INSTRUŌ | SPECIALIST SYNTHESIZERS

dàil

Quantiser

User Manual

Contents

Description

The Instruō dàil is a high resolution quantiser, precision adder, MIDI-to-CV interface, and USB MIDI Host with a very small form factor suitable for any system.

As a quantiser, scales can be defined locally as well as externally via MIDI. The USB Host port will accept and power class compliant devices offering convenience and immediacy to melodies and sequences.

As a precision adder, existing signals can be offset by any defined chromatic interval. Transpose anything with accuracy using the calibrated buffered throughput which runs parallel to the quantiser engine. This feature alone makes for a great companion to any sequencer or 1V/octave source within a system.

No longer is a single repeating octave of quantised notes a limitation. dàil features a fully bipolar quantiser engine through which any multi-octave spanning scale/chord/arpeggio can be engaged immediately from your MIDI keyboard. Patterns can also be programmed onboard with precision with the ability to auto fill from a wide range of major and minor starting points.

Small form factor, big feature set!
dàil will suit any scale of system adding flexibility and immediacy to your melodic needs.

Features

- Multi-octave pattern quantiser
- On-board and MIDI controllable scale programming
- Chromatic interval precision adder
- MIDI-to-CV interface
- USB MIDI host for class compliant controllers
- Includes 2 HP MIDI Expander
- Includes 5-pin DIN to TRS MIDI Type A adapter
- TRS MIDI Type A and Type B compatibility

Installation ▬

1. Confirm that the Eurorack synthesiser system is powered off.
2. Locate 4 HP of space in your Eurorack synthesiser case. Locate an additional, but optional, 2 HP of space in your Eurorack synthesiser case for the included expander.
3. If the optional expander is desired, connect the 8 pin side of the IDC expansion cable to the 2x4 pin headers on the back of the main module, confirming that the red stripe on the expansion cable lines up with the indicator on the main module.
4. If the optional expander is desired, connect the 8 pin side of the IDC expansion cable to the 2x4 pin headers on the back of the expansion module, confirming that the red stripe on the expansion cable lines up with the indicator on the expansion module.
5. If the optional expander is desired, connect the Expansion Back Jacks on the back of the main module and expander together with the included 3.5mm TRS Cable
6. Connect the 10 pin side of the IDC power cable to the 2x5 pin header on the back of the module, confirming that the red stripe on the power cable is connected to -12V.
7. Connect the 16 pin side of the IDC power cable to the 2x8 pin header on your Eurorack power supply, confirming that the red stripe on the power cable is connected to -12V.
8. Mount the Instruō dàil in your Eurorack synthesiser case.
9. Power your Eurorack synthesiser system on.
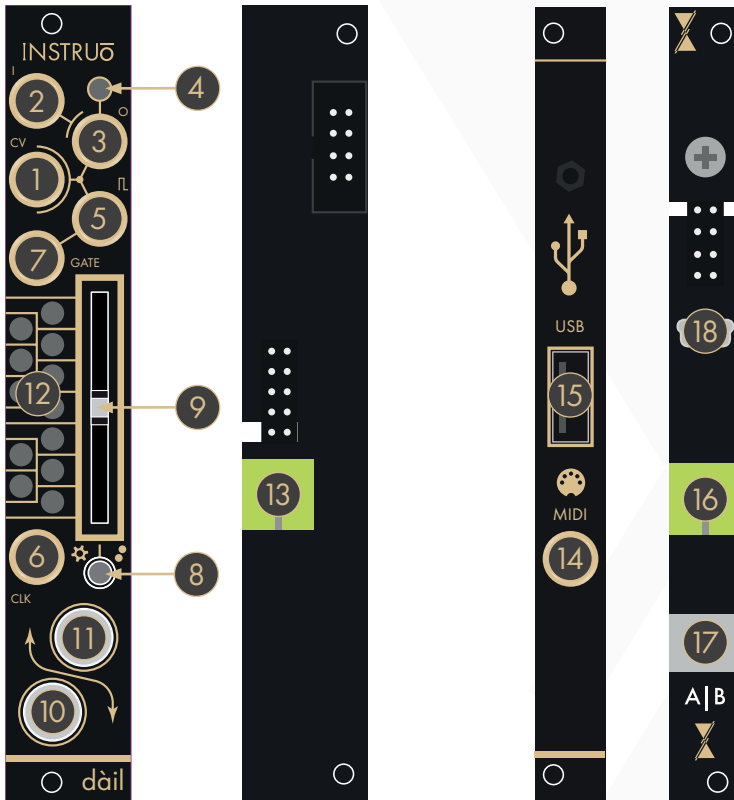
Note:
This module has reverse polarity protection.
Inverted installation of the power cable will not damage the module.

