



# DyingStar Machine

## MANUAL

version 1.3.0



RE device by Turn2on Software

<http://turn2on.ru>

## Introduction

DyingStar Polysynth Machine come to Reason rack. Include 4 osc: 3 with 120 base wavetables +50 Lead WT / 40 Sub WT, and 1 Sub-Oscillator with 40 wavetables. Every Osc include Waveform Range fader to operate wavetables. Oscillators contain Waveshapers with 6 different waveforms.

Scheme of DyingStar contain Amp and Filter Envelopes, Modulation Envelopes, 2 LFO, Modulation Matrix, LP24 Pre-filters, Comb Filter with modulations, 2 PostFilters, Pan with settings, 10 FXs, Static Pre-FX reverbrations, Spaces FX, End Filter.

## MASTER Panel



Pan: Panoram for the whole instrument.

Octave: Octave shift knob for all instrument (-2/-1/0/+1/+2 octaves).

Volume: Master output level of device.

HOTLINK: Osc 1-3, Sub On/Off activity hotlink



Portamento: Switches pitch glide Off, On or Auto.

Glide Time: Key relative to previous key.

Glide Depth: Depth of Glide effect.

Glide Smooth: Smooth of Glide effect.

Glide Destination: Destination of Glide effect to Vol/Pan/Tune/None.

Sync / Inv: Sync and Invert commands of Glide Effect.



Pitch Bend: This standard wheel is used for pitch notes.

Range of this wheel you can set with Pitch Range knob (max to -1/+1 octave).

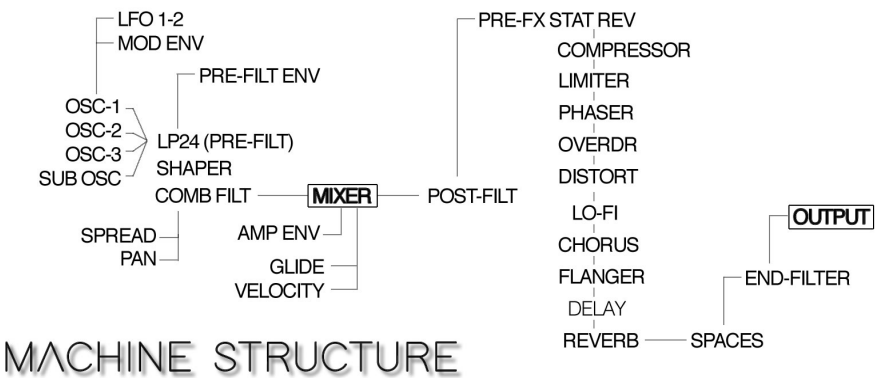
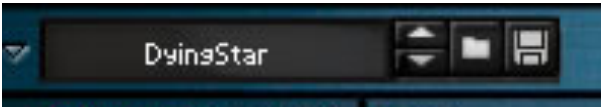
Mod Wheel: Modulation wheel assigned to Cutoff, Frequency and LFO parameters.

Voices: set quantity of voices for current patch (Max = 99 voices).

DYINGSTAR POLYSYNTH MACHINE

Patch Browser

In this section You can select and open patches of device, save own patches.



Device Logic Scheme

OSCILLATORS

- OSC 1 :**  
BASE WT (120)  
LEAD WT (50)
- OSC 2 :**  
BASE WT (120)  
LEAD WT (50)
- OSC 3 :**  
BASE WT (120)  
SUB WT (40)
- SUB OSC :**  
SUB WT (40)



Synthesizer contain 3 Osc and 1 Sub-Osc: **Osc 1-3** include 120 base WT, also +50 Lead WT (in Osc 1 / 2), +40 Sub WT in Osc 3. **Sub-Osc** include 40 Sub WT.

Osc 1 & 2, select between analog waveforms: sine, triangle, sawooth, pulse plus wavetable groups. All OSCs has own Tune / Bypass elements.

