



1. INTRODUCTION

Lava is a VST/VST3/AAX/AU Acqua plug-in that accurately recreates the tone of classic microphones including the microphones' response, harmonic content and proximity effect. It is an out-of-the-box plug-in that can make your own microphones sound just like the microphones you have always wanted to own, with a few simple clicks.

Instantly expand your collection with vintage and modern microphones from the cheapest to the most emblazoned models on the market, as well as a selection of very rare boutique stuff.

Lava includes over 140 microphone emulations (100 source mics plus 41 destination mics).

Just choose your starting and output microphone, a few tricks using the included controls and you're done! A winning choice for recording, mixing and even a tool that can give you satisfaction for broadcasting and podcasting applications.

We invite you to read chapter 6 (Appendix) to find out about the genesis of the project and for information, tips and tricks about the product.

2. OPERATION

Below we will immerse ourselves into the explanation of the Lava plugin controls.



2.1 CONTROLS

1-'From' drop-down menu (Source Mic)

This drop-down menu is used to select a specific model of mic.

Please Note: All trademarks appearing below are the property of their respective owners. The following manufacturer names and model designations are used solely to identify the microphones analysed in the development of our digital emulations and do not in any way imply any association with or endorsement by any of the named manufacturers.

Source mic list

The following is the list of the Source mic models that are included with Lava plugin.

AE-44	001 - [AEA] R44
AE-84	002 - [AEA] R84
AK-451B	003 - [AKG] 451B
AK-C12	004 - [AKG] C12 VR
AK-C214	005 - [AKG] C214
AK-C414B	006 - [AKG] C414B
AK-C414B2	007 - [AKG] C414B TL2
AK-C414	008 - [AKG] C414B ULS
AK-D15	009 - [AKG] D15
AK-D19E	010 - [AKG] D190E
AK-P120	011 - [AKG] Perception 120
AK-TELEBK	012 - [AKG] Telefunken BK Hi
AST-SP	013 - [Aston] Spirit
AUTH-2020	014 - [Audio-Technica] AT 2020
AUTH-2031	015 - [Audio-Technica] AT 2031
AUTH-4040	016 - [Audio-Technica] AT 4040
AX-I5	017 - [Audix] i5
BHR-5	018 - [Behringer] B5
BHR-1	019 - [Behringer] B1
BYRD-160	020 - [Beyerdyna] M160
BYRD-201NC	021 - [Beyerdyna] M201N C
BYRD-69TG	022 - [Beyerdyna] M69 TG
BYRD-M81	023 - [Beyerdyna] M810N
BYRD-88TG	024 - [Beyerdyna] M88 TG
BYRD-MC74	025 - [Beyerdyna] MC740N C P48 Made in W.G.
BR-PHNT	026 - [Brauner] Phantom
BR-VMA	027 - [Brauner] VMA
CL-4038	028 - [Coles] 4038
DK-K613	029 - [Davoli] Krundaal K613
EM-250	030 - [ELA] M 250
EM-251	031 - [ELA] M 251
EVO-27ND	032 - [Electrovoice] RE27ND
FL-C12	033 - [Flea] C12
FL-49	034 - [Flea] M49
PS-01	035 - [Others] Microfono Piero Sturla
MG-692	036 - [Microtech] Gefell MV692
MG-70S	037 - [Microtech] Gefell UM70S
MG-921S	038 - [Microtech] Gefell UM92 1 S
M-VIP50	039 - [Milab] VIP 50
MX-2006	040 - [MXL] 2006
NM-563-7	041 - [Neumann] Gefell CMV 563 M7 capsule
NM-563-55K	042 - [Neumann] Gefell CMV 563 Neumann M55K capsule
NM-184	043 - [Neumann] KM184

