www.muon-software.com

Muon Electron User Manual

Thank you for purchasing the Muon Electron Virtual Synthesiser Plug-in. We hope that you will find that it offers unrivalled creative possibilities for the price, with excellent performance. To get the best out of your purchase, you should read this manual carefully. Don't forget also that we're here to help at service@muon-software.com.

The Muon Team

1. Introduction

The Electron is a complex synthesiser, combining elements of those coveted classic analogue keyboards with some new and innovative features. The Electron gets its fantastic sound from Muon's advanced 64-bit Analogue Modelling technology, and adds the kind of hands on control that you need to take your music to new heights.

2. Front Panel Control Basics

The Muon Electron has a wide variety of controls for creating sounds, with thousands of possible variations. The circular knob controls are used to adjust parameters that have a continuously adjustable range, whereas the buttons are used to select a choice from a limited set of options.

For example, the filter type control may only be set to one of the available choices. If you left-click with the mouse on a button, it will change to the next choice. Right-clicking with the mouse sets the button to the previous choice. If you have a single-button mouse you can use the ALT key on your keyboard whilst clicking to do this. Pressing CTRL and clicking on a button always returns you to the first option.

The knobs can either be operated in the normal VST plug-in "circle" mode or alternatively in "vertical" mode.

In the former, the knob is clicked on, and then the is mouse dragged with a circular motion around the control. The marker on the knob will follow the mouse pointer until the mouse button is released, and so the wider the circle, the more fine the changes you can make. You may notice that when you click on the knob for the first time its value may "jump" to face the mouse pointer - to avoid this, click firstly on the end of the knob's marker, or use vertical mode.

In vertical mode the knob is clicked on with the mouse and the value only changes when the mouse is moved up and down. To make finer adjustments, hold down the SHIFT key when moving the mouse.

The mode of an individual knob can be changed by holding down the ALT key on the keyboard before clicking on it and whilst dragging the mouse. You can change the mode of all of the Electron's knobs at once with the button in the lower right of the screen marked with an circular arrow (circle mode) or two vertical arrows (vertical mode) - see the picture below.

The user interface settings buttons

Also in this bottom right corner of the Electron's panel is a useful button that allows you to see the value of the sound parameter a knob is changing when you click on it. The button is marked with "0.0" and is either on (bright) or off (dark). Whilst you are learning your way around the Electron, or if you wish to make fine adjustments, this is a very useful feature.

Finally, if you wish to set any control back to its default value quickly, then just press and hold down CTRL on your keyboard when you click - this works for buttons too.

3. The Oscillator Section

Each of the Electron's Virtual Computerised Oscillators (VCO for short) produces a single sound waveform, and these are mixed together to make the basic sound of the synth.

You can adjust the individual oscillators so that the pitch they play is up to 12 semitones higher or lower (using the transpose control) than the note the synth receives over MIDI. The fine pitch (detune) can be adjusted for each oscillator also. Setting the detune on different oscillators to different amounts will produce a wide, swirling effect as the oscillators "beat" against each other - this is great for big, fat patches. You can also set the volume of each oscillator using the level control.

The final output volume of all three oscillators, and consequently the whole patch, is set using the master volume control. You can also set the range of your keyboard's pitch bend controller.

VCO's 1 and 2 (but not VCO3) have some additional controls that can be used to alter their basic sound. For example, VCO1 always produces a Sawtooth wave when the Sync control is set to "OFF". Sawtooth waves have a brassy sound and look like the teeth of a wood saw when viewed in a wave editor.

If the Sync control is set to one of the other two VCO's the shape of the VCO1's wave output is retriggered whenever the other starts its cycle over. This causes a distortion that you can vary by changing the transpose and detune settings for VCO1 - however the pitch will not change. If VCO1 is syncing you can change its pitch by changing the pitch of the oscillator it is syncing to.

Note though that it is in the nature of the oscillator sync in general that things can get a bit unstable towards the top of the keyboard!