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**DYINGSTAR POLYSYNTH MACHINE**

**WT selection** - There you can select WT for your needs.

**WT Range** - Fader move points for wavetable effect.

**Coarse:** tuning sound of current Osc. Range of Coarse is -120..0..+120 with +/- 1 octave shifting.

**Fine:** set semitones.

**KBD** - keyboard tracking, Pitch tracking across the keyboard.

### Oscillators **WAVETABLES**

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Oscillator	Base Wavetables	Additional WT	Notes*
<b>OSC 1</b>	120 WT	+ 50 Lead WT	
<b>OSC 2</b>	120 WT	+ 50 Lead WT	
<b>OSC 3</b>	120 WT	+ 40 Sub WT	
<b>Sub-Osc</b>	40 Sub WT		

### Osc Pre-Filters

Oscillators (1-3 plus Sub) contain 4-pole lowpass PRE-filters (LP24 - 24 dB/oct) with Frequency, Resonance, Envelope and Smooth knobs.

Filter Param.	Description
<b>Frequency</b>	Determines the range of high frequencies to be cut
<b>Resonance</b>	It is narrow band of frequencies, near the cutoff level, where the sound is amplified.
<b>Envelope</b>	Generated by the summation of the two contours is a more complex 4-stage contour
<b>Smooth</b>	Smoothing of parameter changes
<b>Invert</b>	Invert for filter parameters





## Pre-Filter Additions:

Section	Parameter	Description
<b>Shapers</b>	Shaper Drive	Drive of the input signal against the curve. More Drive, more waveshaping
	WaveShaper Waves	Clipped / Crashed / Tanhence / Sine / Convex / Cubed
<b>Dist</b>	Distortion Mix	Mix Level of Distortion
	Other Dist parameters	search in Dist module
<b>Spread</b>	Spread Level	Widering signal
<b>Pan</b>	PAN L/R	Pan of oscillator
	More Pan settings	search in Pan module



## Comb Filter

Comb filter can be used with each Osc. CombFilter contain modulation zone with Source and Dest.

Parameter	Description
<b>Tune</b>	Delay time, displayed as resonant frequency in Hz.
<b>Keytrack</b>	Tuning should track playback pitch.
<b>Feedback</b>	Feedback from delay output to input. At high settings the delay becomes a tuned resonator.
<b>Damping</b>	High cut applied to feedback to make it less harsh
<b>Stiffness</b>	Detunes resonant frequencies away from a harmonic series, similar to stiffness in a piano or guitar string.
<b>Mix</b>	Level of the delay output.
<b>Mod Depth</b>	Depth of Modulation
<b>Mod Depth / Source</b>	Selection Source and Depth of CombFilter Modulation
<b>Links</b>	Activity buttons of CobmFilter linked to Osc1-3, Sub-Osc.



## CombFilter Sources / Destinations

Comand	Sources	Description
<b>Mod Source</b>	Const	Constant linear source
	Random 1	Random value between -1 and +1
	Random 2	Random value between 0 and 1
	Pitch band	Pitchband value
	Aftertouch	Aftertouch value
	Veocity	Velocity value
	Glide	Key relative to previous key
	Filter Envelope	Filter Env value
	Amp Envelope	Amp Env value
	LFO 1	LFO 1 value
	LFO 2	LFO 2 value
	Envelope 1	Mod Envelope 1 value
	Envelope 2	Mod Envelope 2 value
<b>Mod Destination</b>	Tune	CombFilter Tune
	Feed	CombFilter Feedback
	Damp	CombFilter Damping
	Mix	CombFilter Mix

## POST-Filters

Pre-Filter LP24 routed to Shaper, after it routed to CombFilter. Signal form CombFilter routed to PostFilters.

There 2 independance multimode filters (6 modes). You can change all parameters of two filters, for switching PostFilters 1/2 - use Switch buttons (1/2).



