IMPORTANT SAFETY INSTRUCTIONS

- Read all the instructions before use.
- Do not position the module in direct sunlight or in areas subject to heat, moisture, dust, cold or vibration.
- Clean the module with a damp cloth while switched off. Do not use solvents or abrasive cleaners.
- Do not apply excessive force to any of the switches and knobs.
- The module is capable of producing audio levels that could cause hearing loss. Do not plug headphones directly into the audio output of the module. It is Eurorack voltage, which is substantially higher than headphone voltage. If you experience ringing in your ears after use, consult an audiologist.
- The EEPROM that stores patches has a life of 100,000 write/erase cycles. You may find it becomes unreliable after this. The FRAM that stores user waves has a life of 100 trillion write/erase cycles.
- THE POWER CABLE MUST BE CONNECTED WITH THE RED IDENT FACING DOWN.
- Do not attempt to service the module. Contact Soulsby Synthesizers if your Oscitron stops working.

Thanks To:

Justin Owen (Abstract Data), Oli Horton (DREAMTRAK), James Weiner, Steve Dawson, Neil Kagan and anyone else who has provided me with information, advice and their time!

Introduction

Thank you for purchasing the Oscitron by Soulsby Synthesizers. We feel certain that it will provide you with a whole world of new sounds and creativity.

The controls have been designed to be intuitive and there are no complex menu systems or sequences of button presses. The Oscitron is hackable which means that completely different audio engines can be easily uploaded to it via an FTDI cable and PC or Mac. This means that you have effectively purchased an ever-growing number of modules, rather than just the one!

The first section of this manual provides you with all the information for basic operation of the Oscitron. The next chapters go through each feature in detail. Following that there is an audio engine system diagram and tables of certain sound parameters.

Oscitron parameters such as function names or physical connections are highlighted in red.

Please take time to visit soulsbysynths.com where you can find more information, including the latest news and downloads.

Specification

Inputs: 2x 0-5V 1V/Oct, 3x 0-5V CV, 1x 5V clock, 1x -/+5V audio, all 100kΩ

Outputs: 1x -/+5V audio output 1kΩ

Power Requirements: +/-12V via 10-pin IDC connector

Current Draw: +12V: 130mA approx., -12V: 70mA approx., +5V: 0mA

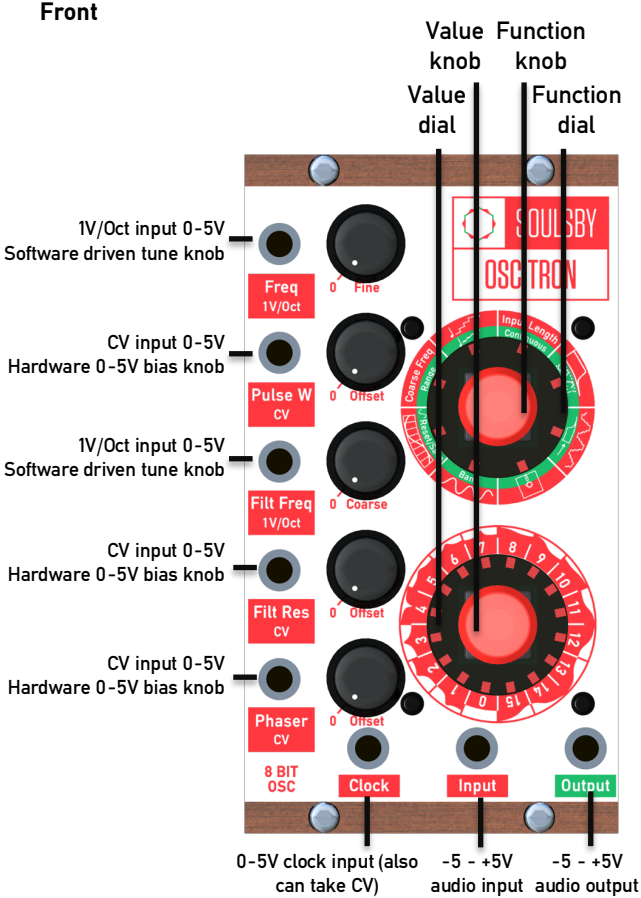
Width: 14HP Depth: 26mm from back panel, including IDC connector

Contents: Oscitron, 4x 10mm M3 screws, 4x 10mm M2.5 screws, 16-pin to 10-pin IDC cable, Quick Ref card, manual