Specifications ▬

- Width: 4 HP + 2 HP MIDI Expansion Module
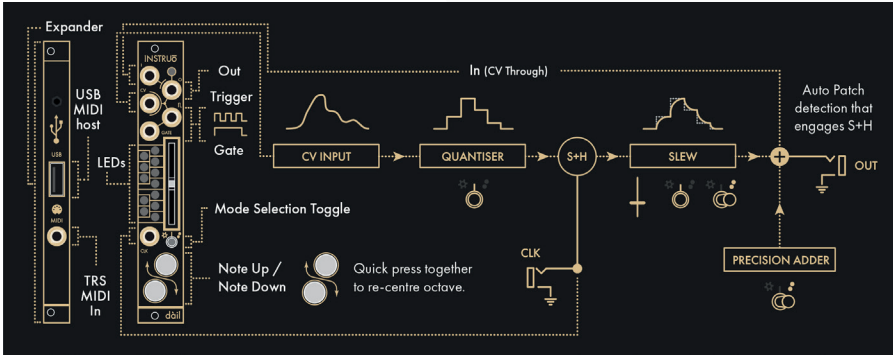- Depth: 32mm
- +12V: 100mA*
- -12V: 8mA

*Current draw on +12V will increase when powering a USB device.

dàil (verb) divide something into parts. (noun) a part of a whole.

Key

1. CV Input (CV)
2. Signal Throughput (In)
3. Output (Out)
4. Output Indicator
5. Trigger Output
6. Clock Input (Clk)
7. Gate Output
8. Interface Selection Toggle
9. Slider
10. Button 1
11. Button 2
12. Voltage Indicators
13. Expansion Back Jack
14. TRS MIDI Input
15. USB 2.0 Type A Port (USB)
16. Expansion Back Jack
17. A|B Switch
18. USB Type B Mini Port

dàil

CV Input (CV): The **CV Input** is a bipolar control voltage input for the quantiser.

- Control voltage present at the **CV Input** will be quantised to the programmed scale (See the Programming Interface section for more information).
- Input Range: -/+10V

Signal Throughput (In): The **Signal Throughput** is a bipolar control voltage input.

- Signals present at the **Signal Throughput** will sum with the voltage produced by the quatiser and can be used for transposition.
- The **Precision Adder** bias will sum at the **Output**.
- Input Range: -/+10V

Output (Out): The **Output** is a bipolar control voltage output that generates the summed signal of the quantised **CV Input** , the **Signal Throughput** and th **Precision Adder**.

- Output Range: -/+10V

Output Indicator: The **Output Indicator** provides LED illumination of the signal present at the **Output**.

- As the signal increases from 0V to a positive value, the **Output Indicator** illuminates white and increases in brightness.
- As the signal increases from 0V to a negative value, the **Output Indicator** illuminates amber and increases in brightness.

Trigger Output: The **Trigger Output** generates a trigger signal with every update in quantised voltage.

- Output Voltage: 5V

Clock Input (Clk): The **Clock Input** is an external clock input for the quantiser engine's optional sample and hold stage.

- An external rising-edge signal present at the **Clock Input** allows for external clocking of a sample and hold implemented after the quantiser engine, before slew is applied. AND logic is applied if the quantiser has a new note and a rising edge is received at the **Clock Input**, a trigger signal will be produced at the **Trigger Output** and the **Output** will update.

Gate Output: The **Gate Output** generates a gate signal for the duration of any sustained MIDI note message present at the **USB 2.0 Type A Port or TRS MIDI Input** of the MIDI Expander (See the MIDI-to-CV Interface/USB MIDI Host section for more information).

Interface Selection Toggle: The **Interface Selection Toggle** selects the operational interface page (See the Programming Interface, Quantiser Interface, and Precision Adder Interface sections for more information).

- If the toggle is in its left position, **Programming Mode** is selected.
- If the toggle is in its centre position, **Quantiser Mode** is selected.
- If the toggle is in its right position, **Precision Adder Mode** is selected.

Slider: The **Slider** is a multi-purpose manual control.

Button 1: Button 1 is a multi-purpose manual control (See the Programming Mode, Quantiser Mode, and Precision Adder Mode sections for more information).

Button 2: Button 2 is a multi-purpose manual control (See the Programming Mode, Quantiser Mode, and Precision Adder Mode sections for more information).

Voltage Indicators: The **Voltage Indicators** provide LED illumination of voltage values available in the **Quantiser** and **Precision Adder Modes** (See the Programming Mode, Quantiser Mode, and Precision Adder Mode sections for more information).