## DYINGSTAR POLYSYNTH MACHINE

Type of filter	Description	Cutoff	Resonance
<b>LP6</b>	1-pole lowpass filter	•	
<b>LP12</b>	2-pole lowpass filter	•	•
<b>LP24</b>	4-pole lowpass filter	•	•
<b>HP6</b>	1-pole highpass filter	•	
<b>HP12</b>	2-pole highpass filter	•	•
<b>BP6</b>	2-pole bandpass filter	•	•

## Velocity

Velocity section contain Velocity Amp. Set to zero and get note Velocity at maximum.

Velocity Destinations:

- Frequency / Resonance selection with Amount level,
- Amp Attack On/Off with Amount level,
- Filter Envelope On/Off with Amount level.



## LFO section

Osc 1&2 and Sub-osc has own LFO 1/2/3. Its simple LFO with choice of waveform, rate, sync, retrigger and destination.



Parameter	Description
<b>Waveform</b>	Sine, Triangle, Square, Saw, Random, Analog Drift
<b>Rate</b>	Duration of 1 cycle of the LFO waveform, in Sync selection from 4/1 to 1/32.
<b>Depth</b>	Amount of modulation
<b>Dest</b>	Destination parameter to be modulated: Vol / Pan / Tune / Freq / Reso (for Global / Osc1-3 and Sub Osc), Range (Global/Osc1-3/SubOsc), Pre-Filter ENV (Intensive, Rate, AHDSR), Amp ENV (Intensive, Rate, ADSR)
<b>Smooth</b>	Smoothing of parameter changes
<b>Sync</b>	Set Rate units to Free Hz (cycles per second) or Synced Beats (quarternotes per cycle).
<b>Retrigger</b>	When Off, all voices will be modulated together in sync. When On, the LFO for each voice starts from the beginning when the note is triggered
<b>Phase</b>	This shifts the starting point in the LFO waveform. It is most useful when Retrigger is off and Sync is set to beats: then it adjusts the alignment of the LFO waveform relative to beats on the song timeline.



# Modulation Envelopes 1 / 2

Envelope Type	Parameter	Description
Amp/Filt	Attack	Attack time
	Hold	Hold time at maximum level
	Decay	Decay time
	Sustain	Sustain level
	Release	Release time
	Amount	Amount of the Envelope
	Attack Curve	-100% (slow to reach final value) to +100% (fast to reach final value).
	Decay Curve	-100% (slow to reach final value) to +100% (fast to reach final value). Typically 75 - 90% for logarithmic curves.

# Amp / Filter Enevelopes



Parameter	Description
Attack	Attack time
Hold	Hold time at maximum level
Decay	Decay time
Sustain	Sustain level
Release	Release time. Adjust the Release time by ear until it best matches the perceived decay time.
Attack Curve	-100% (slow to reach final value) to +100% (fast to reach final value).
Decay Curve	-100% (slow to reach final value) to +100% (fast to reach final value). Typically 75 - 90% for logarithmic curves.

Amp Envelope form sound character. Pre-Filter Envelope rule Osc Filters character.



## Modulation Matrix

Modulation Matrix contain Sources, Amount and Destinations and have 4 slots.



Comand	Sources	Description
Mod Source	Const	Constant linear source
	Random 1	Random value between -1 and +1
	Random 2	Random value between 0 and 1
	Pitch band	Pitchband value
	Aftertouch	Aftertouch value
	Veocity	Velocity value
	Glide	Key relative to previous key
	Filter Envelope	Filter Env value
	Amp Envelope	Amp Env value
	LFO 1	LFO 1 value
	LFO 2	LFO 2 value
	Envelope 1	Mod Envelope 1 value
	Envelope 2	Mod Envelope 2 value
Mod Destination	Volume	Global (all OSC) / Osc 1 / Osc 2 / Osc 3 / Sub-Osc
	Pan	Global (all OSC) / Osc 1 / Osc 2 / Osc 3 / Sub-Osc
	Tune	Global (all OSC) / Osc 1 / Osc 2 / Osc 3 / Sub-Osc
	only 1st mod slot Frequency *	Global (all OSC) / Osc 1 / Osc 2 / Osc 3 / Sub-Osc
	only 1st mod slot Resonance *	Global (all OSC) / Osc 1 / Osc 2 / Osc 3 / Sub-Osc

## PAN SETTINGS

Pan settings contain table for Osc 1-3 and Sub-Osc.

