Acxel II

The Evolution of a Revolution (PRELIMINARY)

Taking advantage of the Acxel (*) legacy and a revolutionary new processor technology, with the **Acxel II**, **IDARCA** introduces a new evolutionary multisynthesis and multitimbral Modular synthesizer. The **Acxel II** promises to become a new reference standard for synthesis and audio processing in the music industry.

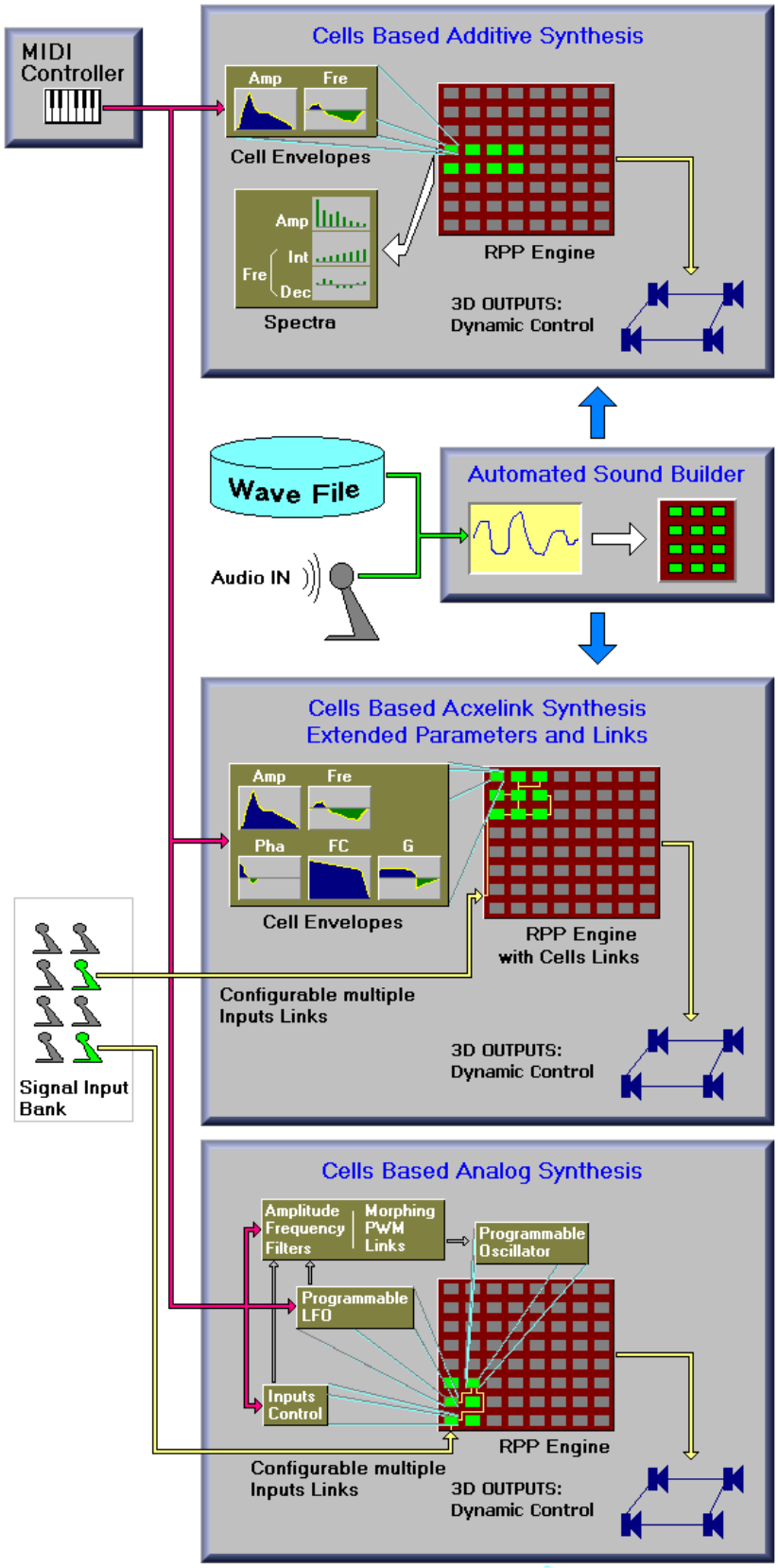
At the heart of the **Acxel II** system is a massively parallel dynamically reconfigurable processor, **the RPP** with signal synthesis embedded capabilities and ultra low granularity parallel calculator. **RPP** is based on an array of interdependent intelligent elements so called cells. This architecture enables flexibility that is not accessible with standard single or multiple DSP technology available today.

The **Acxel II** proposes 3 synthesis modes, including 2 standards: **Additive Synthesis** (including Re-synthesis) and **Analog Synthesis**.

On top of it, the **Acxel II** introduces its native synthesis mode, the so called **Acxelink** (with Re-synthesis), this synthesis is built from cell elements organized in a dynamic matrix architecture network that offers full open access to the sound internal structure thru a very intuitive user interface.

The flexibility of the **Acxel II** based on specific configurations of the **Acxelink** synthesis will naturally enable the introduction of new sound creation models with the introduction of new synthesis modes through continuous software development.

*(*) - The **Acxel** is a ReSynthesizer developped and sold by PiTechnos Inc. in the turning of the 90's, invented by Pierre Guilmette an actual founder and promoter of Idarca Inc.*



The 3 basic Synthesis-Processing Modes available with the **Acxel II** are dedicated to real time control and editing features with a unique approach and no compromise performance but still simple to use:

- **Additive Synthesis Module**
- **Analog Synthesis Module**
- **Acxelink Synthesis & Processing Module**

Other modes will be available later as options.

The Acxel II common Real Time Editing Features

The elements structures are implemented with 2 different operating modes; namely, the synthesis waveshapes and the processing states. The sound elements dynamics is expressed with the envelopes and MIDI controls.

ELEMENTS STRUCTURE:

Elements Synthesis waveshapes: with elements set as sound generator (All modes):

- Sine
- Square
- Sawtooth (ascending, descending)
- Triangle
- Noise generator
- Programmable drawn waveform

Elements Processing states: with elements set as processing elements (**Acxelink** mode only):

- Signal multiple Inputs (3) Recorder with memory size configurable for each element
- Wave Player with memory size and looppoints configurable for each element
- Capture on Signal Inputs (3) no memorization for external direct control

MIDI CONTROLS:

Each element and global parameter can independently be modulated from any selected MIDI Controller. The parameters on each element have a base value (envelope reference) and the envelope itself, the MIDI is assigned to one or the other, depending on the user preference. For example, to control element amplitude, the MIDI controller can be designated to affect the base amplitude or the envelope amplitude.

