

# SYNTHI A (KS) CV&GATE INTERFACE

## Instruction Manual



Synthi AKS

Special pin cable carries CV3 (Synthi A only)

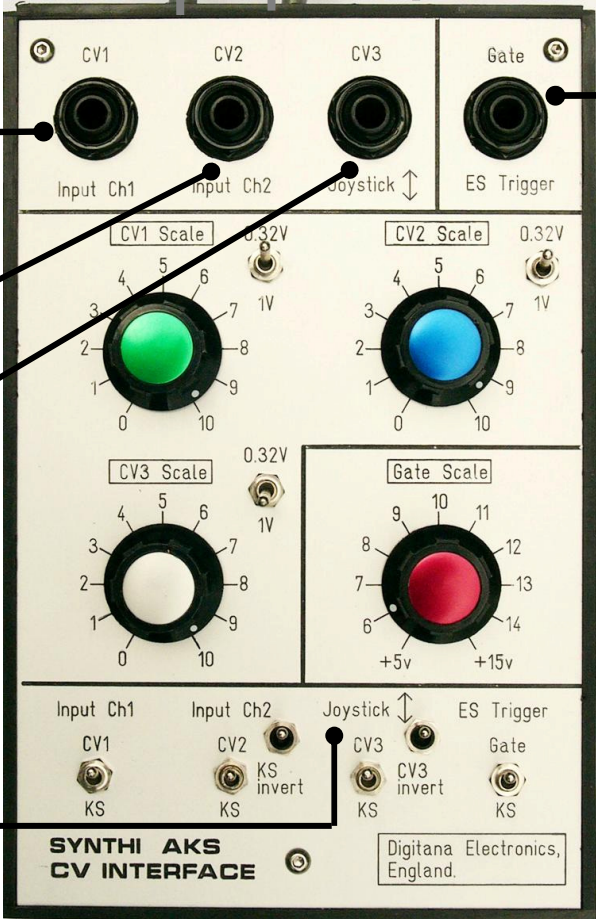
External Gate control input

External CV1 control voltage input

External CV2 control voltage input

External CV3 control voltage input

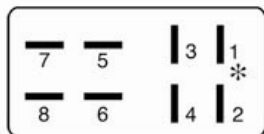
KS Ch2 and CV3 inverters



Synthi AKS CV & Gate Interface

## Instructions on using the Synthi A (KS) CV Interface

Use of this unit is pretty straightforward. The Synthi AKS has actually 3 input channels accessible from the 8 pin 'Jones' keyboard connector, as well as access to the Envelope Shaper(ES) trigger.



Rear of male or female 8 way Jones connector on an AKS

Pin 1 – Input Ch1  
Pin 2 - -9v  
Pin 3 - Ground  
Pin 4 - +12v  
Pin 5 – ES trigger  
Pin 6 – Input Ch2  
Pin 7 - Meter  
Pin 8 – Matrix row 16  
(seq) **AKS ONLY**

**Note on Synthi A's, pin 8 of the Jones connector is not connected to any row of the matrix, so a special pin cable is used for the Synthi A CV & Gate interface to allow CV3 to be inserted into any matrix column. The following features although written with a Synthi AKS in mind equally apply for the Synthi A.**

The 3 input channels to the Matrix are Input Ch1, Input Ch2 and Matrix row 16 (with Joystick vertical control range knob set to the 'seq' position) and Pin 5 is the ES trigger.

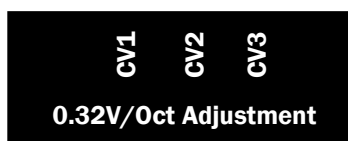
The 3 toggle switches on the unit allow switching of the CV inputs CV1-CV3 or the standard KS connections into Pin 1, Pin 6 and Pin 8 (if a KS is connected). In normal operation the KS sends pitch CV to pin 1, dynamic envelope to Pin 6 and sequencer pitch voltages to pin 8. A 4<sup>th</sup> toggle simply switches between either external gate triggering or KS triggering of the ES.