OSC	1	2	3	SUB
WDT	100	100	100	100
SWP	Off	Off	Off	Off
INV	Off	Off	Off	Off

Pan Settings Param	Description
<b>Width</b>	Adjust stereo width using an M-S matrix (has no effect on mono signals).
<b>Swap Channels</b>	Swap left and right inputs.
<b>Phase Invert</b>	Invert the phase of both channels.

## DIST SETTINGS

Distortion settings contain table for Osc 1-3 and Sub-Osc.

ON	MOD	DRV
Trns	Trns	Trns
Trns	Trns	Trns
Trns	Trns	Trns
Trns	Trns	Trns

Pan Settings Param	Description
<b>On / Off</b>	On / Off links to Osc 1 / Osc 2 / Osc 3 / Sub-Osc
<b>Mode</b>	Transistor (stereo hard clipping) or Tube (mono soft clipping with DC bias).
<b>Drive</b>	Drive level

Distortion Mix placed in Osc-sections. Distortion LowCut and High-Cut placed in FX-section.

## FX SECTION

This section include 10 FX. Every FX can be used or disabled with knob On/Off. FX elements: Limiter, Compressor, Phaser, Overdrive, Distortion, Lo-Fi, Chorus, Flanger, Delay and Reverb.

Also, device contain Static-Pre FX module and SPACES.

## Limiter FX

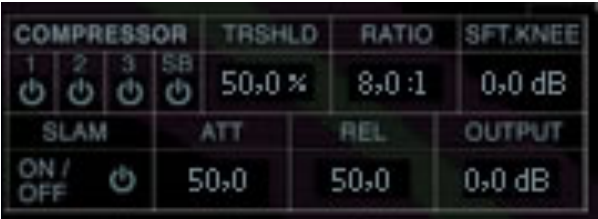
This very basic limiter is intended as a low-CPU safety limiter to keep levels in check

Parameter	Description
<b>Release</b>	Recovery time
<b>Mode</b>	Soft knee, or hard knee with clipping to prevent overshoots



# Compressor FX

Parameter	Description
Osc link	Osc 1 / 2 / 3 / Sub-Osc On/Off
Ratio	Soft knee, or hard knee with clipping to prevent overshoots
Soft Knee	
Slam	Slam On/Off. Boosts the compression ratio so much that the output gets quieter as the input gets louder
Attack	
Release	
Output	Make-up gain



# Phaser FX

Parameter	Description
Osc link	Osc 1 / 2 / 3 / Sub-Osc On/Off
Rate	Modulation rate.
Depth	Filter frequency modulation.
Feedback	Feedback level
Center	Center filter frequency.
Spread	Offset between left and right center frequencies
Mix	Mix level



## Overdrive FX

Parameter	Description
<b>Osc link</b>	Osc 1 / 2 / 3 / Sub-Osc On/Off
<b>Drive</b>	Overdrive level
<b>Mode</b>	Overdrive, Scream, Fuzz
<b>Tone</b>	Tone level
<b>Presence</b>	Presence level



## Distortion FX

Distortion effect present in Osc and DIST sections.  
In FX-Section Distortion module have only High-Cut and Low-Cut knobs.



High pass filter before distortion

Low pass filter after distortion

## Lo-Fi FX

Parameter	Description
<b>On / Off</b>	Activity of Lo-Fi module
<b>Rate</b>	Downsampling rate.
<b>Jitter</b>	Random modulation of downsampling rate.
<b>Mix</b>	Tone level




# Chorus FX

Parameter	Description
Rate	Modulation rate
Depth	Depth of delay (pitch) modulation
Voices	Number of chorus voices
Mix	Mix of Dry/Wet
Delay	Initial delay for each voice
On / Off	Activity of Chorus module

