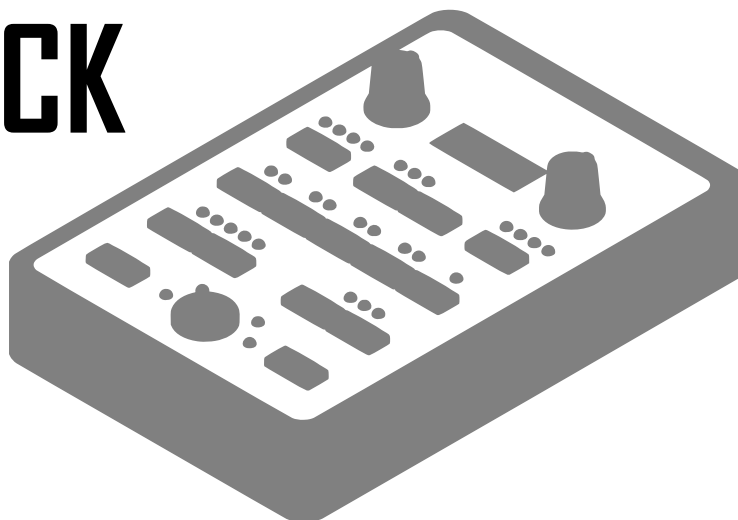


ESSEA.....DEVICES

HYBRID CLOCK

MANUAL FIRMWARE 1.6



THANK YOU & WELCOME!

The Hybrid Clock closes the gap between DJ setups and studio equipment.

It's build to make hybrid DJ- and LIVE- sets simple by synchronizing and manipulating different clock types.

Some features are:

- master clock for CDJs, Ableton Link, MIDI gear, eurorack, Roland DIN or pocket operators.
- synchronize itself to CDJ's, Link or precise audio clock input from a DAW.
- customisable swing presets, a MIDI looper and FX generator.
- adjustable offsets between most sources.
- clock can be tapped, nudged, beat-shifted, half- or double- timed and freely restarted.
- highly configurable via web browser.

The Hybrid Clock is a unique boutique product, handcrafted and limited to 30 units.

Thank you for your purchase and trust in this project!

Steffen Esser

GLOBAL	1
CDJ	2
LINK & INTERNAL	3
AUDIO SYNC	4
SWING EDIT	4
LOOPER	5
MENU	6
OFFSETS & HIERARCHY	7
ABOUT ETHERNET	7
ABOUT WIFI	7
CONTACT	7

Attention! Disclaimer..

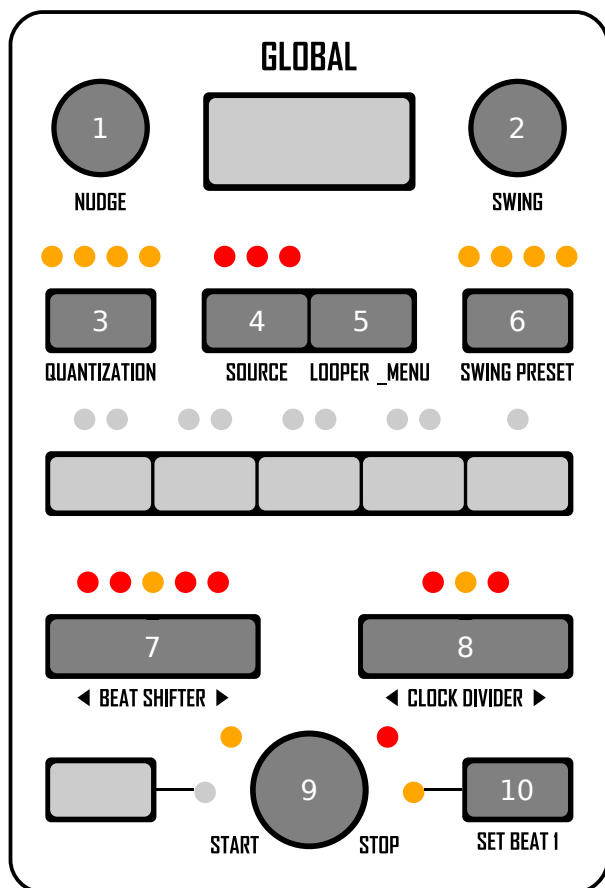
CDJ synchronization is only working with separate CDJs (Pro Link) and NOT with consoles with integrated mixer and player.

