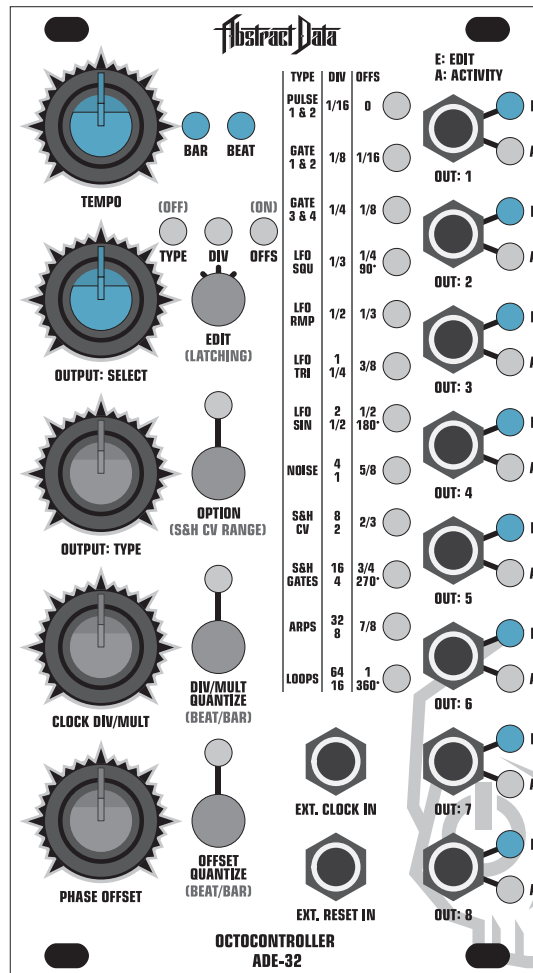# Abstract Data

MACHINES FOR HUMANS

ADE-32 OCTOCONTROLLER

Control, Modulation, Triggering and Pattern module with
12 Output Types individually assignable to 8 simultaneous Outputs.

USER GUIDE

Contents

1) Module Overview

- The ADE-32 is an 8 output module capable of providing multiple, simultaneous triggering, rhythm, modulation and control signals.

- There are 12 different output types including gates, low frequency oscillators (LFOs), random and loopable control voltage (CV), sample & hold (S&H) and a collection of arpeggios and rhythms.

  >> *For more information on output types see Sections 8.1 and 8.2*

- Each output type also has multiple configuration options giving a total of nearly 90 output types.

- The output types can be assigned to any of the 8 outputs in any order and edited at any time.

- Each output can have individual settings for clock division, clock multiple and phase offset and these settings can be quantized or free-running for each output.

  >> *For more information on clock division and phase offset see Section 6*

- Each output's activity can be monitored using the dedicated Activity LED for each output or via the 12 parameter LEDs using the module's 'visualizer mode'.

  >> *For more information on interface functionality see Sections 5 and 6*

- Parameter changes to clock division/multiple and phase offset can be set to change at 'start of next beat' or 'start of next bar'.

- Parameter edits are handled using single-function 'edit modes' where any parts of the physical interface not required for that edit are locked.

- The front panel is laid out in a simple 3 part grid that allows easy access to all the relevant performance information for each output – there is no menu-diving.

- The module's knobs can be configured to suit the user's preference through a choice of 'latching' or 'non-latching' behaviour.

- The module can run using its internal clock or can be synced to an external clock source and will output up to a 64 beat / 16 bar cycle at tempos between 20 and 270 BPM.

  >> *For more information on clock and sync settings see Section 5*

- The module has built-in non-volatile memory and will retain all settings for all outputs as long as there is a minimum of 3 seconds between any settings being changed and module power-down.

- The module's firmware can be upgraded by the user through a simple installation process.

- This version of the manual refers to the latest firmware revision v2.0.

  >> *For more information on firmware versions see Sections 9.3, 9.4 and 9.5*

2) Front Panel
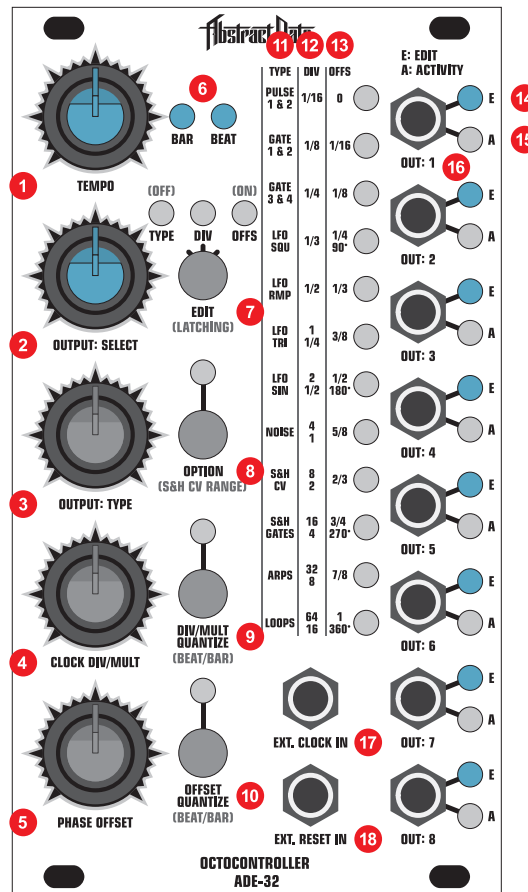
#	Label	Description
1	**TEMPO:**	Sets the master tempo of the internal clock
2	**OUTPUT SELECT:**	Selects outputs 1-8 for editing
3	**OUTPUT TYPE:**	Assigns an output type to the selected output
4	**CLOCK DIV/MULT:**	Sets the clock division/multiple for the selected output
5	**PHASE OFFSET:**	Sets the offset for the selected output
6	**BAR/BEAT:**	Blue LEDs indicate bar and beat timing
7	**EDIT:**	Shows the output type, clock division/multiple and offset settings
8	**OPTION:**	Sets the options for each output type
9	**DIV/MULT QUANTIZE:**	Sets the clock division/multiple quantizing for the selected output
10	**OFFSET QUANTIZE:**	Sets the offset quantizing for the selected output
11	**OUTPUT TYPE:**	White parameter LED shows the output type for the selected output
12	**OUTPUT DIVISION/MULTIPLE:**	White parameter LED shows the clock division/multiple for the selected output
13	**OUTPUT OFFSET:**	White parameter LED shows the offset for the selected output
14	**EDIT LED 1-8:**	Blue LED shows the selected output
15	**ACTIVITY LED 1-8:**	White LED shows the activity at each output
16	**OUTPUTS 1-8:**	Individual outputs
17	**EXT. CLOCK INPUT:**	Syncs the module to an external clock source
18	**EXT. RESET INPUT:**	Resets all outputs to bar 1, beat 1 of the global 16 bar loop