The way MIDI is assigned to parameter is by convention the **MIDI-Minimum** and the **MIDI-Maximum** values; all controllable data is doubled for MIDI response.

- **MIDI Min:** For a specific parameter the MIDI-Min term is the value when its assigned MIDI-control is at minimum value (ex: Lowest velocity)
- **MIDI-Max:** For a specific parameter the MIDI-Max term is the value when its assigned MIDI-control is at maximum value, at intermediate control value the parameter is proportionally interpolated between its min and max terms.

The MIDI-Min/Max convention applies for base and envelopes values. Each MIDI controller assigned to specific parameter is entirely user definable. Extensive selections of control curves are available.

SPECTRA:

Each Spectrum is a representation of a specific element-cell parameter (ex.: base amplitude, etc.)

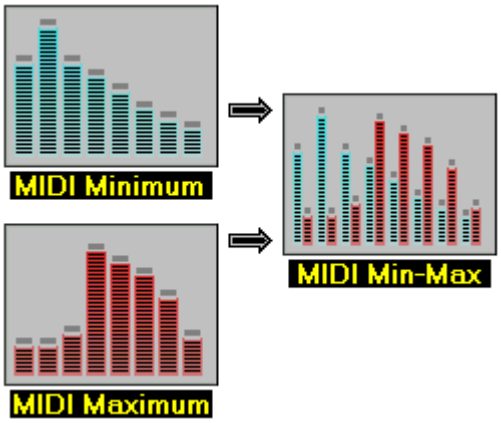
Each Spectrum is represented for **BASE/MIDI Min** (turquoise) and **MIDI Max** (red). Both can also be displayed together with each bars representing associated cell.

Main Parameters are:

- Amplitude
- Frequency: Base, Range

Optional Parameters (on **Acxelink** Mode only):

- Phase: Base, Range
- Filter: Base
- G (multiple: Symmetry or Morphing): Base, Range



ENVELOPES:

The envelopes are accessible in 2 different representations:

- ADSR with loop points shapes
- Point-to-Point

Each parameter has envelopes attached to each element. The correspondent bar of a selected element (Cell) on spectra gives the Base and Variation Range for envelopes.

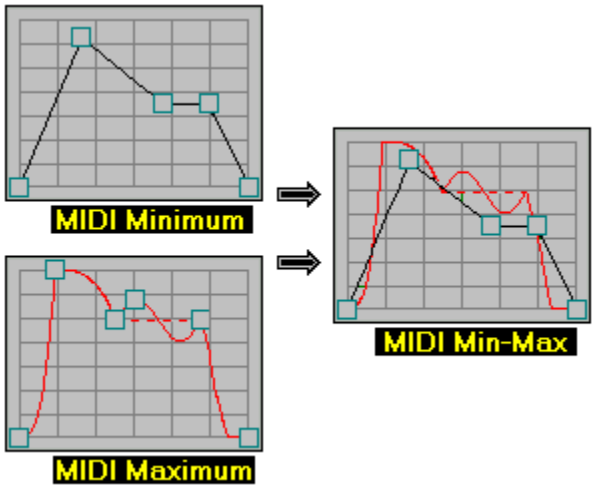
Each parameter envelope is represented for **BASE/MIDI Min** (turquoise) and **MIDI Max** (red). Both can also be displayed together.

Each MIDI-Min/Max envelope has its own user defined Loop points.

ADSR ENVELOPE TYPE:

The envelopes are defined with **Time** and **Level** parameters, with **Slope** types definitions for each section (selection of Linear, Logarithmic or exponential), and sustain variation predefined **Shapes** independently for Midi-min/max :

- Attack time, level and slope type
- Decay time, level and slope type
- Sustain level, time and shape (Flat, Sine, triangle, sawtooth, pulse width); the sustain level can be adjusted from static to variable, with modulation
- Release time and slope type



POINT-TO-POINT ENVELOPE TYPE:

The envelopes are **drawn directly** in a general non recursive shape. No direct time and level are defined, instead, the points define the values related to their vertical position in reference to time axis.

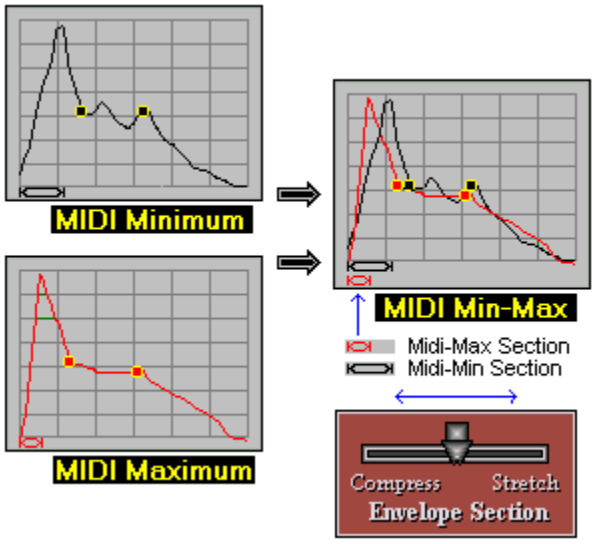
For time domain, whole envelope duration time and with Variation Range level are defined

It is also possible to shorten/extend an envelope section (ex: attack). There are 2 different editing facilities available for Point-to-Point envelopes:

- Selected time section Compression-Expansion with cursor control on each envelope
- Global Attack (time to first peak point) proportional Compression-Expansion for all envelopes with a single cursor

The **Loop points** are directly drawn (start – stop).

On envelopes, a defined section (example: attack section) can be compressed or expanded within each envelope (small block down left, black or red), and then the sections can be compressed or stretched. This function allows to rapidly and easily change the dynamics while keeping the high definition of the point-to-point envelope type.



SYNTHESIS STRUCTURE:

For each Synthesis module, the structure is based on 2 hierarchical levels of resources from base - Module to high - Instrument:

Module – Specific to each Synthesis module (can be combined with different synthesis modes within an Instrument).

