WAVER8

OPERATING MANUAL

ENGLISH

WWW.WAVEREX.DE | SHOP.WAVEREX.DE

waveR8
SAMPLE EXPANSION

Preface

Thank you for purchasing WaveR8. We are convinced that it will bring you a lot of joy in the future and above all a lot of drive to your now 30-year-old R-8. We promise you one thing: with your help we will try everything to make the R-8 great again.

Why you should read the manual

Manuals are usually unpopular, boring or even annoying. We have made every effort to make sure that you don't fall asleep after the first two pages.

Whether you read this manual is up to you, you can also put it aside. However, you should know that this manual guides you about the correct use of WaveR8. In addition, you will find important safety instructions that you must follow. They are highlighted in gray and therefore easily recognizable. You don't want to expose yourself and your environment to unnecessary danger, do you?

Your WaveReX Team

Don't hesitate to tell us any suggestions for improvement. We made WaveR8 for YOU.

support@waverex.de

Hardware-Shop: shop.waverex.de

WaveR8 ROMs: samples.waverex.de

Web: www.waverex.de

Note

We assume no responsibility for errors that may appear in this manual. The content of this manual is subject to change without notice. A current version of this manual can be found at:

www.waverex.de/downloads/

Great care has been taken in the preparation of this manual to eliminate errors and inconsistencies.

Manufacturer:

SynthastiX – Components for electronic sound generators

Owner: Marco Pawlowski

Staatsrat-Schwamb-Str. 89c

D-55278 Undenheim

Germany

The WaveReX Team

Development:	Marco Pawlowski
Software:	Dominik Vogel
Design:	Mario Neitzke

Operation Manual - Revision

English Version: 1.0.2 E – 10.08.2021

Special Thanks to

Emily, Ray Bellis, Rainer Buchty, Jon Sabberton,
Tobias Hopp, Dirk Stephan, Peter Grandl, Vain Sacrosanct and
all our supporters

How to reach us

www.waverex.de
www.waverex.com

www.shop.waverex.de

www.instagram.com/waverexboard/

www.facebook.com/WaveReX/

www.youtube.com/channel/UCfJzIp27T1ikvZaY-JJHWSPA

TABLE OF CONTENTS

Safety Instructions

Read these safety instructions carefully. It is essential that you understand these instructions in order to use WaveR8 safely.

Keep the safety instructions handy until the end of WaveR8's life.

If you have any questions or are unsure how to use WaveR8, contact our support team immediately.

WaveR8 is a plug-in card for the MEMORY CARD 1 (ROM) slot of the Roland R-8 Human Rhythm Composer. It serves as a replacement for the PCM cards created by Roland.

CAUTION!

Insert WaveR8 only into the designated card slot. Make sure that the card is oriented correctly.

WaveR8 was developed for use in private households as well as for use in recording studios.

CAUTION!

Use outdoors can cause damage to WaveR8 as well as to your device. Use WaveR8 indoors only.

CAUTION!

Do not attempt to bend, compress or twist WaveR8. Never force WaveR8 into the card slot of your device.

Do not drop WaveR8 or apply force to the card.

WaveR8 is an electronic product. It contains the state-of-the-art electronic circuit design and implementation.

CAUTION!

Use WaveR8 only in rooms at room temperature and low humidity. Do not expose WaveR8 to liquids. This can damage or even destroy the electronic components.

The WaveR8 housing protects the underlying components and serves as an insertion aid into the card slot.

CAUTION!

Never open the board. This can destroy the board and the electronic components. A defective housing can no longer guarantee proper insertion into the card slot. This can lead to malfunction or destruction of WaveR8 or even your device.

WaveR8's contacts are gold-plated to withstand mechanical demands for longer. Nevertheless, this is a contact-based technology.

CAUTION!

Even though WaveR8 is designed to last, try to remove WaveR8 from the card slot only when necessary.

WaveR8 works with non-hazardous voltages.

CAUTION!

However, you should avoid touching the gold contacts. The contacts can be permanently affected by the skin grease. Please don't lick the contacts.

Metal objects on the contacts can cause short circuits.

ATTENTION!

Never short-circuit the contacts! This will destroy WaveR8 and can cause you serious physical damage!

A defective WaveR8 can severely damage your device.

CAUTION!

Do not use WaveR8 if it has any obvious damage. If you are not sure, contact support.

Web: www.waverex.de

Mail: support@waverex.de

Notes

EU Declaration of Conformity

We hereby certify

Manufacturer: SynthastiX – Components for electronic sound generators

Marco Pawlowski, B.Eng.

Staatsrat-Schwamb-Str. 89c

D-55278 Undenheim

that the following described product

Product: WaveR8

Type of product: Memory card with passive electronic components for use in the Roland R-8 / R-8M and R-8 MK2 drum machine

Type number: SX 002

Serial number: 40001 to 49999 (continuous)

complies with the basic safety and health requirements of the EU directives listed below in its design and construction as well as in the design we put into circulation. This declaration loses its validity if the product is modified without our consent.