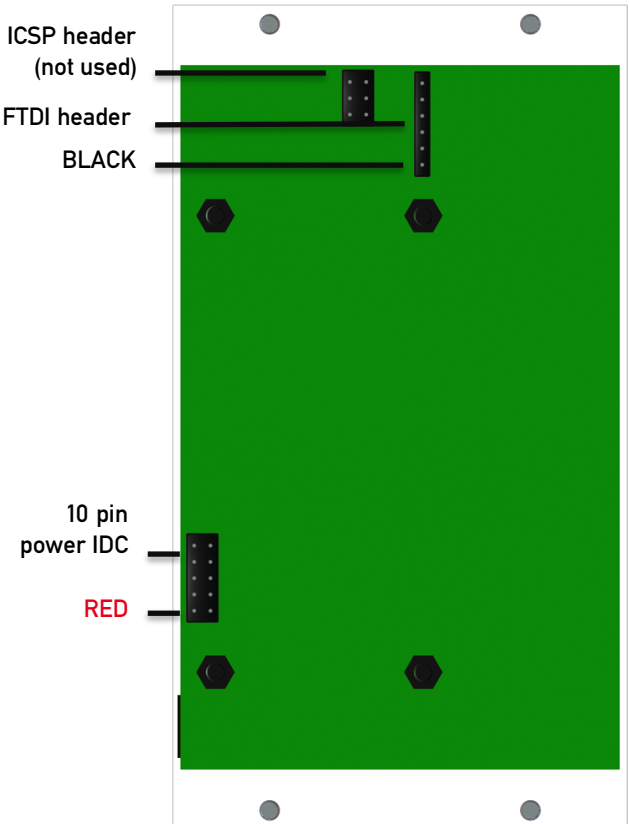
Contents

Connections

Front



Back



Basic Operation

Overview

The Oscitron is an 8-bit wavetable oscillator, with an audio engine architecture based on the Atmegatron MIDI desktop synth.

It has some major differences from the Atmegatron that add features that make it more suitable for Eurorack users. Many parameters are controllable via CV inputs and there is an audio input for sampling User Waveforms.

8-bit means that the sound is calculated digitally using 8-bit values (integer numbers between 0 and 255). This is how home computers worked in the 1980s and the Oscitron excels at creating these kinds of sounds. However the processor is far more powerful than those in 80s home computers, so it is packed with features never possible in that era.

Control of the Oscitron can be divided into the following areas:

Function and Value Dials

Selecting functions and setting values

Function dial

The function dial is on the top and the value dial is on the bottom. By looking at the position of the lit red LED and the corresponding symbol on the dial, you can see what the current function is and its value.

In this example, the function is set to Filter Type and the value is set to 9 (low shelf filter) as shown by the outer ring on the value dial.

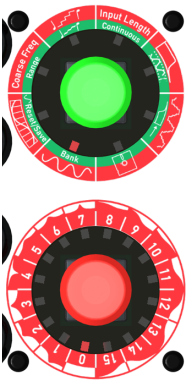
To change the Filter Type, turn the value knob and the circular LED will change position. For example if you want to change the Filter Type to a low pass filter (LPF), turn the knob until the LED next to 1 on the inner dial is lit. There is a symbol representing a low pass filter on the outer ring of

Value dial

the value dial.

The full list of filter types and their corresponding symbols can be found on page 24.

Red and green modes



The function knob can be pushed in and when you do this, it changes from glowing red to green (and vice versa). Each function on the function dial has a green mode, which is activated by briefly pushing the knob (< 2 secs).

For example turn the function knob so that Waveform Select is highlighted. Listen to the output. Now press the knob on the function dial, so it glows green. You will hear that the sound changes. This is because you are now in the green bank of waveforms. If you turn the value dial you can hear all the different waveforms in the green bank.

Global setting mode

Some functions also have an associated global setting. Pressing and holding the Function knob when the relevant function is selected can access these. After 2 seconds it will flash and turn yellow. The value of the global function can then be selected with the Value knob. This value is stored in EEPROM and is global to all patches (sounds), not just the current one. A short press of the Function knob will leave the global setting mode and the knobs and dials will return to their normal values.

Loading and saving patches

To load or save a sound, turn the function knob to the load/save symbol (it looks like a 5¼" floppy disk!)

To load a sound, turn the value knob to the patch number you require, then briefly press the function knob.

To save a sound, turn the value knob to the patch number you want to

save over, and then hold the function knob down for at least **2 seconds**. The knob will flash when it is finished. The previous patch will be lost. See page 17 for more information.

Inputs and Output

The Oscitron has 2 1V/Oct inputs. There is an associated tune knob that adjusts the parameter in software.

There are 3 CV inputs each with an offset knob. The offset knob adds a 0-5V bias and can also be used to manually set the relevant parameter when no input is connected.

There is a Clock input that triggers the waveform sampling of the audio Input by default. However this input has many other options which are described on page 19.

The Audio Input is used to sample User Waveforms into memory. The Output is a standard Eurorack voltage (-5 to +5V) audio output.

