⑩ Controlling AE modular via MIDI
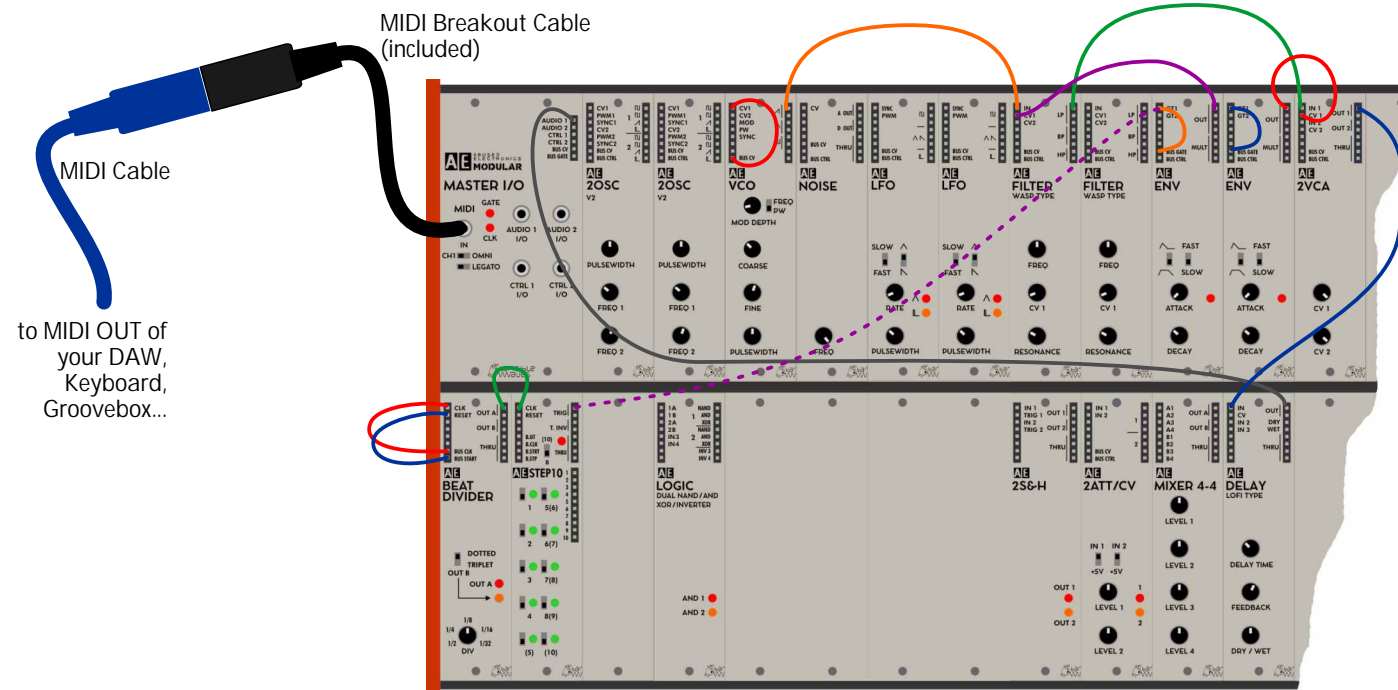
Now, we will patch a „classic"synth that is playable via MIDI; patch as shown in the example:

MIDI Breakout Cable
(included)