NM-84 044 - [Neumann] KM84
NM-149 045 - [Neumann] M149
NM-TLM07 046 - [Neumann] TLM 107
NM-U47 047 - [Neumann] U47
NM-U67-18 048 - [Neumann] U67 2018 reissue
NM-U67 049 - [Neumann] U67 vintage original 1965
NM-U87 050 - [Neumann] U87 ai
NM-U87A 051 - [Neumann] U87A
NM-U89I 052 - [Neumann] U89i
OTV-012 053 - [Oktava] MK 012
PH-6021 054 - [Philips] EL6021 60
PA-COP 055 - [Placid Audio] Copperphone
RC-1612 056 - [RCF] 1612
RVX-M35 057 - [Revox] M3500
RA-R12 058 - [Ribera Audio] R12
RA-R251 059 - [Ribera Audio] R251
RA-R47 060 - [Ribera Audio] R47 MK 2 new
RA-R47V 061 - [Ribera Audio] R47 MK 2 vintage
RD-NT5 062 - [Rode] NT5
RY-121 063 - [Royer] r121
RY-122 064 - [Royer] r122
SSN-C02 065 - [Samson] C02
SCH-MC6-4 066 - [Schoeps] CMC 6 U MK4
SCH-MC3-21 067 - [Schoeps] CMC3 MK21H
SCH-MC3-4 068 - [Schoeps] CMC3 MK4
SCH-MC5-21 069 - [Schoeps] CMC5 MK21H
SCH-MC5-4 070 - [Schoeps] CMC5 MK4
SCH-M221 071 - [Schoeps] M221F
SH-604 072 - [Sennheiser] E604
SH-935 073 - [Sennheiser] E935
SH-MD409 074 - [Sennheiser] MD409 U3
SH-MD214 075 - [Sennheiser] MD214 1
MG-921S 076 - [Sennheiser] MD421 II
SH-MD421 077 - [Sennheiser] MD421 N cream vintage
SH-441 078 - [Sennheiser] MD441 082INV
SH-441N 079 - [Sennheiser] MD441N
SU-K32 080 - [Shure] KSM32
SU-K44 081 - [Shure] KSM44
SU-57 082 - [Shure] SM57
SU-58 083 - [Shure] SM58
SU-7B 084 - [Shure] SM7B
SU-7BN 085 - [Shure] SM7B no filter
SU-81 086 - [Shure] SM81
SU-US545 087 - [Shure] Unidyne 545D made in Mexico
SU-MX545 088 - [Shure] Unidyne 545D Made in USA vintage
SY-017 089 - [Soyuz] 017 Tube
SY-013 090 - [Soyuz] SU 013
TELE-M411 091 - [Telefunken] M411

TELE-82 092 - [Telefunken] M82
TB-B100 093 - [The T bone] RB100
TB-M700 094 - [The T bone] RM700
AK-1000S 095 - [AKG] C1000S
AK-3000 096 - [AKG] C3000
AUTH-2040 097 - [Audio-Technica] AT 2040
RD-1A 098 - [Rode] NT1 A
RD-1000 099 - [Rode] NT1000
RD-2A 100 - [Rode] NT2 A
NM-TLM103 101 - [Neumann] TLM 103
NM-TLM102 102 - [Neumann] TLM 102
NM-TLM127 103 - [Neumann] TLM 127
NM-TLM49 104 - [Neumann] TLM 49
SD-ML1 105 - [Slate Digital] ML1
SD-ML1V 106 - [Slate Digital] ML1 Vintage
SD-ML2 107 - [Slate Digital] ML2
AD-THR 108 - [ADK Microphones] Thor
DPD-FCT 109 - [DPA] D Facto
DPD-4099 110 - [DPA] DAD 4099
EW-M30 111 - [Eathworks] M30
DP-4015 112 - [DPA] 4015
SD-ML2D 113 - [Slate Digital] ML2 Dynamic
NM-U47F 114 - [Neumann] U47 Fet
NM-149B 115 - [Neumann] M149 (B)
NM-U67-18 116 - [Neumann] U67 2018 Reissue (B)
TLS-L22 117 - [Townsend Labs] Sphere L22
CL-TGA 118 - [Chandler Limited] TG Microphone system A
CL-TGB 119 - [Chandler Limited] TG Microphone system B
BR-PHNTC 120 - [Brauner] Phantom Classic
BR-PHNTR 121 - [Brauner] Phantera
SH-MD431 122 - [Sennheiser] MD431
SH-MD531 123 - [Sennheiser] MD531
SH-MD541 124 - [Sennheiser] MD541
SH-BF504 125 - [Sennheiser] BF504
SEE-RNR1 126 - [SE Electronics] RNR1
SEE-RN17 127 - [SE Electronics] RN17
TB-SC450 128 - [The T-Bone] SC450
TB-RB500 129 - [The T-Bone] RB500
LEW-LCT44P 130 - [Lewitt Audio] LCT 440 Pure
AK-D112 131 - [AKG] D112
AK-C747 132 - [AKG] C747



2-'To' drop-down menu (Sampled Mic)

This drop-down menu is used to select your desired mic.

