

RIDES IN THE STORM

QSQ

User Manual v1.3



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Overview

Hello modular lovers,

congratulations on purchasing this powerful instrument, the Q5Q will be the creative partner in your modular setup.

The Q5Q is an 8 track CV & Gate sequencer and a MIDI to CV interface. The Midi interface can be used via USB as a class compliant MIDI Device and / or via the TRS In- and Outputs.

CV & Gate Outputs

The Q5Q has 8 pairs of CV and Gate outputs at the bottom left. Both are calculated at a sampling rate of 48 kHz.

CV

- From 0 to 10V, adjustable in 12000 steps. The Idea is to have 1200 cent for one octave / one volt. Can be adjusted in Cent, Notes, Hertz or Volt.
- Calibrated so that output values are exact and your microtonal dreams can become reality. Now you only need a precise enough oscillator to properly use it (shameless plug: look at our great and precise analog discrete oscillators DOC and BOC).

Gate

0 or 5V

Clock Input

Accepts Clock from 1,2,4,6,8,12,16,24,48 and 96 PPQN (Pulses per quarter note) from 0 to 5V.

Start Input

If the input is 5V then the Q5Q starts running from the beginning and runs as long as the input is 5V. Stops when the input goes down to 0V.

The input can also be set to a reset trigger, so that every time a trigger is received the sequence starts again. This can be changed in the settings > SYNC > *START IN reset trigger*

The clock input can be also used independently the start input, for details see the Sync settings.

Clock Output

Variable Clock output from 0 to 5V. Value can be changed from 1,2,4,6,8,12,16,24 and 48 PPQN.

Start Output

Put out 5V when the Q5Q is running, otherwise 0V.

MIDI TRS Input

Alternative and additional to MIDI USB for MIDI Clock and voice messages.

MIDI TRS Output

Alternative and additional to MIDI USB for MIDI Clock

QSQ and its MIDI to TRS Adaptor uses MIDI A, can be changed by jumper at the back to MIDI B.

CV In

Input to modulate parameters like changing the pattern. Accepts signals from -5 to 5 V. For more info how to use it, see the CV In in the chapter Setting options.

The controls

4x4 knobs 1 - 16

The 16 endless rotary push encoder which are arranged in 4 rows are the main controls to edit your sequences. You can turn, press and hold every knob. Generally by turning the knob you change parameter values, with pressing you activate or deactivate a parameter. In the most windows you can hold it, then you can edit, like copy, paste or delete parameters.

5 Buttons

Below the Screen there are 3 buttons. Their function always depends on the window you're in and is shown in the window.

With the *PATTERN / SONG* button you open the Pattern Window, once opened, pressing the button switches between the Pattern and the Song Window.

With the *START / STOP* button you obviously can start or stop your sequence. Depending on the synchronization settings the sequencer might not start, e.g. when no clock is received.

Utility knob

Depending on the window you're in, the function of this knob varies. In the track window this changes the tempo. By pressing, holding it for at least 250ms and letting it go the settings menu opens.

track - 64-step sequencer with parameter per step

Program a voltage - set steps by pressing the knobs and change parameter values of each step by turning the knobs.



- knobs (4x4)
 - Turn: Change parameter shown on top left for the step
 - Hold: Opens the edit menu for a step: copy, paste or clear. When you're in another parameter than CV clear only clears this parameter, e.g. you set some wild modulation, and you want to remove it, you can reset only the modulation values with this function. If the knob is pushed again then the step is copied onto all the active steps.
 - Press: turn step on/off, Depending on the parameter only the parameter is turned off, This can make some nice live editing
- Buttons
 - *page*: Change to page 1-4. Holding the button opens the edit menu for the page, so pages can be copied and pasted around.
 - *para*: open parameter view
 - *chan*: open channel view
- *UTILITY* knob
 - Turn: change tempo
 - press for 0.2s and release: open settings
- shortcuts:
 - *para* + press knob 1-8: select parameter for track view, the one written on front plate
 - *para* + press knob 13-16: generate a new rhythm / melody,
 - knob 13: generate an euclidean sequence (note: pushing multiple times does not change anything, because the parameter did not change and the same sequence is generated again)
 - knob 14: generate a new rhythm. Each time you push the knob a new rhythm is generated. Change the parameter *DENSE* in the second page of the *para* window for different results.
 - knob 15 & 16: generate a new melody. Each time you push the knob a new melody is generated. Change the parameters *START* and *SPAN* in the second page of the *para* window for different results.
 - *para* + turning knob 9-16: change the parameter which is printed above the knob for this track.
 - *chan* + press knob 1-16
 - 1-8: got to channel 1-8 track view with parameter cv

- 9-16: got to channel 1-8 track view with parameter gate
- *chan* + turning knob 9-16: change the parameter which is printed above the knob for all the 8 tracks. All tracks then have the same value for e.g. swing.
- *UTILITY* knob + press knob: change unity and scale. value written on front plate

Step parameters

There are eight different parameters which can be set for each step individually.