VCO2 produces a Variable Square Wave. This is similar to a Square Wave (as produced by VCO3). The Variable Square wave has a woody, reedy tone when the Pulsewidth control is set to the 50:50 position (12 o'clock). At lower settings of pulsewidth the sound output by VCO2 will become harsher and more nasal. At higher settings, the sound will almost be the same as per the equivalent higher setting but the phase of the wave is inverted.

VCO3 has less controls than the other two oscillators, and produces a pure Square Wave. The sounds of VCO2 and VCO3 are the same if VCO2's pulsewidth control is set to 50:50.
Although less controllable, VCO3 is extremely useful for adding body to your sound. Often, transposing it down an octave gives a bass or pad patch extra bottom-end warmth.

4. The Filter Section

The Electron has a powerful two-section VCF bank (Virtual Computerised Filter), capable of warping the sound of the oscillators beyond all recognition. This is where the majority of the work in creating a patch is done!

There are separate, identical controls for each of the VCF's in the bank. The Mix control sets how the output of the filters is combined.

Each of the two filters can be set to Low Pass (removes treble), High Pass (removes bass), Band Pass (removes both treble and bass, but leaves the midrange) and Band Reject (removes only the midrange sounds).

In all cases, the Cut off knob controls where in the frequency range the filter begins to act. With LP and HP filters the Q control is used to add a boost to the frequencies immediately around the cut off point. Setting this control to 100% will cause the filter to turn into an oscillator, which can be used to great effect (though watch out for the levels - the Electron can easily distort the input of your sequencer's mixer at high Q).

With the BP and BR filter designs, the Q control changes the width of frequencies affected.

The Mix control can be set to either of the following modes:

parallel	The sound of the oscillator section is split according to the position of the Mix Slider and sent to the filters. The output of both filters is then combined and passed to the amplifier. If you set up different filter types, such as LP and HP on VCF1 and VCF2 respectively the mixer slider can be used for some fantastic cross fade effects. The Mix slider is not used in the other modes.
serial	The output from the oscillator section is fed into VCF1, processed and then fed into VCF2 for further processing.
VCF1 off/ VCF2 off	A single filter only is used. This can be good for saving processor power on simple sounds.
link	All of the settings for VCF1 are copied into VCF2, and any control movements on either filter are automatically made on the other too. The sound of the oscillator section is divided equally between the two filters, and then added back together before the output is passed to the amplifier. This mode is used to get serious control over the sound!

The remaining controls affect how the filter's cutoff and Q controls are varied as the sound continues. This is called modulation, and is covered in the next section.

5. The Modulation Section

If you've been following this manual closely so far, and have been trying things out as you go, you've probably managed to build a nice, fat sound that uses the detuning
alone to add movement. However, unless you've read ahead to this section already, the chances are that your new patch is still a bit static.

The Modulation section contains two Envelope Generators (EG's) and two Low Frequency Oscillators (LFO's). These are modulation sources that can be used to change many of the Electron's parameters over time.

The design of the Electron means that it is easy to choose parameters to modulate, and this is the key to powerful, evolving sounds.

Envelope generators output a (non-audible) signal that rises from zero when a key is first pressed up to their peak at the speed determined by the Attack time control. Then, the output falls to a steady level (the Sustain level) at a speed determined by the Decay control. Finally, when the key on the keyboard is released, the output of the Envelope generator falls to nothing again at the speed determined by the Release control. In synth terminology, this is an ADSR envelope generator.

The control signals output by EG1 and EG2 can be used to affect other parameters. For example, EG1 always controls the Electron's final output volume (the user cannot change this routing, though EG1 can still be used to modulate other parameters as we will see). If a sound that gradually fades in and then slowly fades away was required, EG1's Attack and Release times should be set accordingly. Alternatively, if a sound that started quickly and died away was more appropriate before the key is released (like a percussion instrument) the Sustain control should be set to 0, with the Decay setting the overall length of the sound. The default settings of the EG1 controls create a simple "gate" envelope where the sound starts immediately when the key is pressed and ends as soon as the key is released - much like an organ.