3) Rear Connections
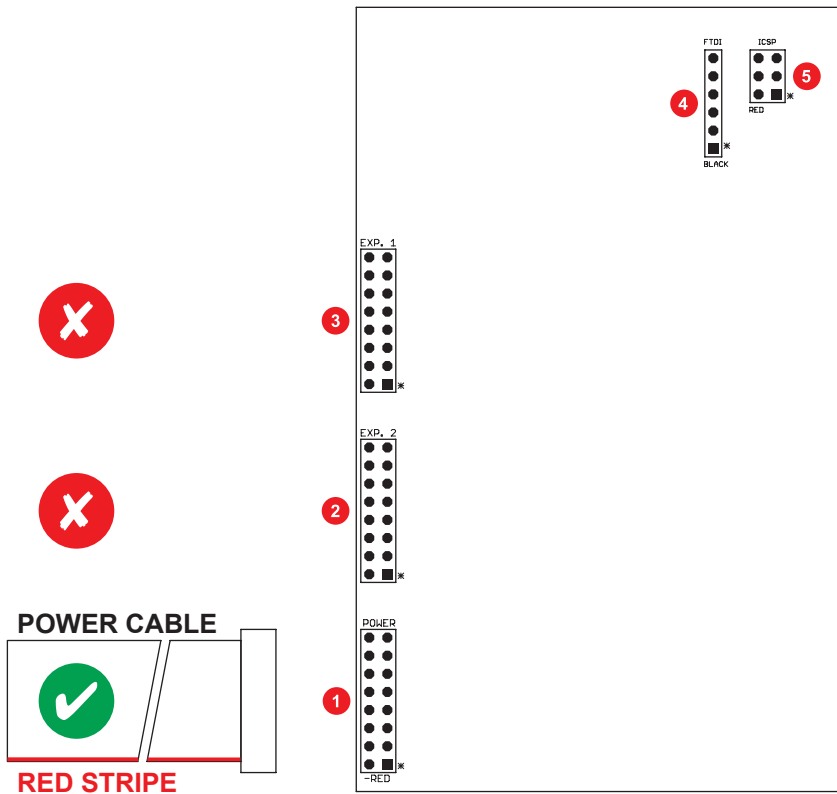
1	**POWER:**	Eurorack power connection	
2	**PORT 1:**	No connection	
3	**PORT 2:**	No connection	
4	**FTDI:**	User firmware upgrade port	
5	**ICSP:**	No connection	

PRECAUTIONS: *ONLY CONNECT THE POWER CABLE TO THE POWER CONNECTION AS SHOWN!*

DO NOT CONNECT THE POWER CABLE TO ANY OTHER PORT!

The ADE-32 uses the Doepfer standard for power connection and cable orientation.

The RED stripe on the supplied power cable connects to the NEGATIVE (-12V) rail on the ADE-32 with the RED stripe facing DOWN. This is marked on the back of the ADE-32 PCB as "– RED".

The ADE-32 has diode and polyfuse protection built in but an incorrectly connected cable may still cause permanent damage to the module or the power supply.

The rear panel of the ADE-32 has exposed parts and connections. Please ensure when handling the ADE-32 that the unit is held by the sides of the front panel or the sides of the PCB (Printed Circuit Board).

4) Quick Start

1) SET THE TEMPO [Global Edit]

Set the tempo to the desired speed using the TEMPO knob.

The tempo is indicated by the two blue LEDs immediately to the right of the TEMPO knob.

2) SELECT AN OUTPUT TO EDIT [Local Edit]

Select an output to edit using the OUTPUT: SELECT knob.

As you move the knob back and forth, the blue LEDs on the right hand side of the front panel will update to indicate the selected output.

Set the OUTPUT: SELECT knob so that the blue LED at OUT: 1 is illuminated.

3) ASSIGN AN OUTPUT TYPE TO THE SELECTED OUTPUT [Local Edit]

Select an output type to assign to the selected output using the OUTPUT: TYPE knob.

As you move the knob back and forth, the vertical row of 12 white parameter LEDs to the left of the outputs will update and illuminate to indicate the output type that has been selected.

Set the OUTPUT: TYPE knob so that LED 5 is illuminated.

Read across to the left column of text labelled TYPE – LFO RMP indicates that a 'ramp' type LFO has been assigned to the selected output.

4) SET THE CLOCK DIVISION [Local Edit]

Set the clock division/multiple for the selected output type at the selected output using the CLOCK DIV/MULT knob.

As you move the knob back and forth, the vertical row of 12 white parameter LEDs to the left of the outputs will update and illuminate to indicate the selected clock division/multiple.

Set the CLOCK DIV/MULT knob so that LED 8 is illuminated.

Read across to the middle column of text labelled DIV – this indicates that the output type now has a length of 4 Beats / 1 Bar at the current tempo.

5) SET THE PHASE OFFSET [Local Edit]

Set the phase offset for the selected output type and output using the PHASE OFFSET knob.