- *CV*
 - from 0V to 10V, depending on the selected unit the value is displayed differently.
 - Depending on *RANGE* the knobs behavior is different. The lower the range the more turns are needed to go from 0V to 10V
- *GATE*
 - The length of the gate, the value refers to the length of the step and can be longer than only the step.
- *RETRIG*
 - Number of retriggers for the Gate. Sometimes this is also called ratchet or flam.
- *MICRO*
 - Microtiming of the step, the start of the step can be adjusted in percent, so from 50%, which means a 1/32 before the 1/16 grid and up to 50% - 1/32 after the 1/16 grid.
- *CHANCE*
 - Turn the knob to the left: set the probability for the step from 1 to 100%. This is calculated everytime the step starts.
 - Turn to the right; A:B, A sets how many times the pattern plays when the step is active and B sets how often this counter is reset. E.g. for 1:2 the step is active in the first of two repeats of the pattern.
- *GLIDE*
 - turn the knob to the right: normal glide as you would expect, smoothes the transition from one cv to the next.
 - turn left: stepped glide. Glide is also applied, but it is quantized to the scale. The slower the glide is, the more you can hear the individual notes.
- *MOD*
 - Additional modulation for the cv, either an envelope or an LFO
 - To the right: LFO, there are different waveforms to choose from: Triangle *TRI*, Ramp *SAW*, Square *SQU*, Random sample and hold *RND* and quantized random sample and hold *QRD*, which is the same as random sample and hold but the values are quantized to the currently selected scale. For each waveform there are different rates, all synced to the tempo, from 4 to 1/128, in 1/16 steps this would be from 64 steps to 1/8 step.
 - To the left:
 - ENV - a simple decay only envelope, different values change the decay time, from 3ms to 2.8s.
 - VCA - with this you get the decay ENV + an additional hold time, which ranges from 5 to 400ms. In this mode the values change their behavior: the *CV* value sets the hold voltage and *AMOUNT* changes the decay.
 - The LFO time also depends on the divider parameter of the track, so the LFO can even go faster or slower.

- *AMOUNT*

- The amount of the modulation, acts like an attenuverter. It can be positive or negative. 100% means that the peak of the modulation is 5V. If you set the CV to 5V, the amount to 100% and mod to TRI a triangle wave ranging from 0 to 10V is created.
- If *MOD* is in VCA mode this changes to the decay of the envelope. Only positive values are used, if set to a negative value the absolute value is used.

Overlay

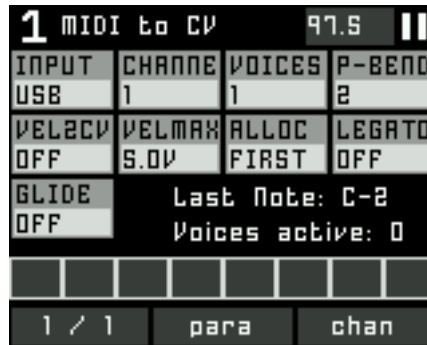


When turning one of the 4x4 knobs the value is displayed in detail. The overlay closes shortly after the last turn. When turning multiple knobs at once it also closes.

Midi Track Window

Track is now depending on MIDI and everything programmed is not played (but still there when changing the view).

To change a track into a Midi track go to the second page in the *para* window and change *TYPE* by turning knob 9.



The eight squares on the bottom show the activity of the different voices of this track. The note value of the last received midi message and the number of active voices is displayed to have some information.

- knobs (4x4)
 - turn: change the parameter
- Buttons
 - *para* go to parameter window
 - *chan* go to pattern window
 - *1/1* no function
- shortcuts
 - *para* + press knob 1-16: got to track window with the selected parameter, written above the knob
 - *chan* + press knob 1-16
 - 1-8: got to channel 1-8 track view with parameter cv or to track 1-8 if it's type is MIDI
 - 9-16: got to channel 1-8 track view with parameter gate or to track 1-8 if it's type is MIDI
 - *chan* + turning knob 9-16: change the parameter which is printed above the knob for all the 8 tracks. All tracks then have the same value for e.g. swing.