The sole responsibility for drawing up this declaration of conformity lies with the manufacturer.

Compliance with the following guidelines is declared:

- EU-Derective EMC 2014/30/EU of 26 February 2014
- EU-Derective RoHS2 2011/65/EU of 8 June 2011
- EU-Derective 2017/2102 of 15 November 2017

Applied harmonized standards in particular:

EN 55032:2016-02 Electromagnetic compatibility of multimedia equipment - Emission Requirements (CISPR 32:2015); English version EN 55032:2015

Undenheim, 26.07.2021

Place/Date

Marco Pawlowski, CEO

Intended Use

WaveR8 was designed exclusively for and is compatible only with the R-8 Human Rhythm Composer manufactured by the Roland Corporation Japan, the rack version R-8M as well as its successor R-8 MK2. It is designed to be used in the **MEMORY CARD 1 (ROM)** of the device.

Attention!

Never use WaveR8 in incompatible devices. You can destroy your device and WaveR8!

Preparation

To connect WaveR8 to your computer, you need a micro USB cable. This is not included in the delivery.

You can also use a USB extension, but make sure that the total length does not exceed 5m. This is not included in the scope of delivery.

Up to Operating systems using Windows 7 and earlier need a USB driver. You can download it from the download page

www.waverex.de/downloads/.

If you are using Windows 8 or higher, you do not need any additional drivers.

To create your own cards and load them on your WaveR8 you need the software editor from WaveReX. Download it from the download page **www.waverex.de/downloads/**. Make sure you always use the latest version, so you don't miss any updates or bugfixes.

Before using the WaveR8 with the Roland R-8 ensure that machine is powered off.

In the following chapters, we will introduce you to the functionality of WaveR8 and the software editor using the QuickStart. If you are familiar with the basic principles of the sound generation of your device, you can start right away. However, we recommend that you first read the Basics and Technical Specifications chapters. Here you will find a basic explanation of how the whole system works and what you should pay attention to.

The Hardware

(1) – WaveR8 Card

(2) – Micro USB port

(3) – Status LED (green)

(4) – Transfer LED (blue)

(5) – Contacts (Back)

The USB Port

The USB port on your WaveR8 is used to transfer data from your computer to WaveR8. It is a USB-B-Micro connector.

To guarantee the longevity of your WaveReX we have chosen a USB connector that is fixed to the board with four solder pads. Additionally, the connector is fixed with 2-component glue. Breaking the socket is therefore excluded as normal wear and tear.

WaveR8 is powered by your device as well as by USB, depending on which voltage is higher.

Attention!

In new condition, the connector may still be slightly tight. Never insert your USB cable by force, as you can destroy the connector!

The Card

The card was manufactured in a sandwich process from conventional PCB material. The layers are both soldered and glued. The lid is made of stainless steel and protects the internal electronic components. It is also firmly glued. Trying to open the card or the lid will destroy your WaveR8. During normal operations there is no reason to open the card.

If you should have problems that your card is not recognized, please refer to the **Troubleshooting** chapter.

The Software Editor

The Main Window

In the main window you can manage and edit your compositions. Here you can add instruments, edit them and load your compilation onto your WaveR8. You can also preview your samples here and always have an overview of the used memory size.

The content of the main window represents the content of your virtual card. All instruments listed in the instrument list are loaded onto the WaveR8 and are then available in the R-8 as Card Sounds. The R-8 can only manage 26 Card Sounds, so the instrument list is limited to 26 instruments.

User interface

"New Card" Button

Press this button if you want to discard your composition and create a new one.

"Open Card" Button

With this button you can load previously saved compilations into the editor.

Note that you can only open files with the extension **.wrr8.**

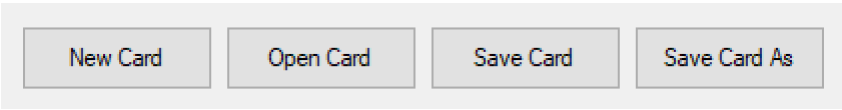
Also note that opening a card will permanently erase your current compilation. Therefore, always save your work before loading a card.

"Save Card" button

With this button you can save your compilation as a virtual card (image). Cards are saved with the **.wrr8** file extension.