EG2 is set up in the same way, but it has no immediate audible effect on the sound as the output must be routed to some parameter to have any effect. Looking in each section reveals a number of possible modulation source buttons relating to some target parameter. For example, the pitches of VCO1 or VCO2 can be modulated with the output of EG1 by selecting EG1 in the Pitch Mod Source control, and then setting the Pitch Modulation Depth. This control determines how much of the signal coming out of EG1 is sent to the oscillator's pitch control input. Setting it fully to the right means that the oscillator will change pitch over a wide range in sympathy with the output of EG1. Setting the depth control fully left means that the pitch will go down instead of up (negative modulation) when the envelope signal is rising. The central position is zero, and means that the pitch will remain unchanged.

EG2 can also be used to modulate other parameters - most often one or both of the two VCFs cutoff frequencies. This is a very common way to get a basic "analogue synth" sound, especially if you use two low pass filters in link mode, with a little resonance.

EG1 and EG2 can also be made to change their output signal level in response to MIDI velocity and other controllers. If a sound that gets louder the harder the key is pressed is required, set the EG1 Depth Modulation Source to VEL (velocity) and turn up the Depth control to suit the amount of velocity sensitivity needed. This can also be done on EG2 - if the filter cutoff is being modulated by the output from this envelope then adding a touch of velocity sensitivity means the sound will change in tone depending on how hard the key is pressed.

LFO1 and LFO2 are just like the VCOs used to create the Electron's sound, but operate at a much lower pitch (frequency) and are inaudible. Instead of being sent to the output, their signals are used to add rhythmic modulations to other parameters.

The wave shape and frequency of the LFO is selected with the shape and rate controls respectively. The strength of the output signal, and the rate can be modulated themselves with a number of sources through the Depth Mod Source, Depth Mod Depth, Rate Mod Source and Rate Mod Depth controls.

If a sound with vibrato was needed, one of the LFOs could be routed to VCO1 and VCO2 pitch. With the LFO shape set to SIN (sine wave) or TRI (triangle wave), the frequency to between 5-6 Hz and the Pitch Mod Depth set to a 1-2% a pleasant vibrato effect could be achieved. This could be made more controllable by setting the Depth Mod Source to the Modulation Wheel on the controller keyboard and setting the Depth Mod Depth so that the vibrato effect increases in strength the more the wheel is turned. This can then be used in a performance with pitch bend, velocity sensitive envelopes and other controllers to inject some life and dynamics.

Tremolo effects can be created in the same way, but by routing the LFO output into EG1 Depth (which is directly connected to the amplifier) using the EG1 Depth Mod Source and EG1 Depth Mod Depth controls.

However, one of the best uses of the LFO is to modulate the filter cutoff for some real swirling, evolving effects - if the VCF section is in parallel mode, try routing LFO1 to VCF1 Cut Mod Depth 2 Source and LFO2 to VCF2 Cut Mod Depth 2 Source. Set the LFOs to different waves, frequencies and modulation depths and some interesting sounds are bound to result. Making use of MIDI controllers such as Aftertouch, velocity and the Modulation Wheel also makes for a more dynamic and playable patch.

Users should note that using a lot of modulation sources and routings can mean that patches will use a lot of processing power. You should always make sure that LFOs and modulation sources that are not being used (or have their corresponding modulation depths at zero) are switched off to conserve processing time. Certain modulations are more "hungry" than others - pitch and pulsewidth modulation of the oscillators, for example.

6. The X-Y Controller

The bottom part of the Electron's main screen houses the Muon logo (click on this to display the version number and credits), the X-Y button (used to activate the X-Y Controller), and the User Interface Settings controls discussed in section 1.
Click on the X-Y button to access the controller screen:

Most software synthesiser designs only permit the user to change one parameter at a time, as this is generally all that is possible with a mouse and on-screen knobs and buttons. Although the Electron uses such controls because many people are familiar with them, the X-Y controller makes best use of the two-dimensional nature of the mouse and screen, and allows the user to control two parameters at the same time, using horizontal (X) and vertical (Y) movements of the mouse.

