CV_LOOPER USER MANUAL

Contents:

Overview

The Nexus Instruments cv_looper is a 4 track cv recorder with tempo syncing capabilities and loop management/manipulation features. Any 0-5V cv or gate signal can be sampled and manipulated. All four tracks have separate loops with a separate record button and loop output. All features are accessed via a single knob and a set of buttons, including a SHIFT button that allows enables features. This allows a large number of features to be packed into a relatively small interface.

Either internally or externally generated CV can be recorded. The source is selected using the 'SHIFT+cvsrc' function. Using the internal CV source means sampling a 0-5V signal based on the position of the knob, whereas external source means that the signal at the input is being sampled. Note that input signals must be between 0 and 5 V to be sampled! Anything outside of this range will be clipped by the input protection circuitry.

All signals are sampled at a tempo-dependent rate of 96 samples per quarter note. A low-pass filter on the CV input removes any very high frequency noise, but will still allow other signals that are above the sample rate. As a result, audio signals will not be correctly sampled, instead sampling will result in highly aliased noise signals.

Panel Controls

1) Main knob – controls CV value and other options.

2) IND LED 1 – displays current input CV value and source. Purple is internal CV, Blue is external CV.

3) IND LED 2 – displays current input Clock source. Purple is internal CV, Blue is external CV.
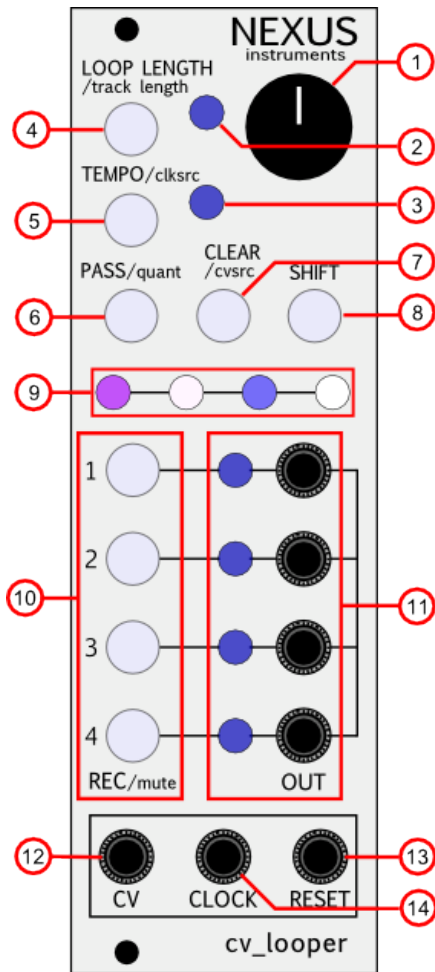
4) LOOP LENGTH/track length – holding button engages loop length mode, SHIFT+pressing activates track length mode. Main knob controls length in both modes.

5) TEMPO/clksrc – holding and turning knob sets tempo. SHIFT+pressing switches clock source.

6) PASS/quant – holding and pressing a REC button activates pass mode for the corresponding track. SHIFT+pressing switching quantize mode on and off.

7) CLEAR/cvsrc – holding and pressing a REC button activates mute mode for the corresponding track. SHIFT+pressing switches the CV source.

8) SHIFT – pressing another button while shift is engaged activates shift function. Holding shift button activates the Operation Mode Menu.

9) Beats display – displays current loop position. Purple represents measures, blue represents beats.

10) REC/mute – holding engages record mode for corresponding track. SHIFT+pressing mutes corresponding track

11) CV outputs – outputs recorded CV signals for corresponding track. LED always represents that tracks output value.

12) CV input – accepts external 0-5V CV signal for sampling.

13) Clock input – accepts clock signal (24 or 4 PPQN) (rising edge).

14) RESET input – accepts reset signal (rising edge).

Recording Procedure:

Each of the 4 tracks can have it's record mode engaged separately. While record is engaged, the currently selected input (either the onboard knob or the external CV input) is continuously sampled and saved to the corresponding track's CV Loop.

The CV source is selected using the 'SHIFT+cvsrc' command. The color of the IND LED 1 represents the current source. Purple represents internal CV source (knob), and blue represents an external CV source. Externally recorded CV signals must be within a 0-5V range.

Recording can be engaged by pressing one of the four record buttons. During standard operation, any track that is recording will have its corresponding record button lit. While a track is recording, it's corresponding CV loop will be continuously overwritten with the value of the selected input for as long as record is engaged.