- **Cells:** Multi mode elements that are defined by user as Oscillators, Sampler, Controller.
  - Parameters: Amplitude, Frequency
  - Parameters: Phase, Filter, Morphing (**Acxelink** mode only)
  - Base/Midi-Min & Midi-Max Envelope on each Parameter,
  - Controls: Control input on parameters (**Acxelink** mode only)
  - Spectra & Envelopes: Applied to parameters
  - Waveshape (as generator) or type – Generator, Capture, Recorder
  - Size (on sampler-recorder type), loops points.
- Module relative tuning (related to Instrument pitch)

Instrument – The top level assigned to a MIDI channel, it contains a user-specified number of Synthesis Modules .

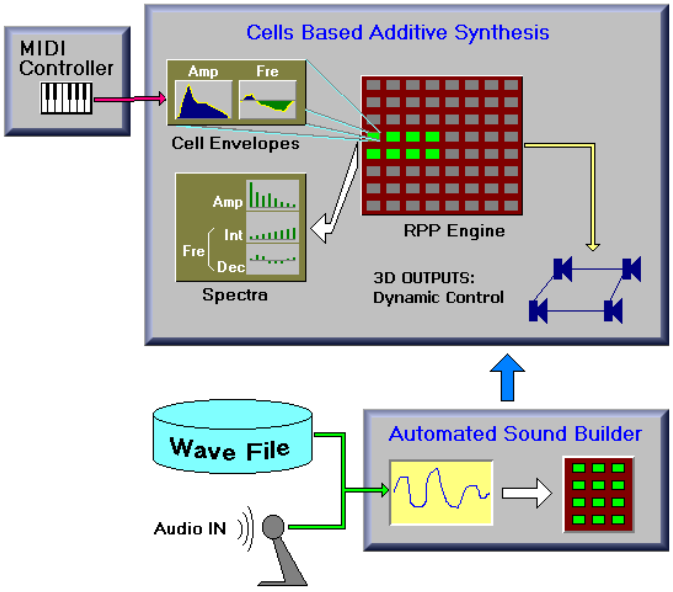
- MIDI Channel Selection
- Number of Modules
- Parameters
  - Volume - Selected on Envelopes (ADSR):
    - Volume reference Value
    - Base/Midi-Min & Midi-Max Envelope,
    - Optional LFO control,
  - Pitch (Selected on Envelopes (ADSR) base or Static):
    - Tuning reference Value
    - Base/Midi-Min & Midi-Max Envelope,
    - Optional LFO control,
  - Filter:
    - Cut-off Frequency reference value
    - Reference frequency response: Fix, tracking
    - Base/Midi-Min & Midi-Max Envelope,
    - Type Selection: Low Pass, High Pass, Band Pass,
    - Slope: 6 to 24 db per Octave,
    - Resonance Factor: 0 to 127,
    - Optional LFO control with Injection Level Factor,
  - OUTPUTS Control - Selected on Envelopes (ADSR)
    - Base/Midi-Min & Midi-Max Envelopes,
    - Envelopes (with 2 outputs): Left-Right,
    - Envelopes (with 8 outputs option) Front-Back, Top-Bottom.

Additive Synthesis access the elements as sound is naturally structured, use short cut functions to personalize it, and real time controls to make it come alive and natural.

The Additive Synthesis Module

Additive Synthesis module becomes the natural solution to create and edit timbre and to apply MIDI controls to selected sound elements. Sound can be created from the **Automated Sound Builder** (from pre-recorded sound or wavefile) or created from scratch.

A large selection of parameters is accessible through the graphic interface. Using this interface, the sound can be modified or made structurally different with independently assigned MIDI controls. As an example, you can automatically build 2 different sounds and use MIDI control to gradually morph from one sound to the other. These modifications apply to all sound parameters, including envelopes and dynamic expression

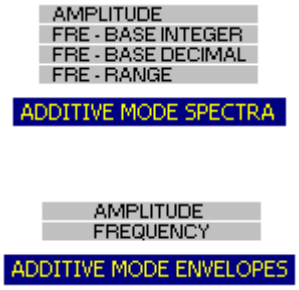


SPECTRA AND ENVELOPES:

In Additive mode, each cell has 2 available parameters through 4 types of data accessible in **Spectrum** representation, with Base/MIDI-Min & MIDI-max.

Moreover, each cell has each parameter accessible using 2 related dual-envelopes, with Base/MIDI-Min & MIDI-max.

If the **Automated Sound Builder** is used to set the initial sound configuration, it will create a number of sinewave elements with sound definition Amplitude and Frequency spectra and envelopes. Once created, this gives the musician full access to the 2 parameters spectra and envelopes for editing.



The default element waveform is the **Sinewave**, it can be changed to other shapes: Square, Sawtooth (ascending, descending), Triangle or a user defined shape.

Full MIDI control on structural elements (Cells parameters) or on global parameters.

The envelopes may optionally be represented as shown point-to-point envelopes (Default using the Automated Sound Builder), or ADSR with dynamic loop (Default if from scratch).

Within the Additive Mode Synthesis, the sound elements parameters (frequencies, amplitudes) are accessible with Spectra (references) and Envelopes (dynamics), each element Waveshape can be selected individually.

By taking advantage of the versatility of the **Acxelink** Synthesis, the **Acxel II** offers an analog module with unique features.