Expansion Back Jack: The **Expansion Back Jack** is a 3.5mm TRS jack used for connecting the included MIDI Expander to the main module.

MIDI Expander

TRS MIDI Input (MIDI): The TRS MIDI Input allows for MIDI-to-CV conversion via a DAW or MIDI controller.
(See the MIDI-to-CV Interface section for more information).

USB 2.0 Type A Port (USB): The **USB 2.0 Type A Port** allows for USB MIDI hosting of a MIDI Controller.
(See the USB MIDI Host section for more information).

- It's recommended to use MIDI controllers that are bus powered and class compliant.
- It should be noted that current draw on the +12V rail will vary depending on the current requirements of the device connected.

Expansion Back Jack: The **Expansion Back Jack** is a 3.5mm TRS jack used for connecting the included MIDI Expander to the main module.

A|B Switch: The **A|B Switch** changes the compatibility of dàil to work with either TRS MIDI Type A adapters (included) or TRS MIDI Type B adapters.

- The switch is set to Type A compatibility by default.

Programming Interface ━━

Programming Mode allows for the activation and deactivation of chromatic intervals for the quantiser and precision adder. It also allows for the selection of preset scales.

Voltage Indication ━━

An activated quantiser chromatic interval is indicated by amber LED illumination of the corresponding **Voltage Indicator**, and **Button 1** will change from a dull amber illumination to a bright amber illumination when the **Slider** has navigated to its location.

An activated precision adder chromatic interval is indicated by white LED illumination of the corresponding **Voltage Indicator**, and **Button 2** will change from a dull white illumination to a bright white illumination when the **Slider** has navigated to the corresponding location.

If a chromatic note is activated for both the quantiser and precision adder, it is indicated by "soft white" (a combination of both amber and white LEDs) illumination of the corresponding **Voltage Indicator**. **Button 1** and **Button 2** will also change from a dull illumination to a bright illumination when the **Slider** has navigated to the corresponding chromatic location.

If a chromatic note is deactivated for both the quantiser and precision adder, it is indicated by no illumination of the corresponding **Voltage Indicator** and **Button 1** and **Button 2** will change from a bright illumination to a dull illumination when the **Slider** has navigated to the corresponding location.

Programming Chromatic Intervals ▬

- Set the **Interface Selection Toggle** to its left position.
- Visualise the **Voltage Indicators** as a chromatic keyboard.
- Use the **Slider** to navigate the desired chromatic note and press **Button 1** to activate and deactivate it for the quantiser and press **Button 2** to activate and deactivate it for the precision adder.

## Drag and Fill Activation of Chromatic Intervals ▬

- Set the **Interface Selection Toggle** to its left position.
- Use the **Slider** to navigate to the desired chromatic note and ensure that the note is deactivated.
    - If it's activated, press **Button 1** to deactivate it for the quantiser or press **Button 2** to deactivate it for the precision adder.
- Press and hold **Button 1** and move the **Slider** up and/or down to activate any adjacent chromatic notes for the quantiser.
- Press and hold **Button 2** and move the **Slider** up and/or down to activate any adjacent chromatic notes for the precision adder.
- Release **Button 1** and/or **Button 2**.

Drag and Fill Deactivation of Chromatic Intervals ▬

- Set the **Interface Selection Toggle** to its left position.
- Use the **Slider** to navigate to the undesired chromatic note and ensure that the note is activated.
    - If it's deactivated, press **Button 1** to activate it for the quantiser or press **Button 2** to activate it for the precision adder.
- Press and hold **Button 1** and move the **Slider** either up and/or down to deactivate any adjacent chromatic notes for the quantiser.
- Press and hold **Button 2** and move the **Slider** either up and/or down to activate any adjacent chromatic notes for the precision adder.
- Release **Button 1** and/or **Button 2**.