Waveform Sampling

The examples 1-4 overleaf show how the Oscitron can sample waveforms via the audio input. Sampling is initiated by either pressing the Value knob or by a pulse at the Clock input. Sampling starts and stops when the incoming audio crosses 0V whilst rising from a negative to positive voltage (known as a "zero crossing").

The Input Length parameter sets the minimum number of samples to store and can be used to eliminate erroneous waveforms captured because of noise around 0V or to capture more complex timbres with multiple zero crossings.

The state of the waveform sampling is shown by the colour of the Value knob. This is shown in the examples.

Example 1: **Single waveform sampling**. Initially the waveform is set to sine wave (red bank 9). This just demonstrates the output sound before sampling. Sampling is initiated (value knob turns yellow). It starts writing to the sample buffer when a zero crossing is detected at the input (value knob turns red). It passes the Input Length value, which is low (e.g. 0 = 4 samples). It stops when another zero crossing is detected at the input

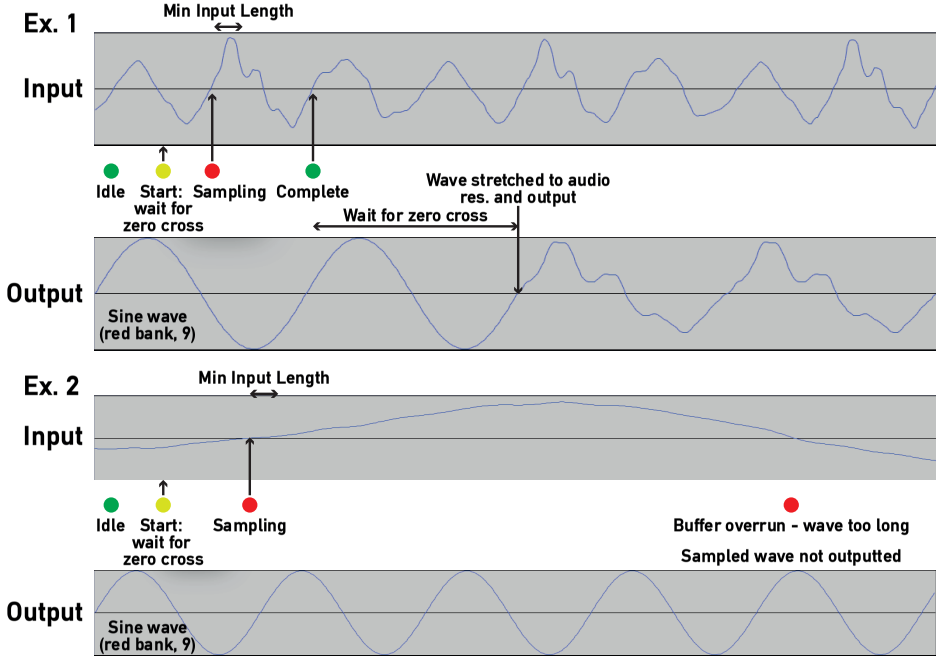
(value knob turns green). The stored waveform is stretched to the current audio engine resolution (see page 11) and outputted after a zero crossing at the output. This is at the pitch defined by the oscillator frequency parameters (1V/Oct input, fine & coarse tune, range).

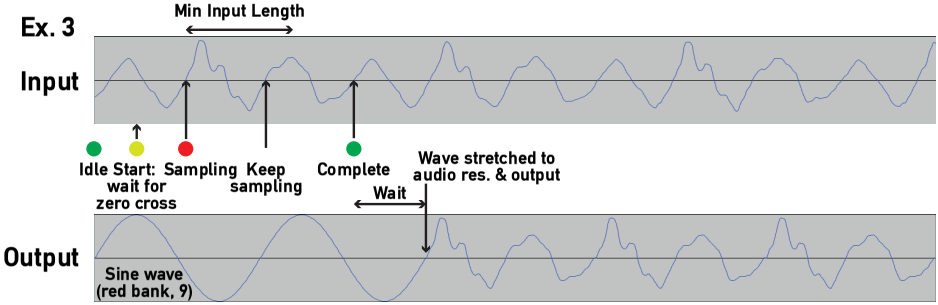
Example 2: **Buffer overrun**. The maximum buffer length for sampling is 256 samples. If the incoming waveform does not cross 0V before reaching the end of the 256 sample buffer, it will abort the capture and the value knob will remain red.