Settings for midi synchronization are in the general settings.

Problems?

- To check if the QSQ does receive MIDI signal you can first go to the second page of the I/O overview and see if there are any midi signal coming at all. To get to this view go to *para* and then push knob 16.
- When using TRS Midi it is possible that the used cable has a different standard. The Input and Output can be separately switched between MIDI A or B via Jumpers on the Back of the PCB.

Midi parameters

- *INPUT*
 - Change between TRS or USB MIDI
- *CHANNEL*
 - The midi channel used
- *VOICES*
 - the number of voices, up to eight voices polyphony. When *VEL2CV* is active then this reduces to four.
- *P-BEND*
 - Range of the received midi pitch bend in semitones
- *VEL2CV*
 - If this is on then the next CV output is used for the velocity. The next track is then blocked.
- *VELMAX*
 - Output voltage of the next CV output for the maximum velocity, e.g. when a note is received with a velocity value of 127 then the cv value is 5V (or whatever you set as the value)
 - is ignored when *VEL2CV* is off
- *ALLOC*
 - Sets the voice allocation strategy.
 - *FIRST*: always use the first free voice
 - *CYCLE*: use the next available voice
- *LEGATO*
 - Change the gate output behaviour when a note is held and a new note is received.
 - *OFF*: the gate output will always reset to 0 when receiving a new note.
 - *ON* the gate output stays high, when receiving a new note when another note is still held.
- *GLIDE*
 - Glide between the notes; the higher the value, the longer the transition will be. When legato is on, then glide is only applied when the notes are played legato (which means that a note is played while the older one is still held).

The Parameters *ROOT* and *SCALE* from the parameter window also effect the midi to CV conversion. The received midi note is quantized to the next note in the scale.

Midi Record Window

Record mono MIDI input and convert the recorded notes into a cv/gate track.

To change a track into a Midi track, go to the second page in the *para* window and change *TYPE* by turning knob 9.

The idea behind this track type is to easily record melodies and then use the powerful step sequencer to enhance the melody further.



To record, push knob 5, which is shown as *REC* in the window. Then all incoming notes are recorded, and the recording status is shown by a red dot at the top of the window. The QSQ must be running so that notes are recorded, so push the *START* button or start your external clock device, which controls the QSQ.

When record is on, overdubbing is automatically on and all the notes are quantized to a 1/16th grid. The quantization cannot be changed.

By pushing *CLEAR* (knob 6) all the notes are erased.

By pushing *EDIT* (knob 7) the recorded notes are converted into a CV/Gate track and the window changes to the step sequencer window.

If a track had programmed steps before, and the track type is changed to a MIDI record track, the steps are not lost and other new notes can be overdubbed.

Parameters

- *INPUT*
 - Change between TRS or USB MIDI
- *CHANNEL*
 - The midi channel used
- *STEPS*
 - Number of steps for the recording, it is the same parameter as in the Parameter window.

***para* - Parameter Window**

Select the Parameter for track view and change a parameter for all steps.

Select step parameter			
CV	GATE	RETRIG	MICRO
CHANCE	GLIDE	MOD	AMOUNT
Track parameter			
SWING	DIVIDE	MODE	STEPS
50%	1	NORMAL	16
TRANSP	ROOT	SCALE	NUDGE
0	C	NONE	1
track	1 / 2	chan	

- knobs (4x4)
 - push 1-8: set the selected parameter for the track window and go to the track window
 - turn 9-16: change the parameter value
- Buttons
 - *track*: go to track window
 - *1 / 2*: change the current parameter page
 - *chan*: go to pattern window
- shortcuts
 - *para* + press knob 1-8: got to track window with the selected parameter, written above the knob
 - *chan* + press knob 1-16
 - 1-8: got to channel 1-8 track view with the parameter cv
 - 9-16: got to channel 1-8 track view with the parameter gate
 - *chan* + turning knob 9-16: change the parameter which is printed above the knob for all the 8 tracks. All tracks then have the same value for e.g. swing.