I tested MIDI swing and song position pionter effects primary with Machinedrum, Octatrack and MPC1000 and it should work with most MIDI sequencers.

I did what's possible to build a well working product, but the sale takes place under exclusion of any liability or warranty. The product owner is responsible for the safe and legal use of it.

However, if there's a problem, please contact me and we will find a solution!





7 ◀ BEAT SHIFTER ▶
Shift clock output by 1 or 2 16th

8 ◀ CLOCK DIVIDER ▶
Half / double time

1 NUDGE
Offset between HBC and:
- *CDJs* in *CDJ* mode
- *LINK* session in *LINK* mode
- *AUDIO* input in *AUDIO-SYNC-IN* mode
- *SYNC OUT* in *INTERNAL* mode

2 SWING
Swing amount negative and positive

3 QUANTIZATION
1 beat, 1 bar, 2 bars or 4 bars

4 SOURCE
Select mode / HBC clock source

5 LOOPER_MENU
Enter / exit *LOOPER*
_Long press to enter / exit *MENU*
In *MENU* enter / exit menu item

6 SWING PRESET
Cycle thru presets
_Long press to enter / exit *SWING EDITOR*

9 START STOP
Starts and stops clock output
_Long press for panic stop

10 SET BEAT 1
Sets the first quantization beat on the next beat.
Hold and press **[START STOP]** will directly set the first beat and restart the clock.

INS AND OUTS:

- Left: **AUDIO SYNC IN**
For audio pulses from a soundcard (3V max!).
There is a suitable click.wav for your DAW in the support files.

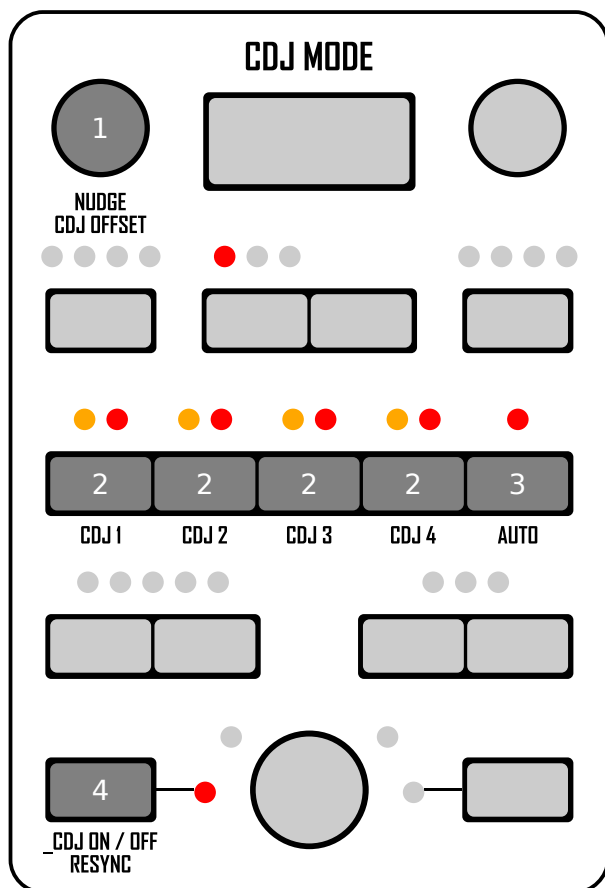
- Right: **5V SYNC OUT**
5V pulse - clock and reset for Roland DIN or eurorack sync.
The SYNC output is highly configurable via the *WEB CONFIG*.
The ticks per beat can also be changed in the *MENU*.
A offset can be applied via the **[NUDGE]** potentiometer when in *INTERNAL* mode.

- Back: **AUDIO SYNC OUT**
The audio pulses can be used with pocket operators, for example.
The ticks per beat can be changed in the *MENU* or *WEB CONFIG*.

- Back: **MIDI IN / OUT**
If *THRU* is enabled via the *WEB CONFIG*, all transport messages are filtered out.
There are also some options for the clock output.

- Back: **ETHERNET**
Normally connected to other *CDJs* via a switch.
Can also be used for *LINK*.
Some configuration may needed if connected directly to a computer or router. (see page 7)

- **WIFI**
To use the WiFi connection, it must be configured via the *WEB CONFIG*.
It is used for *LINK*, configuration and firmware updates.