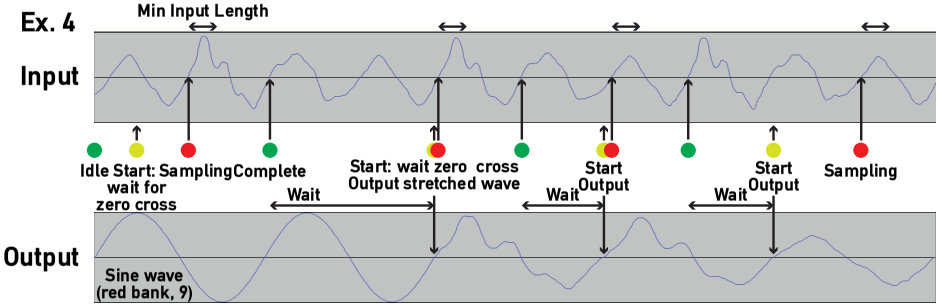
Example 3: **Higher value for Input Length**. As example 1, but 2 wave cycles are stored because the minimum input length hasn't been reached once the first cycle is complete and this allows a more complex timbre to be sampled. The stored waveform is still stretched to the audio engine resolution and will therefore sound at twice the pitch of a single cycle waveform (because 2 cycles are stored rather than 1). The values for Input Length are below.

Input Length Value	Minimum waveform samples
0	4
1	16
2	64
3	128
4	192
5	224
6	240
7	252

Example 4: **Continuous sampling mode**. As example 1, but sampling restarts as soon as the previous sampled wave is outputted. This creates a vocoder-style effect, although the actual process has nothing to do with a vocoder. The Input Length is still changeable and creates variations in timbre.


Ex. 1
Min Input Length
Input
Idle
Start: wait for zero cross
Sampling
Complete
Wave stretched to audio res. and output
Wait for zero cross
Output
Sine wave (red bank, 9)
Ex. 2
Min Input Length
Input
Idle
Start: wait for zero cross
Sampling
Buffer overrun - wave too long
Sampled wave not outputted
Output
Sine wave (red bank, 9)


Ex. 3
Min Input Length
Input
Idle Start: wait for zero cross
Sampling
Keep sampling
Complete
Wave stretched to audio res. & output
Wait
Output
Sine wave (red bank, 9)


Ex. 4
Min Input Length
Input
Idle Start: wait for zero cross
Sampling
Complete
Start: wait zero cross
Output stretched wave
Start Output
Start Output
Sampling
Wait
Wait
Wait
Output
Sine wave (red bank, 9)

Functions

Waveform Select

There are 32 waveforms to choose from, 16 in red mode and 16 in green mode. The full list of waveforms can be found on page 22.

Bank Select

Press the Function knob to toggle between the red and green bank of waveforms.

Reset all User Waves

To reset all User Waves back to the factory presets, hold the Function knob until it flashes while the Value knob is held down

Audio Engine Resolution

One of the key differences between the Oscitron and the Atmegatron that its sound is based on, is its ability to change the resolution of the audio engine. The resolution of the Atmegatron is locked at 32 sample waveforms. The Oscitron can be set to 16, 32, 64 and 128 sample waveforms (value = 0,1,2,3 respectively). It is important to note that these resolutions apply to all stages of the audio chain (filter, phaser, wave crusher etc), not just the oscillator output. The higher resolutions produce more complex timbres, lower resolutions are more “gritty”.

User Wave Reset / Save

A User Wave sampled via the audio Input can overwrite any of the 32 preset waveforms. See page 7 for info on how to sample a waveform. To save a User Wave press and hold the Function knob until it flashes. Please note that it will overwrite the currently selected waveform, the value of which can be viewed by setting the function dial to Waveform Select.

To reset the currently selected waveform back to the factory preset, press the Function knob for a short time (< 2 secs). Setting the Function dial to Waveform Select and incrementing then decrementing the Value knob can restore the User Wave. To save the factory preset: press and hold the Function knob until it flashes, as detailed above. After this, the User Wave can no longer be restored.

Coarse Freq

Coarse Frequency

This sets the coarse frequency of the oscillator. The oscillator frequency is set by the sum of the 1V/Oct input, the coarse and fine frequencies and the range. The coarse frequency is in 4 semitone steps. When coarse = 9, fine = 0, range = red (bottom) and the 1V/Oct input = 3.75V (A4-440Hz using Doepfer MIDI to CV converter), the output will be A4-440Hz.

Range

Range

Press the Function knob to toggle between oscillator frequency ranges.

When the Function knob is red, the frequency is set to the bottom half of the range (equivalent to MIDI notes 0-64). When it is green it sets the frequency to the top half (equivalent to MIDI notes 65-127).

1V/Oct Input Calibration

The Freq and Filter Freq inputs can be calibrated for greater accuracy. The inputs are calibrated before shipping, so this shouldn't normally be necessary.