As you move the knob back and forth, the vertical row of 12 white parameter LEDs to the left of the outputs will update and illuminate to indicate the phase offset that has been selected.

Set the PHASE OFFSET knob so that LED 7 is illuminated.

Read across to the right column of text labelled OFFS – this indicates that the output type now has a phase offset of 180 degrees.

6) REVIEW THE PATCH SETTINGS [Local Edit]

Single-click the EDIT button to cycle through the TYPE (output type), DIV (clock division/multiple) and OFFS (phase offset) settings for the selected output.

The vertical row of 12 white parameter LEDs to the left of the outputs will update to show the current settings for each of the 3 parameters for the selected output.

7) SYNC TO EXTERNAL CLOCK [Global Edit]

Set the ADE-32 PPQN/Clock Resolution and the external clock source to the same PPQN settings.

>> *For more information on PPQN and clock settings see Section 5*

Switch the module into External Clock Mode and connect it to an external clock source.

>> *For more information on internal or external clock settings see Section 7.4*

5) Inputs & Outputs

1) OUT: 1-8

The ADE-32 has 8 outputs aligned vertically down the right-hand side of the front panel.

Any of the 12 output types can be assigned to any of these 8 outputs.

2) OUTPUT LEDs

To the right of each output are 2 indicator LEDs – a blue LED marked 'E' (Edit) to show which of the 8 outputs is currently selected for editing via the OUTPUT: SELECT knob and a white LED marked 'A' (Activity) to show the signal at that output.

The blue LEDs have 3 states:

Solid:	The selected output is active – it can be edited and will output signal.
Flash (Fast):	The selected output is muted – it can be edited but will not output signal.
Flash (Slow):	The selected output is locked – it cannot be edited but will output signal if it is not muted.

>> *For more information on output mute and lock functionality see Section 7.2*

3) EXT. CLOCK IN

The ADE-32 can be operated using its internal clock or it can be synced to an external clock source.

As of firmware revision v1.1 or later it is possible to manually select whether the ADE-32 runs in internal or external clock mode.

When controlled by an external clock – the ADE-32 will not run until it receives a clock signal.

In external clock mode, the ADE-32 will sync to the rising edge of an incoming clock signal between 20 and 270 BPM as long as the incoming clock is set to the same resolution as the module and is within the module's tempo range.

As of firmware revision v2.0 the ADE-32 will sync to external clock resolutions of 1, 2, 4 or 24 PPQN.

1 BAR : 4 BEATS

1	2	3	4

1 PPQN : 1/4 NOTES

1	2	3	4

4 PPQN : 1/16 NOTES : 1 STEP

1.1 1.2 1.3 1.4 2.1 2.2 2.3 2.4 3.1 3.2 3.3 3.4 4.1 4.2 4.3 4.4

24 PPQN

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 2.4 2.5 2.6 3.1 3.2 3.3 3.4 3.5 3.6 4.1 4.2 4.3 4.4 4.5 4.6
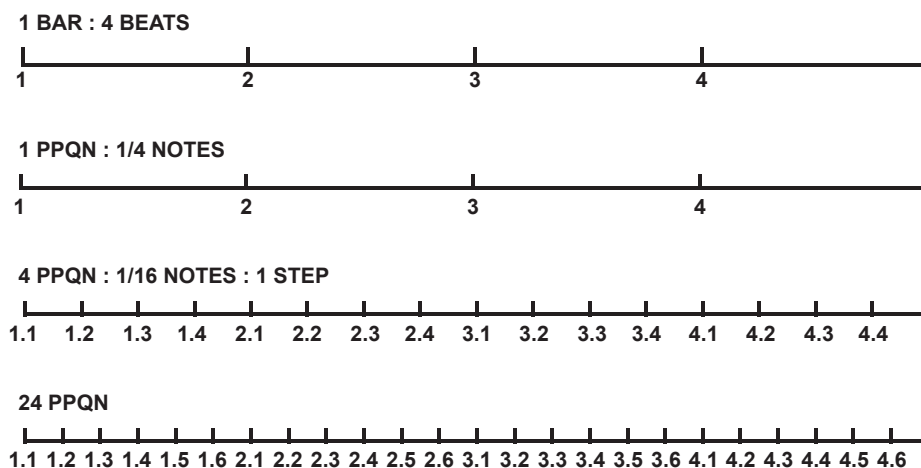
>> *For more information on internal or external clock settings see Section 7.4*

4) EXT. RESET IN

The ADE-32 can be reset using the rising edge of a signal sent to the EXT. RESET IN.

This will reset the cycle of all 8 outputs back to bar 1, beat 1 of the overall 16 bar, 64 beat cycle.

6) Knobs

1) TEMPO

The TEMPO knob sets the master tempo for all 8 outputs.

This is a global edit – this setting is changed for the whole module.

The tempo can be changed from 20 to 270 BPM. The 2 blue LEDs to the right of this knob indicate BAR and BEAT respectively with a slightly longer flash at the first beat of each 64 beat/16 bar cycle.

The TEMPO knob is only active when the module is running in internal clock mode and is disabled when the module is running in external clock mode.

2) OUTPUT: SELECT

The OUTPUT: SELECT knob selects an output to edit.

This is a local edit that only changes settings at the selected output.

Each of the 8 outputs has a blue LED marked 'E' (Edit) to the upper right that will illuminate to indicate the output that is being edited as you turn this knob.

3) OUTPUT: TYPE

The OUTPUT: TYPE knob assigns an output type to the selected output.

This is a local edit that only changes this setting at the selected output.

The 12 output types are listed on the front panel in the left-hand vertical column titled TYPE.

The vertical row of 12 white parameter LEDs will update to show the output type that has been selected for that output.

4) CLOCK DIV/MULT

The CLOCK DIV/MULT knob sets the timing for the output type assigned to the selected output.

This is a local edit that only changes this setting at the selected output.