Track parameter

These are parameters that are the same for all steps

- *SWING*
 - Amount of time shift applied to each second step. 50% means there is no swing.
- *DIVIDE*
 - Sets a clock divider (1/8 - 8 times) for the track.
- *MODE*
 - Change the order (Normal, Reverse, Random, Pingpong, YX, Plus N) of how the steps are played. In YX mode instead of running row after row the steps are used column per column. In the Plus N modes steps the step index is incremented N instead of one, so steps are skipped.
- *STEPS*
 - Number of Steps for the sequence. The sequence is always looped.
- *TRANSP*
 - transpose / shift the CV output up or down in semitones (-60 to +60 semitones)
- *ROOT*

- Root Note (C to B) for the CV Quantization. If Scale is NONE then this has no effect.
- **SCALE**
 - Scale for the CV Quantization. If None is selected then no Quantization is applied to the CV. There are the "normal" scales into but there are also some interesting special tunings.
- **NUDGE**
 - Changes the start offset for the current sequence, e.g. if this is '1' and Steps is '4' then after starting the Steps 2,3,4,1... and so on are played.
 - If the value is higher than Steps then the sequence starts with the offset and is still looped with the Number of Steps.
 - E.g. Nudge is '4' and Steps is '4': Steps 5,6,7,8, are looped
 - Tip: Program a sequence with e.g. 16 Steps and then just play around with Steps, preferably lower than 16 and Nudge
 - If you then Set Steps to 4 and play around with Nudge you can scroll through 4 different sequences only by changing Nudge
 - Tip: If you have a Sequence and carefully tune each CV then set Steps to 1 and change Nudge to only hear one step.
- **TYPE**: Type of the Track
 - CV+GT: Step Sequencer
 - MIDI: Midi to CV Interface
 - REC: Midi recording
- **UNIT**
 - Unit (Cent, Note, Hertz, Volt) of the CV P parameter in the *track* window, only changes how the cv value is displayed but does not change the values itself.
- **RANGE**
 - Range of knob turns for the CV parameter. The smaller the range is the more turns of the knob you need to go from 0V to 10V CV output.
- **MUTE**
 - Mute the Track, can also be accessed in *chan* window

Generators

The next four parameters are all for generators, the principle is that you turn the knob to change a parameter, and you push the knob to generate a sequence. The generation can also be started in the *track* window when holding the *para* button and pushing one knob (knob 13, 14, 15 or 16).

- **EUCLID**
 - Turn the knob: Set the Number of Triggers and Length of the Sequence, e.g. '5 / 8' means five triggers in an eight-step sequence
 - Push: The number of steps for the track is set and each step is set on or off. All other parameters remain untouched.
- **DENSE**
 - Parameter for the rhythm generator. When starting the generation all 64 steps are either set active or not. No other parameter will be changed.
 - Dense changes the probability. The algorithm goes through all 64 steps and for each step there is a random process started which decides if the step is active. So if *DENSE* is 50% then each steps has a chance of becoming active of 50%. Due to the

nature of random the actual number of active steps can vary.

- *START*

- The first of the two parameters for a melody / CV generator.
- This selects the middle note for the generation. The generator creates notes between '*START*' and '*START + SPAN*'.
- The current scale is used and all CV values are quantized to that scale. If *SCALE* is *NONE* then no quantization is applied.
- A new CV value is generated for all 64 steps, even if they are not active.
- If no step at all is active then also the rhythm generator is started when the generator is started the first time.
- Only the CV value is changed with the generator. E.g. you can set a rhythm or generate one and then generate melodies until you find one that you like.

- *SPAN*

- The second parameter for the melody / CV generator.
- The unit is semitones.

Pattern Window - *chan*



- knobs (4x4)
 - 1-8 push Selects the track which is shown in Track View
 - 9-16 turn: change the shown parameter for the current track
- Buttons
 - *track*: go to track window
 - *para*: got to parameter window
 - *mute*: activate Mute mode. At the top right of the window then stands *MUTE MODE*. then you can un/-mute the track by pushing the knobs 1-8. Great for playing the sequencer. When a track is muted, and you're in this tracks window you get a note that the track is muted.
- *UTILITY* knob
 - change the tempo
- shortcuts
 - *para* + press knob 1-8: got to track window with the selected parameter, written above the knob
 - *chan* + press knob 1-16
 - 1-8: got to channel 1-8 track view with parameter cv
 - 9-16: got to channel 1-8 track view with parameter gate
 - *chan* + turning knob 9-16: change the parameter which ist printed above the knob for all the 8 tracks. All tracks then have the same value for e.g. swing.