To calibrate an input set the value dial to one of the following values and send the relevant input the required voltage shown overleaf:

Value dial	Input	Calib Voltage	MIDI note equiv
0	Freq	1.25V	D#2-77.78Hz
1	Freq	3.75V	A4-440Hz
2	Filter Freq	1.25V	D#2-77.78Hz
3	Filter Freq	3.75V	A4-440Hz

Then press and hold the Function knob until it flashes, whilst holding the value knob. Make sure both the low and high voltages are calibrated.

Quantizer Scale

The frequency of the oscillator can be quantized to a given scale. When the Quantize scale = 0, the quantizer is bypassed. When it is active the oscillator frequency is rounded up or down to the nearest note in the scale. The scales are listed on page 23.

Portamento

Portamento (or glide) is the time it takes for the oscillator to change from one frequency to another. The portamento values range from 0 = 0 secs (i.e. portamento off) to 15 = 6.5 secs. This time is fixed and is not proportional to the change in frequency.

Press the Function knob to toggle between Portamento and Quantizer. When it is red the quantizer is active and when it is green the portamento is active.

Quantize Key

This is a global setting that sets the key of the quantizer. When the value = 0 the key is C (the chord is dependant on scale). This increases in semitone steps to 11 where the key is B. See page 6 for more info on global modes.

Minimum Sample Length

This function is relevant when creating a User Wave via the audio Input. Once sampling has started (when the input crosses through 0V from a negative to positive value), it will only stop sampling when there is another zero crossing and the total samples in the buffer is greater than the value set for this function. This value ranges from 4 samples when Input Length = 0 to 252 samples when Input Length = 7. See page 7 for full list. The sample buffer size is 256 samples maximum.

Lower values of Input Length will create more granular sounds. Higher values will capture more complex timbres, but buffer overruns are more likely.

Continuous Sample Mode

Press the Function knob to turn Continuous Sample Mode on and off.

Continuous Sample Mode is the same as normal waveform sampling, apart from rather than performing the sampling routine once, it restarts as soon as the process has completed. It is active when the Function knob is green. A more detailed explanation of the process is on page 7.

Clock Input Destination

By default the Clock input triggers Input sampling when it receives a clock pulse. However this input is incredibly versatile and can be used to control virtually any parameter of the Oscitron. It can also receive 0-5V CV inputs as well as clock pulses. The routing of this input is stored as a global setting. See page 6 for information on global settings and page 25 for the full list of parameters controllable by the Clock input.

Filter Type

There are 15 filter types to choose from. Setting the value knob to 0 will turn off the filter. By shaping the harmonic content of the sound, it can make the sound brighter or duller. The full list of filters can be found on page 23.

The Filter Resonance control doesn't affect the sound with some filter types. This is the case with filter types 12 to 15. This is because the algorithms for Butterworth and Bessel filters do not require a resonance parameter.

If you are used to using analogue synthesizers you will notice that the filters on the Oscitron sound a bit different, particularly at low cutoff values. This is partly to do with the sound being calculated in 8-bit and partly to do with the way the waveform is updated.

Changing the Audio Engine Resolution can dramatically alter the sound of the filter. Higher resolutions allow for more accurate filtering. Lower resolutions produce interesting "Chiptune" effects.

Filter Normalise Mode

Press the Function knob to turn normalise mode on and off.

When Normalise mode is off (Function knob = red), the filter will distort with certain filter settings, particularly when the resonance is high. This is because the waveform is stored at maximum amplitude and there is no headroom (which a 32-bit or 64-bit synth would traditionally have).

When Normalise mode is on (function knob is green), the waveform amplitude is attenuated to 25% before filtering. This allows some headroom, so that the filter doesn't distort as easily. The waveform is then normalised at the output of the filter (hence the name).

Alternative Input Behaviour

The Pulse Width and Phaser inputs can be set to control alternative parameters, namely attenuators for the Freq and Filter Freq inputs. The attenuation is done in software. It is worth noting that it only provides attenuation and no bias. To convert a bipolar signal into a unipolar one suitable for Oscitron inputs, a Soulsby Synthesizers Uni-Five module should be used (or equivalent). The offset knobs for Pulse Width and Phaser can be used to set the attenuation without any need for an external CV source.

Value dial	Alternative behaviour
0	Off
1	Pulse Width input becomes Freq input attenuation
2	Phaser becomes Filter Freq input attenuation
3	Both 1 and 2

Wave Crusher

The Wave Crusher allows the resolution of the waveform to be reduced. It can do this in two ways: reducing the bit depth of the waveform and reducing the sample rate of the waveform. If the waveform were plotted on a graph or viewed on an oscilloscope, changing the bit depth would alter the resolution vertically. Changing the sample rate would alter the resolution horizontally. The symbol for the Wave Crusher demonstrates this process on a sine wave.

There are 15 useful combinations of bit depth and sample rate reduction in the Oscitron. See page 26 for a list of them. When the value knob is at 0, the Wave Crusher is off.

