

ADDAC207 INTUITIVE QUANTIZER
USER'S GUIDE . REV03

Welcome to:

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

PAGE INDEX

- 3. OVERVIEW
- 4. INTRODUCTION
- 5. VCO's SIMPLE SETUP
- 6. QUANTIZER BABY STEPS

- 7. QUANTIZER / KEYBOARD MODES
- 8. KEY / SCALE SET & SETTINGS
- 9. QUANTIZER VOICES

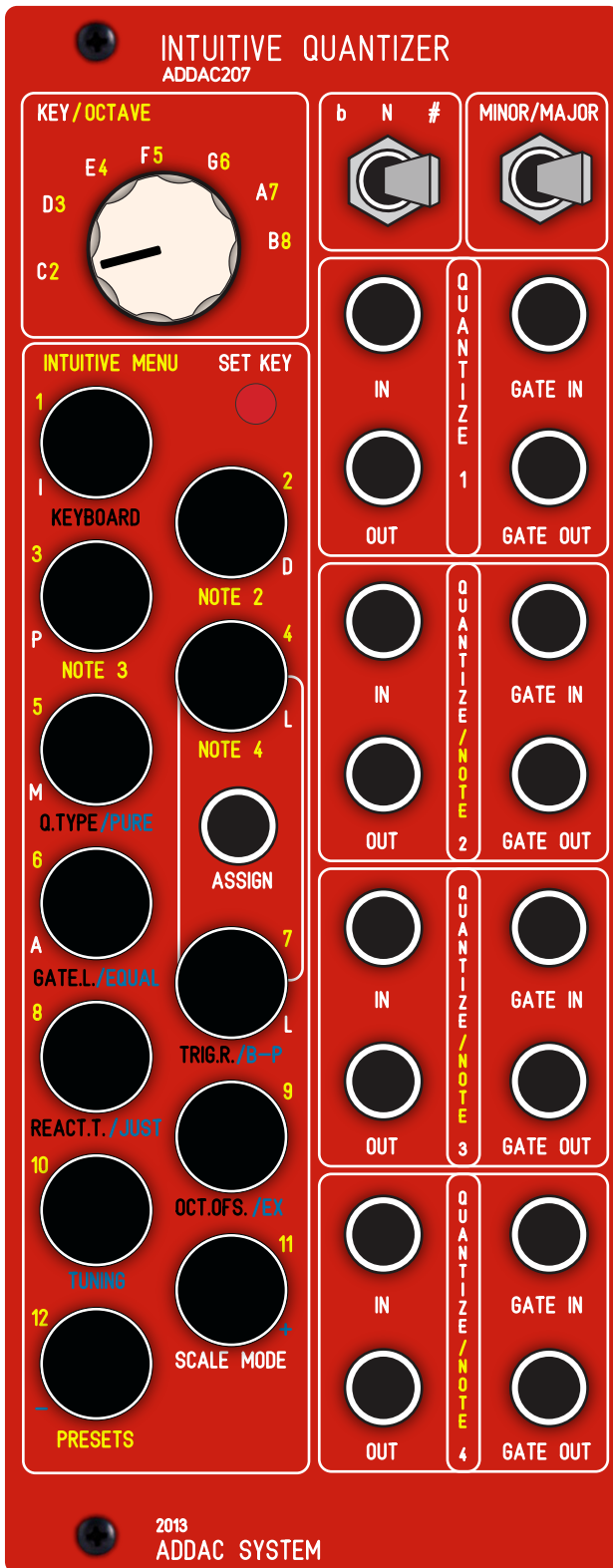
INTUITIVE MENU

- 10-13. OVERVIEW
- 14-24. EXAMPLES
 - 14. NOTES 2-3-4 - EX.I
 - 15. QUANTIZATION TYPE - EX.II
 - 16. GATE LENGTH - EX.III
 - 17. TRIGGER REPEAT - EX.IV
 - 18. REACTION TIME - EX.V
 - 19. OCTAVE OFFSET - EX.VI
 - 20-23. TUNING - EX.VII
 - 24. PRESETS - EX.VIII

- 25-26. ASSIGN & TRANSPOSE
- 27. TUNING RESET
- 28. REMARKS ON TEMPERAMENTS
- 29. MEMORY & TECH SPECS
- 30. HELPFUL TABLES

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



OVERVIEW

FRONTPANEL:

- 1 Rotary Switch Button with 7 Positions
- 1 Toggle Switch Button with 3 Positions
- 1 Toggle Switch Button with 2 Positions
- 12 Illuminated Buttons
- 17 Jacks I/O

FEATURES:

- 4 Voices of Quantization with 10 Octaves range
- Keyboard Mode, using Buttons as triggers
- User definable Scales: any scale is possible.
- Simple Intuitive menu with settings such as:
- User definable NOTES Intervals for Chord generation
- Quantization types: Above, Below, Ignore
- Definable Gate Out Length
- Octave Offsets

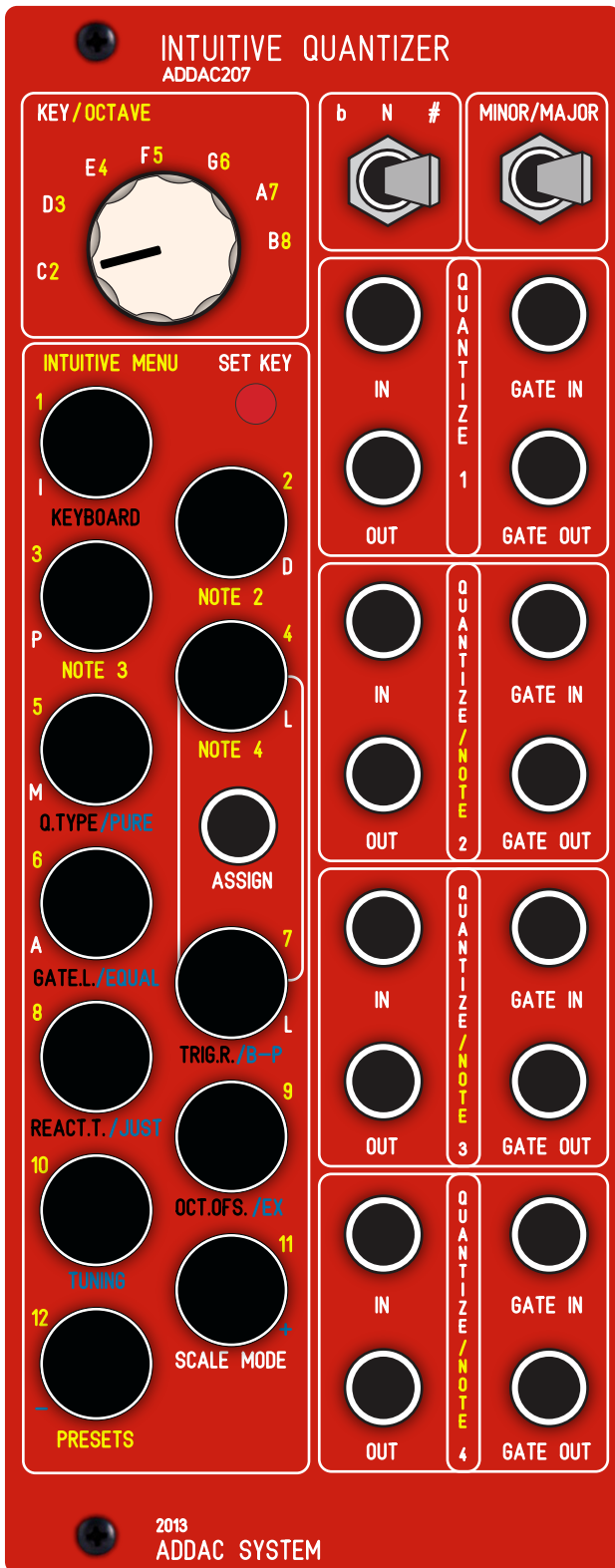
- Menu Reaction Time can be adjusted and saved.
- Assignable CV Input for Menu Functions
- 5 Different Scale Temperaments including Bohlen-Pierce
- Microtonal options for more than 48 notes per Octave
- Transpose through CV input
- Compatible with both Moog and Buchla Standards
- Independent Voice Fine Tuning
- Tuning Reset to 1v/perOctave
- Tuning settings safely stored in non-volatile memory.
- 11 User Presets for easy recalling User's favorite scales and settings.

POWERING UP

After power has been provided the Module will display a brief animation on the leds and load the last selected Preset. It will also load all Fine Tuning Settings.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



INTRODUCTION

We know this Guide it's not the best literature we could be reading but it will be extremely important to have an overall understanding all of the fundamental operational procedures and getting full potential out of it.

So we fully recommend that you read the whole document at some point, most things you'll only need to read once, cause once you understand the operational procedures every feature is right there at the tip of your fingers.

Nevertheless you can start by reading the first pages that will already put you up and quantizing.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



SIMPLE VCO'S SETUP

So you just installed the Intuitive Quantizer in your system and powered it up for the first time!

You saw the lights blinking showing the default factory presets after which the default C Major scale lits up on the keyboard area.

Assuming you immediately want to plug it to your VCO's you should plug cables from OUTS 1 to 4 to your VCO's (showing red in the image on the left). If you have less than 4 VCO's plug them 1 to X depending on the VCO's you have available at the moment.

After this Set all your VCO's to the lowest Octave possible and/or desired.