- 1 **NUDGE**
Offset between HBC and other CDJs
- 2 **CDJ 1-4**
Select CDJ-to-follow / set CD-BOSS in AUTO mode
- 3 **AUTO**
Manual or automatic CDJ-BOSS / CDJ-to-follow selection
- 2 + 3 Select the CDJ to make it the CDJ-BOSS while holding the **[AUTO]** button when not in AUTO mode
- 4 **RESYNC & _CDJ ON / OFF**
Switch / synchronize to the selected CDJ-to-follow when not in AUTO mode, after an offset is created via **[NUDGE]** and **[SET BEAT 1]** buttons or the BPM was changed locally.
_Long press to connect to the *CDJ* session.

_Long press **[RESYNC]** to connect to the *CDJ* session.

-> normal mode:

Enable **[AUTO]**, select HBC as CDJ-BOSS, enable SYNC on the CDJs.

The CDJs will follow all changes, from the HBC (*LINK*, *INTERNAL* or *AUDIO* input).

If the CDJ-BOSS is changed to one of the CDJs by pressing the button on the CDJ or selecting it on the HBC, the HBC will follow it and block changes from *LINK*. If the actual CDJ-BOSS stops playing, another CDJ or the HBC will get CDJ-BOSS.

-> follower mode:

Disable **[AUTO]**, choose the CDJ-to-follow and press **[RESYNC]** to follow / synchronize to it. *1

The HBC will ignore the BOSS-state of the CDJs and will not take the BOSS-state away if the actual CDJ-BOSS stops playing.

This mode is generally more suited if the HBC should not affect the DJ session by taking the BOSS-state away, the DJ is not syncing CDJs or the beat grid of the actual CDJ-BOSS is not right.

It decouples the HBC from the CDJ-BOSS -system.

The CDJ-BOSS can still be changed on the HBC by holding **[AUTO]** and selecting a CDJ.

*1: If the HBC is following a CDJ which is following another CDJ, the timing will get worse!

Use the **[NUDGE]** potentiometer to adjust the offset relative to the CDJs beat grid. - This also offsets the other CDJs beat grids when the HBC is CDJ-BOSS.

Set the first beat of the quantization by pressing the **[SET BEAT 1]** button.

If the beat grid is exact one off or one 16th away, use the **[BEAT SHIFTER]** to compensate for that.

If the beat grid is totally off but the tempo is right, set the first beat directly by holding **[SET BEAT 1]** and pressing **[START]**.

The HBC will still synchronize to the CDJ-BOSS, but the now created offset is taken into account.

This offset can be fine adjusted by nudging in *INTERNAL*, *AUDIO-SYNC-IN* or *LINK* mode (**[CDJ 2]** and **[CDJ 3]** buttons).

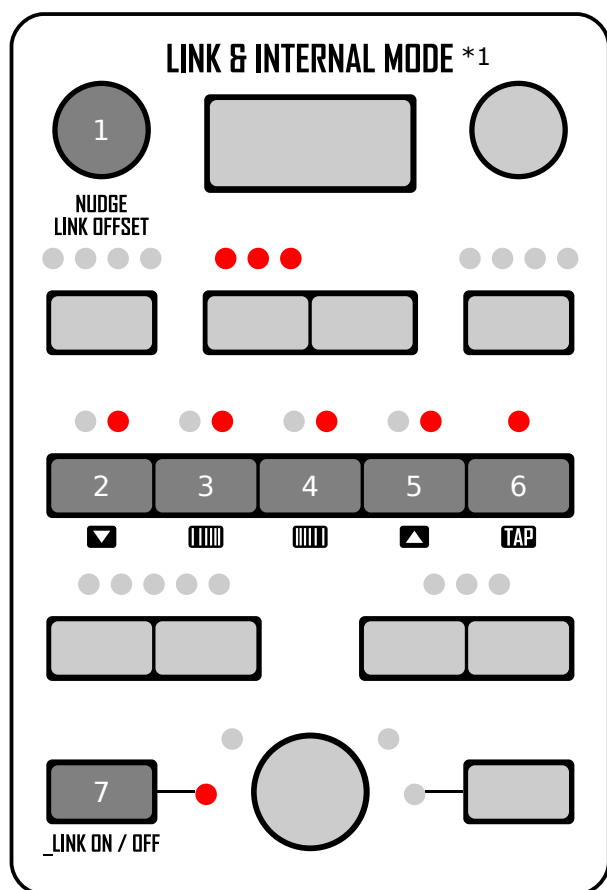
It only gets resetted by pressing **[RESYNC]** - even when **[AUTO]** is used!