It is worth noting that the Wave Crusher works differently to a bit crusher effect commonly used in audio software. The Wave Crusher only affects the waveform and not the overall output of the synthesizer (as would happen with a bit crusher). This means that the decrease in resolution of sample rate isn't fixed, but is a division of the current frequency of the oscillator.

Pre-Filter Mode

Press the Function knob to turn pre-filter mode on and off. When pre-filter mode is off (function knob is red), the waveform is processed through the Wave Crusher after the phaser and before distortion.

When pre-filter mode is on (function knob is green), the waveform is processed through the Wave Crusher after the pulse width modulator and before the filter. See the system diagram on page 21 for a visual depiction

of this. The Wave Crusher will sound more aggressive with pre-filter mode off.

Load/Save Patch

The Oscitron has 16 memory locations to store patches (sounds).

To load a patch, set the function dial to Load/Save Patch and set the value dial to the patch number that is to be loaded. Then briefly press the function knob.

To save a patch, set the function dial to Load/Save Patch and set the value dial to the patch number that is to be overwritten. Then hold the function knob for **2 seconds** until it flashes, signifying that it has saved. The previous patch at this memory location will be lost.

Inputs

Freq

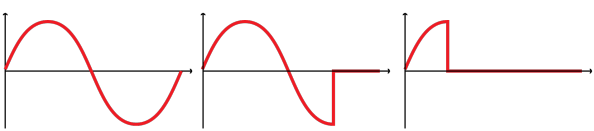
This is a 1V/Oct input to control the frequency of the oscillator. It responds to a voltage range between 0V and 5V. Inputting audio frequency signals will not harm the Oscitron, but the standard Oscitron software will not generate typical FM tones. This input is calibrated to achieve greater accuracy. See page 12 for more information.

The Fine knob allows the oscillator to be offset by up to +4 semitones. See page 12 for setting the coarse frequency of the oscillator. Please note that when the Quantizer is on, the Fine knob may appear to have no effect if quantizing to scales with intervals greater than 4 semitones.

Pulse W

This is a 5V CV input that controls the Pulse Width of the waveform. The Offset knob adds a 0-5V bias to the CV input.

Many classic analogue synthesizers have a pulse width parameter. Traditionally this controls the mark/space ratio of a square wave. The Oscitron's pulse width parameter works in a similar way and is the ratio of sound to silence within the waveform. The diagram below shows Pulse Width applied to a sine wave at 0%, 25% and 75%.



Filt Freq

This is a 1V/Oct input to control the cutoff frequency of the filter. It responds to a voltage range between 0V and 5V. This input is calibrated to achieve greater accuracy. See page 12 for more information.

The Coarse knob sets the offset of filter cutoff frequency with respect to the oscillator frequency (i.e. the filter has pitch tracking). The overall cutoff

frequency is the sum of the 1V/Oct input, the coarse offset and the oscillator frequency.

Filter Res

This is a 5V CV input that controls the resonance of the filter. The Offset knob adds a 0-5V bias to the CV input.

Phaser

This is a 5V CV input that controls the delay time of the Phaser. The Offset knob adds a 0-5V bias to the CV input.

The Phaser effect adds a delayed copy of the waveform to the output. When the delay time is at the minimum value, the phase delay is 0º and the effect is bypassed. When it is at the maximum value, the delay is 360º. A slow sine wave LFO input will produce the classic phaser effect.

Clock

Normally this is a 5V clock input. This input can also except 5V CV signals dependant on a global setting – see page 14 for more information.

When the Clock Destination global setting = 0 (it is set to this on first boot), a clock pulse will trigger the audio Input sampling. This is equivalent to pressing the Value knob.

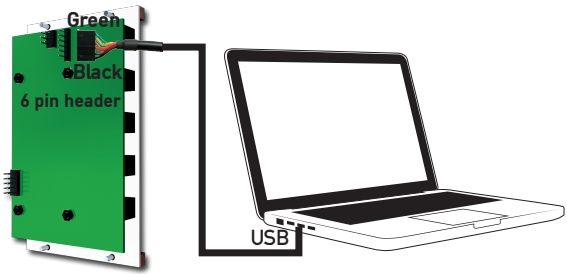
Input

-5V to +5V audio input. This is the audio Input for sampling. Voltages outside of this range will be clipped. Page 7 details the audio sampling process.

Output

The audio output is a Eurorack standard -5V to +5V output.

Hacking



The fastest way to learn how to upload software to the Oscitron is to go to: http://www.soulsbysynths.com/tutorials and watch the "Uploading Oscitron Software" tutorial.

