Betula ADTA Interface

Documentation for v1.4.x

Description

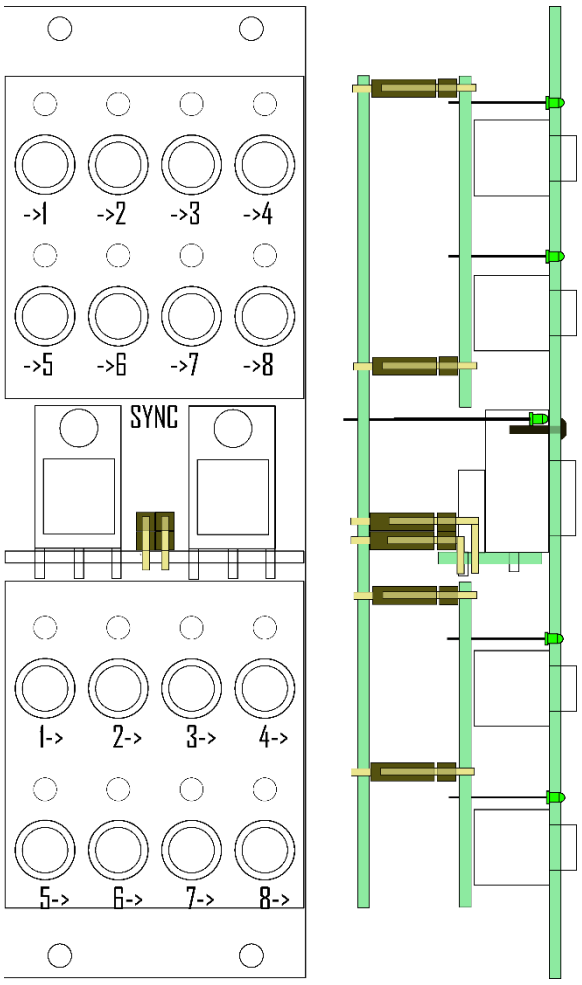
Features

- 8 channels In/Out ADAT Interface
- Outputs are DC coupled
- Inputs can be switched with jumpers between AC and DC coupling (in 2 groups: channel 1-4 and channel 5-8)
- Low noise: -100dB
- Low THD: >0.01% @ 1kHz, -6dB(+-5Vpp)
- 22kOhm input-impedance, 1kOhm output-impedance
- 8HP
- All channels with bicolored indicator LED
- ADAT sync indicator LED
- No µController, no programming required, hardware only
- CC BY-NC-SA 4.0
  DO NOT USE COMMERCIALY!
- small and dense SMD build (0603,TSSOP)
- 180mA @ +12V and 100mA @ -12V
  (Without connected ADTA-signal:
  14mA @ +12V and 0mA @ -12V)

Build Instructions

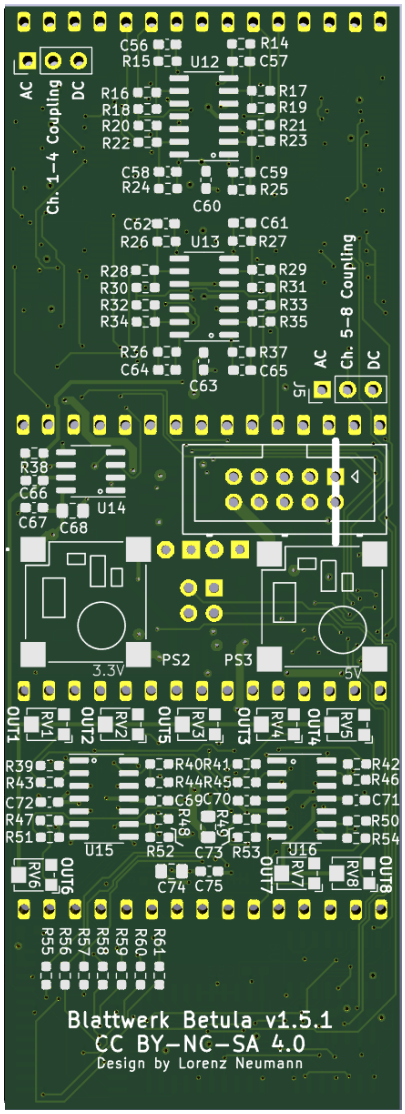
!!!PLEASE READ FIRST!!!