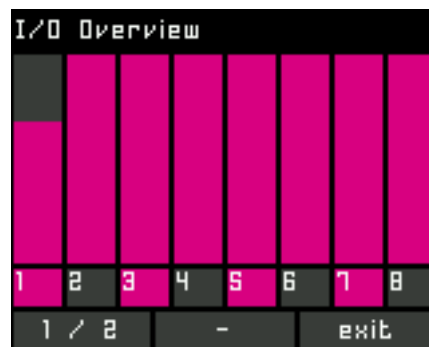
Pattern parameters

- tempo: the tempo can be changed here in 0.1 BPM steps in contrast to the *UTILITY* knob which changes the tempo in 1 BPM steps.
- length:
 - Number of steps for the pattern.
 - Has no effect when no song is running.
 - This is only relevant when changing between patterns. When changing from one pattern to the next one it is done after this number of steps is played.
 - If one track is longer than the length of the pattern this track is not played until its end when changing patterns

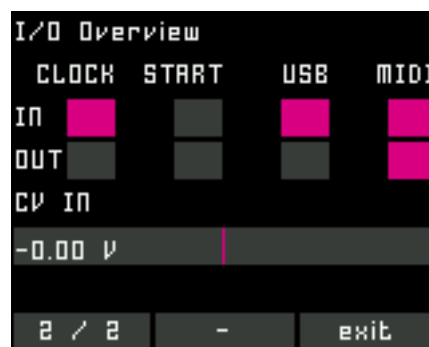
I/O Window

Shows the current state of all inputs and outputs which is helpful to check signals coming in and out.

CV and Gate



Gates, CV and MIDI



- Buttons
 - 1 / 2: change page
 - back: go back to pattern view

Tuner



Use the CV input as a tuner. This is a basic tuner and can analyze the correct pitch for basic waveforms because it works on the principle of counting zero crossings. This will work excellently with waves like sawtooth, triangle, pulse and sine. Just connect an output of an oscillator to the CV IN and you can see the pitch.

With the knobs 1-8 the CV outputs can be overwritten and a CV can be set. By pushing one of the knobs the output is activated, then the CV can be changed, and the gate output is on.

The tuner can be used while the sequencer is running.

Memory

In this view you can directly change the pattern and save/load patterns and songs. You can also copy, paste and clear patterns.

In the Flash memory there is space for 256 patterns, organized in 16 Banks (A-P) with 16 patterns. Flash memory means that the memory is persistent and survives power off.

In the RAM memory, which does not survive a power off, there are 16 patterns. By pushing one of the knobs 1-16 the pattern is changed. If the pattern is changed, no changes on the previous pattern are lost, so you do not need to save anything when changing between patterns.

If the QSQ is currently playing, then the pattern change is sequential, so after a pattern is played until its end. The length of a pattern can be changed in the *chan* window.

Attention: If a song is running or the CV Input for pattern change is active, then pattern selection cannot be changed in this view.



Controls

- knobs (4x4)
 - push: select pattern 1-16
 - hold: The copy, paste / clear menu shows up, and all these actions are applied to the pattern which respective knob was held.
- Buttons:
 - save: go into the save menu to select a pattern, bank or song to save
 - when saving a pattern, you can select the slot in the bank in the next menu by turning the *UTILITY* knob
 - load: go into the load menu to select a pattern, bank or song to load
 - when loading a pattern, you can select the slot in the bank in the next menu by turning the *UTILITY* knob
 - exit: go back to the previous view
- *UTILITY* knob
 - turn: change Bank A-P. When changing the bank only the memory bank where to load and save patterns from is changed. The internal 16 patterns are not affected by changing the bank.

save / load

After pressing the *save* or *load* button, you can choose the pattern, the complete bank or the song to save or load.

- *pattern*: the current pattern, the highlighted one, is saved into or loaded from the selected bank.
 - By turning the *UTILITY* knob, you can set where to save / load the pattern from.
- *bank*: save or load all 16 patterns from one of the 16 banks.
- *song*: save or load the song into one of the 16 banks.

Song

In this window you can arrange a basic song from the 16 patterns in the internal memory. The song is organized in up to 63 slots which show the pattern number and its repeats. The song can be looped.