This timing is a division or a multiple of the master tempo in both internal and external clock modes.

The 12 timing divisions are listed on the front panel in the middle vertical column titled DIV.

The vertical row of 12 white parameter LEDs will update to show the clock division/multiple that has been selected for that output.

5) PHASE OFFSET

The PHASE OFFSET knob sets a phase offset for the output type assigned to the selected output.

This is a local edit that only changes this setting at the selected output.

Phase offset is expressed in degrees or as a fraction of the clock division for that output.

The 12 offset options are listed on the front panel in the right-hand vertical column titled OFFS.

The vertical row of 12 white parameter LEDs will update to show the phase offset that has been selected for that output.

7.1) Buttons: Single-Click

1) Button: **EDIT**
     Function: **Edit Settings [Local Edit]**
     Options: **Parameters 1-3**

Single-click the EDIT button to scroll through the current setting for each of the 3 parameters for the selected output: TYPE (output type), DIV (clock division/multiple) and OFFS (phase offset).

The currently selected parameter is displayed by the 3 edit LEDs.

The vertical row of 12 white parameter LEDs will also update to show which option has been selected for each of these 3 edit parameters.

The 3 edit LEDs will also update when the OUTPUT: TYPE, CLOCK DIV/MULT or PHASE OFFSET KNOBS are moved.

2) Button: **OPTION**
     Function: **Output Type Option 1 [Local Edit]**
     Options: **Option 1 Off / Option 1 On**

Single-click the OPTION button to access the first option. This will turn the option on or off (types 1-8), activate S&H looping (types 9-10) or scroll through patterns 1-10 (types 11-12).

For output types with only one option – the white LED above the OPTION button will update to show whether the option is selected (LED on) or not selected (LED off).

For output types with a looping option – the white LED above the OPTION button will update to show whether looping is on (LED on) or looping is off (LED off).

For output types with multiple options the white LED above the OPTION button will illuminate momentarily with each press.

3) Button: **DIV/MULT QUANTIZE**
     Function: **Clock Division/Multiple Quantizing [Local Edit]**
     Options: **Quantizing Off / Quantizing On**

Single-click the DIV/MULT QUANTIZE button to turn quantizing of clock division/multiple settings on (LED on) or off (LED off) for the selected output.

When quantizing is on, the white LED above the DIV/MULT QUANTIZE button will illuminate and the clock divisions/multiples for the selected output will lock to one of the 12 clock divisions listed in the vertical column on the front panel labelled DIV.

When quantizing is off, the white LED above the DIV/MULT QUANTIZE button will be off and the clock division at the selected output will move incrementally.

When quantizing is off, the vertical row of 12 white parameter LEDs will flash at different speeds to show how far from (slower flash) or close to (faster flash) a particular clock division you are.

4) Button: **OFFSET QUANTIZE**
     Function: **Phase Offset Quantizing [Local Edit]**
     Options: **Quantizing Off / Quantizing On**

Single-click the OFFSET QUANTIZE button to turn quantizing of phase offset positions on (LED on) or off (LED off) for the selected output.

When quantizing is on, the white LED above the OFFSET QUANTIZE button will illuminate and the phase offset for the selected output will lock to one of the 12 phase offset positions listed in the vertical column on the front panel labelled OFFS.

When quantizing is off, the white LED above the OFFSET QUANTIZE button will be off and the phase offset at the selected output will move incrementally.

When quantizing is off, the vertical row of 12 white parameter LEDs will flash at different speeds to show how far from (slower flash) or close to (faster flash) a particular phase offset you are.

7.2) Buttons: Double-Click

1) Button: **EDIT**
    Function: **Edit Mode Exit [Global Edit]**
    Options: **Exit Edit Mode**

Double-click the EDIT button when the module is in any of the edit modes to exit that edit mode and return to normal use.

This option can be used once any edits have been made in that edit mode to confirm new settings or as a simple way to leave an edit mode without making any changes.

2) Button: **OPTION**
    Function: **Visualization Mode [Local Edit]**
    Options: **Visualization Off / Visualization On**

Double-click the OPTION button to enter or exit the visualization mode.

Visualization mode gives users an alternative method of viewing output signals and uses the 12 parameter LEDs to show the activity at the selected output. Positive output voltages are shown using the top 5 LEDs, negative voltages are shown using the bottom 5 LEDs and LEDs 6 and 7 show 0V.

Visualization mode will stay active while any button-activated options are changed or edited for the currently selected output or when a new output is selected using the OUTPUT: SELECT knob.

Visualization mode will stop on the next double-click of the OPTION button or when the EDIT button is single-clicked or when any of the OUTPUT: TYPE, CLOCK DIV/MULT or PHASE OFFSET knobs are turned.

When Visualization mode is de-activated, the interface will update to show either the previously selected or the newly selected settings as applicable.

3) Button: **DIV/MULT QUANTIZE**
    Function: **Output Mute [Local Edit]**
    Options: **Mute Off / Mute On**

Double-click the DIV/MULT QUANTIZE button to mute the selected output.

When an output is muted, the blue edit LED for that output will flash rapidly and that output will not output any signal.

When an output is muted it can still be edited as normal and any changes will be active when the output is unmuted.

To unmute the selected output – double-click the DIV/MULT QUANTIZE button again.

Once unmuted – the selected output will start to output signal again based on its current settings.

4) Button: **OFFSET QUANTIZE**
    Function: **Output Lock [Local Edit]**
    Options: **Lock Off / Lock On**

Double-click the OFFSET QUANTIZE button to lock the selected output.

When an output is locked, the blue edit LED for that output will flash slowly.

If it is unmuted when locked, it will continue to output signal as normal and if it is muted when locked it will remain muted.

When an output is locked it will not respond to any parameter or edit changes.

To unlock the selected output – double-click the OFFSET QUANTIZE button again.

Once unlocked – the selected output can now be edited as normal.