Next step to take is to tune all VCO's among themselves. For this you'll need to go into Keyboard Mode pressing Button 1 for a couple seconds. Lights will go all On besides the Active note being played. (Read

At this point you should rotate the KEY/OCTAVE Knob to F5 label and press C note in the keyboard (Button 1). This will generate a 4V output in all OUT Jacks which relates to a C note 4 octaves above the main octave that you set your VCO to in the previous step.

So now that you have the same 4V going in all your VCO's Tune all them all to the same C note until they play in Unison.

After this you can start playing a major C Scale in your keyboard (like defined by the scale setting in the initial Quantizer Mode) and all your VCO's should still be in tune.

Now you can also change the KEY/OCTAVE Knob to play lower or higher octaves.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



QUANTIZER BABY STEPS

So now that VCO's are tuned we want to start quantizing some signals.

First we need to get out of Keyboard Mode back to Quantizer Mode. For this we need to press Button 1 for a couple seconds. Lights will change and display the Active Notes selected, should still show C Major Key.

At this point you should plug any CV signal into IN jack of NOTE 1 (top left jack).

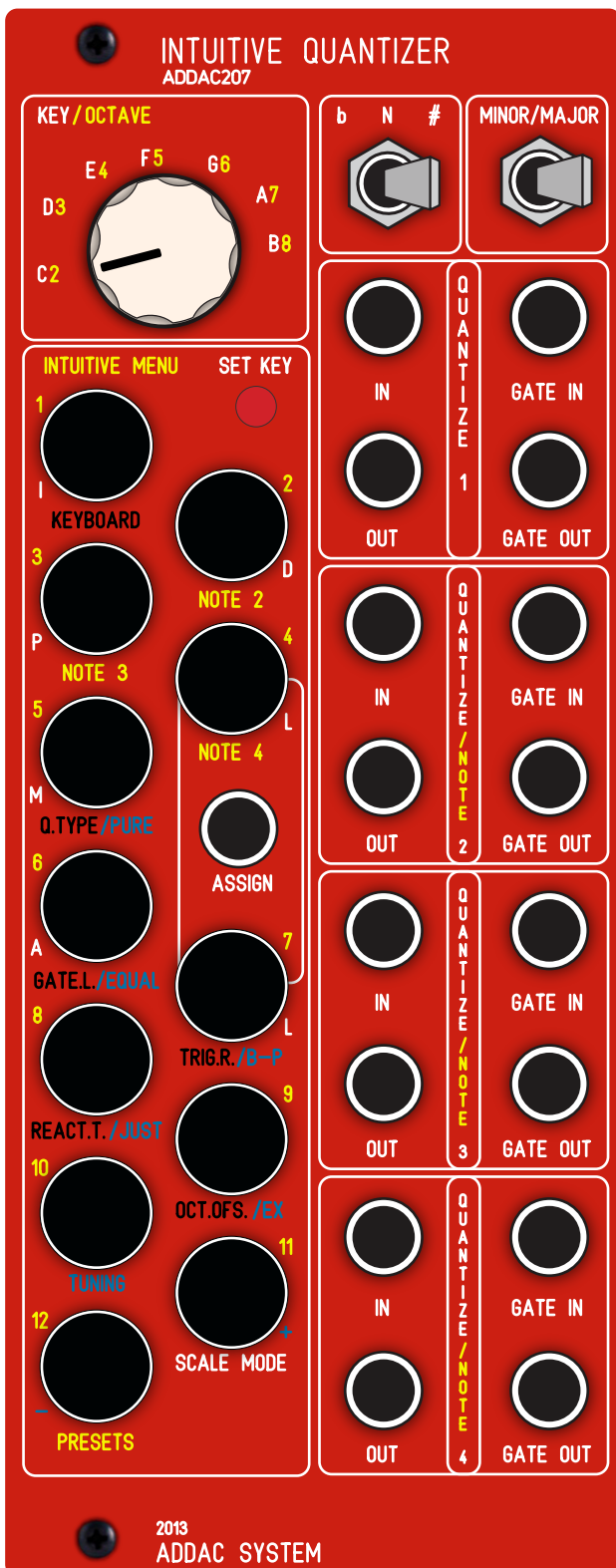
Immediately all outputs will send the same voltages to all VCO's and they all should play tuned.

Now we're able turn notes On and Off by pressing the corresponding keyboard buttons.

After this we could also plug more CV signals to NOTE 2-3-4 Inputs and have them all quantizing a different CV source to the same scale.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



QUANTIZER / KEYBOARD

The Intuitive Quantizer can be used in two Main Operation Modes QUANTIZER and KEYBOARD selectable through the Menu and described further ahead in this document, for now let's explain the 2 MAIN MODES:

QUANTIZER MODE:

In Quantizer Mode the Input Voltage is used to trigger the Quantization Process comparing and adjusting the input voltage to the closest note actively selected. Let's call these sets of Active Notes the Active Scale.

The Active Scale, represented by the Menu Buttons, will light up according to these selected notes (drawn in red in the image on the left).

Every time a new note is quantized on Voice 1 the correspondent button will blink momentarily. To avoid visual confusion other Voices will not blink.

KEYBOARD MODE:

In Keyboard Mode it's the User who manually controls which note will be playing

It acts as a Monophonic Keyboard and all leds are lit besides the one note playing. Once a note is played the output will stay on that note until another note is played.

There is no OFF in an analogue quantizer!

In Keyboard Mode, if the user is using Notes intervals to generate chords it will keep the same notes as defined in Quantizer Mode. This means that in Keyboard Mode Notes 2-3-4 will still respect the notes selected in Quantizer Mode and will not play any note that is not selected in Quantizer Mode.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



KEY/OCTAVE

The KEY/OCTAVE switch relates to the MAIN MODE selected. In QUANTIZER MODE it's used to select the Key or Root Note. In KEYBOARD MODE it's used to select the Keyboard Octave.

SCALE SETTINGS

With the Scale Settings it's possible for the User to select the settings for the scale to obtain. These settings work with the KEY/OCTAVE switch and the SET KEY button.

MINOR/MAJOR defines one of the 2 main scales.

b / N / # defines if scale is:
b (flat), N (natural) or # (sharp)

affecting the scale of
MINOR/MAJOR, the N position provides a bypass.

SET KEY

The Set Key Button changes the Active Scale to the one selected through all the above mentioned settings.

For example, the red buttons in the image show the scale defined by:

KEY: C
Setting 1: # (sharp)
Setting 2: Major

Besides this automatical method for setting a scale the User can as well and at any point change the Active Buttons toggling them On(Lit) or Off(Unlit) to select the quantization notes.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



QUANTIZER VOICES 1-4

There are 4 Quantization Voices, these can be used either Independently; when an Input is plugged in the IN Jack or related to Voice 1: when no input is connected on either Voice 2, 3 or 4.

If no voltage input is used voices 2, 3 and 4 will automatically relate to Voice 1. They will then mirror Voice 1 input or be used for Chords Generation as described in the NOTE 2/3/4 section of the Intuitive Menu chapter.

Each Voice features 4 jacks I/O:

IN (-5v +5v): Voltage Input for Quantization
OUT (0v +10v): Quantized Voltage Output

GATE IN (0 +5v): Trigger Input for External Quantization timing. If this input is used it only Quantizes next note only when a trigger is received. If it's not used then it will quantize depending to CV changes only.

This Gate In ON/OFF detection is made in the software. After the detection goes On, and if the user removes the gate in jack it will automatically goes to Off after 60 seconds. If the user want to reset voices before the 60 seconds period Button 6 (Gate L.) can be pressed at the same time as the voice number Button (1 to 4). For example to Reset voice 2 Gate In, the user needs to press Button 2 and 6 at the same time. This will resume the behaviour without regarding the Gate In until a new jack is plugged in.

GATE OUT (0 +5v): Gate Output for ADSR's Outputs everytime a new quantization is calculated. It respects the incoming Trigger Input Gate, while it's On the Gate Out will remain On. The Gate Out will go Off when Trigger In is Off and the Gate Length time as passed as described in the Gate Length section of the Intuitive Menu Chapter.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



INTUITIVE MENU

OVERALL OPERATION PROCEDURES

All Quantizer Operation Settings are defined through the same Push-Buttons as Scale selection and Keyboard.

For Menu related Access the Push-Button needs to be pressed for approx. 1 second after which the Leds change to give User the necessary feedback to acknowledge his input.

Once this happens the Module is already in the **Menu Windows** recalled by the User.

In these Windows you'll see the active setting identified by the only button that will be lit. Pressing a non-lit button changes the setting to that selection while, at the same time, changes the lit button for visual feedback.

Pressing a lit button is always the confirmation of the desired setting and it automatically jumps out of the Menu Window back to the previous Main Mode (QUANTIZER / KEYBOARD) Window changing the leds as well.

While in any Menu Window, after 5 seconds of inactivity with the Menu Buttons the Module automatically jumps out of the Menu Window back to the previous Main Mode (QUANTIZER / KEYBOARD) Window changing the leds as well.

The User can jump to Menu Windows from inside other Menu Windows using the same Press and Hold for approx. 1 second procedure. However if settings were changed they will not be saved.