"Save Card As" button

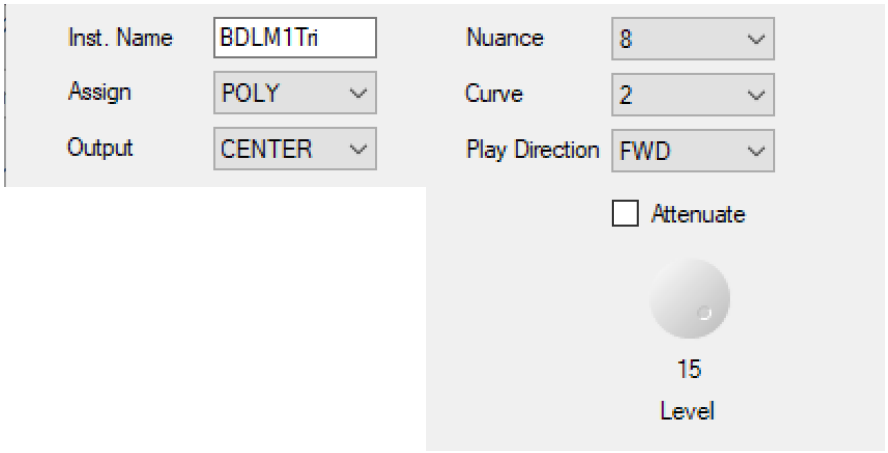
Saves your compilation under a different name.



General instrument section

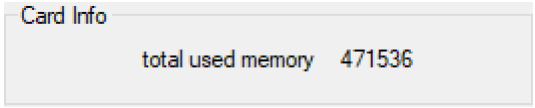
Here you can change the **name of the card** as it is displayed in the R-8, as well as the name of your **instrument**. In addition, you can make presets for all parameters, which are also available to you later in the R-8 (**SOUND EDIT**). These include **Assign**, **Output**, **Nuance**, **Curve** and the **Level** of the instrument, which is hidden behind the Level button in the R-8.

The **Play Direction** and **Attenuate** parameters cannot be changed later the device.



"Play" button
Press Play to audition your instrument. Alternatively, you can press the space bar.

Card Info
Here you can see information about the size of the compilation at any time. Note that you must not exceed a size of 512kb. 12288 bytes are basically occupied by the card format.



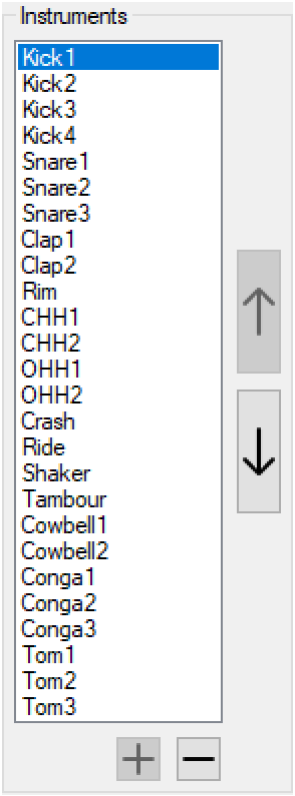
Instrument list
All instruments listed here are then available as Card Sound in the R-8.

Use the Plus (+) button to add a new, empty instrument to your list.

Mark an instrument and press the Minus (-) button to delete the instrument from the list.

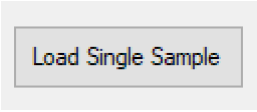
Mark an instrument and use the arrow buttons on the right side of the list to move the instrument within the list.

Please note that the list is limited to 26 instruments, as the R-8 can manage a maximum of 26 card sounds.



„Load Single Sample" button

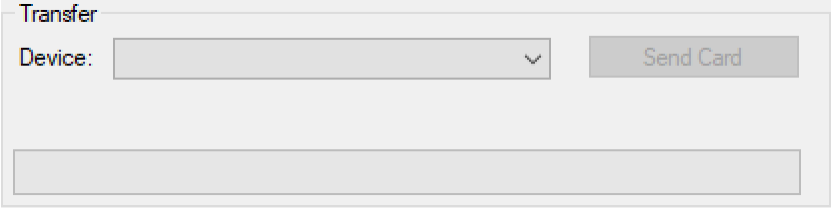
Adds a single sample to your instrument, which is then separated by filters into a resonance sample and an attack sample. Alternatively, you can double-click on your instrument in the instrument list.



Transfer

In the Transfer section you will find the Device selection field. All WaveR8s that are connected to your computer are displayed here. Use the selection box to choose the WaveR8 you want to write to.

You will also find the **Send Card** button here, which you can use to send your compilation to your WaveR8. The progress bar at the bottom informs you about the progress of the transfer.