If the BPM is wrong or not present, switch to the *INTERNAL*, *AUDIO-SYNC-IN* or *LINK* mode and adjust the BPM manually (**[CDJ 1]** and **[CDJ 4]** buttons).

This will stop the HBC from following the CDJ-BOSS and turns off **[AUTO]**.

- **[RESYNC]** must be pressed in CDJ mode to sync to the CDJ-BOSS again.

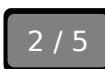
- **[AUTO]** should be enabled again, if used before.



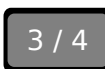
NUDGE

Offset between HBC and:

- *LINK* session in *LINK* mode
- *AUDIO* input in *AUDIO-SYNC-IN* mode
- *SYNC OUT* in *INTERNAL* mode



▼ ▲ (buttons **[CDJ 1]** & **[CDJ 4]**)
BPM UP / DOWN _hold speeds up changes



||||| ||||| (buttons **[CDJ 2]** & **[CDJ 3]**)
PUSH / PULL _hold speeds up changes



TAP (**[AUTO]** button)
Tap the BPM.
_Long press to start a new BPM tap measurement.
The first beat and play will be set on the fifth tap.



_LINK ON / OFF (**[RESYNC]** button)
_Long press to start or stop *LINK* session.

*1 If in *AUDIO-SYNC-IN* or *CDJ* mode and that mode is off, buttons 2-6 will behave like in *LINK* and *INTERNAL* mode!

_Long press **[RESYNC]** to connect to the *LINK* session.

Use the **[TAP]** button to tap in the tempo. *2

_Long press **[TAP]** before tapping and the average BPM is resettet, the first beat will be automatically set at the fifth tap and the clock starts playing.
More taps will be compared to the last average until it get's resettet again.

Adjust the BPM with the **[CDJ 1]** (down) and **[CDJ 4]** (up) buttons. *2
Nudge the clock with the **[CDJ 2]** (pull) and **[CDJ 3]** (push) buttons. *2

*2 Not usable when synced to *AUDIO* input.
When synced to another *CDJ*, adjusting the BPM will disconnect the HBC from following the *CDJ*.
Nudging the clock will create an offset to the *CDJ*, but it will still sync itself to the *CDJ*.

Normally *LINK* apps and the HBC will align themselves every 30 seconds to each other.
But the HBC will NOT align itself to- and receive BPM changes from *LINK* apps when:

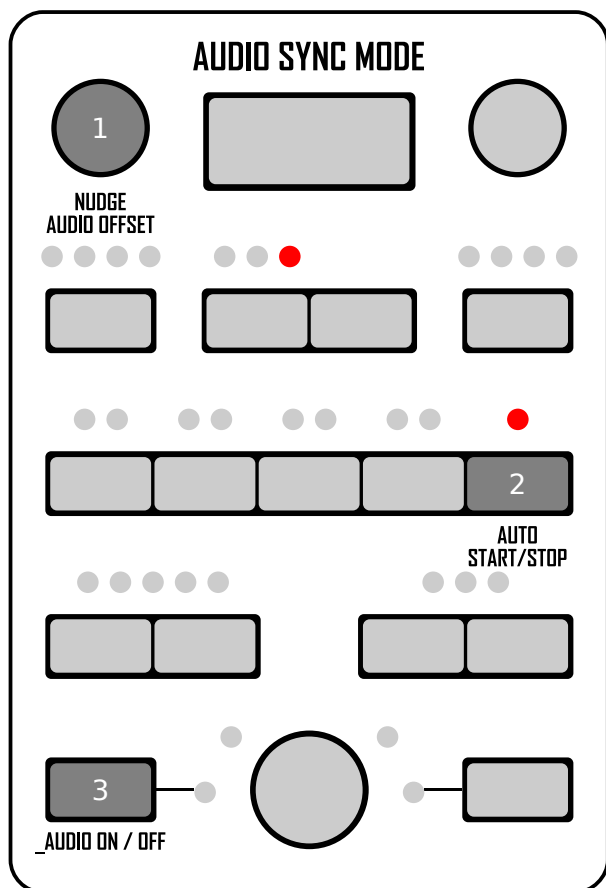
- it is synced via *AUDIO*
- it is following another *CDJ*
- it is in *INTERNAL* mode

Any BPM changes will then be ignored and reverted, to let the HBC stay the BOSS of the *LINK* session and not get influenced by other *LINK* apps.
However other apps are still synchronizing themselves to the HBC and each other.