The Analog Synthesis Module

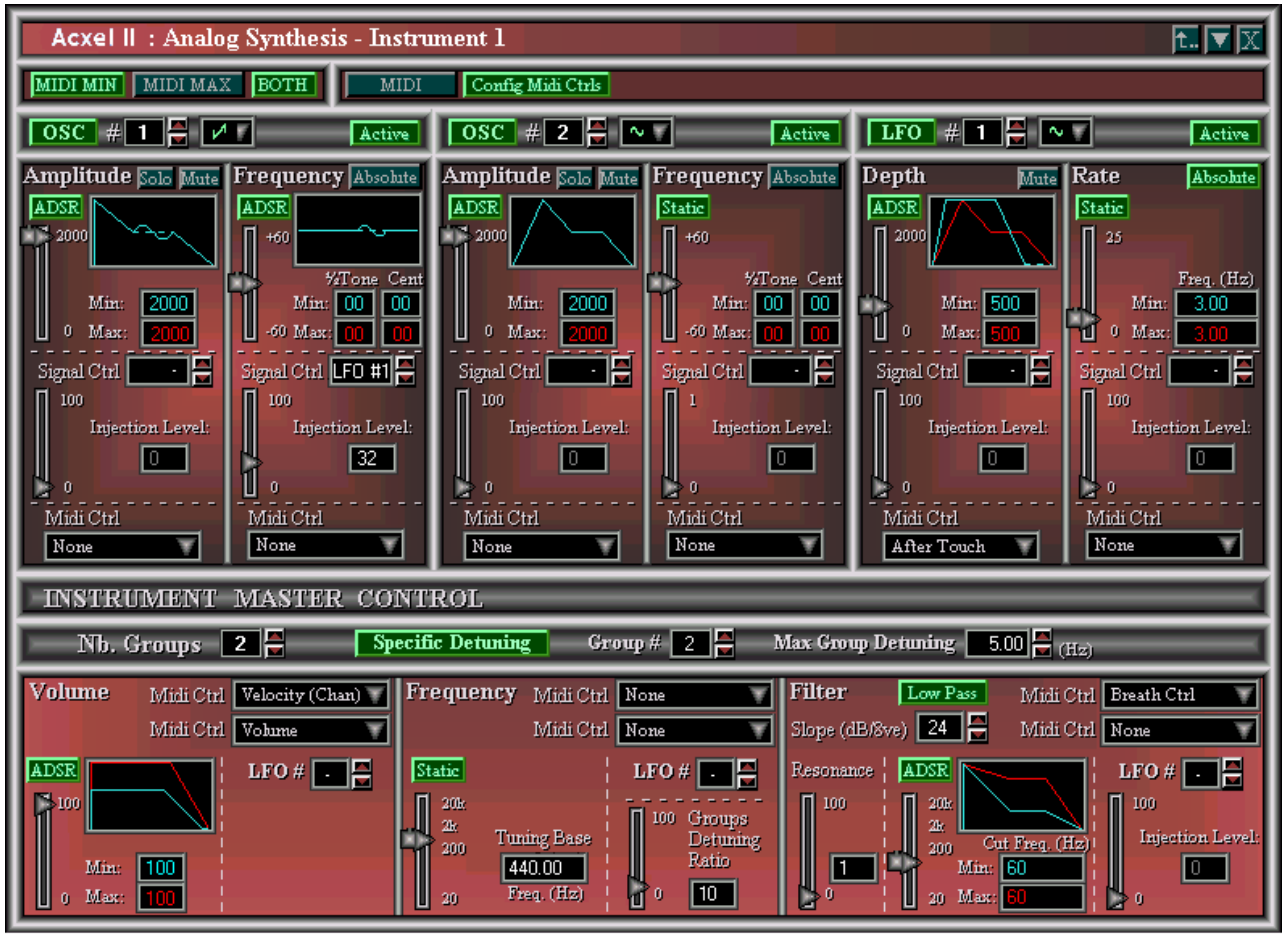
This module is simplified representation of Synthesis using a reduce number of elements: with 4 Oscillators, 4 LFO's, Access to Signal Inputs for controls, Output Dynamic Configurable Filter and Spatial Outputs.

The accessible parameters on Oscillator/LFO are their Amplitude - Frequency envelopes, Shape (with morphing capability on both Oscillators and LFOs).

Each LFO and oscillator is controllable from MIDI, on Dual Envelopes related to MIDI-Min and MIDI-Max of the selected controller. ADSR dual Envelopes on each element: Frequency, amplitude.

Thanks to its open structure with its Signal Input accessibility to control the operations, the analog module allows a very wide sound synthesis and processing palette. Familiar analog type synth sounds with their VCO, VCA, VCF can be created using the Signal to Parameter control. On the other side, the benefits of the programmability for the parameters and specific global controls offer unique functionalities.

Among these: the oscillators block detuning function opens access to spectacular effects simply from a single controller; simulate orchestral groups with many musicians playing at slightly different pitches. Such a feature cannot be achieved with the traditional Chorus effects, as the later applies to already mixed sounds.



Think about a Synthesis mode so powerful that it can emulate most of the known synthesis modes available today and it can create new synthesis modes as well. It can also combine modes, and ultimately give the musician access to **an open world of Sound Synthesis / Processing**.

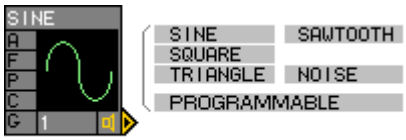
This Synthesis mode contents can be initiated from the Automated Sound Builder. This is not a wish list for a synthesizer. All of this is included with **Acxelink Synthesis**.

The Acxelink Synthesis & Processing Module

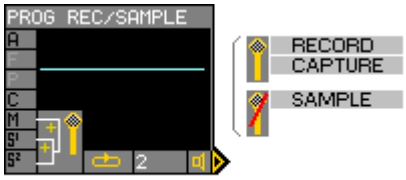
This mode is the extended synthesis mode of the **Acxel II**. **Additive Synthesis** and **Analog Synthesis** are structurally specialized and simplified modes configured internally from **Acxelink Synthesis**. Once done, everything accessible to the Additive Synthesis described before, explicitly apply to the **Acxelink** mode: Spectra, Envelopes, MIDI Controls. And the **Automated Sound Builder** can create the basic sound to be edited directly in **Acxelink** form, and then use its extremely rich palette of controls and unique functions.

The spectral elements of the Additive Synthesis become equivalent to the named cells which are extended sound elements for the **Acxelink** synthesis. Those have 5 basic parameters (2 for additive mode), and introduce an open structure where each parameter can be controlled from any source (other cell, instrument, signal input).

It is possible to set cells to behave as multiple input recorder-player with their own user defined wave area and loops. The **Acxelink** synthesis can be used for real time multiple signal Input Instrument (or any external sound source) processing to create unique effects.



CELL as a Sound Generator



CELL as a Signal Processor

CELLS:

The basic element of the **Acxelink** Synthesis is the cell. Each of the named cells can be configured as a **generator** or as a **signal processor**.

The figure at left represents waveshapes available as 4 **generator** preset waveforms, one noise and one programmable waveform (which can be drawn or recorded from an external source, with configurable recording size and loop points).

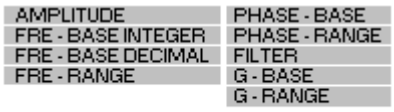
In **processing** mode, a cell can access memory (with configurable size and loop points) to record (microphone ON) and-or playback (microphone OFF) a signal. The Capture mode is the same as record with no memory, this is available to integrate and assign external signal to the **Acxel II** structure.