MIDI Cable

to MIDI OUT of
your DAW,
Keyboard,
Groovebox…

- Set the send MIDI Channel of your DAW, Keyboard (or whatever you use) to Channel 1
- Now, AE modular gets MIDI data; the MASTER module converts these to a control voltage (CV) depending on the played note, a GATE signal ("high" voltage signal when key down, „low" voltage for key up, and MIDI timing informations (MIDI clock / start / stop)
- These signals are available on many modules at the lower sockets of the left row of sockets (named „BUS xxx") These can be patched with short patch wires to the corresponding inputs of the module (e.g. the VCO module gets the CV 1 input from BUS CV - red in the example above); same with ENV module, gate input GT1 and BUS GATE.
- Now, AE modular should play the notes that it receives via MIDI.
- NOTE: The note range of AE modular is limited to the MIDI notes C -1 … C4; MIDI notes outside this range will be ignored.
- The MASTER module has two switches: CH1 - OMNI selects the MIDI channel; left is MIDI channel 1, right is OMNI, that means MIDI Notes from all channels are received. The LEGATO switch changes the behavior of GATE signals on overlapping notes: with LEGATO ON, no new gate signal will be generated, with LEGATO OFF, a gate signal is triggered for every new MIDI note.
- The dotted, violet line shows a variant: here, the ENV for the filter is not triggered by the MIDI note, but by the STEP10 trigger sequencer. The STEP10 iteself gets it's clock from the BEAT DIVIDER module; the BEAT DIVIDER takes the MIDI clock (which are basically 1/96th notes - very fast) and slows them down to 1/4, 1/8 or other selectable measure.
- Now, you can set switches on the STEP 10 to the upper position, and for these steps, a trigger is generated for the ENV module.
- The result is: The pitch is controlled by the MIDI note, the rhythmical structure for the filter modulation by the STEP10 sequencer.
- If you want to trigger the volume envelope (second ENV) just patch another wire from STEP10 TRIG OUT to the GT1 input of the second ENV.

Conclusion

I hope you enjoyed this first look into the world of modular synthesis with AE modular; this Quick Start Guide can give only a very short overview to get the thing making sound, but has given (hopefully) a first idea how the things work. Feel free to experiment! Try connections as you like, listen and try to understand „why does this sound like this" or „why do I hear nothing" (what also can happen…)! E.g. from ENV to VCO CV, from one oscillators output to CV / PWM / SYNC in of another, with LFO output to everywhere… If you are lost, just get back to the simple patches that are described here.
Please also take the time to go through the detailed brochure that will be available soon (and sent for free to all Kickstarter backers who purchased a device, or otherwise available in the webshop).

QUICK START GUIDE

You have received your AE modular, now you want to get sound out of it! This short guide shows you the first steps into the world of modular sound synthesis, which may look a little challenging if you are used to"normal" synths, whether that is hardware or software synths. With a Modular, there are no presets, you have to patch the entire signal flow from scratch, you could say you build a new synth every time ;-) Don't worry, this sounds more complicated than it is; if you take some time and patience (which is definitely necessary) following these examples you will soon discover the potential and fun of this device.
Happy patching!

① Connecting the AE modular

- Snap the appropriate plug for your power socket onto the power supply adapter (there are four different included for EU, US, UK, AU)
- Connect the power plug with the AE modular (left side)
- Connect AUDIO 1 I/O on the MASTER module with a minijack (3.5mm) cable to your mixer, sound system, DAW, whatever you use. Probably, an adapter is needed from minijack to 6.35 jack, chinch… depending on the input.
- NOTE: The I/O jacks are mono (because they can also be used for connecting to a Eurorack modular synth; if you use a stereo cable, the signal will be only on one channel.

POWER SUPPLY

MIXER, SOUNDCARD IN…
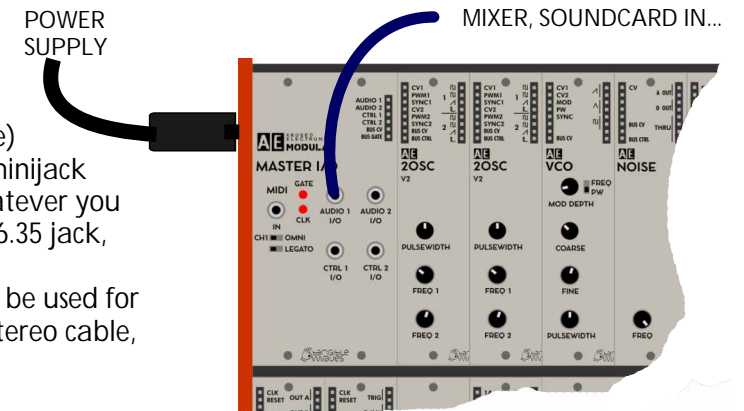
② Basics you should know

- Each module has two rows of (mostly 8) sockets at the upper edge; the left row are the INPUTS, the right row are the OUTPUTS.
- A number of knobs control how the module works, depending on it's function
- If it is appropriate, one or more LED's show what the module does (e.g. the speed of the LFO)
- Often, outputs are doubled or tripled; this makes it easier if a signal is used as source for more than one input
- Outputs named with „MULT" are 4 interconnected sockets that have no internal connection to the module; they can be used to split or „multiply"signals (similar to the multiple outputs described above)
- No matter what connections you make, you cannot destroy anything!