Rotary control

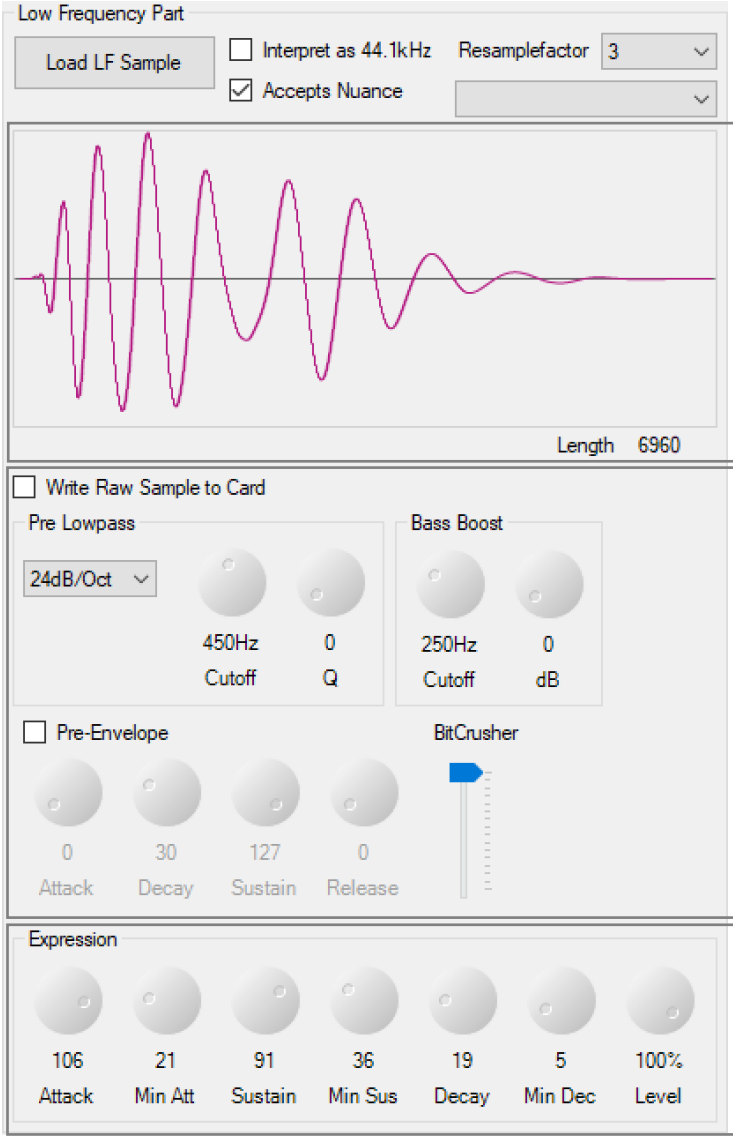
You can operate each knob in several ways.

You can click on it with the **left mouse button** and move the mouse up or down. The knob moves in fine steps. To make larger steps hold down the **CTRL** key.

Alternatively, you can use the **mouse wheel**. Move your mouse pointer over the knob and turn the mouse wheel for small steps or press CTRL for large steps.

You can also simply click on the numerical value below the knob and enter the desired numerical value directly.

Low Frequency Part



"Load LF Sample" button

Adds a sample to the Low Frequency part only. You can think of the part as a kind of channel that the sample runs through from top to bottom. This part represents the independent resonance sample.

Waveform display

Here you can see the waveform of the resonance sample in its already processed state. You can watch every change of the sample live here. The length of your sample can be seen below the waveform display.

Pre-Processing section

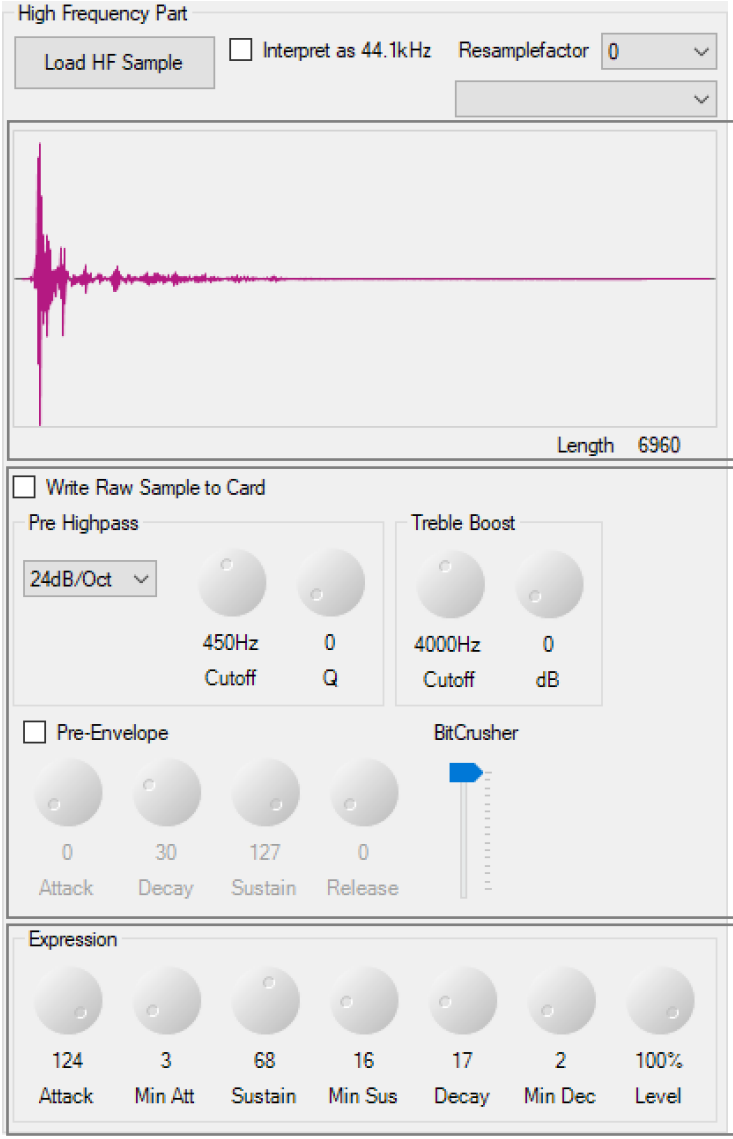
This part of the processing takes place exclusively in the software, i.e. independently of the R-8. Here you have a lowpass filter with resonance, a bass booster, an ADSR envelope to shape your sample in advance, and a bit crusher.