CHORUS	RATE	DEPTH
ON / OFF 	0,00	16,0 ms
DELAY	VOICES	MIX
16,0 ms	2	0,0 %

# Flanger FX

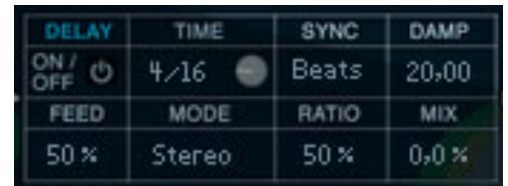
Parameter	Description
On / Off	Activity of Flanger module
Rate	Modulation rate.
Depth	Delay modulation depth.
Delay	Minimum delay.
Feedback	Feedback level
Mix	Mix level

FLANGER	RATE	DEPTH
ON / OFF 	24,9 %	0,8 ms
DELAY	FEED	MIX
0,1 ms	50 %	50 %



## Delay FX

Parameter	Description
<b>Time</b>	
<b>Feedback</b>	
<b>Damping</b>	Progressive loss of high frequencies
<b>Mix</b>	Mix of Dry/Wet
<b>Ratio</b>	Negative values reduce the left channel delay, positive values reduce the right channel delay
<b>Mode</b>	Sets which channel(s) feedback is taken from
<b>Sync</b>	Sets Time parameter to seconds or quarternote beats
<b>Sync Beats</b> <b>Sync Sec</b>	1/16..16/16, 1/8T.. 6/8T 0-4 seconds scaled as 0-100%



<b>DELAY</b>	<b>TIME</b>	<b>SYNC</b>	<b>DAMP</b>
ON / OFF	4/16	Beats	20,00
<b>FEED</b>	<b>MODE</b>	<b>RATIO</b>	<b>MIX</b>
50 %	Stereo	50 %	0,0 %

## Reverb FX

Parameter	Description
<b>Time</b>	Length of reverb tail
<b>PreDelay</b>	Initial delay before reverb
<b>Damping</b>	Progressive loss of high frequencies in reverb tail
<b>Mix</b>	Mix of Dry/Wet



<b>REVERB</b>	<b>TIME</b>	<b>PRE-DEL</b>	<b>DAMP</b>
ON / OFF	50,0 %	16,0 ms	20,00
<b>LO-CUT</b>	<b>HI-CUT</b>	---	<b>MIX</b>
50,0 %	69,9 %		0,0 %

This is an algorithmic reverb emulating a digital reverb unit

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## Spaces / Pre-FX

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### Static Pre-FX:

Static Pre-FX section contain 4 preinstalled static-reverbs with Decay level knob. This reverbs working as first effects in FX-Section before Compressor / Limiter. Static Pre-FX module provide signal from Mixer to FX-section.



### SPACES:

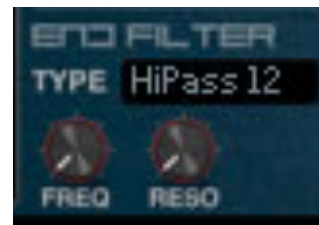
Emulations of hardware fx-pedals (reverbs and delays):

- 19 Eve modes
- 10 Boz modes
- 8 Syman modes

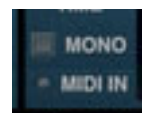
### END FILTER:

End-Filter provide signal from Spaces to Synthesizer Level output.

Type of filter	Description	Cutoff	Resonance
<b>LP6</b>	1-pole lowpass filter	•	
<b>LP12</b>	2-pole lowpass filter	•	•
<b>LP24</b>	4-pole lowpass filter	•	•
<b>HP6</b>	1-pole highpass filter	•	
<b>HP12</b>	2-pole highpass filter	•	•
<b>BP6</b>	2-pole bandpass filter	•	•



### Voices:



Mono Voices button (every OSC with 1-voice, OSC voices summed)