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Destination mic list

The following is the list of the Destination mic models that are included with Lava plugin.

- AK-C12** 001 - [AKG] C12 VR
- AK-C414** 002 - [AKG] C414B ULS
- AK-D15** 003 - [AKG] D15
- AK-D19E** 004 - [AKG] D190E
- AK-TELEBK** 005 - [AKG] Telefunken BK Hi
- BYRD-M81** 006 - [Beyerdynamic] M810N
- BYRD-MC74** 007 - [Beyerdynamic] MC740N C P48 Made in W.G.
- BR-PHNT** 008 - [Brauner] Phantom
- BR-VMA** 009 - [Brauner] VMA
- DK-K613** 010 - [Davoli] Krundaal K613
- EM-250** 011 - [ELA] M 250
- EM-251** 012 - [ELA] M 251
- FL-C12** 013 - [Flea] C12
- FL-49** 014 - [Flea] M49
- MG-692** 015 - [Microtech] Gefell MV692
- MG-70S** 016 - [Microtech] Gefell UM70S
- MG-921S** 017 - [Microtech] Gefell UM92 1 S
- M-VIP50** 018 - [Milab] VIP 50

NM-563-7 019 - [Neumann] Gefell CMV 563 M7 capsule
NM-563-55K 020 - [Neumann] Gefell CMV 563 Neumann M55K capsule
NM-184 021 - [Neumann] KM184
NM-149 022 - [Neumann] M149
NM-U47 023 - [Neumann] U47
NM-U67 024 - [Neumann] U67 vintage original 1965
NM-U87 025 - [Neumann] U87 ai
NM-U87A 026 - [Neumann] U87A
PH-6021 027 - [Philips] EL6021 60
PA-COP 028 - [Placid Audio] Copperphone
RC-1612 029 - [RCF] 1612
RVX-M35 030 - [Revox] M3500
RA-R12 031 - [Ribera Audio] R12
RA-R251 032 - [Ribera Audio] R251
RA-R47 033 - [Ribera Audio] R47 MK 2 new
RA-R47V 034 - [Ribera Audio] R47 MK 2 vintage
SCH-M221 035 - [Schoeps] M221F
SH-MD409 036 - [Sennheiser] MD409 U3
SH-MD214 037 - [Sennheiser] MD214 1
SH-MD421 038 - [Sennheiser] MD421 N cream vintage
SU-US545 039 - [Shure] Unidyne 545D Made in Mexico
SU-MX545 040 - [Shure] Unidyne 545D Made in USA vintage
TELE-M411 041 - [Telefunken] M411
SU-7B 042 - [Shure] SM7B
SN-C800 043 - [Sony] C800
NM-U67A 044 - [Neumann] U67 Vintage (A)
NM-U67B 045 - [Neumann] U67 Vintage (B)
NM-U47F 046 - [Neumann] U47 Fet
NM-U77 047 - [Neumann] U77
NM-149B 048 - [Neumann] M149 (B)
NM-M249 049 - [Neumann] M249
NM-U87-P48 050 - [Neumann] U87 P48
CL-TGA 051 - [Chandler Limited] TG Microphone system A
CL-TGB 052 - [Chandler Limited] TG Microphone system B
CL-RDD-N 053 - [Chandler Limited] Redd microphone Type Norm
CL-RDD-D 054 - [Chandler Limited] Redd microphone Type Drive
BR-PHNTC 055 - [Brauner] Phantom Classic
BR-PHNTR 056 - [Brauner] Phantera
BR-VM1 057 - [Brauner] VM1
SH-MD431 058 - [Sennheiser] MD431
SH-MD521 059 - [Sennheiser] MD521
SH-MD541 060 - [Sennheiser] MD541
SEE-RNR1 061 - [SE Electronics] RNR1
SEE-RN17 062 - [SE Electronics] RN17
LEW-LCT44P 063 - [Lewitt Audio] LCT 440 Pure
AK-C747 064 - [AKG] C747

3- Input Trim

This sets the input level from -24dB to +24dB, and is used to control the signal level inside the Mic, the output level is then automatically compensated by the same amount of gain. At first execution of the plug-in, set the input to ensure that you feed an appropriate level from the first stage of your signal path to the final one.