③ The first sound

MIXER, SOUNDCARD IN…

- Take a patchwire (a short one) and connect the square wave output of the first 2OSC module to AUDIO 1 on MASTER module.
- Set the PULSEWIDTH knob fully to the left, turn FREQ 1; now you should hear a continous squarewave sound with different frequencies depending on the position of the knob. This may seem not so impressive, but this is our raw material for all further sounds!
- Turn the PULSEWITH knob, listen to the variation in sound. Turn it continously back and forth, hear how you get a „dynamic" and fatter sound (with an LFO triangle output to PWM input on 2OSC you can automate this).
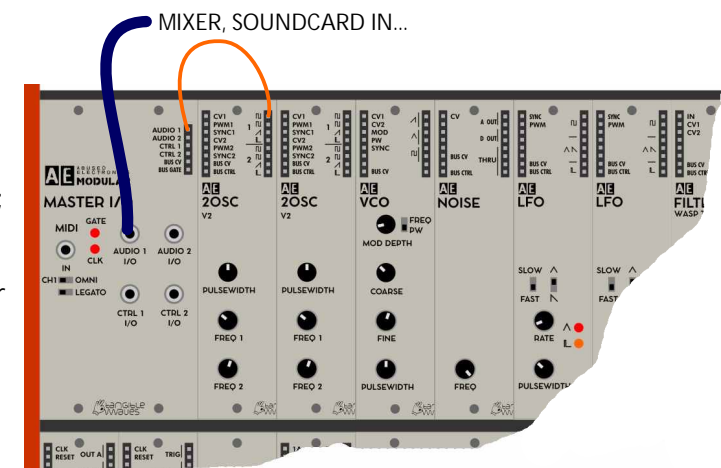
4 Exploring the FILTER

- Connect the Output of the first oscillator on 2OSC with the input of the filter (shown in red) and output LP (Lowpass) of the FILTER to the MASTER, our main output to the speakers (shown in green).
- Turn RESONANCE on the FILTER fully left; move FREQ and listen to the opening and closing of the filter.
- Increase RESONANCE and try combining with changing FREQ; the more RESONANCE is increased, the more the filter starts to „ring" - listen!
- In parallel, try different Oscillator frequencies, and try also the sawtooth wave of the oscillator (red dotted patchline).
- Finally, change the output of the FILTER to BP (Bandpass) and HP (Highpass); tweak the frequency and resonance and enjoy the wide palette of sounds!
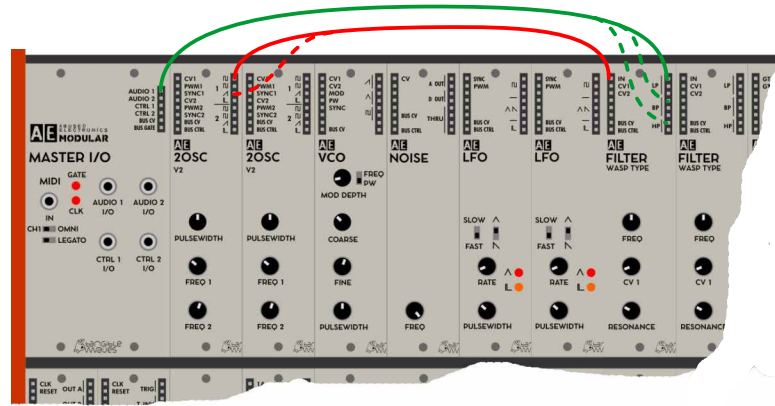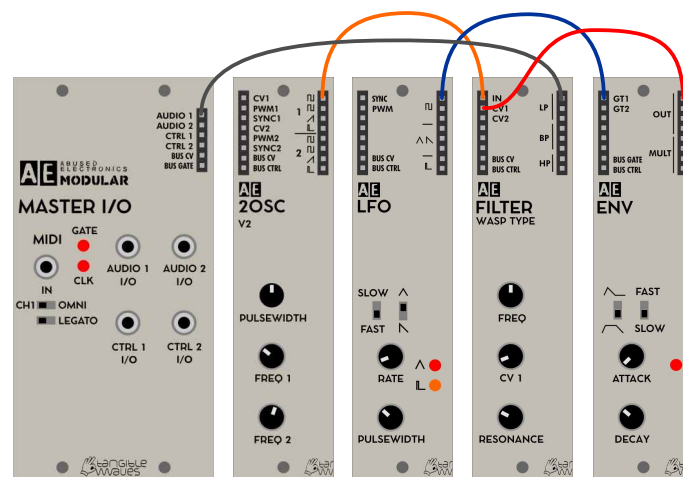
5 Modulating the FILTER