If you don't want any pre-processing, you can deactivate it with the checkbox at the upper left edge.

Post-Processing section

These parameters only affect the processing in the R-8. For the editor's internal player, we have tried to emulate the R-8 as best we can in software.

High Frequency Part



"Load HF Sample" button

Adds a sample to the High Frequency part only. You can think of the part as a kind of channel that the sample runs through from top to bottom. This part represents the independent attack sample.

Waveform display

Here you can see the waveform of the attack sample in its already processed state. You can watch every change of the sample live here. The length of your sample can be seen below the waveform display.

Pre-Processing section

This part of the processing takes place exclusively in the software, i.e. independently of the R-8. Here you have a high pass filter with resonance, a treble booster, an ADSR envelope to shape your sample in advance, and a bit crusher.

If you don't want any pre-processing, you can deactivate it with the checkbox at the upper left edge.

Post-Processing section

These parameters only affect the processing in the R-8. For the editor's internal player, we have tried to emulate the R-8 as best we can in software.

Quick Start

Principle

With the software editor for the WaveR8 you can create a virtual card, a so-called image, on your computer. This image can contain up to 26 instruments. The image can then be transferred from the editor to your WaveR8 and used by the R-8.

Connecting

Turn on your computer and wait for it to boot up.

Take your WaveR8 out of the box. The side with the label is the top side. The bottom side has the warning labels.

Do not put your WaveR8 into the R-8 for the time being. First place it on a smooth, dry surface, e.g. a table.

Now take the micro USB cable and connect it to your WaveR8. The other side of the cable can then be plugged into a free USB port on your computer. It doesn't matter if you use a USB2 or USB3 port. **WaveR8 will be powered when the green LED is on.**

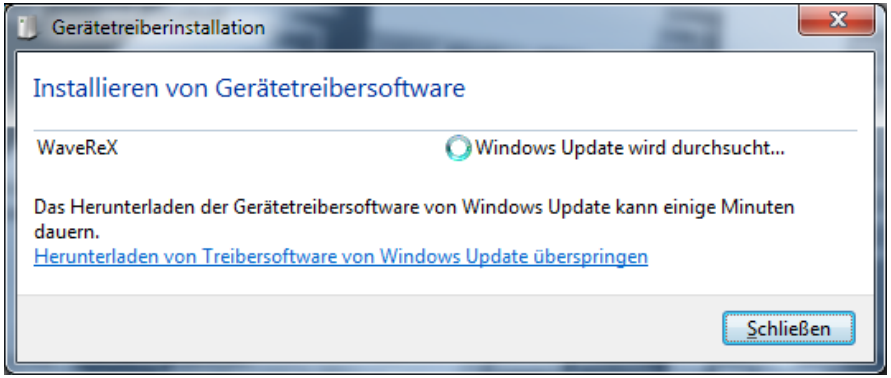
Your WaveR8 will start in bootloader mode for five seconds. You can see this by the **double blinking of the blue LED**. After that, your WaveR8 will automatically start in operating mode.

Starting with Windows 8, Windows should now install the drivers on its own. Check in the device manager if your device appears as **WaveReX bootloader**, then you have done everything right.

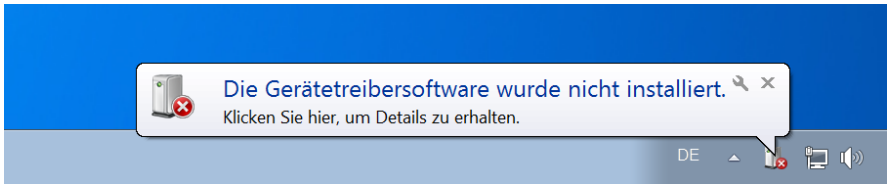
Installing the USB driver

If you are using Windows 7 or an older version, you must install the drivers manually.