COLOR CODING

Buttons are numbered in Yellow from 1 to 12, other color engravings are coded depending on their function:

Black is used for Overall settings

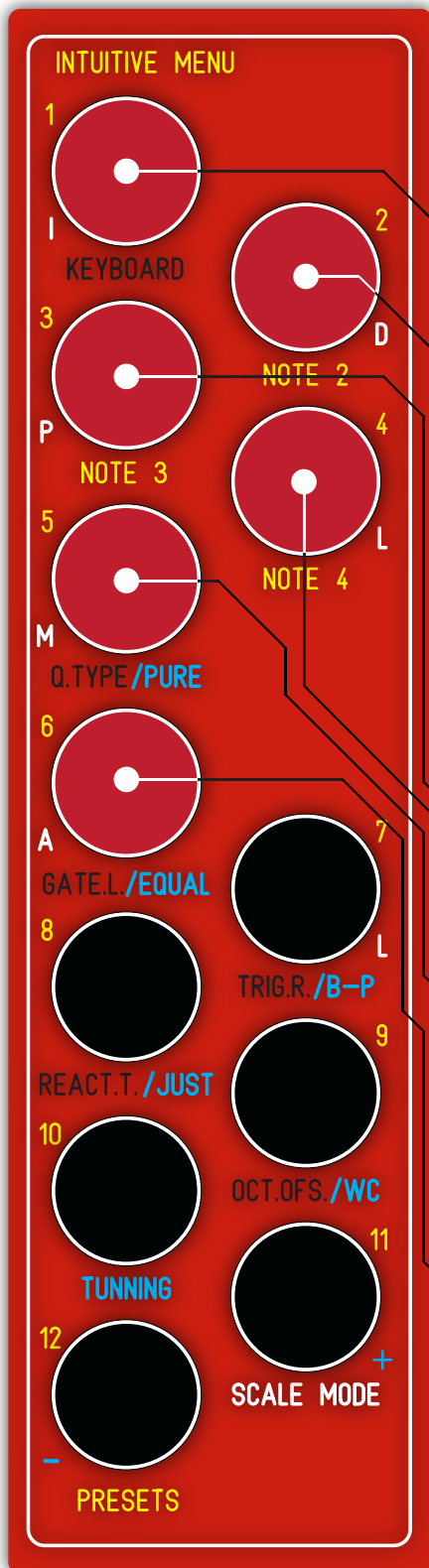
Yellow is used for Chords Generation Settings

Blue is used for Scale Tempeprament and Fine Tuning Settings

White is used for Scale Mode Settings (Iorian, Dorian...)

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



INTUITIVE MENU (cont.)

Here's a complete description of the Menu functions:

BUTTON 1 (QUANTIZER / KEYBOARD)

Pushing this button for approx. 1 second changes between QUANTIZER and KEYBOARD Mode.

BUTTON 2 - NOTE 2 (BUTTONS 1 to 12)

Pushing this button for approx. 1 second will define the interval for NOTE 2 or Quantizer output 2.

Intervals can be selected from buttons 1 to 12 referring to an interval of +1 to +12 semitones. Major/Minor 3rds will be automatically selected depending on the scale defined. In this window you'll see only one button lit indicating which interval is selected.

Pressing a non-lit button changes the setting to that selection and changes the lit key for visual feedback.

Pressing a lit key is the confirmation of the desired setting and it automatically jumps back to the previous Main Mode (QUANTIZER / KEYBOARD) window changing the leds as well.

BUTTON 3 - NOTE 3 (BUTTONS 1 to 12)

Same as NOTE 2 for Quantizer Output 3

BUTTON 4 - NOTE 4 (BUTTONS 1 to 12)

Same as NOTE 2 for Quantizer Output 4

BUTTON 5 - Q.TYPE - QUANTIZER TYPE (BUTTONS 3, 5 and 6)

Only Buttons 3, 5 and 6 can be selected in this window.

Quantizer Type defines how the quantization process occurs. There's 3 methods for Quantizing the input voltage to the closest note: Above (BUTTON 3), Below (BUTTON 6) or if it omits any voltage that is not in the scale range (BUTTON 5).

In this window you'll see only one of the 3 buttons lit indicating which setting is selected.

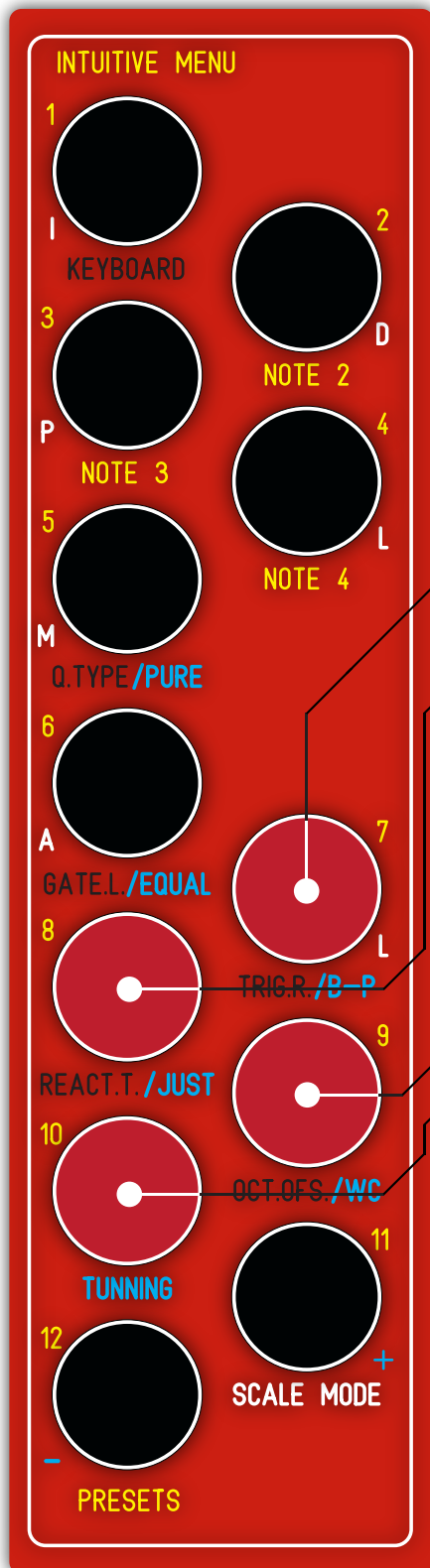
BUTTON 6 - GATE L. - GATE LENGTH (BUTTONS 1 to 12)

Gate Length defines to size of the Gate Output from 10 to 10000ms, selectable from buttons 1 to 12.

In this window you'll see only one of the buttons lit indicating which setting is selected.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



INTUITIVE MENU (cont.)

BUTTON 7 - TRIG.R. - TRIGGER REPEAT (BUTTON 7)

Only Button 7 can be selected in this window. Imagine an analog keyboard and you're pressing C4 over and over, if this voltage would be sent to the Quantizer voltage input and it would quantize its output to C4 and output a Gate On, the second time you'd press the C4 key, if the Trigger Repeat setting was on, it would do exactly the same thing, although the Output would already be in C4 so no change there but it would give a new Gate On, retriggering your external ADSR. If Trigger Repeat would be Off then it would not output gates when quantizing to the same note it already is quantizing to. In this window only regards to button 7, if Lit setting is ON. To exit this window press any other Button than 7.

BUTTON 8 - REACT.T. - MENU REACTION TIME (BUTTONS 1 to 12)

Reaction Time defines how long it takes until it enters in a Menu Window. So far we've stated you need to press a button for 3 seconds, with this setting you can change this value from 500ms to 5 seconds to adjust it to your personal preference.

BUTTON 9 - OCT.OFS. - OCTAVE OFFSET (BUTTONS 1 to 12)

Octave Offset defines the 1v/octave offset from the input to output. Meaning you can: send a 3v input and quantize it to a 1v output, offsetting the output to -2octaves; or send a -3v input and quantize it to a 2v output, offsetting the output to +5octaves. The Range is from -3 to +8 octaves. Button 4 for is for 0 Offset.

BUTTON 10 - TUNNING (BUTTONS 1 to 12)

This Window is a particular window and shares functions with the FINE-TUNING function described further down.

1. SCALE TEMPERAMENT (BUTTONS 5 to 9)

Only Buttons 5 to 9 can be selected for this function. Scale Temperaments defines the ratios used to calculate the scale semitones. In a standard EqualTempered scale (our standard scale) all notes interval are equal This is meant to be easy to transpose a scale to any key without the need to retune the whole instrument. In Non-Equal scales the intervals ratios are calculated from the Root note or the scale key.

User's can select from 5 different temperaments:

PURE: The Mitical La Monte Young's Well Tunner Piano temperament

EQUAL: Our standard scale

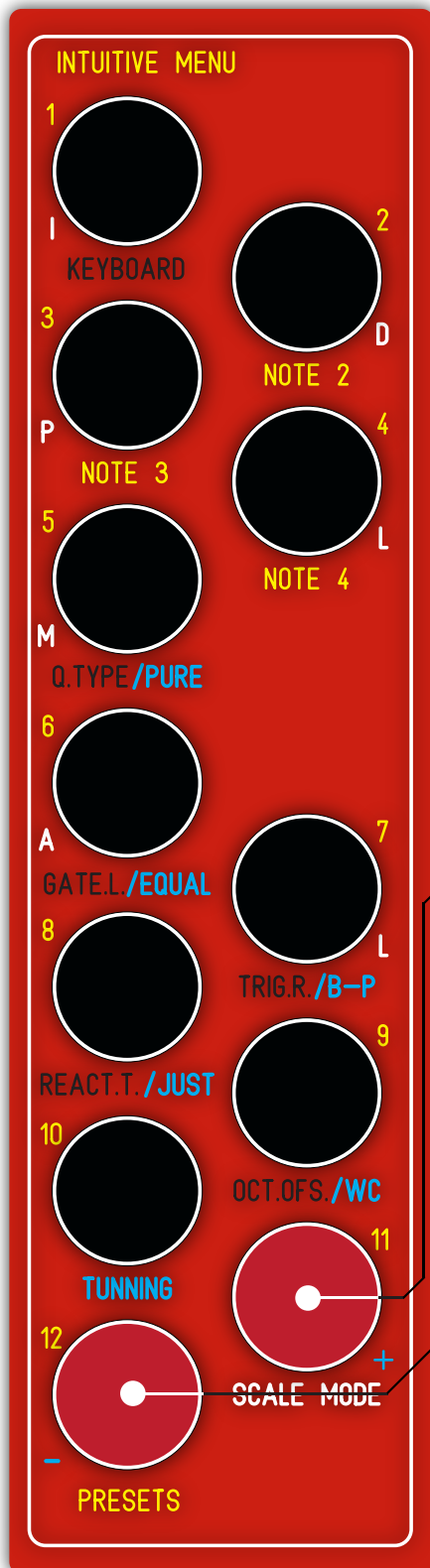
B-P: Bohlen-Pierce

JUST: Just Temperament

EX: Exotic

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



INTUITIVE MENU (cont.)