- Turn CV 1 on FILTER to the left
- Add a patchwire from LFO to FILTER, input CV 1
- SET LFO switches to „FAST" and triangle wave
- Set RATE on LFO to a speed you like
- Increase CV 1 on the FILTER and listen to the modulation of the filter frequency
- Switch to Sawtooth wave on the LFO (runs about double the speed, then adjust if desired), so you get a kind of percussive beat
- Play with FREQUENCY and RESONANCE
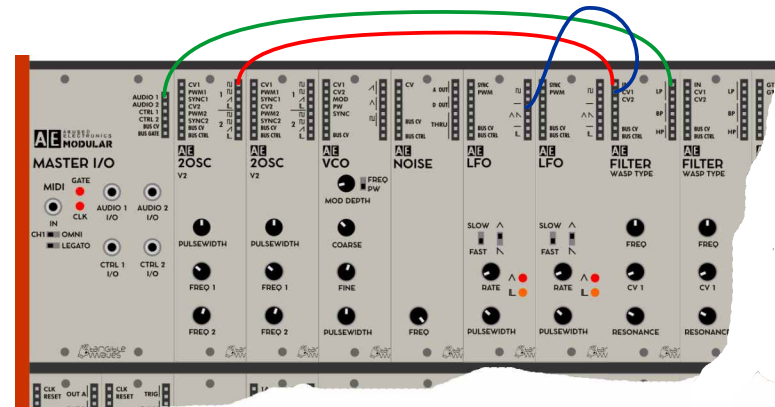
6 The Envelope (ENV)

- The ENV modules provide an AD envelope, switchable either with a hold / sustain phase (lower position of the switch) or without (upper position). The time range is switchable SLOW and FAST; usually, FAST is best except when you need veeery long envelopes.
- The ENV is triggered by a full voltage signal on the GT1/GT2 inputs (GaTe); in the example we use the LFO square output as source for this gate signal.
- Set ATTACK fully to the left, DECAY to about 20%, and the speed of the LFO to about 2 pulses per second.
- Now turn up the CV 1 knob on the filter, this determines how much of the envelope modulates the filter
- With a low frequency on the 2OSC, a relatively short decay and FREQ on the filter set low, you can get quite tough bass sounds, for example. Now try different combinations of filter FREQ and RESONANCE and DECAY times on the ENV

NOTE: Here, we have used the ENV for modulating the FILTER, the other typical application of an envelope is to give the sound a volume contour with the VCA - we'll see this later when controlling AE modular by MIDI. At the moment we are still dealing with a static tone.

7 Random with the Sample&Hold (S&H)

- The S&H module is a so called Sample & Hold; it works as follows:
  - there are two inputs, one for a signal (IN) and one for a trigger (TRIG)
  - if the trigger signal goes high, then the momentary value of the signal is frozen and sent to the output
- So what is this useful for? The classic application is to get some random control for modulation; but where do we get a random value as signal input for the S&H? The answer is: NOISE! Noise is a randomly fluctuating waveform which is the perfect source for this case.
- In the example, the LFO is again the source for the „beat", in this case the trigger of the S&H (blue); The A output of the NOISE is the signal for S&H (green). This means the random noise signal is frozen on every clock from the LFO
- The output of the S&H goes again to the CV 1 in of the filter, and when turning up the CV1 knob on the filter we hear a randomized opening/closing of the filter. Quite nice rhythmic structures!