SPECTRA & ENVELOPES :

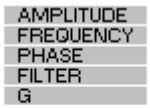
On **Acxelink** mode each cell has 5 available parameters through 9 types of data accessible in **Spectrum** representation, with MIDI-Min-max.

Also, each cell has each parameter accessible using 5 related dual-envelopes with the same graphic format as in Additive Synthesis, with Midi-Min-max.

If the **Automated Sound Builder** is used to set the initial sound configuration, it will create a number of sinewave cells with automated drawn Amplitude and Frequency spectra and envelopes. Once done, the musician has complete access to the 5 parameters spectra and envelopes for editing.

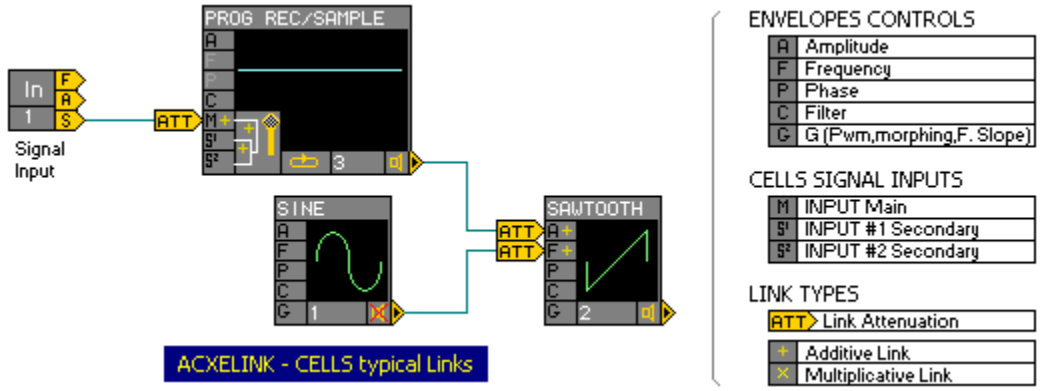


ACXELINK MODE SPECTRA



ACXELINK MODE ENVELOPES

ACXELINK CELL LINKS:



With the Links concept, cells function taken as sound element generators and/or processors can be combined and related.

For each **Generator-Cell,** any of its parameters can be controlled (or modulated) from other sources (Cells, external signal Inputs or an entire Instrument). This means that a specified source can modulate any cell envelope – Amplitude, Frequency, Phase, Filter Cutoff, G (PWM, morphing, Filter Slope), there is no restriction in terms of links that can be create. Each cell has 5 control input (as related parameters). Each control input on envelope can be attenuated (including inverting) so a single source can control different destinations with separate attenuation factors. Each control can independently be applied to be additive or multiplicative on each related parameter.

> **Example**:
> In the preceding figure a SINE cell (#1) controls (+ indicates that the control is additive) the Frequency parameter of sawtooth cell (#2) and a RECORDING cell (#3) controls the Amplitude (A) parameter of sawtooth cell (#2).

For each **Signal Processing-Cell,** any of its parameters or multiple signal inputs can be controlled or driven from a source (Cells, device signal Inputs or an entire Instrument). As for Generator Cells, specified source can modulate any of the Cell Envelopes. Also a source can be directed to any of the 3 available Inputs on a specified cell. The 3 Signal Inputs (Main, Secondaries 1 and 2) can be combined with each of the input selectively added or multiplied to the others. Each Control or Signal Input can be attenuated (including inverted). Control Inputs can independently be applied to be additive or multiplicative on related envelope.

> **Example**:
> In the preceding figure the Signal Input #1 is directed to the Main Input (M) of the RECORDING Cell (#3).

In the preceding figure, an example of combination of **Generator-Cells** and **Processing-Cell** is shown. It is a very simple application of **Acxelink** Mode. The cells #1 and #2 are Generator cells with defined waveform, with controls. The #3 cell is a Signal Processor which can be combined to synthesis cell, but more of that this cell can act as a real processor to process for example effects on connected Instruments (ex: Guitar, etc.). The **Acxel II** is capable to simultaneous implement many functions normally executed with different devices without constraints:

- Multi-Timbral and Multi-Mode Synthesizer and/or Resynthesizer (with Automated Sound Builder)
- Multiple Effects Processor: Phasing, Delaying, Reverb, Filtering, Spatialization, etc.
- Multi-Sampler (up to 16 available signal inputs)
- Mixing Console (up to 16 available signal inputs)
- Spatialization Outputs controller

Again the structure can be initially set with the Automated Sound Builder module.

Thanks to the native **Acxelink Synthesis & Processing** the potential of Processing Capabilities virtually unlimited as it is allowed to emulate well known existing Synthesis techniques or original combinations of Synthesis Modes, effects and Signal processing functions.

Supplementary Planned Optional Synthesis & Processing Modules

These Synthesis and Processing modules can operate in exclusive processes or combined with other base or optional modes.

SYNTHESIS MODES:

- Physical Modeling
- Wavelets
- FM
- Wave Table
- Vocoders
- Instrument emulation: Acoustical, Synthesizer
- Real Time Control Macro functions
- …

PROCESSING APPLICATIONS:

- Dynamic Mixing Console
- Studio environment system
- Room emulation
- Effect Processing: Guitar, Voice, other instruments
- Noise reduction
- Graphic equalizer
- …

Sampling vs. Re-synthesis with the Acxel II

The Re-synthesis, is now finally available from **IDARCA** by virtue of two newly developed technologies – the **RPP** processor and the **Automated Sound Builder** based on dedicated sound analysis algorithms. Real Time Re-synthesis is here at last with a simple user interface that belies the underlying complex sound structure.

SAMPLING

Current day sampling technology contains inherent constraints that limit its use as a creative and expressive tool. Any pitch changes will cause a proportional duration variation and timbre alteration, which limits the sonic reproduction.

Multisampling allows the musician to distribute many different sampled sounds along the keyboard, recorded at different pitches and intensities. The timbre expression is entirely dependent on the original sample.

The looping is unable to accurately represent the timbre dynamics. The expression is limited and poor. The sampled sound editing is virtually inexistent.