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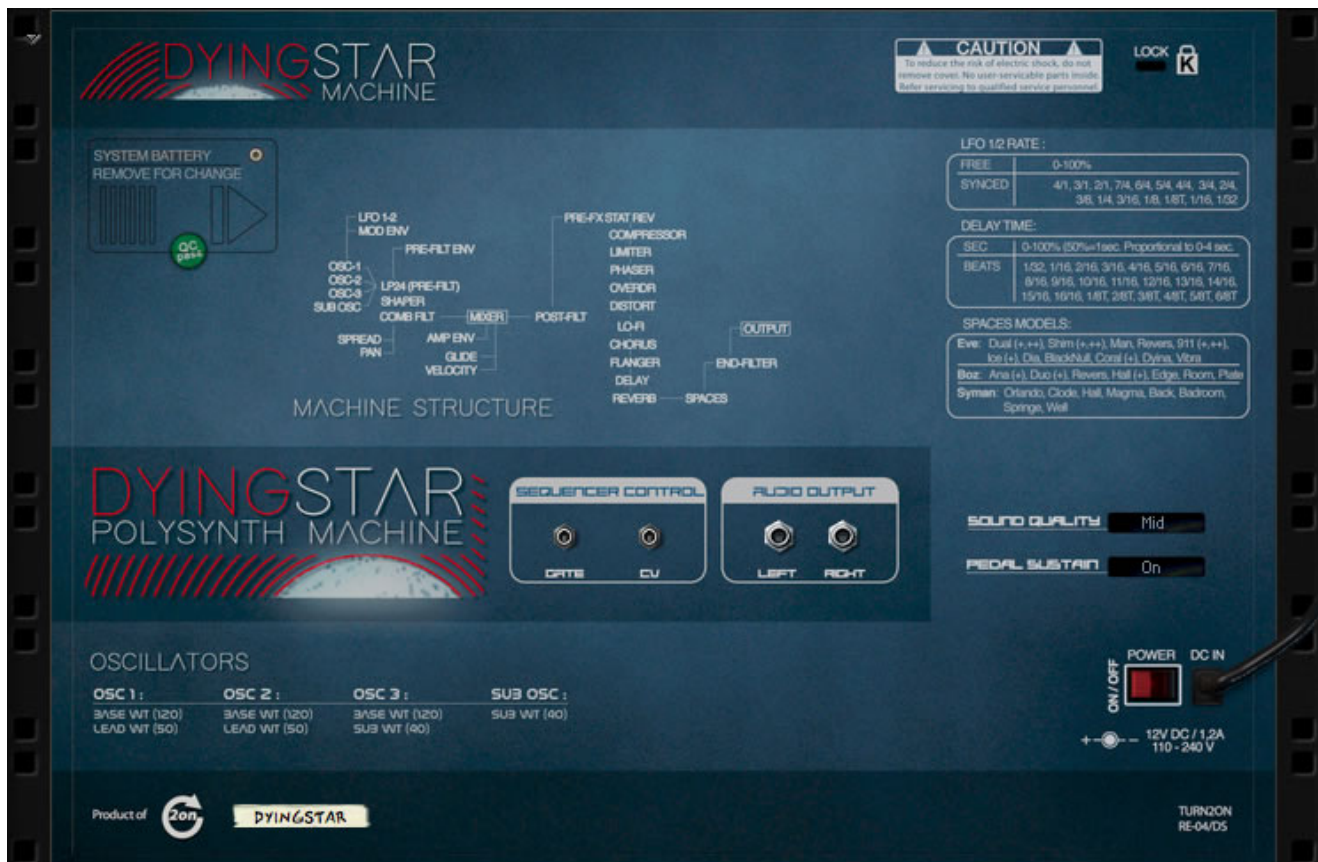
## BACKSIDE (rear panel)

There You can find Device Logic Scheme, Audio outputs (L/R), CV inputs (Gate, Note), selection of Sound Quality and Pedal Sustain mode.

### Rear Panel:

Sound Quality: Eco (better for CPU) / MID / HIGH

Pedal Sustain: mode of sustain.



# DYINGSTAR MACHINE

Polyponic Synthesizer

<https://shop.propellerheads.se/product/dyingstar-polysynth-machine/>

## Turn2on - software Rack Extension build company

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