If *LINK* has problems getting connected via WiFi and a combined 2.4 and 5 GHz WiFi network is used. Try to separete them and / or use the 2.4 GHz only.
See "About WiFi" on the last page for information.
To find a place with good WiFi reception, the RSSI value can be displayed via the *MENU*.

It is also possible to use *LINK* without a router.
Change the WiFi setting from station to accesspoint in the *MENU* or the *WEB CONFIG* and use the own WiFi network of the HBC.
SSID: HybridClock PASS: 987654321xx
(Can be changed in the *WEB CONFIG*)

LINK also works via ethernet. Change the setting from WiFi to ethernet in the *MENU* or the *WEB CONFIG*.
If the HBC is connected directly to a computer or a switch, it may be necessary to configure the computers network settings.
(IP 192.168.0.xxx - Subnetmask 255.255.0.0 - Gateway 192.168.0.1)
If a router with DHCP is used, enable DHCP on the HBC and it will get an IP assigned by the router.



NUDGE

Offset between HBC and audio input



AUTO START / STOP

Automatic start and stop with the audio input



AUDIO ON / OFF (button [RESYNC])

_Long press to start or stop *AUDIO-SYNC-IN* mode

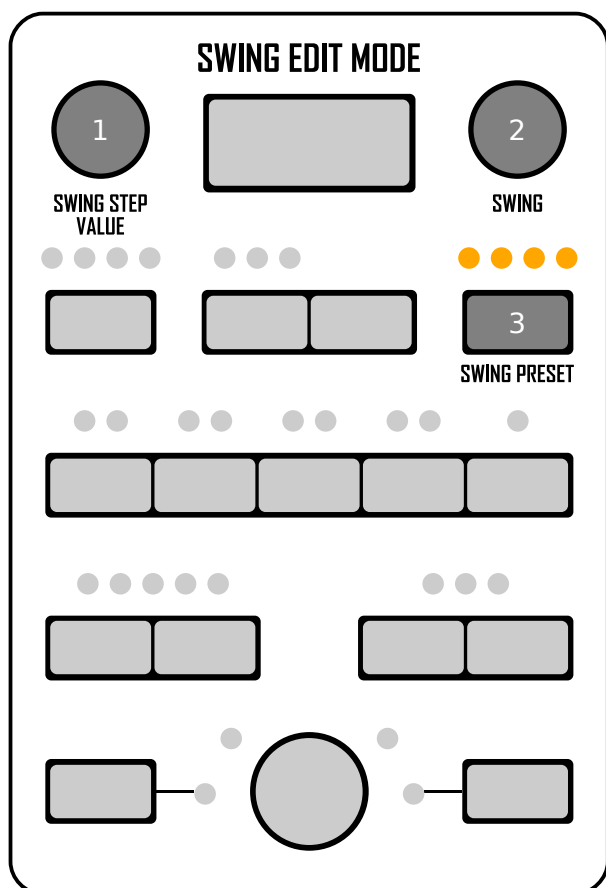
_Long press [RESYNC] to start *AUDIO-SYNC-IN* mode.

When enabled, the [TAP], [BPM] and [NUDGE] buttons are disabled. Otherwise this mode behaves like the *LINK* or *INTERNAL* mode.

If [AUTO] is on, the HBC will automatically start and stop when new trigs are received after a break / no trigs are received anymore.

The input trigs per beat can be changed in the *MENU* or the *WEB CONFIG*.

The input is only compatible with audio clicks (max 3V)!
If the clock is unstable, adjust the output volume of your sound card channel. I use the trigger pulse sample at -6db in ableton.
Also there's a potentiometer on the back under the sticker to trim the input level, but it's already adjusted properly.