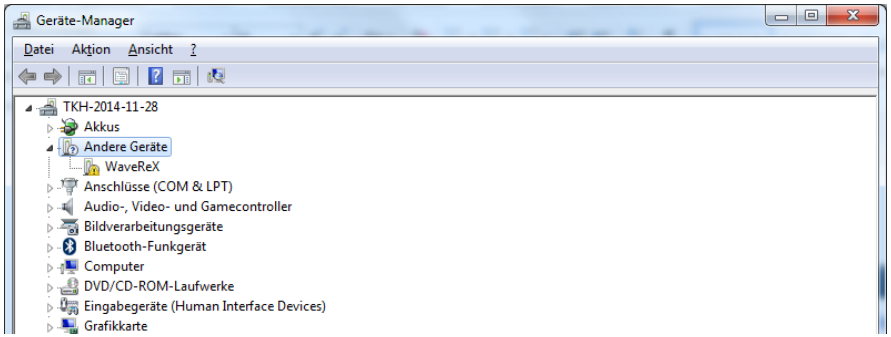
Plug your WaveR8 into the computer. If Windows 7 directly starts installing the driver software, you can simply close or ignore the window.



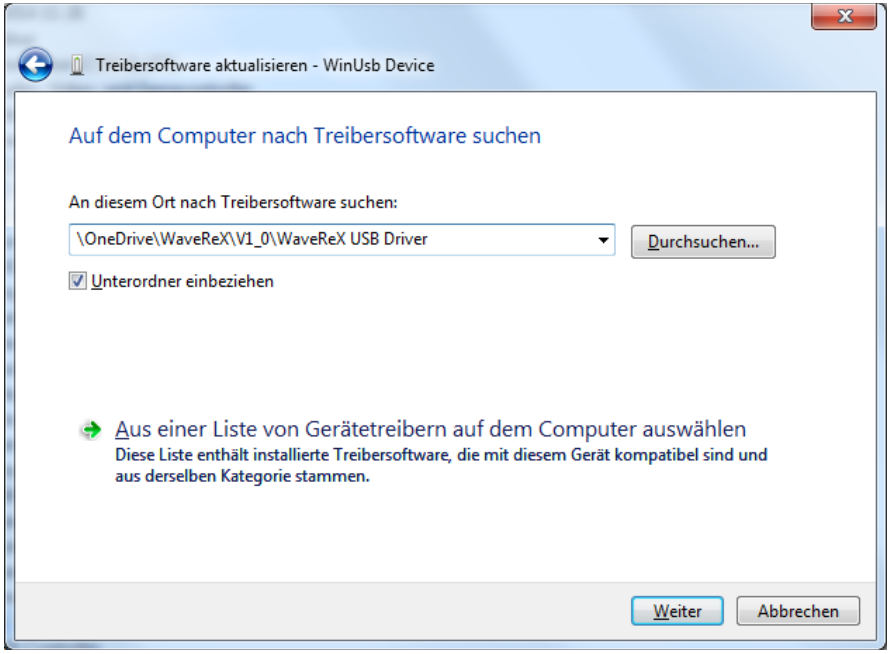
However, at least the following message should appear in the taskbar:



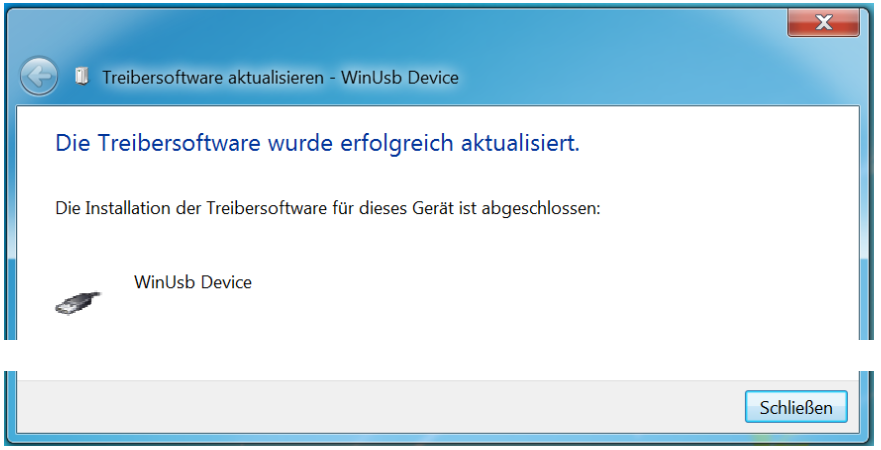
Enter the Device Manager. WaveReX should appear under **Other Devices**. Right-click on WaveReX and select **Update Driver Software....**