Programming Voltages via MIDI

- Connect a MIDI controller to dàil via the **USB Type A Port** or the **TRS MIDI Input** on the MIDI Expander.
- Use the MIDI controller to select and deselect notes by playing chords.
  - Press and hold down each note together to activate the corresponding voltage.
  - With the notes held down, toggle a note on by adding it to the played voicing (notes must be sustained for >200ms to latch on). To deactivate the corresponding voltage play the note staccato (note duration must be <200ms).
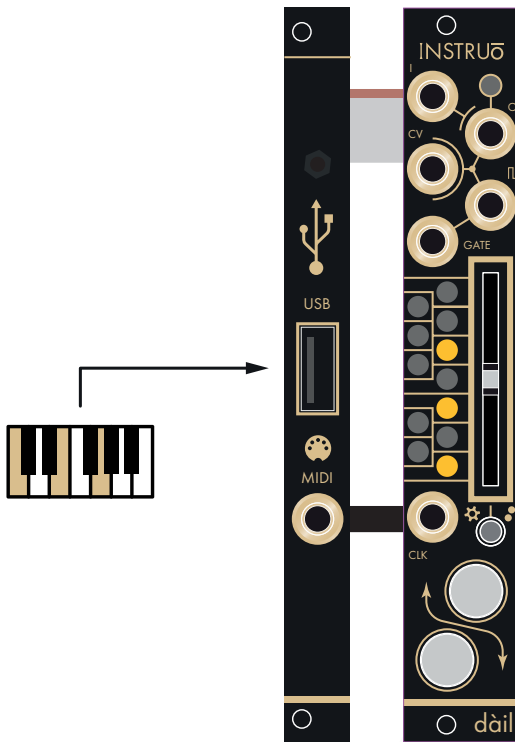
Selecting Preset Major Scales

- Set the **Interface Selection Toggle** to its left position.
- Set the **Slider** to its lowest position.
- Press and hold **Button 1** for the quantiser and/or **Button 2** for the precision adder and move the **Slider** to its highest position, then lowest position, then highest position again.
- A major triad will be illuminated on the **Voltage Indicators**.
- With the button still pressed down, move the **Slider** to its lowest position, then highest position to autofill the next preset major scale.
- Keep repeating this gesture until the desired major scale is selected.
- Release the button.

Press + Hold 2 for Precision Adder ➝

Press + Hold 1 for Quantiser ➝

MAJOR SCALE SELECTION
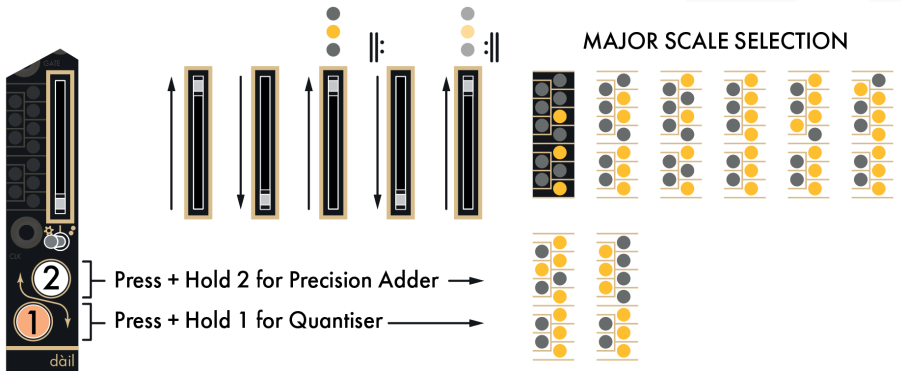
The preset major scales are:

Major Triad
Major Pentatonic
Major 7th
Ionian (Major)
Lydian
Mixolydian
Ionian #5 (Augmented Major)
Whole Tone

Selecting Preset Minor Scales

- Set the **Interface Selection Toggle** to its left position.
- Set the **Slider** to its highest position.
- Press and hold **Button 1** for the quantiser and/or **Button 2** for the precision adder and move the **Slider** to its lowest position, then highest position, then lowest position, then highest position again.
- A minor triad will be illuminated on the **Voltage Indicators**.
- With the button still pressed down, move the **Slider** to its lowest position, then highest position to autofill the next preset minor scale.
- Keep repeating this gesture until the desired minor scale is selected.

MINOR SCALE SELECTION
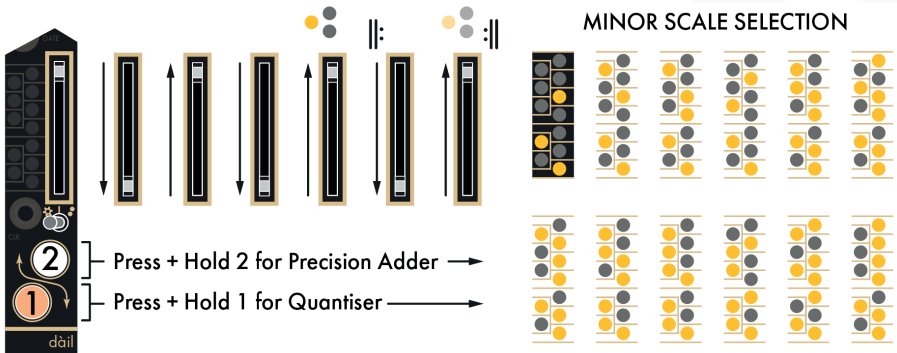
- Release the button.