7.3) Buttons: Click-Hold

1) Button: **EDIT**
    Function: **Knob Latching [Global Edit]**
    Options: **Latching Off / Latching On**

Click-hold the EDIT button until one of the 3 edit LEDs starts to flash.

The selected parameter is shown by: TYPE [Latching Off] and OFFS [Latching On].

Single-click the EDIT button to cycle through these options.

When knob latching is off, any parameter changes requiring an interface update will cause the currently selected parameter to jump to the currently selected knob positon if any knob is moved.

When knob latching is on, any parameter changes requiring an interface update will require the corresponding knob to be in the correct position for that parameter before changes are registered.

Knob latching is shown on the interface using the 12 parameter LEDs. A flashing LED shows the position of the currently selected knob and a solid LED shows the required knob position for latching.

Turning the knob in the correct direction moves the flashing LED towards the solid LED. Once the knob reaches the right position – it will 'latch'. You can now use that knob to change parameters.

To exit this edit mode – click-hold the EDIT button until the edit LED stops flashing.

2) Button: **OPTION**
    Function: **Output Type Option 2 [Local Edit]**
    Options: **Parameters 1-3**

Click-hold the OPTION button until one of the 3 edit LEDs starts to flash.

The selected parameter is shown by: TYPE [Option 2.1]; DIV [Option 2.2] and OFFS [Option 2.3].

Single-click the OPTION button to cycle through these options.

>> *For more information on output type options see Sections 8.1 and 8.2*

To exit this edit mode – click-hold the OPTION button until the edit LED stops flashing.

3) Button: **DIV/MULT QUANTIZE**
    Function: **Beat/Bar Latching [Global Edit]**
    Options: **Change At Next Beat / Change At Next Bar**

Click-hold the DIV/MULT QUANTIZE button until one of the 3 edit LEDs starts to flash.

The selected parameter is shown by: TYPE [Change At Next Beat] and OFFS [Change At Next Bar].

Single-click the DIV/MULT QUANTIZE button to cycle through these options.

When 'Change At Next Beat' is on – clock division/multiple parameter changes activate at the next beat.

When 'Change At Next Bar' is on – clock division/multiple parameter changes activate at the next bar.

To exit this edit mode – click-hold the DIV/MULT QUANTIZE button until the edit LED stops flashing.

4) Button: **OFFSET QUANTIZE**
    Function: **Beat/Bar Latching [Global Edit]**
    Options: **Change At Next Beat / Change At Next Bar**

Click-hold the OFFSET QUANTIZE button until one of the 3 edit LEDs starts to flash.

The selected parameter is shown by: TYPE [Change At Next Beat] and OFFS [Change At Next Bar].

Single-click the OFFSET QUANTIZE button to cycle through the options.

When 'Change At Next Beat' is on – phase offset parameter changes activate at the next beat.

When 'Change At Next Bar' is on – phase offset parameter changes activate at next bar.

To exit this edit mode – click-hold the OFFSET QUANTIZE button until the edit LED stops flashing.

7.4) Buttons: Combo-Click-Hold

1) Buttons: **EDIT & OPTION**
   Function: **External Clock PPQN [Global Edit]**
   Options: **Parameters 1-4**

Click-hold both the EDIT and the OPTION buttons until one of the 3 edit LEDs starts to flash.

>> For more information on PPQN and clock settings see Section 5

The selected parameter is shown by one of the 3 edit LEDs flashing where:
TYPE (Slow Flash) [1 PPQN]; DIV (Slow Flash) [2 PPQN]; OFFS (Slow Flash) [4 PPQN]
and TYPE (Fast Flash) [24 PPQN].

Single-click the OPTION button to cycle through the options.

To exit this edit mode – click-hold both the EDIT and the OPTION button until the edit LED stops flashing.

2) Buttons: **EDIT & DIV/MULT QUANTIZE**
   Function: **Clock Source [Global Edit]**
   Options: **Internal Clock / External Clock**

Click-hold both the EDIT and the DIV/MULT QUANTIZE buttons until one of the 3 edit LEDs starts to flash.

The selected parameter is shown by one of the 3 edit LEDs flashing where: TYPE [Internal Clock] and OFFS [External Clock].

Single-click the DIV/MULT QUANTIZE button to cycle through the options.

When the module is set to internal clock, the module's tempo is set using the TEMPO knob and the module will ignore clock signals at the EXT. CLOCK IN input.

When the module is set to external clock, the TEMPO knob is ignored and the module will only run when a suitable external clock signal is received at the EXT. CLOCK IN input.

To exit this edit mode – click-hold both the EDIT and the DIV/MULT QUANTIZE button until the edit LED stops flashing.

3) Buttons: **EDIT & OFFSET QUANTIZE**
   Function: **Factory Reset [Global Edit]**
   Options: **Standby / Reset**

Click-hold both the EDIT and the OFFSET QUANTIZE until one of the 3 edit LEDs starts to flash.

The selected parameter is shown by one of the 3 edit LEDs flashing where: TYPE [Standby] and OFFS [Reset].

Single-click the OFFSET QUANTIZE button to reset the module to factory settings.

Once a reset has been initiated the module will go through the visual startup routine.

When this is complete – the module is ready for use.