These instructions may help you to assemble all 4 PCBs in the correct way. It's a complex build with multiple PCBs. Soldering a part in the wrong order can cause problems.

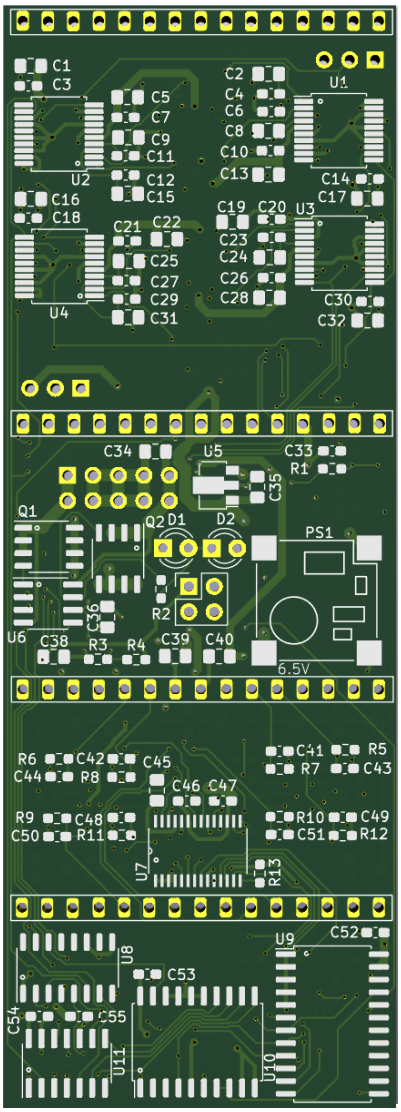


1. Place all **SMD components** in your preferred order on all 4 PCBs.
2. Solder **power-connector** and **1x3 header** on main PCB.
3. Place **all jacks** and bicolored **LEDs** (with short leg on square pad) on the input and output PCB. Solder with panel mounted. Make sure the PCBs are straight.
4. Solder **ADTA-connectors** on ADAT PCB
5. Place **2x2 angled header** in ADAT PCB. Solder as straight as possible
6. Place all 4 male and 4 female **15x1 headers**. Place **2x2 female pin header** on ADAT PCBs male header. Bring all PCBs in final position. Solder the main PCBs female headers including 2x2 header.
7. Solder pin 1 and 15 of each male header on input and output PCB.
8. Remove panel and finish soldering male headers on input and output PCB.
9. Place **D1** and **D2** on main PCB, do not solder yet.
10. Connect main PCB with output PCB and fit into panel.
11. Solder LEDs, use pliers to hold them in place. They should both face the clear dot on the back of the panel as centered as possible. Do not cut legs yet. (helps in case you have to correct placement later.)
12. Add input PCB and ADAT PCB to the panel.
13. Assemble all PCBs on the panel, add **screws** on ADAT connectors and place **jumper** according to your preferred input coupling. Cut D1 and D2s legs if you are happy with placement.
14. **Continue with Calibration**