2. MOOG / BUCHLA Standard (BUTTON 10)

In Eurorack we use the Moog 1v/octave standard but in Buchla land they use 1.2v/octave.

Button 10 is an indicator for which standard the quantizer operates to.

Pressing Button 11 & 12 at the same time will change Button 10 state, Off is for Moog Standard, On is Buchla

3. FINE TUNING (BUTTONS 1 to 4, 11 and 12)

This is the Function for User's fine tuning to adjust it's 1v/octave ratio to any particular VCO reaction.

Fine Tuning is independent for each voice.

Buttons 1 to 4 show which voice is active, pressing each of these Buttons selects a new voice for Fine Tuning.

After the voice is selected, pressing button 11 will increase the 1v/octave relation in intervals of 0.001mV; Pressing button 12 will decrease the 1v/octave relation in intervals of 0.001mV.

These settings can be saved permanently in non-volatile memory pressing button 10. This will also Exit the Menu Window.

BUTTON 11 - SCALE MODE (BUTTONS 1 to 7 and 11)

Scale Mode defines which Mode (Ionian, Dorian, Phrygian, Lydian, Mixolydian, Aeolian, Locrian) abbreviated in White to match mode numbers in Yellow (1-I, 2-D, 3-P, 4-L, 5-M, 6-A, 7-L).

This Setting is only used when Pressing the Set Key Button and normally is Bypassed.

To activate the Scale Mode function press Button 11 and its light will change state, Lit is ON.

BUTTON 12 - PRESETS (BUTTONS 1 to 11)

Presets Store all the information related to the Scale defined in Quantizer Main Mode as well as the main Menu settings (page 26). When entering this window there will be only one led lit indicating which preset is currently being edited.

To select and change settings to a new preset just press the desired one, the button will light up and pressing again will load it and exit the Menu Window.

To save a preset, select the preset button you wish to save to and hold the PRESET Button (12) for aprox. 3 seconds, after which it will exit the Menu Window.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. I

INTUITIVE MENU

NOTE 2, 3 and 4 Operation - Buttons 1 to 12

This Menu Function Works the same way for NOTE 2, NOTE 3 and NOTE 4 Windows. Default value is Root Note (Button 1).

	Interval
BUTTON 1	Root
BUTTON 2	2nd
BUTTON 3	3rd
BUTTON 4	4th
BUTTON 5	5th
BUTTON 6	6th
BUTTON 7	7th
BUTTON 8	8th
BUTTON 9	9th
BUTTON 10	10th
BUTTON 11	11th
BUTTON 12	12th

1. Let's imagine we're in **QUANTIZER MODE** and have the C Maj Scale Active (image 1).

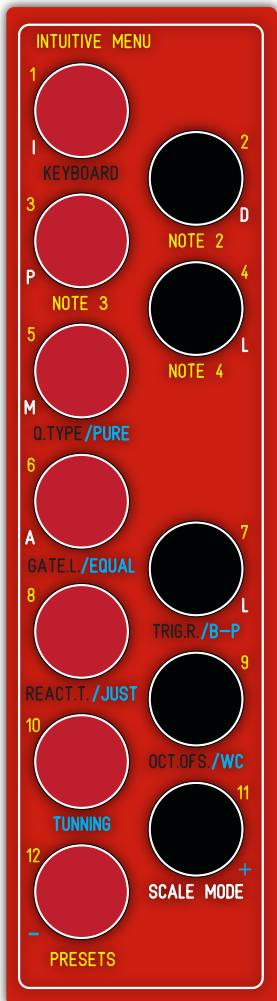


Image 1

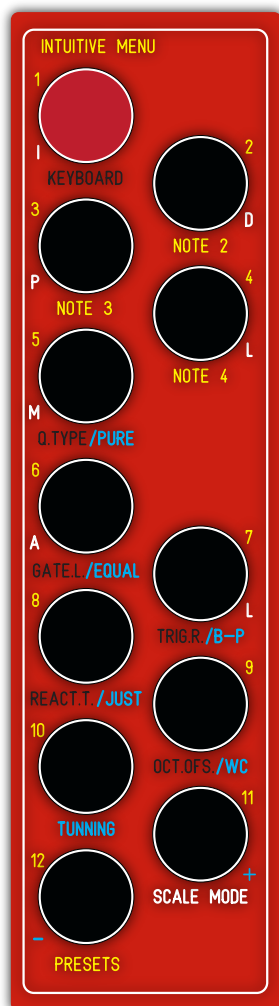


Image 2

2. If the User Holds the **NOTE 2** Button for approx. 1 second, the Menu Buttons will change to the configuration shown in image 2. Indicating Interval for NOTE 2 is currently set to its default value of 1 or 0 Semitones.

As a mnemonic, while in this Menu Window buttons numbers are related to the desired interval from the Root Note (Voice 1). So, Button 5 relates with a Fifth or Button 11 stands for the Eleventh note from the Root.

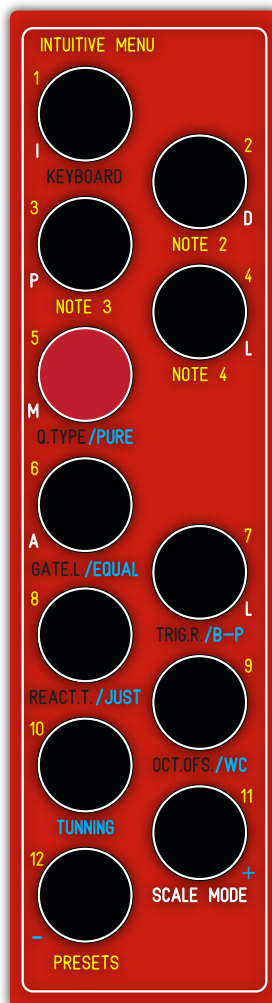


Image 3

3. If it's the User's wish to change the second Voice output to a 5th (Fifth) (related to the Root note defined by Voice 1) he'll need to press button 5 once. This action will set the interval to a 5th and the led will change accordingly (Image 3).

Once Button 5 is Active pressing it once again confirms the new setting change and Exits the Menu Window back to Quantizer Mode (Image 1).

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Q.Type	
BUTTON 3	ABOVE
BUTTON 5	IGNORE
BUTTON 6	BELOW

Ex. II INTUITIVE MENU

Q.TYPE - Quantization Type Operation - Buttons 3, 5 and 6

This setting is shared by all 4 Voices.
Default value is Above Method (Button 3).

1. Let's imagine we're still in **QUANTIZER MODE** and have the C Maj Scale Active (image 1). It's the User's decision to change the Quantization Type, please keep in mind that there are 3 methods for Quantizing the input voltage to the closest note: Above (BUTTON 3), Below (BUTTON 6) or if it ignores any voltage that is not in the scale range (BUTTON 5).

As a mnemonic, always remember that Button 3-Above is Above the Q.TYPE Button and that Button 6 - Below is Below the Q.TYPE Button.

Let's assume the Active Method is Above (Button 3).

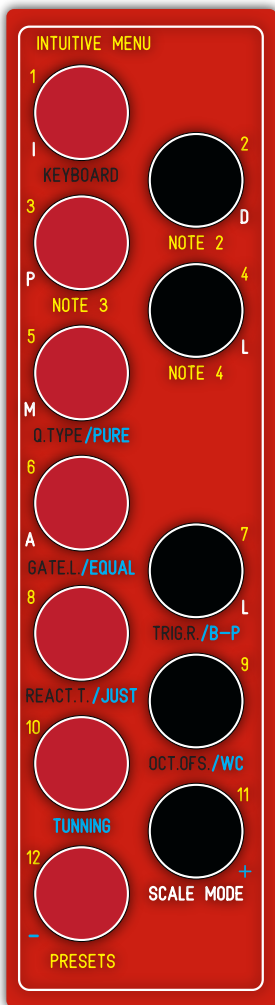


Image 1

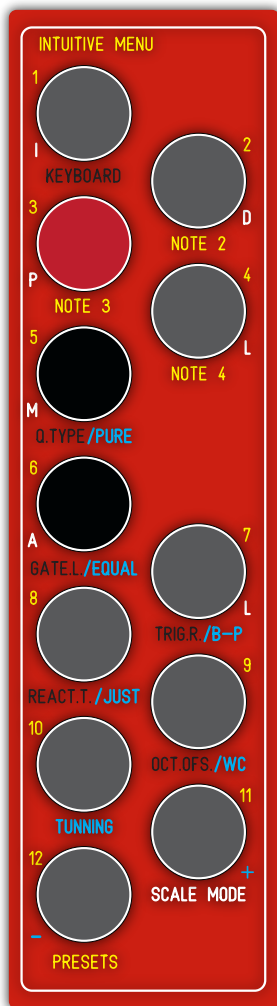


Image 2

If the User Holds the **Q.TYPE** Button for approx. 1 second, the Menu Buttons will change to the configuration shown in image 2. Indicating setting for Quantization Type is currently set to 3 or Above Method.