7.5) Buttons: Quick Reference

Edit **Single-Click** Edit Settings [Local Edit] (Parameters 1-3)	**Option** **Single-Click** Output Type Option 1 [Local Edit] (Option 1 Off / On)	**Div/Mult** **Single-Click** Div/Mult Quantizing [Local Edit] (Quantizing Off / On)	**Offset** **Single-Click** Offset Quantizing [Local Edit] (Quantizing Off / On)	**Edit & Option** **Combo-Click-Hold [1]** External Clock PPQ [Global Edit] (Parameters 1-4)
Edit **Double-Click** Edit Mode Exit [Global Edit] (Exit Edit Mode)	**Option** **Double-Click** Visualization Mode [Local Edit] (Visualization Off / On)	**Div/Mult** **Double-Click** Output Mute [Local Edit] (Mute Off / On)	**Offset** **Double-Click** Output Lock [Local Edit] (Lock Off / On)	**Edit & Div/Mult** **Combo-Click-Hold [1]** Clock Source [Global Edit] (Internal / External)
Edit **Click-Hold [1]** Knob Latching [Global Edit] (Latching Off / On)	**Option** **Click-Hold [1]** Output Type Option 2 [Local Edit] (Parameters 1-3)	**Div/Mult** **Click-Hold [1]** Beat/Bar Latching [Global Edit] (Latch at Beat / Bar)	**Offset** **Click-Hold [1]** Beat/Bar Latching [Global Edit] (Latch at Beat / Bar)	**Edit & Offset** **Combo-Click-Hold [1]** Factory Reset [Global Edit] (Standby / Reset)

NOTES: [1] Knobs and buttons not required while in these edit modes are locked and will not respond to changes until that edit mode is exited.

Version 2.0.0

8.1) Output Types: Option 1

#	Name	Description	Option 1.1	Option 1.2	Clock Div. (Min)	Clock Div. (Max)
1	Pulse 1 & 2	Time-based Pulse	5 Msec duration	10 Msec duration	1/16 Beat	2 Beats | 1/2 Bar
			50 Msec duration	100 Msec duration	4 Beats | 1 Bar	16 Beats | 4 Bars
			0.5 Sec duration	1 Sec duration	32 Beats | 8 Bars	64 Beats | 16 Bars
2	Gate 1 & 2	Fixed-width Gate	1/16 of clock division	4/16 of clock division	1/16 Beat	64 Beats | 16 Bars
3	Gate 3 & 4	Fixed-width Gate	8/16 of clock division	12/16 of clock division	1/16 Beat	64 Beats | 16 Bars
4	LFO SQU	Square-wave LFO	Non-inverted	Inverted	1/16 Beat	64 Beats | 16 Bars
5	LFO RMP	Ramp-wave LFO	Non-inverted (Falling)	Inverted (Rising)	1/16 Beat	64 Beats | 16 Bars
6	LFO TRI	Triangle-wave LFO	Non-inverted	Inverted	1/16 Beat	64 Beats | 16 Bars
7	LFO SIN	Sine-wave LFO	Non-inverted	Inverted	1/16 Beat	64 Beats | 16 Bars
8	Noise	Digital Noise	Type 1 (Unfiltered)	Type 2 (Filtered)	1/16 Beat	64 Beats | 16 Bars
9	S&H CV	Random CV	Looping (Off)	Looping (On)	1/16 Beat	16 Beats | 4 Bars [1]
10	S&H Gates	Random Gates	Looping (Off)	Looping (On)	1/16 Beat	16 Beats | 4 Bars [1]
11	Arps	Arpeggio Melodies	Scroll (Arps 1-10)	-	1/16 Beat	16 Beats | 4 Bars [1]
12	Loops	Rhythmic Patterns	Scroll (Loops 1-10)	-	1/16 Beat	16 Beats | 4 Bars [1]

NOTES: [1] Looping output types have a maximum clock division of 16 Beats | 4 Bars but the total loop length at this clock division is still 64 Beats | 16 Bars.

8.2) Output Types: Option 2

#	Name	Description	Option 2.1 [1]	Option 2.2 [1]	Option 2.3 [1]
1	Pulse 1 & 2	Time-based Pulse	**+V-Trig (0V || +5V)**	S-Trig (0V || -5V)	-V-Trig (+5V || 0V)
2	Gate 1 & 2	Fixed-width Gate	**Unipolar (0V || +5V)**	Bipolar (+/-5V)	Inverted (+5V || 0V)
3	Gate 3 & 4	Fixed-width Gate	**Unipolar (0V || +5V)**	Bipolar (+/-5V)	Inverted (+5V || 0V)
4	LFO SQU	Square-wave LFO	Unipolar (0V || +5V)	**Bipolar (+/-5V)**	Bipolar [+/-2.5V]
5	LFO RMP	Ramp-wave LFO	Unipolar (0V || +5V)	**Bipolar (+/-5V)**	Bipolar [+/- 2.5V]
6	LFO TRI	Triangle-wave LFO	Unipolar (0V || +5V)	**Bipolar (+/-5V)**	Bipolar [+/- 2.5V]
7	LFO SIN	Sine-wave LFO	Unipolar (0V || +5V)	**Bipolar (+/-5V)**	Bipolar [+/-2.5V]
8	Noise	Digital Noise	**Algorithm 1**	Algorithm 2 [2]	Algorithm 3 [2]
9	S&H CV	Random CV	**Unquantized (0V || +5V)**	Unquantized (+/-5V)	Quantized (0V || +1V)
10	S&H Gates	Random Gates	**Loop (Forwards)**	Loop (Backwards)	Loop (Alternating)
11	Arps	Arpeggio Melodies	**Loop (Forwards)**	Loop (Backwards)	Loop (Alternating)
12	Loops	Rhythmic Patterns	Set 1 (Kick Patterns)	Set 2 (Snare Patterns)	**Set 3 (Rhythm Patterns)**

NOTES: [1] Options marked in bold are the default factory settings

[2] Noise algorithm types 2 and 3 are not affected by clock division or offset. These settings are disabled for these 2 algorithm types.

8.3) Arpeggios

#	Artist [1]	Track	Note 1	Note 2	Note 3	Note 4
1	Orbital	Remind	C	C#	G	G#
2	Energy 52	Café Del Mar	C	D	G	F
3	Leftfield	Song Of Life	C	D#	D	D#
4	Aphex Twin	Polynomial Arpeggios	C	D#	G	G#
5	Pink Floyd	On The Run	C	D#	G#	F
6	Boards of Canada	Collapse	C	D#	A#	G
7	Tangerine Dream	White Eagle	C	G	C*	G
8	Underworld	Rez	C* [2]	G#	D#	C
9	Donna Summer	I Feel Love	F	F	C	D#
10	New Order	Blue Monday	G	F	D	C

NOTES: [1] The ADE-32 includes 10 preset arpeggios of 4 notes each in the style of various classic pieces of electronic music.
Use them as is or as building blocks for further experimentation and manipulation.
[2] C* is 1 octave up from C.