SWING STEP VALUE ([NUDGE] potentiometer)

Change the swing amount for the selected step



SWING

Swing amount negative and positive



SWING PRESET

Select the second 16th, off beat or third 16th

_Long press to enter / exit the *SWING EDITOR*

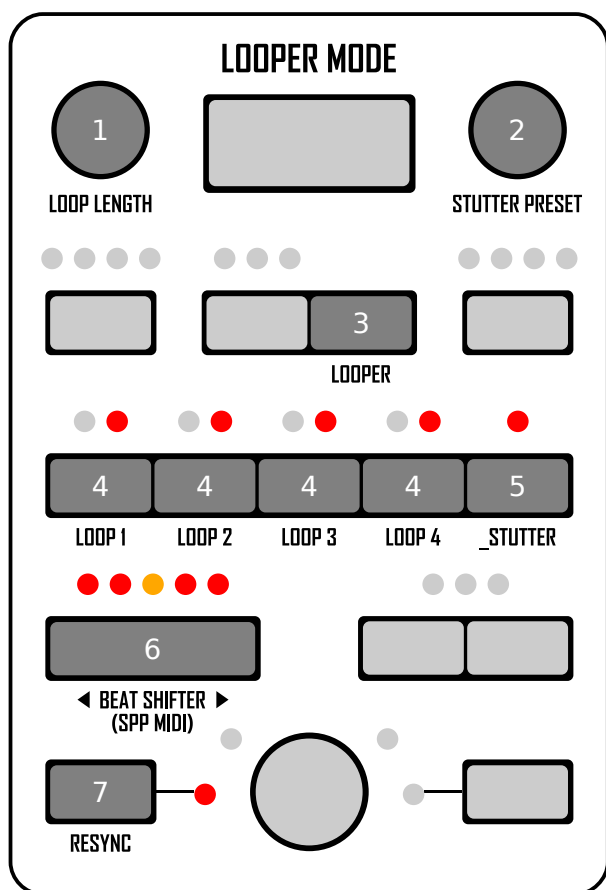
_Long press [SWING PRESET] to enter the *SWING EDITOR* and edit the active preset. The LED of the preset to edit is blinking.

Step thru the second 16th, off beat and third 16th with the [SWING PRESET] button and change the swing amount with the [NUDGE] potentiometer from -10 (earlier) to +10 (layed back).

_Long press the [SWING PRESET] button to exit the *EDITOR*.
The preset will be saved when leaving.

It may make sense to crank the swing amount to +10 via the [SWING] potentiometer to edit the preset with it's maximum influence.

Swing is generally computed to be in the possible BPM range of the BPM minimum and maximum settings.. meaning that aggressive swing may be reduced in high BPM ranges or with double time [CLOCK DIVIDER] to prevent too fast clock pulses.



- 1 **LOOP LENGTH** ([NUDGE] potentiometer)
Change the loop length of the active preset in 16th.
- 2 + 5 **STUTTER PRESET** ([SWING] potentiometer)
Change the actual stutter preset while holding the [AUTO] button.
- 3 **LOOPER**
Enter / exit *LOOPER*
- 4 **LOOP 1-4** (buttons [CDJ 1-4])
Activate loop presets 1-4
- 5 **_STUTTER** (button [AUTO])
_Hold to temporary activate the stutter effect.
- 6 **◀ BEAT SHIFTER ▶**
Shift the MIDI song position pointer by 16th
Pressing booth resets the shifted position.
- 7 **RESYNC**
Reset everything to the original timeline position and disable any active loop.

Press the [LOOPER] button to enter the *LOOPER*.

Select one of the four loop presets with the [CDJ 1-4] buttons to activate a midi loop.
Use the [NUDGE] potentiometer to change the length of the active loop (in 16th).

_Hold the [AUTO] button for a 16th stutter effect.
While holding the [AUTO] button another stutter preset can be selected with the [SWING] potentiometer.

The length of the loop presets and the selected stutter preset will be saved when leaving the *LOOPER*.

The [BEAT SHIFTER] can shift the MIDI song position of the sequencer by up to +-8 16th notes and also changes the loop position while a loop is activated. Pressing both [BEAT SHIFTER] buttons together will quickly reset the sequence position.

Press [RESYNC] to exit the loop and reset the sequence position.

Note: The Looper is only effecting the MIDI output and the MIDI device needs to be able to work with song position pointer messages.