### Precision multi-turn trimmers for fine tuning of 0.32V/Oct scaling of CV1-CV3

You will notice 3 toggle switches that switch between '0.32V/Oct' and '1V/Oct' settings. The purpose of these switches is to change the range of the 3 cv scaling pots for CV1-CV3. In the 1V/Oct setting, setting a pot to max (10) will feed an external CV into the Synthi input channels without any scaling. So if the external CV is pitch CV scaled at 1V/Oct, it will remain so when reaching the Synthi.

However the two main audio oscillators of all Synthi (Osc1 and Osc2) are calibrated at 0.32V/Oct (!). In order for external CV of 1V/Oct to play chromatic pitches on these oscillators, the voltage has to be scaled quite precisely to match this. This is why the other toggle switch settings is '0.32V/Oct'. This is the setting to use (with scaling pots set to max 10) if you want eg to play chromatic pitched sequences that come from an external sequencer, midi cv etc which is calibrated at the more standard 1V/Oct.

On the rear of the unit you will find 3 multi-turn trimmers. These are used to calibrate the 0.32V/Oct scaling precisely, one each of CV1-CV3. Each can be adjusted by inserting a small flat head screwdriver. They are labelled:-





## Osc2/CV2 calibration

Apply the same procedure as above to CV2 and Osc2. The patch will now be as above but the black pin connects Osc2 out to Output ch1 and the red precision pin connects Input Ch2 to Osc2 frequency control. Adjust trimmer marked CV2 on the rear of the unit.

**Again, make sure Input ch2 level pot is set at 10 on the Synthi and CV2 scale pot set to 10 on the unit and the toggle switch set to 0.32V/Oct range during calibration**

The fine tuning of CV3 scaling is less critical unless you intend on using CV3 to act as pitch CV for controlling Osc3 in the audio range. Note Osc3 in the Synthi is not (by design) tracking at 0.32V/Oct but at 0.26V/Oct (!) so you will need to adjust the **third** trimmer on the rear of the unit rather more than for CV1 and CV2 to get the scaling down to 0.26V/Oct. Other than this the procedure is as above but the patch should now take Osc3 to eg Output Ch1 and CV3 to Osc3 freq. control. which is achieved by inserting a red precision pin to connect row 16 (stick vertical CV) to Osc3 freq control input and also making sure you have rotated and 'clicked' off the stick vertical scaling pot on the Synthi. This turns row 16 into the third input channel where CV3 emerges into the matrix.

*In the case of a Synthi A, you insert the pin of the special pin cable into Osc3 freq control column on the matrix. This pin carries CV3, because as mentioned earlier, a Synthi A (or a mk1 VCS3) does not have the feature that matrix row 16 'doubles' as a sequencer CV input, as on the Synthi AKS/VCS3(mk2). So use of a special pin cable is the only way of getting 3 channels of CV into a mk1 Synthi.*

Finally, to use CV3 as pitch CV, you will have to have the inverter toggle switch in the 'invert' position. Otherwise you will find Osc3 plays 'backwards', i.e. playing a higher pitched note via the external sequencer (hence a larger positive CV3 voltage if it's standard 1V/Oct type) generates a lower sounding note (and vice-versa). The reason is a bit technical but it's to do with the fact that all 3 Synthi oscillators actually track using a -ve CV (NOT Positive CV which is the norm for most other Synths). Since Input Ch1/2 have amplifiers that invert voltages fed into them (they are inverting amplifiers) positive midi-generated CV1 and CV2 get inverted to -ve CV by them. But row 16 (the third Input channel) has no such amplifier, so does not invert, hence the reason why I designed the unit to allow inverting of CV3!

It is also possible to invert the dynamic KS voltage on Input Ch2 which is a useful additional feature.

The Synthis are designed so that the ES is triggered by a positive voltage around 4-5v. The Gate scale pot allows larger voltages to trigger the ES safely up to a maximum of +15v. Many hardware external sequencers produce various trigger voltages so the gate scaling pot can be adjusted to accommodate any gate range between +5 to +15v. By adjusting this pot you can also get different gate times eg if your gate voltage is +5v, adjusting the pot to higher values will result in shorter and shorter gate times until finally the ES will not trigger.