Controls

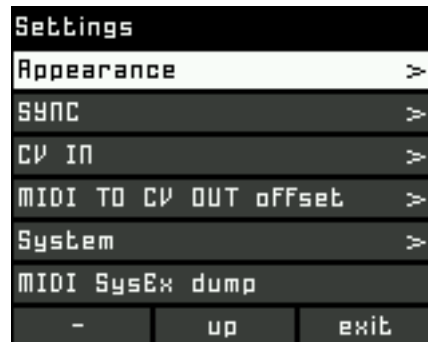
- knobs (4x4)
 - Depending on the slot the functionality is different, if there is no slot, just the grey background, then by pushing a new slot is added. When pushing the knob at *LOOP* then looping the song is either turned on or off.
 - push: change if turning the knob affects the pattern number or the repeats
 - hold: Only on slots: a menu shows up. The slot can be removed or a new one inserted.
- Buttons:
 - *page*: change the page, if there is only one page this has no function. To see more than one page, at least 15 slots must be added.
 - *OFF / ON*: activate the song mode. Only when this is ON the Song is played. If this is OFF, then only the current pattern is played and the song is ignored
 - *exit*: go back to the previous view

Notes

- Each pattern is played in its own tempo if the internal clock is used, otherwise the QSQ synchronizes to the external clock.
- The length of a pattern can be changed in the *chan* window and affects the number of steps after which a pattern is changed.
- When the song is played, then the *track*, *para* and *chan* windows always show the current pattern and the track / parameter you previously were in that pattern.

Settings

Go to settings by holding the *UTILITY* knob for at least 250ms and let it go.



- Buttons
 - *up*: go up in the list / one folder above
 - *exit*: go back to the previous view
- *UTILITY* knob
 - turn: go up and down in list
 - push: go into a folder, show possible values, set value

Setting options

- *Appearance*
 - *Color Scheme*: Pick one of the schemes
 - *Accent Color*: Change the accent color for Color Scheme Light or Dark
 - *CV output meter*: The CV output of a track can be shown in the track window. A little meter on the right side of the screen appears and shows the current output value. This can be switched on and off individually for each track.
- *SYNC*
 - *Clock Source*: Choose where the QSQ does get a clock from
 - *Transport Input*: From which source does the QSQ start and stop. If set to *as Clock* then the same input is used as the *Clock Source*.
 - *MIDI clock smoothing*: The incoming clocks are smoothed, depending on the stability of the clock you feed the QSQ you can change it. There are 3 options:
 - *Minimal*: React faster to tempo changes, can be unstable when the incoming clock is also unstable.
 - *Moderate*: In between setting
 - *A lot*: React slower to tempo changes, optimized for stability
 - *CLOCK IN PPQN*: PPQN – Pulses per quarter note the Clock Input expects
 - *CLOCK IN smoothing*: The same options as *MIDI clock smoothing*.
 - *CLOCK IN ignore START IN*: If this is active then the QSQ also starts as soon a clock signal is at the clock input, otherwise it only start if the start input gets 5V
 - *START IN reset trigger*: If this is set then the start everytime the start in gets a trigger the sequence is reset to the start.
 - *CLOCK OUT PPQN*: PPQN – Pulses per quarter note the Clock output generates
 - *TRS MIDI Clock Out*: If active, the MIDI output sends clock messages
 - *TRS MIDI Transport Out*: If active, the MIDI output sends transport messages

- *USB MIDI Clock Out*: If active clock messages are send via USB
- *USB MIDI Transport Out*: If active transport messages are send via USB
- *MIDI: continue resets*: If active, the sequencer always starts at the first step, otherwise it continues where it was stopped. This can be useful when working with a DAW and the current starting position is not at the first bar. Then the DAW sends a continue MIDI message, and the QSQ and the DAW can be out of sync.
- *CV In*
 - *Transpose*: Change the transpose parameter for tracks.
 - *Active*
 - *Range*: Like an attenuverter on the Input. If set to 100% then a 5V input results in 60 semitones added to the cv. If set to 50%, then the same 5V results in 30 semitones added to the cv.
 - *Tracks*: select which tracks are affected by the modulation
 - *Retrigger*: Change the Retrigger parameter for all steps of tracks.
 - *Active*
 - *Range*: attenuverter on the input, Maximum effect it 10 retriggers.
 - *Tracks*: select which tracks are affected by the modulation
 - *Tempo*
 - *Active*
 - *Range*: attenuverter for the CV input, the maximum modulation is 100 BPM, so with range at 100% a CV inputs of -5V results in a tempo reduction of 100 BPM and a CV input of 5V results in a tempo increase of 100 BPM.
 - *Pattern*: Change the current pattern depending on the CV. One of the 16 internal patterns is played. Changing between patterns is done sequentially, so each pattern has to be finished before another pattern plays
 - *Active*
 - *Range*: attenuverter on the input
- *MIDI TO CV offset*
 - For each CV output an offset in semitones can be set. The default value is -12 semitones.
 - To set the offset, push the utility knob, change the value by turning the knob and press again to save the value.
 - This offset is applied when using a track for MIDI, so for both Recording and MIDI to CV Interface. The offset has no effect on the standard CV/Gate track.
- *System*
 - *Version*: shows the name of the current firmware on the device
 - *CV Calibration*: push the knob to get into the calibration window. See the chapter calibration window for details.
- *MIDI SysEx dump*: push the knob to open a new window to export and import patterns via MIDI SysEx