To program the Oscitron you will need a USB TTL Serial Cable. The **FTDI TTL-232R-5V** is recommended and is available from the Soulsby Synthesizers web store. Other cables may also work.

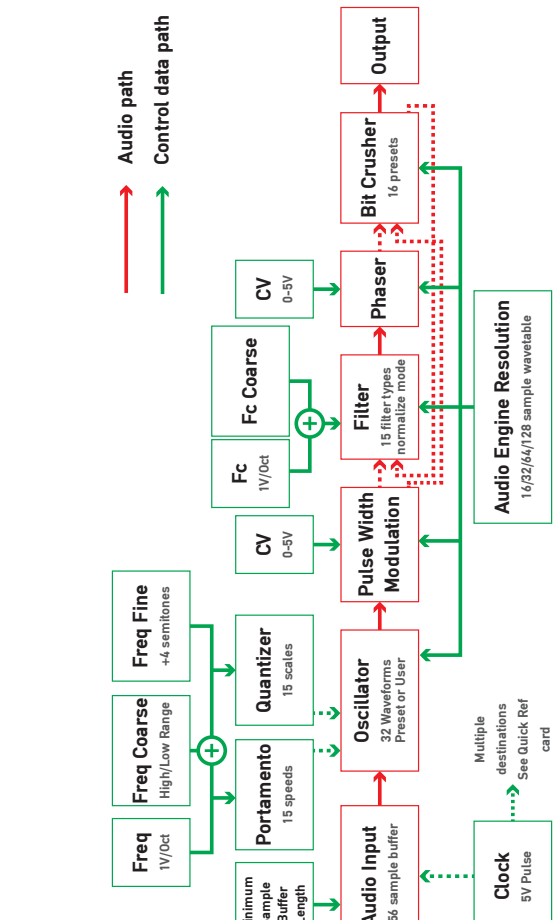
Be **very** careful to insert the cable the correct way round, as shown in the diagram above.

The Oscitron software is built entirely on the Arduino platform. The latest Arduino software can be downloaded from: http://arduino.cc/en/main/software

The latest Oscitron software can be downloaded from www.soulsbysynths.com/downloads.

The software should be simple to understand for anyone with a basic understanding of C and the Arduino platform. Before uploading any modified software, go to the Tools menu and make sure Board is set to Uno, Serial Port is set to your TTL cable and Programmer is set to AVRISP mkII.

System Diagram



Audio Waveforms

0		Square	Pure Square	0		Metallic	Metal 1
1			Oct. Square (Juno 60)	1			Metal 2
2			Square Fifths	2			Metal 3
3			Pulse Wave (RP2A07)	3			Metal 4 (PPG)
4		Saw	Pure Saw	4		Vocal	Vocal 1
5			Buzz Saw	5			Vocal 2
6			Saw Fifths (Juno 60)	6			Vocal 3 (PPG)
7			Octave Saw (Juno 60)	7		Organ	Brass (Multivox)
8		Sine	Sub Sine + Square	8			Reed Organ (PPG)
9			Pure Sine	9			Electric Piano
10			Sine + Harms (PPG)	10			Reed
11			Warped Sine	11		R	Resonant Saw (CZ101)
12		Pulse	Pulse (CZ101)	12		Harmonic	Bell (PPG)
13			Bassoon (Multivox)	13			Chord
14			Bass (Multivox)	14			Sine Overtones
15		N	Continuous Noise	15			Saw Thirds

Quantize Scales

	Scale
0	Off
1	Chromatic
2	Major
3	Harmonic Minor
4	Natural Minor
5	Whole Tone
6	Diminished
7	Pentatonic
8	Blues Hexatonic
9	Blues Heptatonic
10	Major Triad
11	Minor Triad
12	Diminished Seventh
13	Augmented Triad
14	Root + Fifth
15	Root

Filter Types

0		Filter Bypassed	Cutoff and Resonance controls inactive
1		Low Pass Filter	
2		High Pass Filter	
3		Band Pass Filter	
4		Notch Filter	
5		Parametric EQ (10dB gain)	
6		Parametric EQ (30dB gain)	
7		Parametric EQ (100dB gain)	
8		Low Shelf (10 dB gain)	
9		Low Shelf (30dB gain)	
10		High Shelf (10dB gain)	
11		High Shelf (30dB gain)	
12		Butterworth Low Pass Filter	Resonance control inactive
13		Butterworth High Pass Filter	Resonance control inactive
14		Bessel Low Pass Filter	Resonance control inactive
15		Bessel High Pass Filter	Resonance control inactive