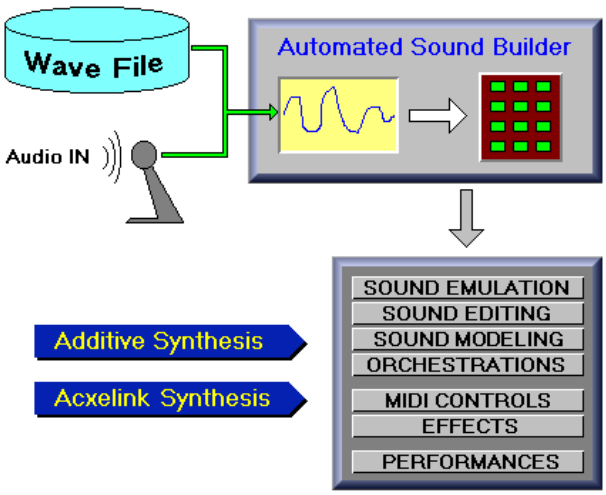
Also, the efforts involved to create a good sample library are enormous, considering that it requires a complex management, large data base and time consuming.

ACXEL II RE-SYNTHESIS

The Re-synthesis proceeds in a radically different manner, which consists of analysing and decoding a sound and extracting the basic elements of the sound in their respective time domain. This process gives the musician access to all of the sound element parameters by means of the related independent envelopes.

In contrast with sampling, the spectral dynamic content remains intact throughout the entire range of the keyboard, keeping the intact the crucial musicality of the sound. In other words, the original harmonic envelopes are preserved with their specific properties across the entire range of the sound.

Another exciting result of this approach is that the timbre can be modified during playback, dynamically and in real time, by means of a large palette of modifications, including MIDI controls, and in the exact manner requested by the musician. Also, by assigning different parameters (Velocity min-max, Pan, LFO, etc.) on 2 or more of the basic components together, the musician is able to obtain a dynamic variation of the timbre, with very fine transitions in between the parameter groups. Furthermore, the attack and release sections of the sound are precisely and dynamically interpreted along all expressive levels. Consequently, no looping is necessary.



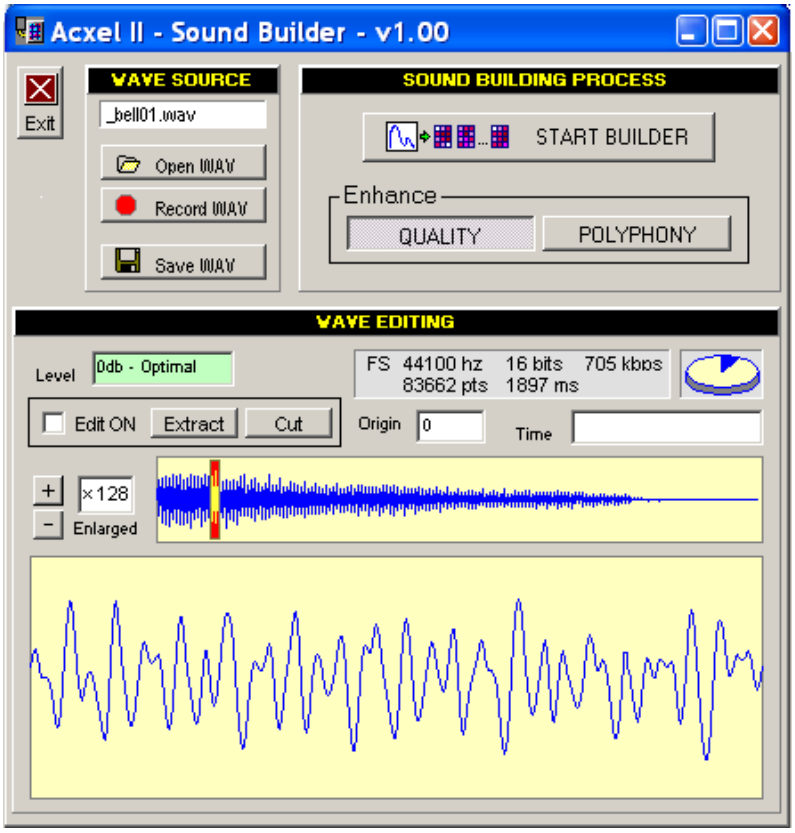
Acxel II re-synthesis also enables a deep musical sense with each of the newly created sounds. The perspectives are infinite, as so many samples are available as a basis for. Each sample now becomes a foundation for the creation of an unlimited variety of dynamic timbres. No such physical modelling as in similarly named instruments is involved, making the **Acxel II** a really new concept.

Re-synthesised sound can be combined within their structure to other sound elements, alternate synthesis modes, in Real Time.

The Automated Sound Builder (Acxel II Re-synthesis originator)

This module allows the musician to pick a signal from a .WAV file or from a system signal inputs. After the sound is loaded into the processor's memory, the program encodes it, extracts the elements and assigns them to the Re-synthesis resource.

The only user requirement is to specify the preference for an enhanced polyphony or an enhanced reproduction quality and the synthesis mode that is required. After the sound building is completed, the musician has full access to the new sound structure. The sound can subsequently be modified and any selected element(s) can be controlled by MIDI in real time. The built sounds can also be combined to create timbral interpolation from MIDI control.



Automated Sound Building Steps:

- Select the origin sound from Input [Record WAV] or from a .WAV file [Open WAV]
- RECORD or OPEN the file
- EDIT the signal if necessary with selected section [cut/extract]
- Select the preferred Building Mode: to prioritise [Polyphony] with fewer elements, or reproduction [Quality]
- [START BUILDER]: on a 1 GHz Pentium 4 the building process takes about the same time as the recording time (example - a 2 second sound will take about 2 second to build).
- Close the SOUND BUILDER Window.

Uses of a newly Built Sound:

- Create original sound library with very low storage requirements, since no samples are used in the reconstructed sound, only parameters.
- Combine 2 original sounds into a new composite sound with dynamic MIDI interpolation.
- Create new sounds by editing them
- MIDI Control: can be applied on global or structural sound level, and you have access to a very rich control palette from subtle to large variations.