Sync the QSQ with other devices

If you want the QSQ to follow other devices, there are three options:

- Clock input, with or without the Start inputs
 - Clock input only: In the Settings - SYNC menu 'CLOCK IN ignore START IN' must be set and then the QSQ runs as long as it receives a clock.
 - Clock input + Start input:
- USB MIDI
 - Connect the QSQ via USB to your PC a USB MIDI Host. The QSQ can only act as a MIDI Device. QSQ reacts to Midi Real Time Messages, which means Start, Stop, Pause and Clock and Voice Messages, see 'Midi Track Window'.
- TRS MIDI
 - The MIDI input and output jacks can support both MIDI A and B standard. To support both there are 4 jumpers on the back of the QSQ: 2 for the input and 2 for the output so you can change them individually.

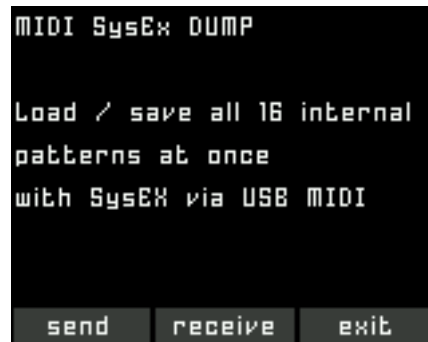
Clock smoothing

Incoming clock signals, especially from MIDI, jitter and can be pretty inconsistent. We want the QSQ to work with a lot of other devices, so the incoming clock is smoothed and adjusted so you don't have to worry about it.

The more the incoming clocks are smoothed, the slower QSQ will respond to tempo changes. There is a trade-off between stability and fast reaction to tempo changes. So if you want the QSQ to react faster to tempo changes, you can change the clock smoothing.

By default, the incoming MIDI clock is smoothed *a lot* and the CLOCK In *minimal*. You can change that in the Settings - SYNC menu and check which settings suit your setup.

MIDI SysEx dump



In this window patterns from the internal memory can be exported and imported via USB MIDI SysEx. All 16 patterns, also called one bank, which are currently in the internal memory can be sent and received. Using the TRS MIDI is not supported.

To get into this window go into the settings (hold the utility knob and let it go) and scroll down to *MIDI SysEx dump* and press the knob again.

For this you need software on your computer, which can send and receive MIDI SysEx messages. there are different free options. E.g., for Mac there is SysEx Librarian <https://www.snoize.com/SysExLibrarian/>, and for Windows there is MIDI-OX <http://www.midiox.com/>, e.g. see the tutorial: <https://www.presetpatch.com/articles/saving-patches-and-banks-with-midi-ox>. For other OS and alternatives see <https://www.martintarenskeen.nl/syxdump.html>.

QSQ overall sends each pattern as one SysEx messages, so in total 16 messages are sent. Depending on the application you are using this has to be taken into account, e.g. with SysEx Librarian 'Record Many' must be used receive all messages. In total QSQ sends 114 KB.

To send the internal bank set the MIDI Interface to 'QSQ Midi2CV', arm your application to receive data and press *send* on the QSQ.

To receive one bank press *receive* on the QSQ and send the data with your application to the QSQ. If everything worked fine *FINISHED* is shown.

While sending or receiving the QSQ does not react to any button presses. If anything fails *ERROR* is shown or when nothing happened after while, 90 seconds when receiving and 20 seconds when sending, the QSQ shows *TIMEOUT*.

Attention: If you want to back up banks from the Flash memory you first have to go into the memory window and load them into internal memory. This workflow is a little complicated, this is because loading and storing data in the Flash memory with the used RP2350 microcontroller is also complicated, sorry for that.

Update

To Update the firmware of the QSQ you need a PC or Mac and a USB cable. The firmware is a .uf2 file and there is no extra software needed as the QSQ shows up as a storage device in the update process. You can check the current version of the firmware in the settings menu. To get there press the *UTILITY* Knob for more than 250ms and let it go. Then go to *System* and then the first entry shows the *Version*.