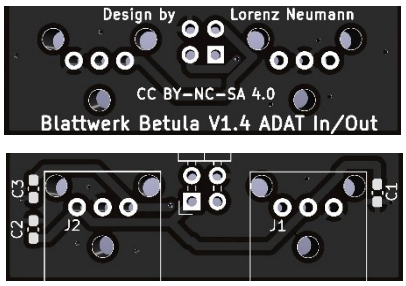
PCB Pictures



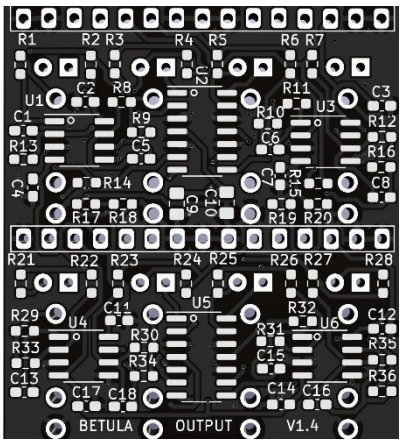
Main PCB back



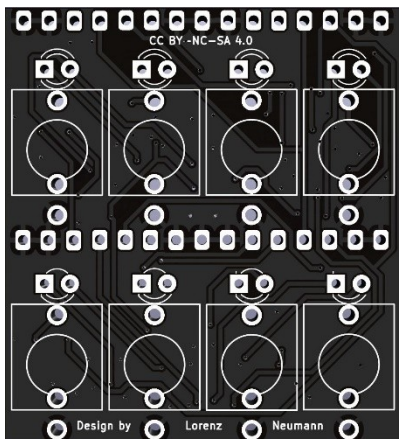
Main PCB front



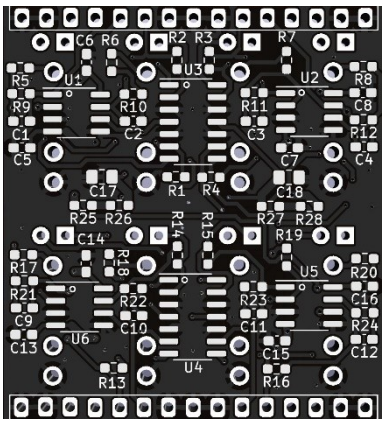
ADAT PCB back and front



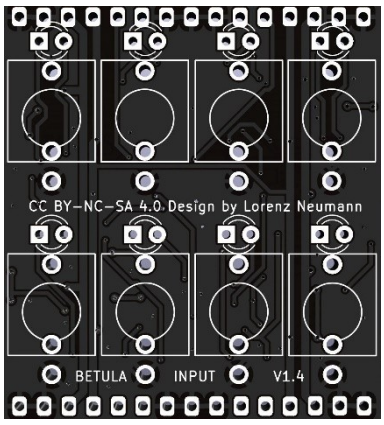
Output PCB back



Output PCB front



Input PCB back



Input PCB front

Calibration

1. Connect the module to a power supply, do not connect ADAT signal yet.
2. The module should start up and *SYNC* should be colored red. Power consumption should be as low as <20mA @ 12V in this state.
3. Connect ADAT Signal. *SYNC* should turn green. Power consumption goes up to >100mA @ 12V and >35mA @ -12V
4. Measure each output with a multimeter, adjust SMD-trimmer RV1-RV8 until DC offset is as close to 0mV as possible (<2mV is doable)

Troubleshooting

Please use the schematics!

In case you want to check for presence of a signal on an IC: Do measure on the leg of the IC, not on the pad. This way you check your soldering as well.

Case 1: Module does not sync:

-> Your module does not light up the green *SYNC* LED

- Is your ADAT signal and cable ok? Can you test with other gear?
- Check all power rails 3.3V, 5V, 6.5V at the DC/DC converters and 5VA at the regulator U5.

Is pin 21 of U10(V1402) at 5V?

- **YES:** your ADAT Signal is not present or in bad condition.
- Check the *ADAT_RX* signal is present on the 2x2 headers pin 2 (top left corner) below the power connector.
- Check for ADAT Signal on pin 6 of U10

- **NO:** ADAT is fine, but standby switching is not working. Check U6, Q1 and Q2

Case 2: No input is present, not even a noise floor:

-> You can't see any input signal in your DAW

Does your audio interface indicate sync to the module? Or, is the *ADAT_TX* signal on the 2x2 headers pin 3 (bottom right corner) below the power connector present?

- **Yes:** ADAT is ok. Problem with the ADCs.
- Check 5VA rail at U5 and at every ADC, Check 3.3V at ADCs
- Check presence of *SCLK_3.3V, BCLK_3.3V* and *WCLK_3.3V* on ADCs - *in case one is missing check their 5V equivalent at U8.*
- Is any digital output signal present on U11 (check inputs and outputs of U11)

- **No:** Check soldering U9. Is *WLCK_5V* present on pin 4?

Case 3: Some input channels work some show not even a noise floor

- Check corresponding ADC for power, clock signals and output signal on U11 as shown in Case 2

Case 4: only some input channels are working.

- Check all corresponding parts on the input circuit (parts around U12 or U13)
- Check soldering on input PCB.
- If a pair of signals is not present (1&2 or 5&6) check corresponding ADC

Case 5: No output is present.

-> Module does not respond to digital inputs from your DAW

Are all output signals missing?

- **Yes:** Check U7 for power, clock signals and digital input signal.
- Check 47 Ohm resistors next to U7

- **No:** Check according *OUTx_DC* signal and *OUTx (*x corresponds to the number of missing channel.

- Check soldering of parts on the output PCB

Need more help?

If you need help, please check the schematics first.

If you can’t help yourself, you can write me an e-mail:

blattwerk-audio@posteo.de

Please describe the problem as detailed as possible, describe what you have tried by now. And please make some good photos, so I can check your soldering!