4-Filter

This sets the cutoff frequency for the high-pass filter from 45 Hz to 1k1 Hz (continuous filter). First step bypasses the filter.

5-Distance

This slider allows you to set the average distance separating the microphone from the signal source. The distance (Proximity) is measured in centimetres, from a minimum of 25 to 50 cm. The closest distance (25 cm) and the farthest distance (50 cm) are the result of sampling, while intermediate distances are the result of interpolating these. By using this control, you can remove any proximity effects that may have been introduced by the source.

6-Mix

This controls the proportion between the original (Dry) and 'effected' (Wet) signal. Range:0 to 100.

7-Oversampling buttons

These buttons allow you to change the oversampling rate to improve the audio quality increasing the sampling frequency of the plugin and minimize aliasing artefacts (

- The 1x mode bypasses the oversampling functionality.

- The 4x mode increases the sampling frequency of the preamp being processed by a fixed multiple of 4x.

- The ECO mode bypasses the harmonic content of the emulation and so has a less CPU consumption.

8-SIZE drop-down menu

This menu adjusts the whole plugin-GUI size (1x,1.5x,2x). Select the desired resizing format from the drop-down menu. Close the plugin and re-open it in your DAW to finalize the operation.

9-Input-Output Led meters

They measure the input and output levels of the plugin.

10-Automatic Gain

Automatically match the RMS input level with the target microphone RMS output level to compensate for volume variations between the various selectable models. By enabling the Autogain button, the plug-in will internally apply a gain compensation to balance the perceived output volume. The maximum compensation is 6dB.

3. HOW TO DOWNLOAD, INSTALL, AND AUTHORIZE YOUR PRODUCT

Acustica Audio products can be downloaded, installed, and authorized using the Aquarius Desktop application. The Aquarius Desktop application is a free standalone application that will manage every step in an automatic way without user intervention.

Download Aquarius Desktop Application:
www.acustica-audio.com/pages/aquarius

3.1 HOW TO DOWNLOAD A PRODUCT IN AQUARIUS DESKTOP APPLICATION

To download a product using the Aquarius Desktop application go to the purchase page and select the product and format (VST2, VST3, AAX, AU) to install. In case you can't find your product on the purchase page use the search page.

3.2 HOW TO INSTALL A PRODUCT IN AQUARIUS DESKTOP APPLICATION

The installation is done automatically by the Aquarius Desktop application after the download. As the Aquarius Desktop application creates a temporary file of the downloaded products, known as the stage area, at the moment you want to reinstall a product it will not be necessary to download it again.

3.3 HOW TO AUTHORIZE A PRODUCT IN AQUARIUS DESKTOP APPLICATION

The authorization is done automatically by the Aquarius Desktop application after the product installation. You can manage your authorizations using the Aquarius Web Service.

[Click HERE for a complete installation user guide](#)

4. SYSTEM REQUIREMENTS

Modern computers are powerful enough to run many plugins at once. However, our technology requires more resources than algorithm-based software, so we recommend optimizing your system to work with high CPU loads and low audio latency.

Before starting the installation process, please confirm that your system meets the minimum system requirements to run the plugins please consult the following link:

<https://app.box.com/v/AASYSTEMREQUIREMENTS>

5. CUSTOMER CARE

To contact Acustica Audio, always use the single point of contact, which is this help-desk portal:

<https://acusticaudio.freshdesk.com/>

We do not provide official assistance via social networks, public forums, or email accounts. For troubleshooting and issue reporting, check the available solutions in the knowledge base.

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6. APPENDIX

6.1 BEHIND THE SCENES

Lava is a project that took more than six months of development, in order to properly understand how best to capture the sound characteristics of each different sampled microphones.

We started by choosing the most suitable environment in which to carry out the measurements: an anechoic room. In particular, we used the one inside the 'Politecnico di Milano' run by Professor Roberto Fumagalli, who spared no effort in his helpfulness and precious advice during our long stay.