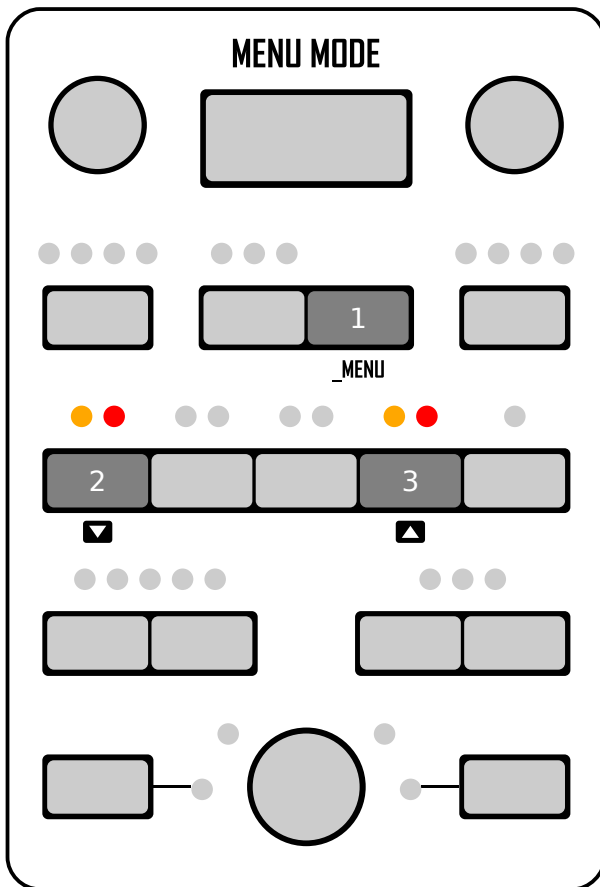
The sequencer quantization needs to match the quantization of the HBC and will probably not work right in any sequencer song modes.

I tested this feature with Octatrack, Machinedrum and MPC1000.

Some devices need an additional MIDI continue message - this can be enabled in the *WEB CONFIG*.

STUTTER PRESETS:

- 0 : 16th STUTTER HOLDING
- 1 : 16th STUTTER CHANGING EVERY OFF
- 2 : 16th STUTTER CHANGING EVERY BEAT
- 3 : 16th STUTTER CHANGING EVERY 1.5 BEAT WITH QUANTIZED RESET!
- 4 : RANDOM 16th
- 5 : 16th STUTTER CHANGING TO A RANDOM 16th EVERY BEAT



1

_MENU

Enter / exit the submenu

_Long press to enter / exit the *MENU* mode

2 / 3



(buttons **CDJ 1** & **CDJ 4**)

Menu up / down

_Long press the **[MENU]** button to enter the *MENU* mode.

To go up in the menu use the **[CDJ 4]** button - to go down use the **[CDJ 1]** button.

To enter the sub-menu press the **[MENU]** button.
Change the setting with the **[CDJ 1]** and **[CDJ 4]** buttons.
To exit the submenu press the **[MENU]** button again.

_Long press the **[MENU]** button to exit the *MENU* mode.

To use the *WEB CONFIG*, go to "CONF" in the menu and press the **[MENU]** button. Use a mobile or computer connected with the same WiFi, the HBC is connected to (or use the access point of the HBC).
Enter the IP in the browser displayed on the HBC.

The access point login can be changed in the *WEB CONFIG*.
The default network is: "HybridClock" Password "987654321xx"

MENU STRUCTURE:

CONFIG

(Enter the IP in your browser to use the WEB CONFIG)

WIFI

- > STA (station - connect to your WiFi network)
- > AP (access point - Hybrid Clock's own WiFi)
- > RST (resets the access point to default login values)

RSSI

Shows the signal strength of the WiFi network the HBC is connected to. (-80 bad ... -40 very good)

DHCP (Ethernet)

- > On (when a router is used)
- > Off (static IP, when a switch is used)

CDJ ID (ID of the Hybrid Clock in the CDJ network)

- > 1 - 4 (automatically changes if the ID is used by another CDJ!)