When the building is completed, the sound is ready to be played. **The resulting newly built sound is not a sample.**

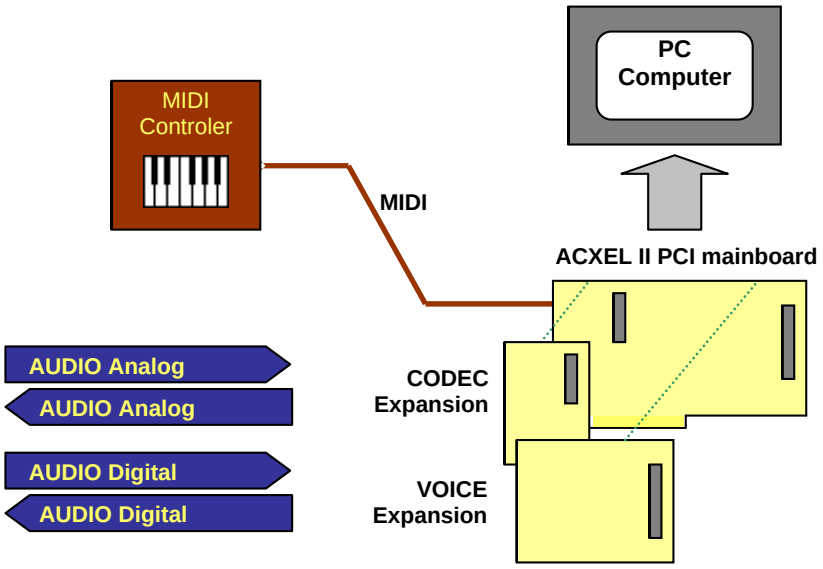
For this reason, it can be **directly transposed** without affecting the duration or quality. For example, a 3 second violin note at 200 Hz transposed one octave lower will be heard as a 3 second Cello.

The Sound duration can be **stretched**. For example from 3 to 10 second without changing the original pitch. For example, a 0.3 second pizzicato violin at 220 Hz, extended to 5 second with its components detuned will be hear as a sort on organ.

AND the newly built sound can then be modified and controlled, using the Synthesis Mode Interfaces (explained in preceding sections).

The ACXEL II Hardware : PC

ACXEL- II PCI (PC Computer Plugin Card)



Standard Features

Compatible to standard PCI Sound Card operation with full **Acxel II** Operations.

Full multitimbral unit with graphic interface and Synthesis hardware.

- Sound Synthesis
- Sound processing
- Extensive structural MIDI Controls
- **Synthesis Modes**: **Acxelink**, Additive Synthesis, Analog Synthesis

Hardware

- 256 Cells (16 voices)
- 2 signals IN / OUT (24 bit, 48 khz)
- MIDI Interface
- Digital Signal interface

Software

- Sound editor & Signal processing Platform

Optional Features

Extensions on voices, Input/outputs

- **Synthesis Modes**: Physical modeling, Wavelets, WaveTable, Vocoder, etc.

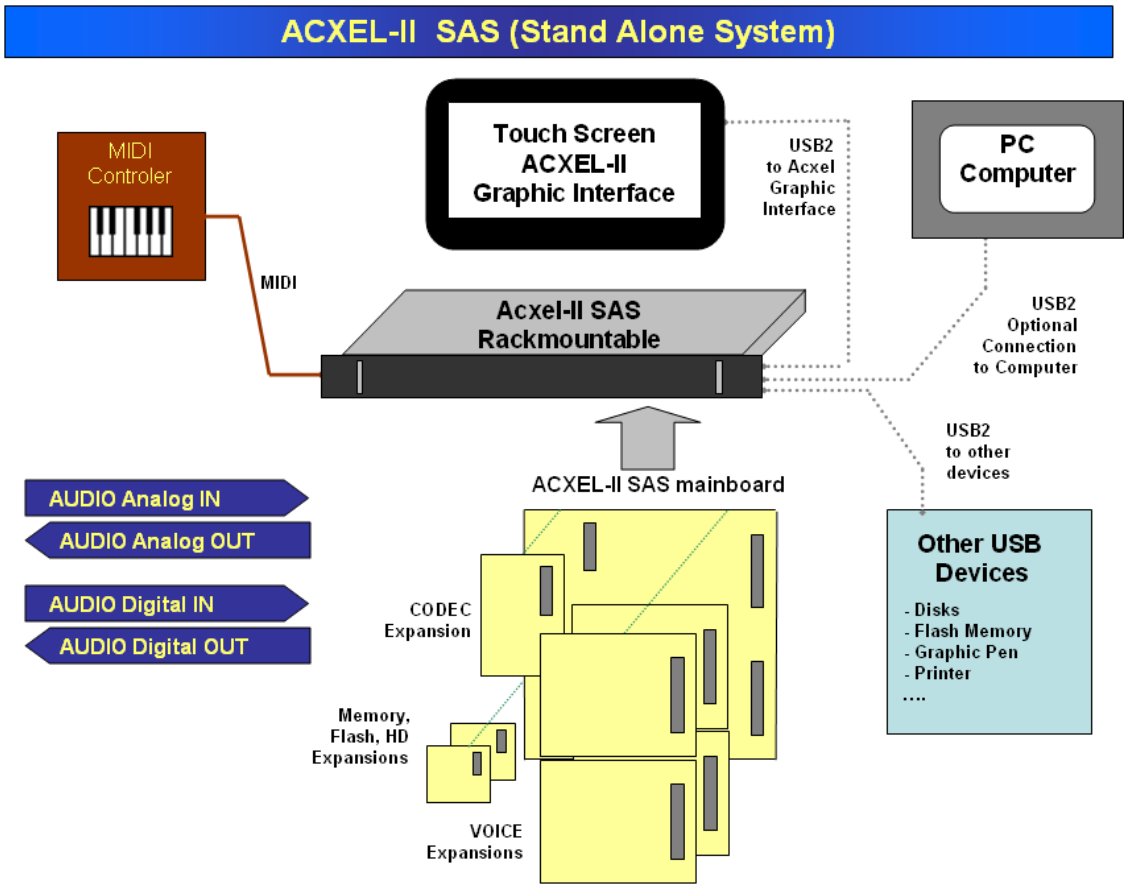
Hardware

- 256 Cells expansion (16 voices)
- 8 signals IN / OUT (24 bit, 48 khz)
- 8 signals IN / OUT (24 bit, 192 khz)

Software

- Automated Sound Builder, using Sound encoding & analysis to build re-synthesised sound

The ACXEL II Hardware : Stand Alone System



Standard Features

Complete Stand Alone Synthesis Unit that can be link to a PC Computer or other devices.

Full multitimbral unit with graphic interface and Synthesis hardware.

- Sound Synthesis
- Sound processing
- Extensive structural MIDI Controls
- **Synthesis Modes**: **Acxelink**, Additive Synthesis, Analog Synthesis.