LOOP #	STEP 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Drum & Bass	■										■					
Drum & Bass & Fill	■										■				■	
Break Beat	■								■		■					
Break Beat & Fill	■								■		■				■	
Electro	■						■				■					
Electro & Fill	■						■				■			■		
Garage	■							■			■			■		
Garage & Fill	■			■				■			■			■		
4x4 Broken Beat	■						■			■						
4x4 Kick & Fill	■				■				■				■		■	

LOOP #	STEP 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pattern 1					■								■			
Pattern 2					■								■		■	
Pattern 3					■			■					■			
Pattern 4					■			■		■			■			
Pattern 5					■			■		■			■		■	
Pattern 6					■					■			■			
Pattern 7					■					■			■		■	
Pattern 8					■			■					■		■	
Pattern 9			■				■									
Pattern 10			■				■		■							

8.6) Loops: Rhythm Patterns

LOOP #	STEP 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pattern 1																
Pattern 2																
Pattern 3																
Pattern 4																
Pattern 5																
Pattern 6																
Pattern 7																
Pattern 8																
Pattern 9																
Pattern 10																

Version 2.0.0

9.1) Firmware Upgrades: Mac

1) UPGRADE REQUIREMENTS

- Apple Mac computer running OS 10.9 - 10.14 with 1 free USB port.

- USB to FTDI cable (TTL-232R-5V): A suitable cable can be purchased directly from the Abstract Data website or from any of the suppliers listed on the Abstract Data website.
  Please note: This needs to be the 5V cable – *not* the 3.3V version.
  Please note: Abstract Data cannot provide support for cables or programmers that do not fit this spec.

2) DOWNLOADS: http://www.abstractdata.biz/products/eurorack/3x/ade32/?tab=firmware

- FTDI Cable Driver: This is the driver for the USB to FTDI cable – this only needs to be installed once.

- Easy Uploader: This is the firmware installer – this only needs to be installed once.

- Firmware files: These are the latest EEPROM and firmware versions that are unique to each upgrade.

3) UPGRADE PROCEDURE

- Please note that this procedure will restore your ADE-32 to factory settings. Please consider making a written record of any important settings you might currently have on the ADE-32 before upgrading.

- Install the FTDI driver on the computer that you'll be using for the upgrade.

- Install the Easy Uploader on the computer that you'll be using for the upgrade.

- The ADE-32 needs to be plugged in via a standard Eurorack power cable – but *not* powered up. You will also need access to the FTDI port (6x vertical pins) on the rear PCB of the ADE-32.

- Carefully plug the FTDI cable in to the FTDI port (6x vertical pins) on the rear of the ADE-32. The black wire on the FTDI cable faces down.

- Ensuring the ADE-32 is in a secure position where none of the exposed components are likely to touch other conductive surfaces – power up the ADE-32.

- Plug the USB end of the USB to FTDI cable into the computer you will be doing the install on. The ADE-32 might appear to stall a little as it is mounted – this is normal.

- Open the application 'Easy Uploader'. If you get an 'unidentified developer message' – click 'OK' and then open the application using a Control/Right Click – this will bring up a dialogue box – click 'Open'. Check the correct USB port is selected – it will generally be the one on the bottom of the list and will look something like: /dev/cu/usbserial-XXXXXXXX

- EEPROM must be updated first. Click the 'Upload…' button, then navigate to and select the ADE-32 EEPROM file you downloaded.
  You will see the status message "Programming. Please wait…" followed by the status message "Completed!". The unit will now be in a coma. This is normal.

- Now update the firmware. Click the 'Upload…' button again, then navigate to and select the ADE-32 firmware file you downloaded.
  This step will take a bit longer – but you will see the status message "Programming. Please wait…" followed by the status message "Completed!".

- Quit the 'Easy Uploader', unplug the USB end of the cable from the computer, power-down the ADE-32 and then carefully unplug the FTDI end of the cable from the ADE-32.
  You have now completed the Firmware upgrade.

9.2) Firmware Upgrades: Win

1) UPGRADE REQUIREMENTS

- Windows computer running Win XP or later with 1 free USB port.

- USB to FTDI cable (TTL-232R-5V): A suitable cable can be purchased directly from the
  Abstract Data website or from any of the suppliers listed on the Abstract Data website.
  Please note: This needs to be the 5V cable – *not* the 3.3V version.
  Please note: Abstract Data cannot provide support for cables or programmers that do not fit this spec.

2) DOWNLOADS: http://www.abstractdata.biz/products/eurorack/3x/ade32/?tab=firmware

- FTDI Cable Driver: This is the driver for the USB to FTDI cable – this only needs to be installed once.

- Easy Uploader: This is the firmware installer – this only needs to be installed once.

- Firmware files: These are the latest EEPROM and firmware versions that are unique to each upgrade.

3) UPGRADE PROCEDURE

- Please note that this procedure will restore your ADE-32 to factory settings. Please consider making a
  written record of any important settings you might currently have on the ADE-32 before upgrading.

- Install the FTDI driver on the computer that you'll be using for the upgrade.

- Install the Easy Uploader on the computer that you'll be using for the upgrade.
  The installer is 32bit but will also work on 64bit systems.

- The ADE-32 needs to be plugged in via a standard Eurorack power cable – but *not* powered up. You
  will also need access to the FTDI port (6x vertical pins) on the rear PCB of the ADE-32.

- Carefully plug the FTDI cable in to the FTDI port (6x vertical pins) on the rear of the ADE-32.
  The black wire on the FTDI cable faces down.