While in this Menu Window all buttons other than 3, 5 and 6 will be inactive. Pressing any of the grey Buttons shown in image 2 for less than 3 seconds won't cause any reaction.

A. BELOW

if the User wants to change the Quantization type to the closest note Below (Button 6) he just needs to press it once and the led beneath will light up, pressing a second time confirms the setting and exits the Menu Window back to the Main Window.

B. IGNORE

if the User wants to change the Quantization type ignoring all voltages that are not in the selected Scale note, meaning it won't quantize to any note above or below. He needs to press Button 5 once and the led beneath will light up, pressing a second time confirms the setting and exits the Menu Window back to the Main Window.

A. ABOVE

if the User wants to change the Quantization type to the closest note Above (Button 3) he just follows the same process as above options, select and confirm Button 3.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. III INTUITIVE MENU

GATE L.- Gate Length Operation - Buttons 1 to 11 and 12

This setting is shared by all 4 Voices.
Default value is 40 milliseconds (Button 3).

The Minimum value for this setting is 10 milliseconds (Button 1) the maximum is 10240 milliseconds (Button 11).
Time intervals increase multiplying by 2, meaning the next button is twice the size of its previous one: Button 1-10 Milliseconds ; 2-20; 3-40; 4-80... and so on.
It can also be calculated with the formula:
Milliseconds = $10 * 2^{(ButtonX-1)}$

Button 12 is used for a GATE OFF CONDITION before Quantizing a new note (described below).

So let's imagine we have already pressed the GATE L. Button for aprox. 1 second and entered in its Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying the default setting for Gate Length or Button 3.

BUTTON 1	10 ms
BUTTON 2	20 ms
BUTTON 3	40 ms
BUTTON 4	80 ms
BUTTON 5	160 ms
BUTTON 6	320 ms
BUTTON 7	640 ms
BUTTON 8	1280 ms
BUTTON 9	2560 ms
BUTTON 10	5120 ms
BUTTON 11	10240 ms

GATE LENGTH

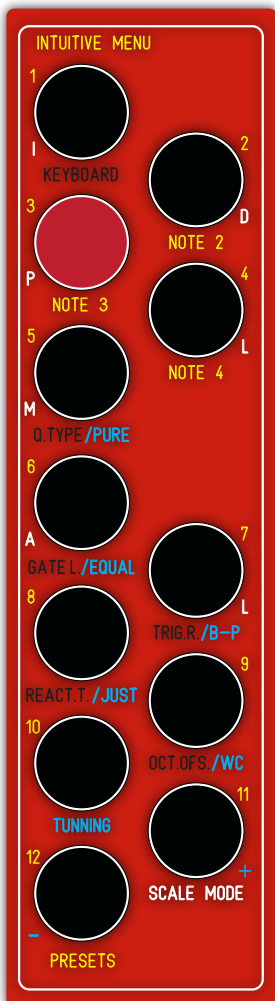


Image 1

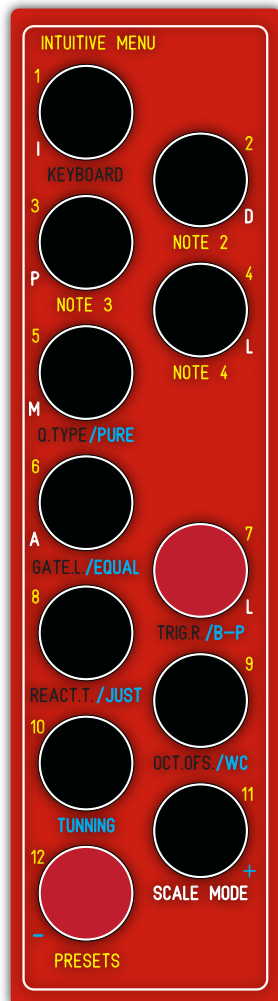


Image 2

If it's the User's wish to change the Gate Length to any other size he'll need to press the desired length button twice. Let's assume Button 7 (640 milliseconds).
Once Button 7 is lit (image 2) pressing it once again confirms the new setting and Exits the Menu Window.

GATE OFF CONDITION

Button 12 acts as a Toggle (Lit = On, Unlit = Off).
It limits the quantization process to happen only when the gate Out is Off.
For ex. Imagine the User had already pressed Button 12 (image 2) setting the Gate Length to be 10 seconds.
As soon as the module quantizes a new note it will set the Gate Out to +5v and hold it there for the pre-defined time of 10 seconds.

With Button 12 Lit (Condition On) it will ignore any input and will not quantize any note until the 10 seconds pass and the Gate set to 0v.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July,2013

Ex. IV

INTUITIVE MENU

TRIG.R. - Trigger Repeat Operation - Button 7

This setting is shared by all 4 Voices.
Default value is Off.

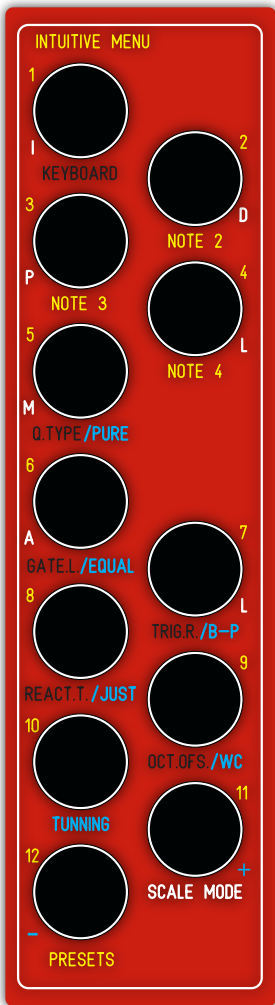


Image 1

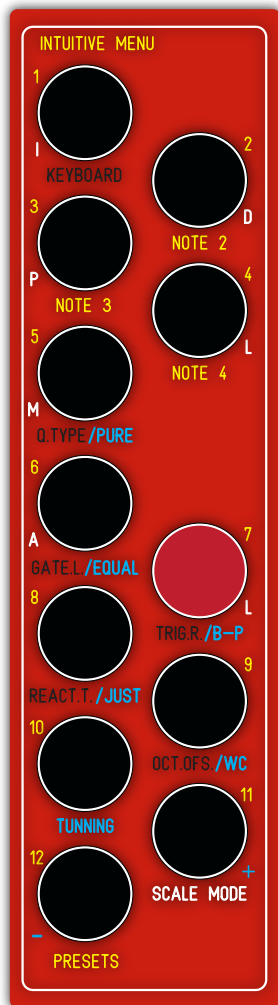


Image 2

So let's imagine we have already pressed the TRIG.R. Button for aprox. 1 second and entered in its Menu Window, the Button's leds change but no led is lit (image 1). In this Menu Window only Button 7 can be lit and works as a selector: Unlit - Off, Lit is On.

Pressing Button 7 once will activate the Trigger Repeat option and activate the according led (image 2).

Saving this setting is done in this order, select the state you wish to save pressing Button 7 to be either lit(On) or Unlit (Off) then press any key other then key 7 (black keys in image 2). When this happens the User confirms the key 7 state as the new setting and returns to the Main Window.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. V

INTUITIVE MENU

REACT.T. - Reaction Time Operation - Buttons 1 to 12

Default value is 700 milliseconds (Button 2).

This setting is independently saved and kept safe in non-volatile memory.

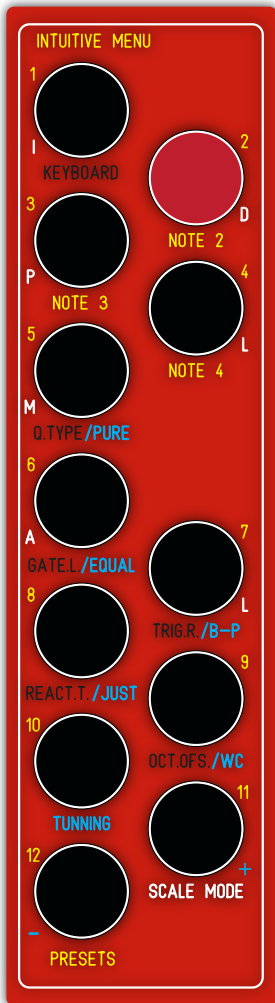


Image 1

This setting is used to adjust the way the Menu responds to the User input, how long the User needs to Hold buttons to enter in the Menu Windows and how long it will take for the menu buttons to be idle until the module automatically exits to the Main Window.

So let's imagine we have already pressed the **REACT.T.** Button for approx. 1 second and entered in its Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying the default setting for Menu Reaction Time or Button 2.

As in previous Menu Windows, pressing another Button selects it, pressing it a second time Saves the setting in the non-volatile memory and Exits to the Main Window.

Below is a table with the times defined by the Menu Buttons:

	Hold Time	Idle Time
BUTTON 1	500 ms	5000 ms
BUTTON 2	700 ms	6000 ms
BUTTON 3	900 ms	7000 ms
BUTTON 4	1100 ms	8000 ms
BUTTON 5	1300 ms	9000 ms
BUTTON 6	1500 ms	10000 ms
BUTTON 7	1700 ms	11000 ms
BUTTON 8	1900 ms	12000 ms
BUTTON 9	2100 ms	13000 ms
BUTTON 10	2300 ms	14000 ms
BUTTON 11	2500 ms	15000 ms
BUTTON 12	2700 ms	16000 ms

The Hold Time value shown on the table above, triples while in **KEYBOARD** Mode, so Hold Time * 3. By slowing this reaction time when the User is most likely to be playing the keyboard it adds some extra time proven to avoid entering unwanted Menu Windows.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. VI INTUITIVE MENU

OCT.OFS.- Octave Offset Operation - Buttons 1 to 10

This setting is shared by all 4 Voices.
Default value is 0 Octaves Offset (Button 1).

