

PYRATONE MODULES FOR SALE

PYRATONE SOUND SYNTHESIS IN YOUR MUSICAL INSTRUMENT:

THE MODULE IS SUITABLE FOR SPARTAN 6 LX75 DEVICES WITHOUT CHANGE. TESTED ON TRENZ TE630 AND TERASIC DE2-115. OTHER FPGAs ON DEMAND.

WHAT PYRATONE GIVES YOU:

4(8) Complete Music Instruments depending on the type and size of the FPGA

Each Musical Instrument has 64 KEYS with full Polyphony. Each Key has several Sound Sources and Modulators / Filters

Main Oscillator

Parameters for Main OSC

**Waveform
Distortion
Offset
Volume
ADSR**

**Volume
ADSR**

**Volume
ADSR**

**Parametric
Complex
Parabolic
Oscillator**

4 LFOs

E-Harmonics

2 LFO

O-Harmonics

2 LFOs

Side Oscillator

Parameters for Second OSC

**Waveform
Volume
ADSR-curve**

**Parametric
Oscillator**

2 LFOs

FM-Oscillator

**Depth
Volume
ADSR**

FM-Distorter

2 LFOs

Resonance Filter

**Frequency
Depth**

2 Oscillators

2 LFOs

VA-Synthesis

Common Parameters for all Keys

**Octave Shift
Fine Detuning**

Phase Shifting

**Vibrato Speed ADSR
Vibrato Depth ADSR**

**Phase Dithering
Phase Degradation**

**Main OSC Distortion, Offset, Volume
Main OSC ADSR - Setting**

**Second OSC Distortion, Offset, Volume
Second OSC ADSR - Setting**

FM Modulation ADSR, Volume, Depth

Resonance Filter, Volume

**VA-Synthesis Energy, Phase, Damping,
Loss,
Recouple, Decouple, Harmonics**

**HI-Pass
LO-Pass**

**Amplitude Dithering
Amplitude Degradation**

Sound Mix

Common Parameters for all Instruments

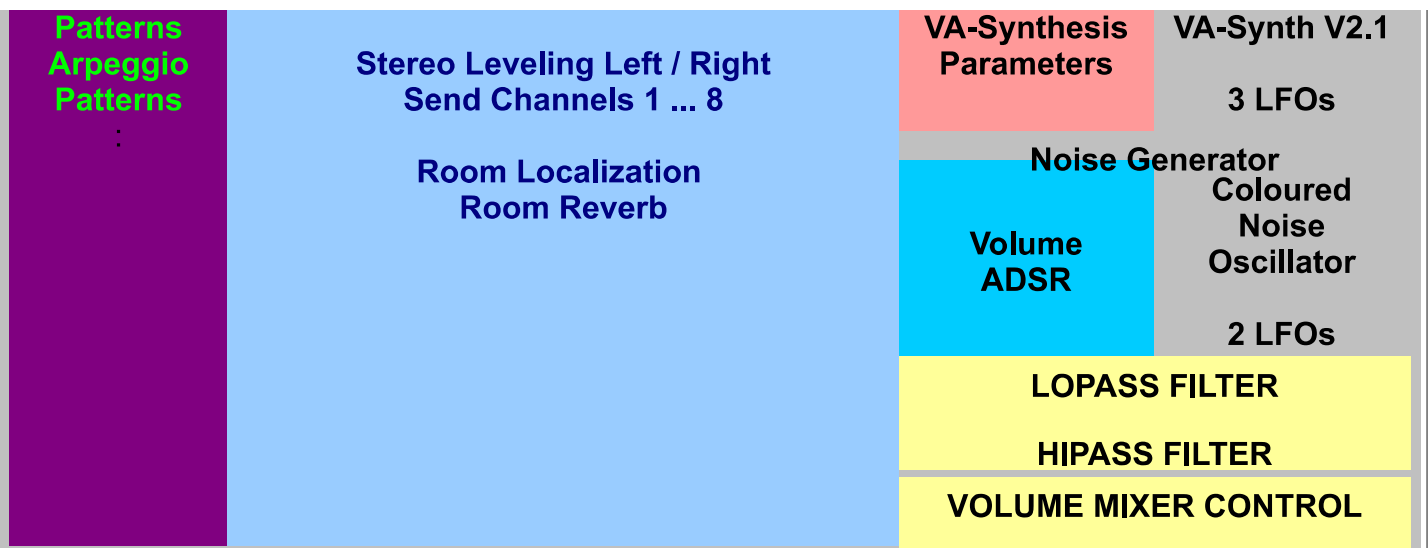
**Master Temperature
Master Tuning
Global Tempo
MIDI Tempo
MIDI Shift**

Routing Options

**16 x Audio Level
8 x MIDI In
8 x MIDI Out
64 x MIDI Internal**

Generators

**Rhythm Patterns
MIDI**



Pyratone Sound Synthesis operates from 8 Hz up to 120 kHz with 768kHz sampling rate.
For Audio, it is limited to 32kHz meeting the external sampling rate of 96kHz.

Each single Key has it's own control set for oscillators, LFOs and ADSR-behavior.

Altogether, there are 10 ADSRs + 16 LFOs + 6 HI-SCS running.

This leads to 8192 Oscillators simultaneously operating.

In a larger FPGA the double number of modules can be implemented lead to 8 musical instruments.

Sound Mix is performed with Phase and Amplitude based Room Placing in different ways.
Several Options can be combined.

The FPGA module offers 8 Outputs for Analog (PDM) or Digital (DSD) data.
Usually 4 PDMs are used to feed a double bass array with a HICUT at 400 Hz.
Standard Digital Output is 8 channel S/PDIF and 8 channel I2S in parallel.
All outputs are present simultaneously.

WHAT YOU NEED:

FOR CLASSICAL MIDI:

AN INPUT AND OUTPUT CIRCUIT COMPATIBLE TO MIDI CURRENT LOOP
PROVIDING INTERFACE FOR RX AND TX BOTH IN 3.3V @ 31.250 kHz

FOR FAST MIDI 2000:

AN INPUT / OUTPUT CIRCUIT COMPATIBLE TO S/PDIF
PROVIDING INTERFACE FOR RXS AND TXS BOTH IN 3.3V
RUNNING AT 48KHz x 64 = 3,072 MBAUD @ 6.144 MHz

FOR ANALOG PDM OUT:

AN ANALOG FILTER CIRCUIT COMPATIBLE TO 3,3V
WITH A BANDWIDTH FROM E.G. 15 Hz to 25 kHz
PROVIDING A GOOD REJECTION FOR FREQUENCIES > 25kHz

FOR DIGITAL DSD OUT:

A DIGITAL FILTER WITH RESAMPLING OPTION OR
A DIGITAL DEVICE LIKE FPGA OR PLD
COMPATIBLE TO 3,3V
ACCEPTING DSD5x64 = 30,72MHz OR DSD25x64 = 153,6MHz

FOR DIGITAL S/PDIF:

**A DIGITAL DEVICE COMPATIBLE TO 3,3V
ACCEPTING 48kHz x 64 = 3,102 MHz BMC**

FOR I2S OUT

**A DIGITAL DEVICE COMPATIBLE TO 3,3V
ACCEPTING 6,144 MHz BIT/DATACLOCK + 96kHz WORD CLOCK**

FOR PARALLEL OUT

**A DIGITAL DEVICE COMPATIBLE TO 3,3V
ACCEPTING 192kHz / 24 BIT**

VHDL - CORES FOR SALE

If you are interested in one of my VHDL Cores for Signal Processing, please contact me.

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