- Ensuring the ADE-32 is in a secure position where none of the exposed components are likely to
  touch other conductive surfaces – power up the ADE-32.

- Plug the USB end of the USB to FTDI cable into the computer you will be doing the install on.
  The ADE-32 might appear to stall a little as it is mounted – this is normal.

- Open the application 'Easy Uploader' – there should be a short-cut on your desktop.
  Check the correct USB port is selected – it will generally be the one on the bottom of
  the list and will look something like: \\. \COM3

- EEPROM must be updated first. Click the 'Upload…' button, then navigate to and select the
  ADE-32 EEPROM file you downloaded.
  You will see the status message "Programming. Please wait…" followed by the status message
  "Completed!". The unit will now be in a coma. This is normal.

- Now update the firmware. Click the 'Upload…' button again, then navigate to and select the
  ADE-32 firmware file you downloaded.
  This step will take a bit longer – but you will see the status message "Programming. Please wait…"
  followed by the status message "Completed!".

- Quit the 'Easy Uploader', unplug the USB end of the cable from the computer, power-down
  the ADE-32 and then carefully unplug the FTDI end of the cable from the ADE-32.
  You have now completed the Firmware upgrade.

9.3) Firmware v1.0: 08/2015

1) NEW FEATURES

- This was the original firmware version that shipped with the ADE-32 at launch in 2015.

2) CHANGES

- N/A

3) FIXES

- N/A

4) QUICK VERSION ID

- The module powers up without any interface visuals.
- The module will not respond to double-click or combo-click-hold functionality.
- The module will not manually switch between internal and external clock modes.

5) MANUAL URL

https://www.abstractdata.biz/assets/manuals/ADE32_Manual_v1_0_0.pdf

9.4) Firmware v1.1: 05/2016

1) NEW FEATURES

- External clock resolution can now be selected to 1, 4 or 24 PPQN.
- The ADE-32 now has two clock modes. Choose between internal clock mode where the ADE-32 runs from its own internal clock or external clock mode where the ADE-32 will not run unless a suitable clock source is present at the external clock input.
- Switching clock modes when no external clock is present can be used for manual stop/start control.
- The 2 blue bar/beat LEDs reverse out to show when the ADE-32 is running under external clock.
- Each output can now be muted individually. The blue edit LED flashes to indicate a muted state on the currently selected output.

2) CHANGES

- Quantized (0-1V) or unquantized (+/-5V) S&H CV types can now be set locally, per output.
- Pulses, gates and loops are now unipolar 0-5V.
- Gate 1 and 2 lengths are now 1/16, 4/16, 8/16 and 12/16 respectively.
- LED indicator behaviour standardized for all option and global settings.

3) FIXES

- Fixed a bug where pulses would not trigger at clock divisions greater than 16 || 4.
- Fixed a bug where output types 9-10 might not act as expected when allocated to output 8.

4) QUICK VERSION ID

- The module powers up without any interface visuals.
- The module will not respond to double-click functionality.

5) MANUAL URL

https://www.abstractdata.biz/assets/manuals/ADE32_Manual_v1_1_3.pdf

9.5) Firmware v2.0: 07/2020

1) NEW FEATURES

- Visualization mode adds a new way for users to see the signal activity at each output.
- Output lock ensures no parameter or edit changes can be made while an output is locked.
- Unipolar 0-5V and bipolar +/-2.5V options added for all LFO output types.
- New V-Trig and S-trig options for Pulse output types.
- Two new Digital Noise algorithms added.
- Korg-compatible 2 PPQN added as an external sync option.
- Two new 'kick and snare' Loop sets added for quick, simple beat creation.
- Arpeggios and S&H Gate looping now have options to run forward, backward or alternating.
- Universal 'Exit Edit Mode' button functionality to easily exit any edit mode.
- Factory reset functionality allows users to quickly reset all outputs to default factory settings.

2) CHANGES

- Global paramater changes are now made via a simple 'Enter Edit Mode / Edit / Exit Edit Mode' to ensure no accidental edit changes are made.
- Controls not being used for global edits are now locked to ensure only the required parameters are changed during any edit.
- Improved the UI for showing knob-latching settngs.
- Improved the UI for showing non-quantized clock division and offset settings.
- Major improvements and optimizations to the entire code base.

3) FIXES

- Syncing to Arturia BeatStep Pro at 24 PPQN should no longer cause intermittent sync issues.
- Interface now correctly updates for all output types limited to clock divisions of less than 64 | 16 when changing from output types that are not clock division limited.
- Setting multiple outputs to Pulses with a clock division of greater than 16 | 4 while running under external clock no longer causes issues with any of those outputs.
- Output values of quantized S&H CV now working correctly across 1V/Octave.
- Rhythmic loops now match the manual and run as expected.
- Leaving the ADE-32 powered up for multiple days should no longer cause the module to freeze (...but is still not recommended!).

4) QUICK VERSION ID

- The module powers up with an interface sequence running through all LEDs.
- The module has a visualization mode activated by a double-click on the OPTION buton.

5) MANUAL URL

https://www.abstractdata.biz/assets/manuals/ADE32_Manual_v2_0_0.pdf

10) Specs

HARDWARE:	Inputs (Clock):	Rising-edge clock signals ≥ +2.5V
	Outputs (Signal):	8x @ +/- 5V maximum
	Power Requirements:	+/-12V: 16-16-pin IDC connector

	Current Draw:	+12V:	approx. 135mA average
		-12V:	approx. 110mA average
		+5V:	NA

	Dimensions:	Width:	14HP
		Depth:	35mm (Panel to IDC connector)

	Supplied Accessories:	Cable:	1x 16-16-pin, IDC
		Screws: 4x M3	

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VERSIONS:

	Firmware:	v1.0	08/2015
		v1.1	05/2016
		v2.0	07/2020

	Manuals:	v1.0.0	08/2015
		v1.1.3	08/2016
		v2.0.0	07/2020