The Minimum value for this setting is 0 Octaves (Button 1) and the maximum is +9 Octaves (Button 10).

This allows for negative voltages up to -5v to be quantized as well. In this case if Oct.Ofs setting is set to 5 octaves -5v will be quantized to 0v, -4v to 1v and so on.

If Quantized Notes fall off the modules voltage range they will be quantized to the lowest or highest note possible.

So let's imagine we have already pressed the OCT.OFS. Button for approx. 1 second and entered in its Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying the default setting for Octave Offset or Button 1 (0 Octaves Offset).

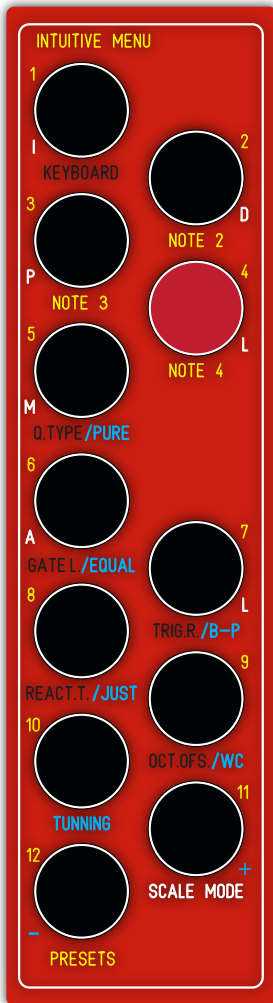


Image 1

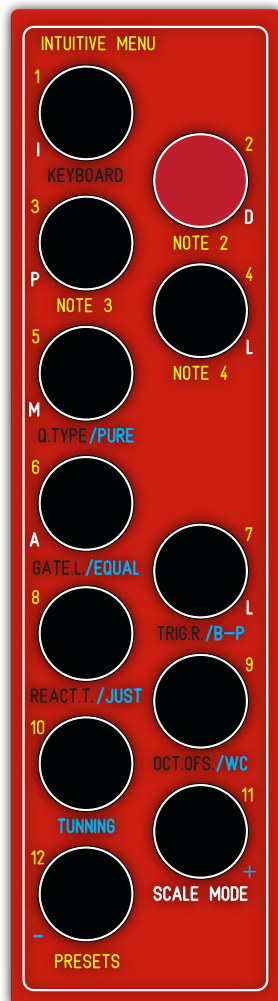


Image 2

If it's the User's wish to change the Octave Offset to any other value he'll need to press the desired button twice. Let's assume Button 2 (1 octaves Offset) Once Button 2 is lit (image 2) pressing it once again confirms the new setting and Exits the Menu Window.

Here's a Table With the Offset values for each Menu Button:

BUTTON 1	0 Octaves
BUTTON 2	1 Octaves
BUTTON 3	2 Octaves
BUTTON 4	3 Octaves
BUTTON 5	4 Octaves
BUTTON 6	5 Octaves
BUTTON 7	6 Octaves
BUTTON 8	7 Octaves
BUTTON 9	8 Octaves
BUTTON 10	9 Octaves

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. VII - part A

INTUITIVE MENU

TUNING Operations - Buttons 1 to 4 and 6 to 12

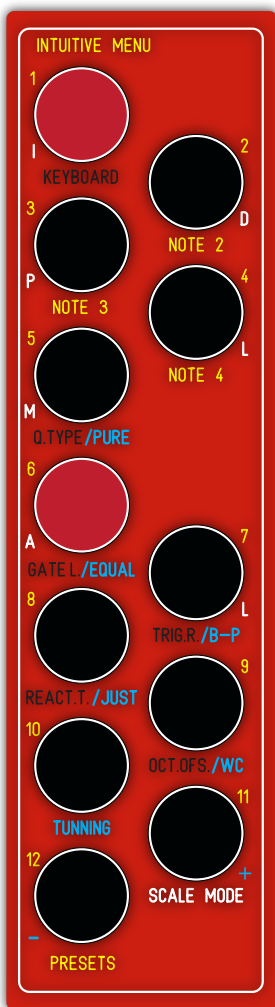


Image 1

This Menu Window has 4 different functions:

Scale Temperament (Buttons 5 to 9)

Independent Voice Fine Tuning (Buttons 1 to 4, 11 and 12)

Moog/Buchla Standard Definition (Buttons 11 and 12)

Saving Fine Tuning Settings (Button 10)

So let's imagine we have already pressed the TUNING Button for approx. 1 second and entered in its Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying both the default settings for Active Voice Tuning (Button 1) and Scale Temperament (Button 6).

Active Voice Tuning is the Quantizer Voice that is currently set to be tuned.

	Function
BUTTON 1	Tune Voice 1
BUTTON 2	Tune Voice 2
BUTTON 3	Tune Voice 3
BUTTON 4	Tune Voice 4
BUTTON 5	Well Tunned
BUTTON 6	Equal
BUTTON 7	Bohlen-Pierce
BUTTON 8	Just
BUTTON 9	Exotic
BUTTON 10	Save F.Tune
BUTTON 11	+
BUTTON 12	-

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. VII - part B

INTUITIVE MENU

TUNING Operations

Set Scale Temperament Procedure- Buttons 5 to 9

This setting is shared by all 4 Voices.

Default value is EQUAL Temperament (Button 6).

	Function
BUTTON 5	Pure
BUTTON 6	Equal
BUTTON 7	B-P
BUTTON 8	Just
BUTTON 9	Exotic

As in part A we have already pressed the TUNING Button for approx. 1 second and entered in its Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying both the default settings for Active Voice Tuning (Button 1) and Scale Temperament (Button 6).

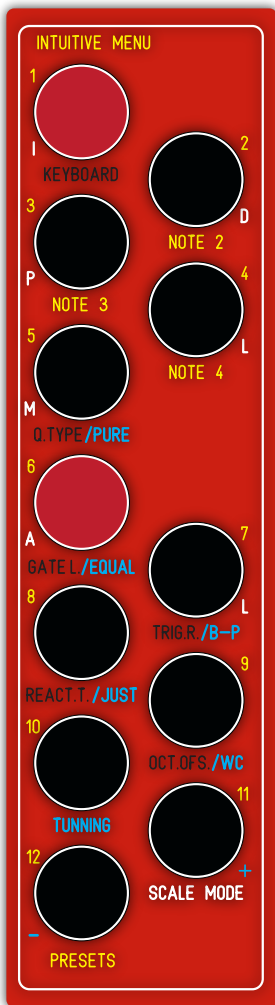


Image 1

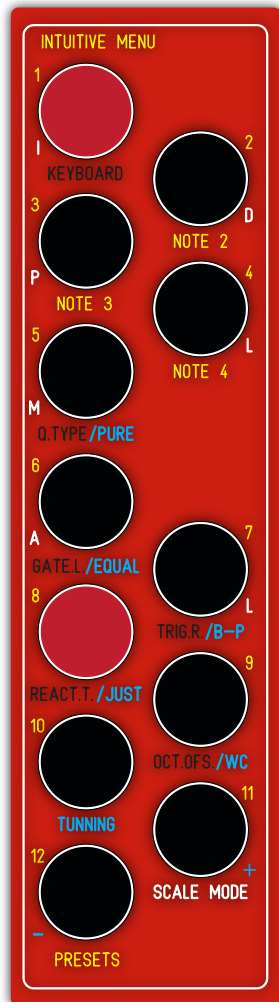


Image 2

Users can select from 5 different temperaments:
 PURE: La Monte Young's Well Tunned Piano temperament
 EQUAL: Standard Equal Temperament
 B-P: Dr. Boulanger 12 Note Bohlen-Pierce Temperament
 JUST: Just Temperament
 AFR: African Temperament

If it's the User's wish to change the Scale Temperament to a different one he'll need to press the respective button color coded in blue. Just like any other Menu Window pressing it twice will save the setting and Exit back to the Main Window.

Let's assume Button 8 (Just Temperament). Once Button 8 is lit (image 2) pressing it once again confirms the new setting and Exits the Menu Window. **This is the best way to Exit this particular Menu Window.**

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. VII - part C

INTUITIVE MENU

TUNING Operations

FINE - TUNING Procedure- Buttons 1 to 4, 11 and 12

Default value for Active Voice Fine Tuning is Voice 1 (Button 1).

This Setting can be used to adjust the 1v/octave ratio.

So let's imagine we have already pressed the TUNING Button for approx. 1 second and entered in it's Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying both the default settings for Active Voice Tuning (Button 1) and Scale Temperament (Button 6).