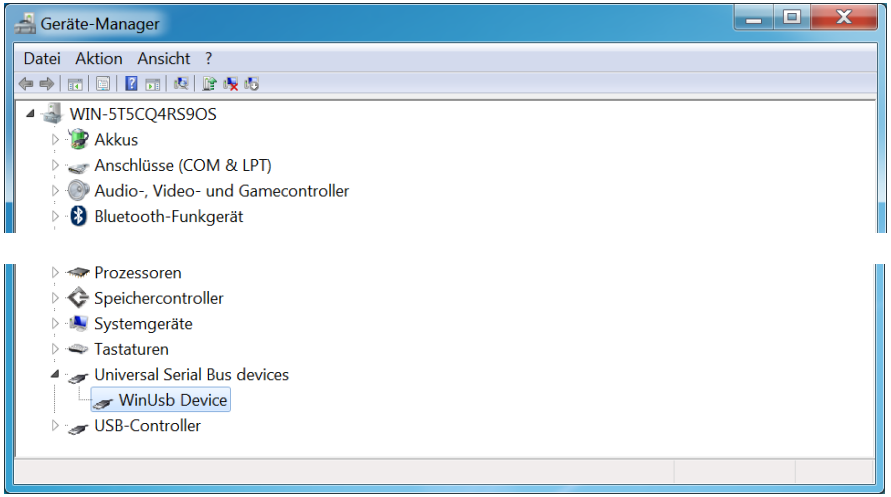
Select **Search for driver software on the computer**. Then specify the folder of the USB driver.



Confirm with Next. Windows will then install the driver for WaveR8.

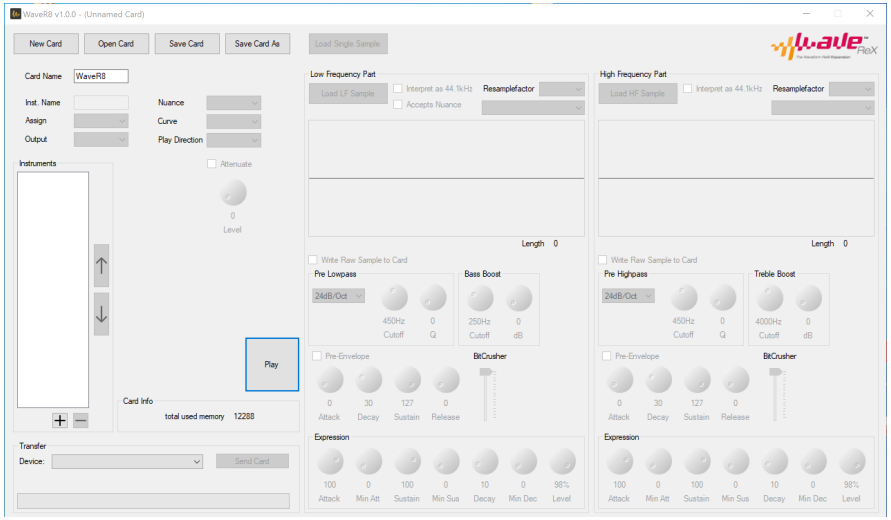


WaveR8 is now displayed in the Device Manager as **WinUsb Device** under Universal Serial Bus **devices**.

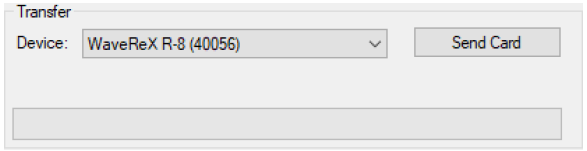


Opening the software editor

Make sure that your WaveR8 is already connected to your computer. Now open the WaveR8 software editor. You have also downloaded it from our site before. You should now see the main window:



You can see if your WaveR8 is connected to the software in the lower right corner of the device overview. The connected WaveR8 and its serial number are displayed here.



You can also connect more than one WaveR8. In this case, you can use the drop-down field to select the device you want to use.

Loading a card

Click the **Open Card** button. A dialog box opens. Here you can select a previously saved card. We have already provided you with several cards for this purpose. The files have the extension **.wrr8**.

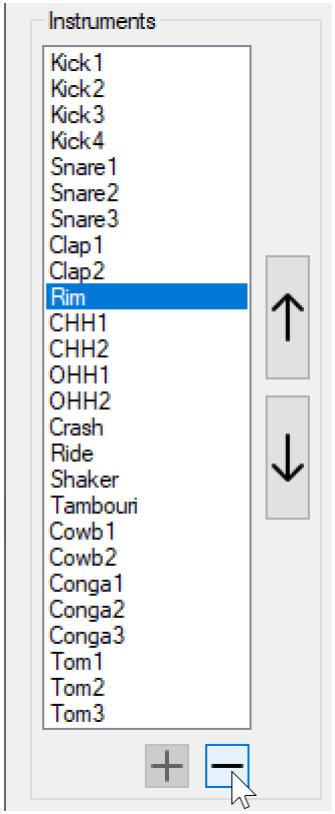
If your files are in a different folder, navigate to the desired folder via the window.