Hardware

- Rackmountable System enclosure
- 256 Cells (16 voices)
- 2 signals IN / OUT (24 bit, 48 khz)
- DSP Controller
- USB2 Interfaces (4)
- SD memory Interface

Software

- PC: sound editor & Signal processing Platform
- PC: Automated Sound Builder, using Sound encoding & analysis to build re-synthesised sound
- On System: Complete Synthesis & Signal processing Software

Optional Features

Extensions on voices, Input/outputs.

Touch Screen Graphic Editing

- **Synthesis Modes**: Physical modeling, Wavelets, WaveTable, Vocoder, etc.

Hardware

- 4 x 256 Cells expansions (4 x 16 voices)
- 16 signals IN / OUT (24 bit, 48 khz)
- 16 signals IN / OUT (24 bit, 192 khz)
- **Acxel II** Touch Screen Graphic Interface
- Memory expansions: HD, Flash

Software

- On System (Option): Graphic Editing and Controls – With the Touch Screen Graphic Interface
- Automated Sound Builder, using Sound encoding & analysis to build re-synthesised sound

Thanks to the native **Acxelink Synthesis & Processing** the potential of Processing Capabilities virtually unlimited as it is allowed to emulate well known existing Synthesis techniques or original combinations of Synthesis Modes, effects and Signal processing functions.

Supplementary Optional Synthesis & Processing Modules

These Synthesis and Processing modules can operate in exclusive processes or combined with other base or optional modes.

SYNTHESIS MODES:

- Physical Modeling
- Wavelets
- FM
- Wave Table
- Vocoders
- Instrument emulation: Acoustical, Synthesizer
- Real Time Control Macro functions
- …

PROCESSING APPLICATIONS:

- Dynamic Mixing Console
- Room emulation
- Effect Processing: Guitar, Voice, other instruments
- Noise reduction
- Graphic equalizer
- …

Specifications and Technical Data

General Data

HARDWARE (BASE)	
System hardware - 1	▪ **PCI card**
System hardware - 2	▪ **SAS** (Stand alone unit with USB2 connectivity to a PC)
Inputs	▪ 2 (24 bit, 48 khz),
Outputs	▪ 2 (24 bit, 48 khz),
Cells	▪ 256
Voices	▪ 16
Polyphony	▪ 16

SOFTWARE (BASE)	
System Software	▪ **Acxel II** / synth ▪ **Acxel II** / Sound Builder
Compatibilities	▪ Windows^{tm} XP, Vista ▪ MIDI
Minimum requirements	▪ Pentium 800 Mhz, 64 Mb RAM ▪ Additive ▪ Analog ▪ **Acxelink**

HARDWARE (OPTIONS)	ACXEL II - PCI
Inputs	▪ 8 (24 bit, 48 khz),
Outputs	▪ 8 (24 bit, 48 khz),
Sampling Rate	▪ 96 – 192 Khz
Cells	▪ 256 supplementary
Voices	▪ 16 supplementary
Polyphony	▪ 16 supplementary

SOFTWARE (OPTIONS)	ACXEL II - PCI
	▪ Extended Sound Builder

HARDWARE (OPTIONS)	ACXEL II - SAS
Inputs	▪ 16 (24 bit, 48 khz),
Outputs	▪ 16 (24 bit, 48 khz),
Sampling Rate	▪ 96 – 192 Khz
Cells	▪ 4 x 256 supplementary
Voices	▪ 4 x 16 supplementary
Polyphony	▪ 4 x16 supplementary
Graphic Interface	▪ Touch Screen Graphic Interface (USB2)
Memory	▪ Flash, Hard Disk

SOFTWARE (OPTIONS)	ACXEL II - SAS
	▪ In System Editing Software (with Graphic Interface) ▪ Extended Sound Builder
Synthesis Modes (options)	▪ Physical Modeling ▪ Wavelets ▪ FM, Wave Table, etc.
Processing Modes (options)	▪ Dynamic Mixing Console ▪ Effect Processing

Acxel II –Performances

Modes	▪ Synthesis, Signal process
Synthesis Waveform count	▪ 2 per cell: Base, Secondary (for Morphing)
Synthesis Waveforms	▪ Sine, Square, Sawtooth (+, -), Triangle, Noise, Programmable
Processing Cells Modes	▪ Record, Playback, Capture
Base Parameters	▪ Amplitude, Frequency, Phase, Filter Cutoff, G (PWM, Morphing, Filter Slope)
Links Source types	▪ Cell, Signal Input, Instrument
Envelopes links	▪ Each Base Parameter
Signal Input Links	▪ 3 (main, secondary 1 – 2)
Links parameters	▪ Link Source selection ▪ Attenuation and Inversion, ▪ Affectation in Additive or Multiplicative form
Cell to Voice Assignment	▪ Independent on each cell, dynamically allocable
Base Parameters	▪ Level, Pitch
Output control	▪ Envelope: Left-Right, Front-Back (Top-Bottom, w 8 out option)

Envelopes types	▪ Point-to-point with variable length and loop points, ADSR with looping
Processing Cell Count (RAM)	▪ One per Even Cell (base 128)
Processing Ram on cells	▪ 8 M x 24 bits, with configurable length and loop points
Ram control from cell	▪ Frequency, looped/non-looped
Cell Amplitude Env.-Link	▪ Absolute or Relative to Voice
Cell Frequency Env.-Link	▪ Absolute or Relative to Voice
Cell Phase/Delay-Link	▪ Phase – Synthesis, ▪ Delay – Processing
Cell Filter Envelope-Link	▪ Frequency Cut-off, type, base slope
Filters count	▪ One per Even Cell (base 128)
Filters types	▪ Low-Pass, High-Pass, Band-Pass with 1 – 24 db / octave
Cell General Env. Function	▪ Selection from: PWM, Morphing, Filter Slope
LFO	▪ Each cell can be set as LFO
MIDI Controls	▪ On any Cells – Voice parameters
MIDI Destinations types	▪ Spectra - Dual with balance ▪ Envelopes – Dual with Balance

Specifications and Technical Data (Continued)

Acxel II - ASB (Automated Sound Builder) Performances

Modes	▪ Enhance Quality ▪ Enhance Polyphony
Source for ASB	▪ Signal Input, Wave File
Destinations	▪ Additive Synthesis, **Acxelink** Synthesis
Options	• Extended duration • Real Time Analysis – Real time operation on external sound structure

NO, THIS MACHINE IS NOT A MYTH

Back from the early 90's it is ready for a new evolution

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