Clock Input Global Settings

	Routing	Input Type
0	Initiate sampling	Clock 5V pulse
1	Increment Waveform Select	
2	Increment Audio Engine Resolution	
3	Increment Quantize Scale / Portamento Time	
4	Increment Filter Type	
5	Increment Wavecrusher setting	
6	Increment Patch	
7	Select Waveform Select (0-5V = red bank 0 – green bank 15)	CV 0-5V
8	Select Audio Engine Resolution	
9	Select Coarse Pitch and Range (0-5V = low range 0 – high range 15)	
10	Select Quantize scale / Portamento Time	
11	Select Filter Type	
12	Select Wavecrusher setting	
13	Select Quantizer key (0-5V = C – B)	
14	Select Freq input attenuation	
15	Select Filter Freq input attenuation	

Wave Crusher Presets

	Bit Depth Reduction	Sample Rate Reduction
0	Off	Off
1	3 bit	Full
2	2 bit	Full
3	1 bit	Full
4	4 bit	1/2
5	3 bit	1/2
6	2 bit	1/2
7	1 bit	1/2
8	4 bit	1/4
9	3 bit	1/4
10	2 bit	1/4
11	1 bit	1/4
12	4 bit	1/8
13	3 bit	1/8
14	2 bit	1/8
15	1 bit	1/8

Notice regarding disposal (for EU)

When this “crossed-out wheeled bin” symbol is displayed on the product, owner's manual, battery, or battery package, it signifies that when you wish to dispose of this product, manual, package or battery you must do so in an approved manner. Do not discard this product, manual, package or battery along with ordinary household waste. Disposing in the correct manner will prevent harm to human health and potential damage to the environment. Since the correct method of disposal will depend on the applicable laws and regulations in your locality, please contact your local administrative body for details. If the battery contains heavy metals in excess of the regulated amount, a chemical symbol is displayed below the “crossed-out wheeled bin” symbol on the battery or battery package.

RoHS

Soulsby Synthesizers, London declares that, to the best of our knowledge, all electrical and electronic equipment (EEE) sold by the company are in compliance with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (also known as “RoHS Recast”). In addition, this declaration of conformity is issued under the sole responsibility of Soulsby Synthesizers. Specifically; products manufactured do not contain the substances listed in the table below in concentrations greater than the listed maximum value.

Lead (Pb) 0.1%

Cadmium (Cd) 0.01%

Mercury (Hg) 0.1%

Hexavalent Chromium (Cr6+) 0.1%

Poly Brominated Biphenyls (PBB) 0.1%

Poly Brominated Diphenyl ethers (PBDE) 0.1%

WARRANTY

Soulsby Synthesizers warrants that, for the warranty period set out in paragraph 2 below, the enclosed product will be free from defects in material and workmanship, and agrees that it will, at its sole discretion, either repair or replace any defective product subject to the following terms and conditions:

1. This limited warranty extends only to you, the customer, as the end-user of the Product. You may have additional rights under applicable law. This limited warranty does not affect such rights.
2. The warranty period is 1 year from the date on which you purchased the product. You must notify Soulsby Synthesizers of any defects as soon as possible after you have become aware of them. Please be aware that claims made 6 months after the purchase date will not be valid.
3. This limited warranty shall not apply in respect of the following:
    i. damage, deterioration or malfunction resulting from accident, negligence, misuse, abuse, improper installation or operation or failure to follow instructions according to the Instruction Manual for this product, any shipment of the product (claims must be presented to the carrier), repair or attempted repair by anyone other than Soulsby Synthesizers or a certified Synthesizers repair centre.
    ii. any unit which has been altered or on which the serial number has been defaced, modified or removed.
    iii. normal wear and any periodic maintenance.
    iv. deterioration due to perspiration, corrosive atmosphere or other external causes such as extremes in temperature or humidity.
    v. damages attributable to power line surge or related electrical abnormalities, lightning damage or acts of God.
    vi. rfi/emi (interference/noise) caused by improper grounding or the improper use of either certified or uncertified equipment, if applicable.
4. All defective parts or products, which have been replaced by Soulsby Synthesizers during the warranty period, shall become the property of Soulsby Synthesizers.
5. A repaired or replaced products will be warranted for the balance of the original warranty period.
6. You are requested to keep your original proof of purchase, such as the receipt. You will need it to prove the date of purchase in respect of any warranty claims.
7. Contact the Soulsby Synthesizers at info@soulsbysynths.com if you need warranty service. You cannot send a unit to Soulsby Synthesizers for repair unless agreed to by Soulsby Synthesizers. The customer is responsible for shipping charges if the machine needs to be shipped to Soulsby Synthesizers for warranty service. Soulsby Synthesizers covers the shipping back to the customer during the warranty period. Should the unit be dead on arrival, or if the hardware malfunctions within 2 weeks of the original purchase date, Soulsby Synthesizers will cover the shipping.

This limited warranty is granted to you by Soulsby Synthesizers, 69a Napier Road, London, UK. N176YG.