Just follow the steps:

- 1 Unscrew and switch the power from the QSQ / your modular off
- 2 Connect QSQ with computer via usb
- 3 Hold the button on the back of the QSQ while turning the power back on
- 4 You can let the button go
- 5 On The computer a new device shows up (RP2350)
- 6 drag and drop the firmware into the device
- 7 Done

Calibration View

Calibrate the CV outputs so that they go exactly from 0 - 10V in the first two pages and a third page for the CV input.

Attention: Do not change anything here unless you're sure what you're doing. The QSQ is factory calibrated. If you don't have a voltmeter, don't do anything here. (You cannot damage anything, but you can make your tuning messed up)

If you're not sure if the calibration might be messed up, then you can use a voltmeter, attach it to a CV output, change the *UNIT* (second page in *para* window) and change the CV and see if the value you set is the same you can measure with the voltmeter.

Setup

- Voltmeter connected to one channel, measure dc voltage
- Read measured value and turn coarse and fine Knobs for the channel until you read 0V / 5V, this depends on the page 1/2 buttons.



- Knobs (4x4)
 - turn: change channel output value
- Buttons
 - 1 / 2: switch output voltage between 0 and 5V
 - save: Save and overwrite the calibration for all 8 cv outputs
 - exit: go back to settings

To calibrate the CV input go to the third page and follow the instructions on the screen. When there is an error shown, no cable is connected to the CV input.

Note: the CV input has a small voltage offset, wich is automatically calibrated at boot when there is no cable connected to the CV input.

At the end of the calibration save the changes: push *save*.

Firmware changelog

v1.3

New features

- Random LFO: Sample and hold, with adjustable rate and optional quantization
- Tuner: The CV input can be used as a tuner
- MIDI: New setting option so that MIDI continue messages reset the sequence
- CV output meter: each track can show an output meter to have visual feedback. Can be switched on and off for each track in the settings.
- MIDI SysEx Dump: import and export the internal bank via MIDI
- New play modes
- Generate CV and rhythms with two new generators
- The step parameter chance has additional values, 1:2 to 8:8
- More hold times for MOD: VCA Mode, additionally the hold times are displayed.

Fixes

- Modulation via CV input is now processed faster. When modulating the cv of one track with another track, a delay in the modulation could be audible.

v1.2.1

Fixes

- USB MIDI could sometimes not work when a USB cable was connected while booting

v1.2

New features

- MIDI to CV Interface
 - Root and Scale parameters are now only accessible in the *para* window
 - Voice allocation is now changeable
 - Sustain pedal MIDI messages are now processed
 - Legato parameter added
 - Voice stealing for more than one voice always uses the oldest one
- New track type: MIDI Recording
- New setting for a CV offset for the MIDI to CV conversion
- In the CV/Gate track window: when pushing one of the knobs 1-16 and the selected parameter is not cv or gate the step is now activated when the step was not. In the older firmware only the selected parameter could be turned on/off but not the step itself.
- 3 new scales: harmonic minor, minor blues and major blues.
- Pressing the utility button closes all edit windows
- When editing a step pushing the knob again copies the steps value to all active steps

Fixes

- There could be hanging gates with MIDI to CV when sending a sequence from another sequencer
- TRS MIDI could only receive on the first channel
- Copy and paste of steps did not work properly when nudge was used.
- When starting a song in the first loop of the song the first pattern change could come too early
- CV modulation (LFO and envelopes) did not use microtiming correctly in all cases
- CV out can be calibrated now.
- Refined knob sensitivity to ensure on-screen menus only appear when you're actually making an adjustment
- An increased button press duration is recognized as a Hold to prevent unintentional activations.
- Increased font size for track numbers for better readability

v1.1

New features

- More PPQN values for Clock In and Out: 6, 8, 16
- New setting: Start input can be used to reset the sequence
- Smoothing of the incoming clocks can be changed between: *minimal*, *moderate* and *a lot*.
 - The default value for Midi clocks is *a lot*
 - For analog clock it is *minimal*
- The transpose parameter also affects Midi tracks
- Visual indication added when changing patterns

Fixes

- Midi out didn't send one clock every 2 minutes
- The first slot in Song mode was only played once in the first loop of the song
- When synced externally and when changing between patterns sometimes QSQ could go out of sync
- When synced externally and no clock was present for around 10-30 minutes and then starting again there were problems with synchronization.