LINK CONNECTION

- > WiFi -> Ethernet

LINK START / STOP

- > Off -> On -> send only -> receive only

AUDIO SYNC IN TRIGS (audio pulses per beat)

- > 1 -> 2 -> 4 -> 24

AUDIO SYNC OUT TRIGS (audio pulses per beat)

- > 1 -> 2 -> 4 -> 24

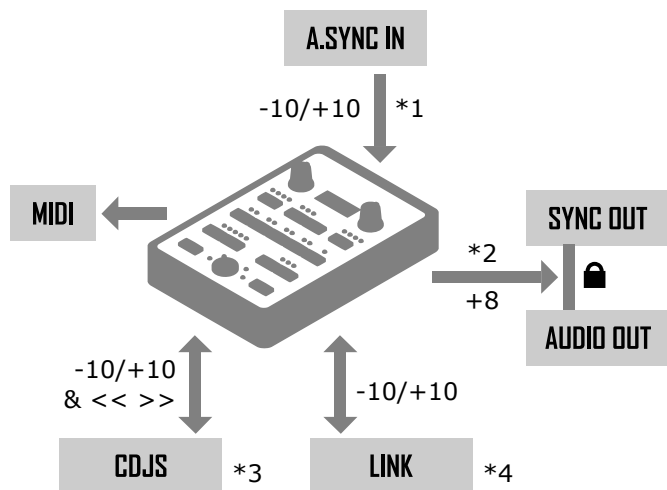
SYNC OUT TRIGS (5V pulses per beat)

- > 1 -> 2 -> 4 -> 6 -> 8 -> 12 -> 16 -> 24

LEDS (LED brightness)

- > 0 - 16

OFFSETS & HIERARCHY



*3 - If the HBC is synced to another CDJ and it's nudged in *INTERNAL*, *AUDIO-SYNC-IN* or *LINK* mode via **[CDJ 2]** or **[CDJ 3]** buttons - or the clock's first beat was freely set via the **[SET BEAT 1]** button, it will still follow this CDJ but uses the now created offset.

- **[RESYNC]** must be pressed to get rid of this offset.

If the BPM is changed in *INTERNAL*, *AUDIO-SYNC-IN* or *LINK* mode, the HBC stops syncing to the CDJ-BOSS and disables the **[AUTO]** function.

- **[RESYNC]** must be pressed in *CDJ* mode to sync to the CDJ-BOSS again.

- **[AUTO]** should be enabled again, if used before.

*1 - If the HBC is synced to *AUDIO-SYNC-IN* it will revert any changes made in other modes and it will get and stay CDJ-BOSS for the other CDJs. The **[TAP]**, **[BPM]** and **[NUDGE]** buttons are disabled.

*2 - A SYNC OUT offset can be applied in *INTERNAL* mode with the **[NUDGE]** potentiometer. The AUDIO SYNC OUT is locked to the 5V SYNC OUT.

*4 - If the HBC is synced to *AUDIO-SYNC-IN* or another CDJ (meaning it's not CDJ-BOSS) it will revert any BPM changes from - and it will not align itself to - other *LINK* apps.

To make sure the other apps are aligning themselves to the HBC, it's advised to start *LINK* on the HBC first.

(This is not a must with most *LINK* apps, but some will not align themselves if started before other apps.)

ABOUT ETHERNET

If a router is used, it normally has DHCP (Dynamic Host Configuration Protocol) enabled. That means it will take care of assigning an IP to the connected device.

If a switch is used, DHCP isn't available, no static IP is assigned or two devices are connected directly to each other, most devices will use APIPA (Automatic Private IP Addressing) to assign an IP itself.

If a device (PC for example) isn't using APIPA and DHCP isn't available a static IP must be set.

In this case use a static IP in the range of 169:254:0:1 to 169:254:255:254, the subnet mask 255:255:0:0 and gateway 0:0:0:0.

CDJs are using APIPA if no DHCP is available - so does the Hybrid Clock, but DHCP can also be disabled in the HBC if always used without it.

Since some routers (and managed switches) are taking care of processing the network data between devices and have all sorts of security options which can get in the way of stable and fast communication, the use of a simple (unmanaged) switch is often more reliable / hassle free.

ABOUT WIFI

There are two network standards: 2.4 GHz and 5 GHz. The HBC is only using 2.4 GHz networks.

Most modern routers will take care of the communication between devices in combined networks, but this is not always working flawlessly. It's possible that different *LINK* apps can't see each other.

It's recommended to only use a 2.4 GHz or two separate WiFi networks within the router and connect all *LINK* apps to the 2.4 GHz network.

Also, some routers are disconnecting devices every x minutes or refusing to send broadcast messages, unfortunately there's not much we can do about it, if the router has no advanced options for that.

CONTACT

STEFFEN ESSER
WECKENSTR. 2 | 30451 HANNOVER | GERMANY
esserdevices.com | esserdevices@gmail.com

copyright ESSER DEVICES 2024