	Function
BUTTON 1	Tune Voice 1
BUTTON 2	Tune Voice 2
BUTTON 3	Tune Voice 3
BUTTON 4	Tune Voice 4
BUTTON 10	Save
BUTTON 11	+
BUTTON 12	-

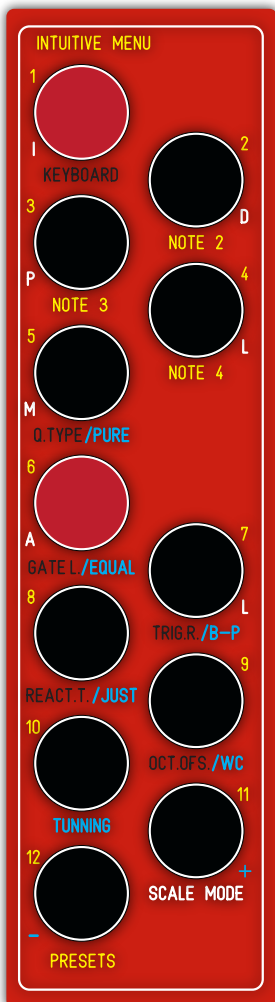


Image 1

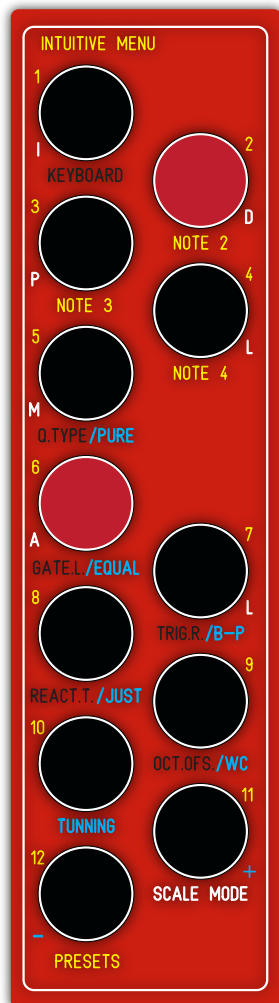


Image 2

This is the Function for User's fine tuning to adjust its 1v/octave ratio to any particular VCO reaction. Fine Tuning is independent for each voice.

Buttons 1 to 4 show which Voice is active for Fine Tuning, pressing each of these Buttons selects a new Voice. Let's assume Voice 2 (image 2).

After the desired Voice is selected the User can then Fine Tune with Buttons 11 and 12, color coded in blue, these buttons will also blink everytime they are pressed: Button 11 (+) will increase the 1v/octave relation in intervals of 0.001mV; Button 12 (-) will decrease the 1v/octave relation in intervals of 0.001mV.

These settings can be saved permanently in non-volatile memory simply pressing TUNING Button (10). This will also Exit the Menu Window.

MICROTONAL SCALES

This setting also opens the possibility to more than 12 note equal tempered scales. Bringing down the 1v/octave value to 1/2 will set the scale to a 24 note scale, bringing it further down to 1/4 will set it to a 48 note scale or any combination in between.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. VII - part D INTUITIVE MENU TUNING Operations

MOOG/BUCHLA v/octave Procedure - Buttons 11 and 12

This setting is shared by all 4 Voices.
Default value is Moog (1v/octave).

The **TUNING** Button (10) is the monitor for this setting:
If Button 10 led is Off then 1v/octave Moog Standard is selected.
If Button 10 led is On then 1.2v/octave Buchla Standard is selected.

So let's imagine we have already pressed the **TUNING** Button for approx. 1 second and entered in its Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying both the default settings for Active Voice Tuning (Button 1), Scale Temperament (Button 6) and Moog Standard (Button 10).

To change this state simply Press both Buttons 11 and 12 at the same time, **TUNING** Button (10) will change state.

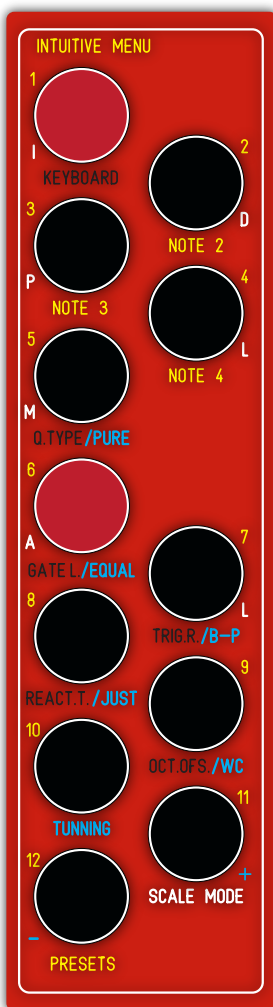


Image 1

SAVE TUNING SETTINGS Procedure- Buttons 1 to 4, 11 and 12

This setting Writes the User's current Fine-Tuning settings to non-volatile memory. This will be loaded automatically every time you power up your system. Fine Tuning settings will not be saved with the User's Presets.

So let's imagine we have already pressed the **TUNING** Button for approx. 1 second and entered in its Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying both the default settings for Active Voice Tuning (Button 1) and Scale Temperament (Button 6).

To Save simply Press and Hold the **TUNING** Button (10) for more than 5 seconds, leds will blink giving the User the feedback of procedure completed.

After Saving, the Menu will Exit to the Main Window.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Ex. IX INTUITIVE MENU

PRESETS Operation - Buttons 1 to 11

Default value is PRESET 1 (Button 1).

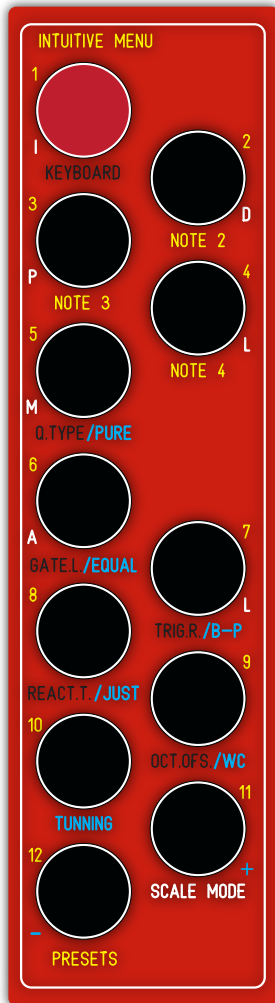


Image 1

Imagine the User has already pressed the **PRESETS** Button for approx. 1 second and entered in its Menu Window, the Menu Buttons already changed to the configuration shown in image 1, displaying the default Active Preset (Button 1).

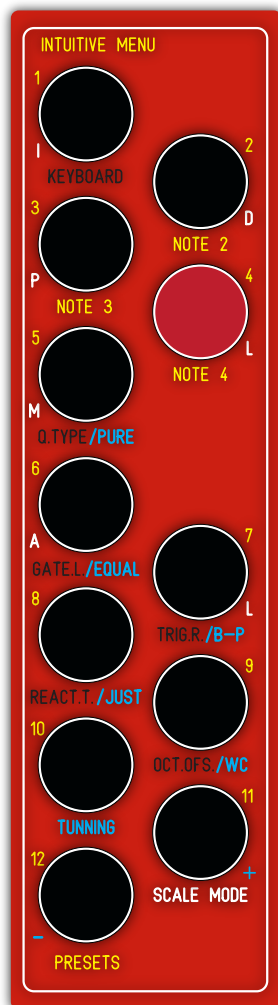


Image 2

A. LOADING

If it's the User's wish to Load, for Ex., Preset 4 he just needs to press Button 4 twice. Once the first push occurs the led below will light up. After the second push it will load Preset 4 and Exit to the Main Mode Window.

If Preset 4 was already selected pressing it a second time will not load it again but rather return to the Main Window leaving the volatile memory intact, meaning that any settings that might have been changed in the meantime are kept changed and not freshly loaded from Preset 4 saved data.

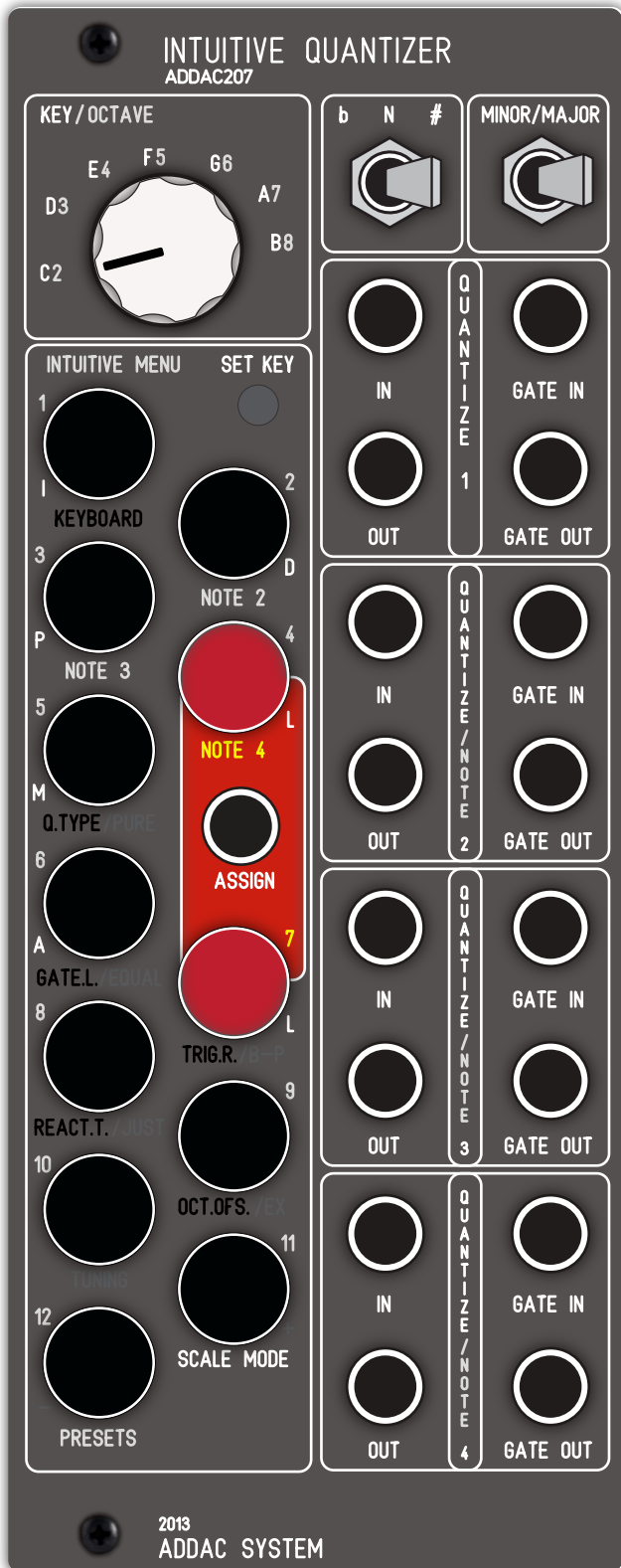
If the User needs to clean all changes made and load back Preset 4, he just needs to load any other preset and then load back Preset 4.