The parameters to be controlled are selected either with the X Parameter and Y Parameter knobs, or by clicking on the displays next to them. The large square in the centre is the controller itself. The yellow dot visible in this square represents the current value of these two parameters, much like a graph. If both of the X and Y parameters are zero, for example, the dot will appear in the bottom left corner. Whenever you click the mouse in the square, the X and Y parameters will automatically be changed to match the new value as represented by the horizontal and vertical position of where the mouse was clicked relative to the bottom left corner.

If this doesn't make sense immediately, use the parameter displays mode and experiment. Remember though, if both the X and Y parameter are set to the same control, the yellow dot will always move in a diagonal line as the horizontal and vertical distances that represent the parameter values will always be exactly equal!!

Sometimes you might be found that it doesn't make sense to have the parameter value increasing in the default direction. The buttons marked with an "I" are used to invert the direction in which the control responds for either axis.

Any parameter changes you make using the X-Y controller are immediately remembered if you go back to the main screen. They are also saved with the patch (but the X-Y controller settings themselves are lost if the Electron is closed and re-opened, and are not saved). Since Cubase VST supports the recording of control movements, you can use the X-Y controller to record automation data - and watch it being played back too (assuming the X and Y parameters are still set to the ones recorded).

7. MIDI Control

The Electron has a comprehensive MIDI implementation. In this manual you will have seen so far how velocity, modulation wheel, aftertouch and pitchbend data can all be used. Additionally, the Electron responds to MIDI continuous controller messages.

These CC messages are numbered from 1-127. The Electron can only respond to CC's 75-102. You can usually configure these in your hardware controller's setup facility or software package. Only parameters that have continuous ranges can be controlled by CC's - the same ones as can be changed using the X-Y controller. These parameters, and their value ranges, are listed below.

Please note though that the Electron's controls cannot SEND CC values. It can only receive them.

Parameter	CC	Range
VCO1 Level	75	0-127
VCO1 Pitch Mod Depth	76	0-127, 64=centre (no modulation)
VCO2 Level	77	0-127, 64=centre (no modulation)
VCO2 Pitch Mod Depth	78	0-127, 64=centre (no modulation)
VCO2 PulseWidth	79	0-127, 64=centre (square wave)
VCO2 PulseWidth Modulation Depth	80	0-127, 64=centre (no modulation)
VCO3 Level	81	0-127
VCF Cross Fade	82	0-127, 64=centre (50/50 balance)
VCF1 Cutoff	83	0-127
VCF1 Q	84	0-127
VCF1 Cutoff Mod Depth 1	85	0-127, 64=centre (no modulation)
VCF1 Cutoff Mod Depth 2	86	0-127, 64=centre (no modulation)
VCF1 Q Mod Depth	87	0-127, 64=centre (no modulation)
VCF2 Cutoff	88	0-127
VCF2 Q	89	0-127
VCF2 Cutoff Mod Depth 1	90	0-127, 64=centre (no modulation)
VCF2 Cutoff Mod Depth 2	91	0-127, 64=centre (no modulation)
VCF2 Q Mod Depth	92	0-127, 64=centre (no modulation)
EG1 Attack	93	0-127
EG1 Decay	94	0-127
EG1 Sustain	95	0-127
EG1 Release	96	0-127
EG2 Attack	97	0-127
EG2 Decay	98	0-127
EG2 Sustain	99	0-127
EG2 Release	100	0-127
LFO1 Rate	101	0-127
LFO2 Rate	102	0-127

8. Getting Help

It's no doubt that the Electron is a powerful synthesiser, and it is designed to make creating new sounds easy and quick. For some though all that power can be daunting -just mail us at service@muon-software.com and we'll do our best to answer your questions quickly and courteously.

There's also a support page on our website for Electron Users. We hope that if you make a great sound with your new synth and feel like sharing it you'll send it to us so we can post it on the users page for others to download. You will also find news of user issues and upgrade information here too.

Best of luck!!