This anechoic room is a place where external sounds and unwanted or polluting noises cannot invalidate the measurements.

The decoupled room is perfectly shielded from the outside environment, air recirculation can only be activated with the doors open, the connection cables run through special pre-constructed channels, and absolute silence reigns inside. This room also has the complete absence of reverberation in high, medium and low frequencies, there are no room modes that can in any way change the timbre of the sampling transducers. The internal sound absorption is almost cumbersome and one is forced to work on special platforms as the absorbers are also present on the floor.

Once the ideal location was found, we moved on to the choice of the speaker, the transducer responsible for emitting our proprietary measurement signals. After several attempts, the choice fell on the passive Rasch Audio© speakers by Simone Fagnani driven by a hi-fi amplifier.

We were particularly convinced by the phase coherence and the very low impulse response, basic characteristics for not emphasising data capture. The 3-way speaker with its dedicated sub was measured with special calibration microphones and calibration file. In this way, we were able to cancel out even the smallest emission dissimilarities.

The measurements were carried out under controlled temperature and humidity thanks to the instruments in the chamber. Laser levels and laser metres helped us to achieve repeatability of positions and operating distances.

Once the measurement routine was established, we moved on to find a conspicuous number of microphones that represented the timbre, engineering and history of these fascinating transducers. We were helped in this task by Piero Sturla, a technician and microphone manufacturer for Ribera Audio who is well known and appreciated among professionals.

Piero ensured that the electronic functioning of every single sampled microphone was perfect, especially for the vintage ones, devices that now have more than 70 years on their shoulders. In fact, each microphone was carefully checked in its operation before and after measurement, verifying the data acquired with those released by the manufacturer.

The pre-amplifier used for the acquisition is among the best in terms of linearity and driving capacity, its generous input impedance being able to handle even the hardest microphones. The converter used for recording and test signal output is a benchmark for linearity and absence of harmonic distortion.

A heartfelt thank you goes to Marco Vannucci, Acustica's collaborator, who actively participated in the project and contributed significantly to its realisation.

6.2 INFO, TIPS AND TRICKS

The best way to use the Lava plugin is to stay within similar polar diagrams and transduction systems. The source and target microphone should have these same characteristics to ensure more than optimal operation. For example, if a source microphone has an omnidirectional polar pattern, it will be less accurately reproduced if converted to cardioid. All lava microphones are sampled as cardioid polar pattern where you can choose this option on the microphone body. The advice on the translation system is the same, stay on the same principle: condenser to condenser, dynamic to dynamic, ribbon to ribbon.

You can convert a dynamic source microphone to a condenser microphone with good results. The performance will be even more accurate if you convert a low-cost condenser source to a high-end or vintage condenser destination.

Microphones were measured and profiled using a highly sophisticated and extremely accurate system. We got an impressive first result thanks to our sampling approach and a first basic correction powered by an ad-hoc algorithm.

In this way, as with the Sienna for headphones plugin, in Lava we correct the microphones' frequency response, taking into account physical measurements and complex psychoacoustic phenomena.

To correct the microphones' response, we developed a proprietary algorithm, similar to that used for the Sienna plugin that doesn't just apply an inverted curve to the signal but imposes a maximum corrective gain at different frequency bands. Therefore, by simply setting a microphone source pattern, without selecting a target microphone, you will already be able to appreciate the linearisation and significantly improve your sound.

We are very pleased with the results achieved by Lava, taking into account all the effort and extremely complex processes that went into achieving our goal, which was to create one of the best sounding microphone emulation tools.

The denoising process required an elimination of the noise components introduced by the sampling system despite the choice of a controlled environment, subtractive process of the speakers' frequency responses, resynthesis and fine-tuning techniques and finally the complex and delicate microphone inversion techniques obtained thanks to Acustica's know-how and partly derived from the Sienna project's algorithms.

This plugin will allow you to choose between dozens and dozens of emulations, we would like to share an extra word of appreciation for the ELA 251, in our opinion a 'magical microphone' and one of the most successful emulations.

Avoid using the high-pass on source mics that include it, this variable has not been sampled on source mics, let alone destination mics.