Depending on the Record mode, the record button will behave differently. In 'HOLD' mode, Record is engaged while a record button is depressed, and disengaged when the record button is released. In 'ONE LOOP' mode, recording is toggled on upon depressing a record button, and toggled off either when the record button is depressed a second time, or when one full loop has been recorded (decided by the corresponding track's track length). For information on changing record modes, see the OPERATION MODE MENU section.

The CV being recorded can be chromatically quantized before being saved to a CV buffer. This is useful for using the knob to create pitched sequences, or for turning input CV into arpeggiated signals. Quantize mode can be engaged and disengaged using the 'SHIFT+quantize' command. When it is engaged, the second LED from the top will flash red. When disengaged this LED will flash blank.

Altering Master Loop Length:

CV loops can vary in length. These lengths are synced to the current tempo, and can be altered at any time. The current position in the loop is represented on the 4LED beat/measure display. The purple LED represents the current measure (1-4) and the blue LED represents the current beat (1-4).

The main length of the sequence can be altered via the Loop Length button. Length selection mode is engaged by holding down the Loop Length button, and the selected length is applied upon releasing the button. While length mode is engaged the currently length is selected via the knob and represented on the 4LED beat/measure display.

Just as in normal function, blue LEDs represent beats, whereas purple LEDs represent measures. e.g., two blue LEDs represents a length of two beats, four blue LEDs means 4beats/1measure, 2 purple LEDs means 2 measures. The one nontraditional length representation is that 1 purple LED and one blue LED represents 1 measure and two beats.

Altering Track Lengths

In addition to the master loop length, all tracks can have their own individual track sublength. If the track sublength is smaller than the master length, the sublength will be used for that track. If the track sublength is larger, the master length will be used. Track lengths are applied in the following manner:

Track Length Selection Mode is engaged via the 'SHIFT+track length' command. Once this command is input you will see the length button slowly flashing, indicating that you are in the correct mode. When this mode is engaged, you can use the knob to select the desired length, and the track record buttons to select which tracks the length will be applied to. When the track is set to have the tracklength applied, its record button will light up until the application is done. Once the length and tracks are selected, the operation can be confirmed by again pressing the flashing length button. As an example, you may engage the selection mode using the shift function, set the length to 2beats using the knob and press rec1 and rec2 buttons so that they are lit. At this point, confirming by pressing the length button again will switch the track length of tracks 1 and 2 to 2beats, while leaving the other track lengths unaltered.

Tempo Syncing:

The speed of the loops are synced to a tempo, which can be set either internally or externally. Whether the tempo is internal or external is determined by using the 'SHIFT+clksrc' command. IND LED 1 will change color depending on mode. Purple represents internal clock, and blue represents external clock.

When an external clock is being used the tempo is selected using the tempo button, although the way the button behaves depends on the current tempo mode set in the operation mode menu. See the section on operation modes for info about switching these. In 'Knob' mode, the tempo is selected by holding down the tempo button and turning the knob, and results in tempos ranging from 40-200BPM. In 'Tap' mode, the tempo is selected by tapping the tempo button at the desired speed, and can range from 40-240 BPM.

When in external clock mode, the clock input is read instead of the internal clock. This clock must be a continuous pulse train, set to one of two standard speeds, either 24ppqn DIN rate or 4ppqn (sixteenth notes) rate. Using the higher clock resolution will result in more accurate timing. For information on setting the expected clock rate, see the section on the Operation Mode Menu. When externally clocked, the tempo can range from 40-240 BPM.

Passing and Muting:

Each Track can be muted individually using the 'SHIFT+rec' command. Muted tracks will not pass out a voltage and will not record when the record button is pressed, until unmuted. Tracks can also be set to pass through the current input value, which is useful for monitoring the signal about to be recorded. This is done using the 'PASS+rec' command. Pressing a record button while pass mode is engaged will disengage pass mode and start recording. When either pass or mute mode is engaged, the corresponding rec button will be dimly lit. Engaging pass while mute is already engaged will switch the track from mute mode to pass mode, and vice versa.

Operation Mode Menu:

The operation mode menu contains options that change the core functionality of certain aspects of the cv_looper. It can be accessed by holding the SHIFT button for at least 4 seconds. When the menu is opened you will see the SHIFT button LED flashing on and off.

While the menu is open, pressing the CLEAR, PASS, TEMPO, and LOOP LENGTH buttons will alter the following functions:

Button	Option	Value (Blank)	Value (Lit)
CLEAR	Clock Rate	24ppn (DIN)	4ppqn (sixteenths)
PASS	Rec Mode	Hold to record	Press to record one loop (toggle)
TEMPO	Tempo Mode	Hold and turn knob	Tap tempo
LOOP LENGTH	Bit/Length Mode	10bit CV outputs, 2measure max	8bit CV outputs, 2measure max