- BTW: If you want to hear the NOISE directly, patch NOISE -> FILTER -> audio output; tweak FREQ of the NOISE module and also FREQ / RESONANCE of FILTER - all kinds of wind, waves.... will be audible.
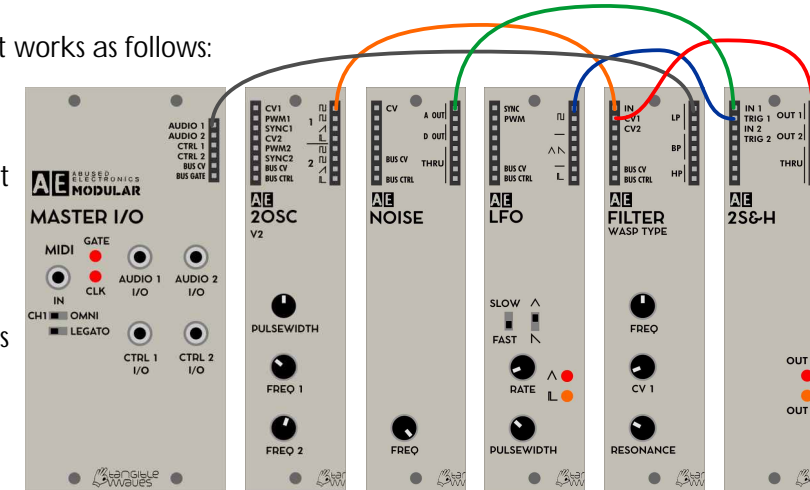
8 Mixing Oscillators (MIXER 4-4)

It's quite common that you want to mix two or more sound sources; for this there is the MIXER 4-4 module. It offers 4 audio inputs (A1...A4) with mixing knobs, the output is OUT A. Additionally there are 4 inputs for control voltages; these are mixed at full level and sent to OUT B.

- In the shown example the pulsewave output of the first oscillator of 2OSC, the saw output of the second oscillator and the output of the noise are patched to the MIXER inputs
- With the knobs LEVEL 1 ... LEVEL 3 you can adjust the relation between the three sounds.
-
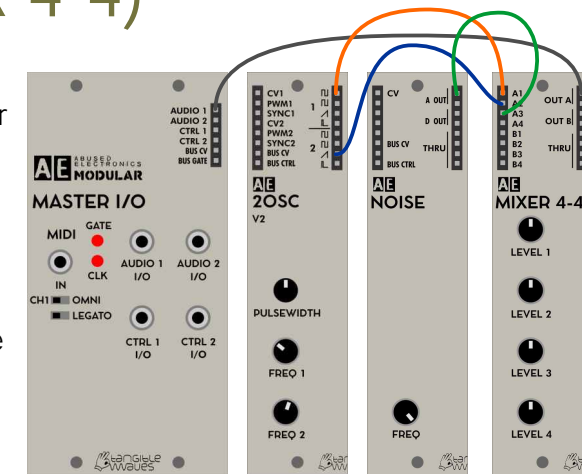
9 DELAY!

- The DELAY module is a simple delay effect with the usual knobs DELAY TIME, FEEDBACK, DRY/WET mix.
- The shown example patch is the same as in point 5;except that the output of the FILTER goes via the DELAY to the output (green wire).
- Set DELAY TIME to about 1/3, FEEDBACK to the left, DRY/WET in middle position; you hear the pulsating filter sound delayed.
- Adjust DELAY TIME slowly and hear the different rhythmic combinations
- Turn up FEEDBACK to get more delays.
  NOTE: The FEEDBACK knob causes infinite / distorting feedbacks if turned more than 70% to the right (which may be quite interesting).
- Now play with ENV Decay time and filter FREQ, hear the variations - one can have lot of fun with this simple patch!