B. SAVING

If it's the User's wish to Save the current configuration in Preset 5 he just needs to light Button 5 and after that Push and Hold the **PRESETS** Button (12) for 3 seconds, after which the button's leds will blink and exit to the Main Window.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



ASSIGNING ASSIGN INPUT TO CONTROL MENU FUNCTIONS

ASSIGN 1v/Octave CV Input

This CV input can be assigned to control 8 of the Menu Functions.

To do this the User needs to access the Assign Window momentarily pressing both Button 4 and 7 at the same time.

In this Window the User can also deactivate the CV input from controlling the Transpose Function (by Default only this function is active).

Here's a Table with the Button Assignments

BUTTON 1	Transpose
BUTTON 2	NOTE 2
BUTTON 3	NOTE 3
BUTTON 4	NOTE 4
BUTTON 5	Q.TYPE
BUTTON 6	GATE L.
BUTTON 7	TRIG.R.
BUTTON 9	OCT.OFS.

Lighting On any of the corresponding Buttons will route the incoming CV to control that particular function.

Multiple Leds can be chosen at the same time.

To Exit the Assign Window press any of the unused buttons: Button 8, 10, 11 or 12.

In this input negative voltages are fully rectified and will be interpreted as positive ones.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



TRANSPOSE OPERATIONS

TRANSPOSE 1v/Octave CV Input

If Assigned, this CV input allows a positive 1v/octave CV to be connected for external Scale Transposition. Incoming CV is divided in 12 semitones for every 1v, let's assume X semitones. The scale is immediately transposed offsetting the Root note by the same X semitones.

The CV input voltage range is not important by itself, meaning that +1v will result in the same transposition as +3v which would be zero or no transposition.

This operation is visible in the Scale Leds.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013



TUNING RESET

Tuning Reset is the procedure where the module calibrate its 4 Voices to the 1v/octave standard.

This procedure will overwrite the User's Fine-Tuning settings but will not save itself to the non-volatile memory, so it won't affect the User's previously saved settings if he restarts his system. If it's the User's wish to save the calibration results he can do so as described in EX.VII - part D.

To execute this procedure Press and Hold the **SET KEY** button for 5 seconds.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

REMARKS ON TEMPERAMENTS

Temperaments are just a different way of tuning the intervals between notes. Our common Equal Temperament scale defines that every interval is Equal which translates to $1\sqrt[12]{\text{octave}}$ equals $(1\sqrt[12]{\text{notes}})$ 0.08333333 between each note. This is referred to as the Interval Ratio.

The Equal Temperament that we are so used to is attributed to Johann Faulhaber circa 1630 and it survived all these years because it is the easiest way to tune an instrument so that any scale can be played without the need to calculate and retune everytime you change the scale Root. This was strictly a functional decision and in disagreement with the nature and mathematics of music.

So everything comes down to Ratios. Imagine that we're on A4 minor scale and we want to calculate the frequency of the 3rd from the Root or C5

Ex. I - Equal Temperament

In Equal Temperament to calculate any desired note frequency we simply multiply the Root frequency by 2 powered to the semitone divided by 12:

Root * $2^{(3/12)}$

if our A4 is 440Hz then C is:

$440 * (2^{(3/12)})$

$440 * 1.1892$

=

523.25Hz C5, which is also true for the frequency we tune C5 in a piano.

Although valid in our Equal Temperament system this is not true in other Temperaments.

Ex. II - Just Temperament

In Just Temperament every interval has its own ratio and none of them are equal.

These are the Ratios used for the Just Temperament:

16/15, 9/8, 6/5, 5/4, 4/3, 7/5, 3/2, 8/5, 5/3, 7/4, 15/8

If we try making the same calculation from the previous example we'll find that:

$440 * (6/5) = 528$ C5

So C5 in Just Temperament does not have the same frequency as pure C5.

The implications of this example is that if you tune an instrument in Just Temperament it will only be valid for the Root you tune it to. To play in any other scale the whole instrument needs to be tuned accordingly.

Which leads us to a particular function:

For any Temperament other than EQUAL the b/N/# + KEY / OCTAVE Switches will set the Root for the tuning to comply with the procedure described above.

Although this will change the Tuning it will not change the keyboard layout and led indicators.

As an example if the User selects the Natural A Root selecting a C on the keyboard is actually selecting an A note. So all Roots are relative to the same C keyboard layout.

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

HELPFUL TABLES

NOTE 2/3/4	Interval	Reaction Time	Hold Time	Idle Time	Tunnings	Function
BUTTON 1	Root	BUTTON 1	500 ms	5000 ms	BUTTON 1	Tune Voice 1
BUTTON 2	2nd	BUTTON 2	700 ms	6000 ms	BUTTON 2	Tune Voice 2
BUTTON 3	3rd	BUTTON 3	900 ms	7000 ms	BUTTON 3	Tune Voice 3
BUTTON 4	4th	BUTTON 4	1100 ms	8000 ms	BUTTON 4	Tune Voice 4
BUTTON 5	5th	BUTTON 5	1300 ms	9000 ms	BUTTON 5	Well Tuned
BUTTON 6	6th	BUTTON 6	1500 ms	10000 ms	BUTTON 6	Equal
BUTTON 7	7th	BUTTON 7	1700 ms	11000 ms	BUTTON 7	Bohlen-Pierce
BUTTON 8	8th	BUTTON 8	1900 ms	12000 ms	BUTTON 8	Just
BUTTON 9	9th	BUTTON 9	2100 ms	13000 ms	BUTTON 9	Exotic
BUTTON 10	10th	BUTTON 10	2300 ms	14000 ms	BUTTON 10	Save F.Tune
BUTTON 11	11th	BUTTON 11	2500 ms	15000 ms	BUTTON 11	+
BUTTON 12	12th	BUTTON 12	2700 ms	16000 ms	BUTTON 12	-

Quantization Type

BUTTON 3	ABOVE
BUTTON 5	IGNORE
BUTTON 6	BELOW

Gate Length

BUTTON 1	10 ms
BUTTON 2	20 ms
BUTTON 3	40 ms
BUTTON 4	80 ms
BUTTON 5	160 ms
BUTTON 6	320 ms
BUTTON 7	640 ms
BUTTON 8	1280 ms
BUTTON 9	2560 ms
BUTTON 10	5120 ms
BUTTON 11	10240 ms
BUTTON 12	GateCondition

Trigger Repeat

BUTTON 7	ON/OFF
----------	--------

Octave Offset

BUTTON 1	0 Octaves
BUTTON 2	1 Octaves
BUTTON 3	2 Octaves
BUTTON 4	3 Octaves
BUTTON 5	4 Octaves
BUTTON 6	5 Octaves
BUTTON 7	6 Octaves
BUTTON 8	7 Octaves
BUTTON 9	8 Octaves
BUTTON 10	9 Octaves

MAIN MEMORY

Moog/Buchla
Reaction Time
Fine Tunings

Assigns

BUTTON 1	Transpose
BUTTON 2	NOTE 2
BUTTON 3	NOTE 3
BUTTON 4	NOTE 4
BUTTON 5	Q.TYPE
BUTTON 6	GATE L.
BUTTON 7	TRIG.R.
BUTTON 9	OCT.OFS.

PRESETS MEMORY

Scale Notes
CV Assigns
NOTE 2
NOTE 3
NOTE 4
QUANTIZING TYPE
GATE LENGTH
TRIGGER REPEAT
OCTAVE OFFSET
Scale Temperament
Gate Off Condition

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July, 2013

Non-Volatile MEMORY

There are two different locations in memory:

- Main Memory, stores overall settings
- Presets Memory, stores 11 User Presets

WHAT'S KEPT IN MAIN MEMORY

Moog/Buchla

Reaction Time

Fine Tunings

WHAT'S KEPT IN PRESETS MEMORY

Scale Notes

CV Assigns

NOTE 2

NOTE 3

NOTE 4

QUANTIZING TYPE

GATE LENGTH

TRIGGER RESET

OCTAVE OFFSET

Scale Temperament

Gate Off Condition

TECH SPECS

MECHANICAL:

Format: Eurorack

Width: 10 HP

Depth: 6 cm

CONTROL VOLTAGE I/O:

CV inputs: $\pm 5v$

CV outputs: 0 +10v

ELECTRICAL:

Max current: 150mA

Compatible with +-12v and +-15v power supplies

Bus Board Cable: 8 x 2 IDC (Doepfer style) connector

ADDAC207 INTUITIVE QUANTIZER USER'S GUIDE

Revision.03 July.2013