_current	3mm_red_low_current
PCB_BREAKOUT	MIDI_TO_CV_V3-R03-v81_19-09-2025	MIDI_TO_CV_V3-R03-v81_19-09-2028
R1	1K	RESISTOR, European symbol
SW2	DIP8-SW2-PEDALS	8-position DIP switch
USB-4-CABLE	1x USB4_Cable_20cm_4pin	1x USB4_Cable_20cm_4pin
X-USB-C	PIN2=NC	PIN HEADER 2-pin RM5.08
X1	NRJ6HF-1-AU	Phone Connectors 1/4 JACK STEREO SW SLIM-FULL THREAD NSE"
X14	SUST-PEDAL	LONG PIN HEADER 1x3pin 14mm
X15	VOL PEDAL	LONG PIN HEADER 1x3pin 14mm
X19 *	EURORACK 90° PWR (*) do not solder X19)	HARTING 16-pin 90°
X2	NRJ6HF-1-AU	Phone Connectors 1/4 JACK STEREO SW SLIM-FULL THREAD NSE"
X21	Expa.Board 8TE 90° 8TE front panel	HARTING 16-pin 90°
X4A	USB4-A4	DIP-USB-A-TYPE-FMAL(4+2P-2.0-90D)
X4B	USB4-A4	LONG PIN HEADER 1x4pin 14mm
X4B1	USB4-A4	PIN HEADER 1x4pin 90°
X5	USB HOST	LONG PIN HEADER 1x4pin 14mm
X5A	USB HOST	DIP-USB-A-TYPE-FMAL(4+2P-2.0-90D)
X5B	USB HOST	PIN HEADER 1x4pin 90°
X8	VCC Breakout	LONG PIN HEADER 2x5-pin 14mm

1 to 35 of 35 entries

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23) Appendix F

Changes:

Changelog: from May 25, 2025 to July 2, 2025

Pedal USB – PCB version V3-R01-v64 from May 25, 2025

- USB Host (X5B) 4-pin and USB A4 (X4B1) with 90° 4-pin connector strips added for connection cables to the 8HP front panels

Pedal USB – PCB version V3-R02-v73 from July 2nd, 2025

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

24) Appendix F

Changes:

Changelog: from 02.07.2025

Pedal USB – PCB version V3-R03-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
- 3 mounting holes for securing the 4-pin USB adapter cable with a cable tie

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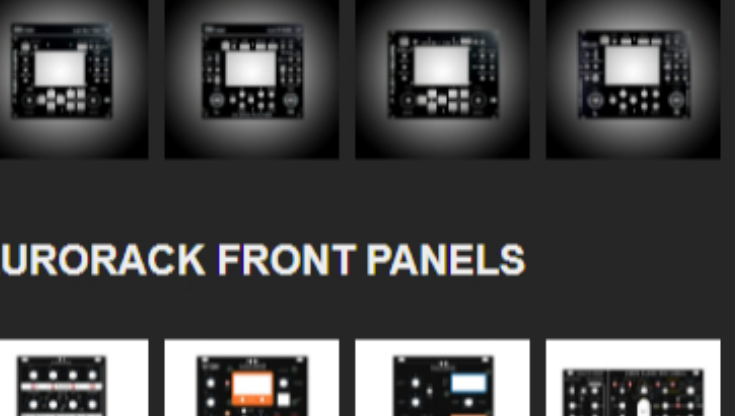
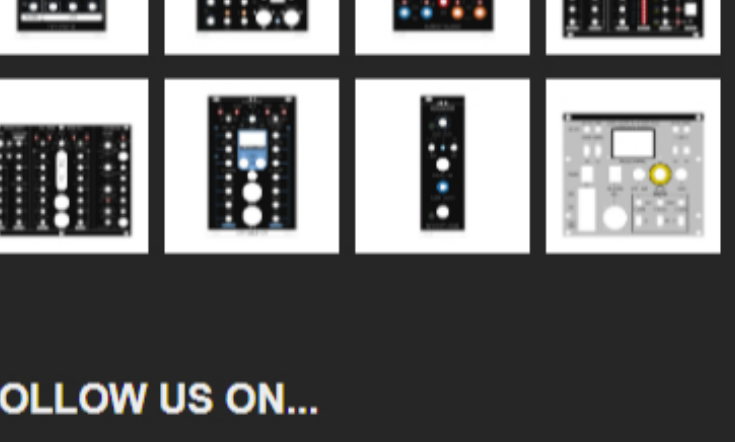
DOWNLOADS | LINKS

- All downloads
- Interesting links
- 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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