

Super Gemini

The UDO Super Gemini is a 20-voice polyphonic, bi-timbral synthesizer based on a hybrid of analog and digital technologies. By combining the aesthetics and sonic character of vintage-era classics with state-of-the-art synthesis technology, it was designed to be flexible, powerful and, above all, *immediate* – providing you with gorgeous sound times two!

Individual sound shaping controls for each of the two layers allow for simultaneous patch programming in dual and split modes while the performance control section to the left of the keyboard contains performance-related elements such as a bender, transpose and portamento controls as well as a second LFO. To further increase the expressiveness of your performance, the Super Gemini is also equipped with a custom-designed ribbon controller and a 61-note keyboard capable of polyphonic aftertouch.

Summary

- 20-voice polyphonic, bi-timbral hybrid synthesizer with real-time controls for both layers
- True stereo signal path for binaural modulations and spatially enhanced sounds
- Two FPGA-based oscillators featuring classic analog waveforms, capable of cross and ring modulation
- First oscillator with ‘super mode’ and up to 64 user definable waveforms
- Second oscillator with two sub oscillator options and hard sync
- Analog filters (low-pass and high-pass) and VCAs
- Two LFOs, two envelope generators and an 8x8 modulation matrix per layer
- Arpeggiator and 64-step sequencer per layer
- Two 24-bit stereo effects (chorus and delay) per layer
- Various voice assign options for polyphonic, monophonic and unison modes
- Memory: 512 performances, 512 patches, 64 alternative waveforms, 16 sequences
- MPE support
- 61-note, semi-weighted, velocity-sensitive Fatar keyboard with polyphonic aftertouch
- Custom-designed ribbon controller for expressive modulation control
- Folded aluminium and steel construction and high-quality mechanical controls

DDS 1 (Oscillator 1)

- FPGA-based super waveform oscillator core featuring a centroid oscillator and six 'sister' oscillators using sampled waveforms that can be dynamically de-phased in the stereo field to produce wide and thick single-oscillator sounds in one of two 'super modes'.
- Waveshapes: sine, sawtooth, square, triangle, noise and up to 64 alternative waveforms
- Alternative DDS 1 waveform format:
 - 16-bit signed integer format samples
 - Normalised, single-cycle waveform with 4096 points (8192 bytes)
 - Bandlimited at sampling frequency/8 (Nyquist/4), i.e. frequency content above 512 Hz in your 4096 point waveform should be removed
 - Binary file containing no header data and file extension '.ws6'

DDS 2 (Oscillator 2)

- FPGA-based oscillator core running at a very high sample rate with an algorithmic core.
- Waveshapes: sine, sawtooth, square, triangle, variable noise (pink, white, blue), pulse with variable pulse width
- Can be hard-synced to DDS 1
- LFO mode
- Ring modulation mode
- Square wave and Sine wave sub-oscillator modes

Mixer

- Controls the balance between the audio signals from DDS 1 and DDS 2 or DDS 1 and the sub oscillator.
- In shift mode, this parameter becomes a pan control, allowing you to position a layer within the stereo field.

Voltage Controlled Filter

- 4-pole, 24 dB per octave, analog resonant low-pass filter that uses a classic polysynth filter design by Sound Semiconductor (SSI)

- 1-pole, 6 dB per octave, analog high-pass filter, preceding the low-pass filter
- Two overdrive settings
- Selectable keyboard tracking modes
- Modulation by ENV 1 and/or ENV 2, LFO 1 and DDS 2

Voltage Controlled Amplifier

- Analog VCA with selectable velocity sensitivity
- Modulation by ENV 2 or one of two fixed envelopes, LFO 1 and DDS 2

Envelopes

- ENV 1: 6-stage envelope (attack hold, attack, decay hold, decay, sustain, release) featuring inverted and loop modes with selectable key tracking
- ENV 2: 5-stage envelope (attack, decay hold, decay, sustain, release)

LFO 1

- Freely assignable main LFO with low and high-frequency modes
- Can be used as a standard LFO, a third oscillator, as a drone, or for audio rate modulations
- Waveforms: triangle, reverse sawtooth, sample & hold and square as well as any waveform DDS 1 is currently set to
- Features controls for delay and left-right phase offset for binaural modulations
- Free-running, reset and one-shot modes
- Can be synced to the arpeggiator and sequencer or an external clock source