The preset major scales are:

Minor Triad
Minor 7th
Minor Pentatonic
Diminished
Aeolian (Natural Minor)
Harmonic Minor
Dorian
Phrygian
Super-Locrian (Altered Diminished)
Phrygian Dominant with Chromatic Leading Tones
Melodic Minor (Ascending Pattern)

Quantiser Interface

Slew

Quantiser Mode allows for quantisation of the signal present at the **CV Input**.

- Any changes made in **Programming Mode** will not be committed until dàil enters **Quantiser Mode**.

- In **Quantiser Mode**, the **Slider** sets a global slew amount for the quantiser.

- The slider's LED will illuminate white and increase in brightness as slew amount is increased.
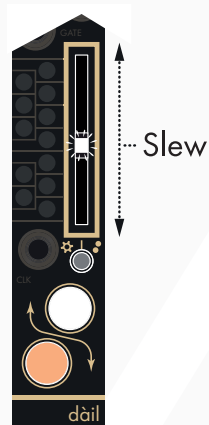
Octave-Offsetting Quantised Voltage

In **Quantiser Mode**, **Button 1** and **Button 2** are used to globally offset the quantised voltage present at the **Output** by perfect octaves.

Quick press together to re-centre 8v.

Button 1 will offset the quantised voltage negatively by up to 9V (9 octaves). The button will illuminate white when an octave offset is applied.

Button 2 will offset the quantised voltage positively by up to 9V (9 octaves). The button will illuminate white when an octave offset is applied.

Press both buttons to reset the octave offset voltage to 0V.

Precision Adder Interface ━━

Precision Adder Interface allows for chromatic offset of the signal present at the **Output**.

- Any changes made in **Programming Interface** will not be committed until dàil enters the **Precision Adder Interface**.
- In **Precision Adder Interface**, the **Slider** sets a global slew amount for the quantiser.
  - The slider's LED will illuminate white and increase in brightness as slew amount is increased.
  - The slew is applied to the **Quantiser Interface** signal only. **Precision Adder Interface** offsets will be applied immediately.

Chromatic-Offsetting Quantised Voltage ━━

- In **Precision Adder Interface**, **Button 1** and **Button 2** are used to globally offset the voltage present at the **Output** by the defined chromatic divisions.
- **Button 1** will provide a negative voltage offset of up to -9V (9 octaves).
  - The button will illuminate white when an octave offset voltage is applied.
- **Button 2** will provide a positive voltage offset of up to +9V (9 octaves).
  - The button will illuminate white when an octave offset voltage is applied.
- Press both buttons to reset the offset voltage to 0V.

MIDI-to-CV Mode ━━

MIDI-to-CV Mode turns dàil into a MIDI-to-CV Interface.
To enter **MIDI-to-CV Mode**, press and hold both buttons for 2 seconds.
To exit **MIDI-to-CV Mode**, press and hold both buttons for 2 seconds.

MIDI Interfacing ━━

- As a USB MIDI Host, dàil can be connected to a MIDI controller via the **USB Type A Port**.

  - Class compliant devices will connect directly to the dàil expander for USB MIDI control. (class compliance is a standard, but there are only so many brands/devices that we could test in house! Please check with the service team for any active list of confirmed compatibility of devices.)
  - Optimum current consumption of a USB MIDI device is up to 500mA.
  - The current draw on the +12V rail will increase when powering a USB device. Please plan accordingly.

- dàil can be connected to a MIDI controller or a MIDI interface via its included TRS MIDI Type A adapter. Through this adapter legacy 5-pin DIN MIDI connection can be used.

- By default, MIDI can be used to dynamically program the Quantiser engine's scale. In **MIDI-to-CV Mode** dàil functions as a more traditional monophonic MIDI interface producing 1V/octave (including pitch bend), gate and trigger signals relating to MIDI note input.

Firmware Update ━━

- Power dàil off
- Unmount both the main module and the MIDI expander from the system
- Ensure that the MIDI expander is fully connected to the main module.
- Connect the **USB Type B Mini Port** on the back of the MIDI Expander to a computer.
- Press and hold the **Firmware Update Button** while powering dàil on, ensuring that nothing could potentially short circuit the module while powered on.
- dàil will show up as a storage device on the computer.
- Drag the firmware file to the root directory of dàil.
- Once the firmware update file is copied, dàil will unmount from the computer and reboot.
- The firmware has now been updated.
- Power dàil off and mount it back into the system.