DDS Modulator

- LFO 1 and ENV 1 pitch modulation (DDS 1 and/or DDS 2)
- Selectable 'super modes' and detune spread control for DDS 1
- Wave modulation allows for morphing between two DDS 1 waveforms, modulatable by LFO 1, ENV 1 or manually
- Pulse-width control for DDS 2's pulse waveform, modulatable by LFO 1, ENV 1 or a dedicated PWM LFO
- Cross and ring modulation between DDS 1 and DDS 2

Effects

- 24-bit dual-mode stereo chorus per layer with three settings
- Clock-syncable and modulatable 24-bit stereo delay per layer featuring a delay freeze function that enables you to create sound-on-sound loops while you are performing

Performance Control Section

- Two-axis bender with LFO 2 trigger and dedicated controls for DDS1/2 pitch and VCF modulation
- Variable portamento per layer
- Playable spring-lever keyboard octave selector
- LFO 2 with rate and delay controls, selectable trigger modes, six selectable waveforms (sine, reverse sawtooth, sample & hold, square, sawtooth, sample & glide) and dedicated controls for rate, pitch, VCF and VCA modulation

Expressive Controls

- 61-note, semi-weighted, velocity-sensitive keyboard with polyphonic aftertouch
- Custom-designed ribbon controller for expressive modulation control, featuring an adaptive downbend behaviour that allows you to pitch bend notes down several octaves according to the pitch of the note you play
- MPE support for external MPE controllers

Overarching Controls & Parameters

- Master volume, tempo and lower layer detune controls
- Individual hold modes for each layer
- Selectable keyboard modes for setting up a performance: Single, Dual and Split
- Individual layer select buttons

Modulation Matrix

- Intuitive 8x8 modulation matrix with pre-defined sources and destinations
- Up to 25 more destinations can be modulated using the direct parameter mapping method
- LEDs give clear feedback on mappings and modulation amounts

Voice Assign Modes

- Four selectable voice assign modes including two monophonic and two polyphonic modes

- Eight delectable unison modes including various stacked voice modes and two variants of filter separation per voice, useful for creating vowel-like sounds
- Dynamic voice allocation when unison is enabled in both polyphonic modes
- Binaural option allows for choosing between 10 true stereo 'super voices' or 20 non-binaural monaural voices in single layer mode.
- Front panel control to disable Binaural and enter fully true-mono audio output

Arpeggiator & Sequencer

- MIDI-syncable multi-mode arpeggiator with smart hold option
- MIDI-syncable 64-step sequencer with programmable step, slide, accent, rest and sequence length tracks
- Clock parameters feature easy adjustable clock divider settings and swing per layer

Memory & File Management

- 256 performances (each containing 2 patches), 256 patches, 64 alternative waveforms for DDS 1 and 16 sequences
- Files can easily be copied to the internal memory or backed up using the USB port
- Quick firmware updates via USB connection

Connections

- AC power connector for worldwide use with a standard, grounded IEC power cord (90-250 volts, 50-60 Hz)
- USB port
- MIDI In, Out and Thru ports on 5-pin DIN sockets
- Pedal inputs: volume, expression, sustain per layer and delay freeze per layer
- Stereo mix output for summed layer signals (unbalanced 1/4 inch jacks)
- Individual upper and lower layer stereo outputs for individual mixing and processing (unbalanced 1/4 inch jacks)
- Easy to reach headphone output on the front side with both 1/4 inch and 3.5mm stereo jack sockets

What is Binaural Synthesis?

In binaural mode, the Super Gemini features a true stereo signal path in which its 20 voices are twinned to form either ten stereo 'super voices' in single mode or five stereo 'super voices' in dual or split modes. Consequently, the left and right channels (and your ears) are each assigned a complete synthesizer voice per layer.

Starting with the stereo oscillators, parameters of both channels of each 'super voice' may also be independently controlled, enabling you to create gorgeous stereo images. The

effect on the sound ranges from subtle to extreme stereo movement, resulting in an enhanced sense of spatial positioning compared to conventional monaural signal chains.