Double-click on the file or select it and click the **Open** button. The content of the card will be loaded and displayed in the main window.

Editing a card

Deleting an instrument

To delete an instrument from your compilation, first select the instrument to be deleted and press the minus button below the instrument list.



If there is no instrument left in the list, the minus button is grayed out.

Adding an instrument

First make sure that there are less than 26 instruments in the instrument list. There are exactly 26 instruments in the list. If it is full, you cannot add any more instruments. You can see this by the grayed out plus button.

To add another instrument to the instrument list, press the plus button below the list. A new, initially empty instrument is created.

Renaming an instrument

First select the instrument you want to rename in the instrument list.

Now enter the new name for the instrument in the **Inst. Name** text field. The input is automatically accepted, you don't have to press Enter or something like that.

Note that the R-8 supports only eight characters for instrument names.

Rearranging the instrument list

The instruments are available in the R-8 in the order they are in the instrument list. If you want to change the order, proceed as follows:

First mark the instrument in the instrument list that you want to rearrange. Now press the arrow keys to the right of the instrument list to move the instrument within the list.

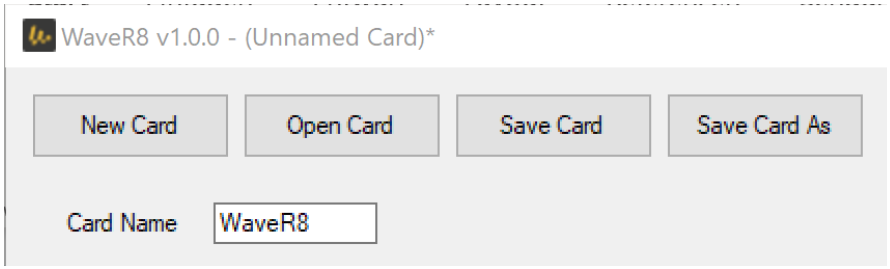
Create a card

Click **New Card** in the main window. If you have worked on a composition before, remember to save it. But you should be warned before 😉.

The main window is now empty and you can start your work.

Changing the card name

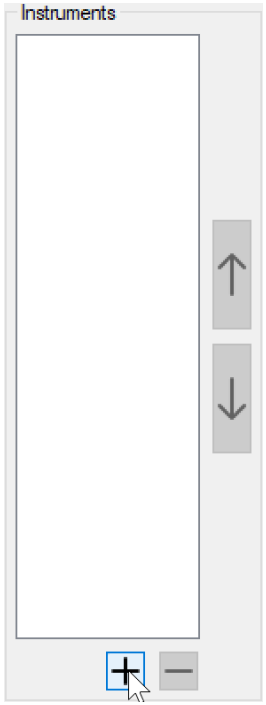
The card name as displayed in your R-8 defaults to **WaveR8**. However, you can change it at any time.



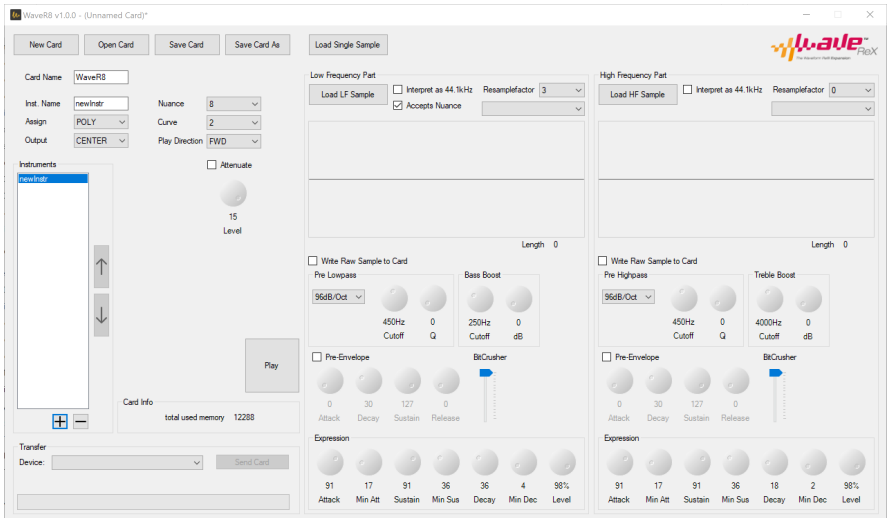
The **Card Name** text box is located in the upper left corner of the main window.

Create an instrument

Click the plus button below the instrument list in the main win-dow. and to create the



An empty instrument is created and displayed in the instrument list. It initially has the name **newInstr**.



All controls and parameters are initially set to their default values. Now one or two samples can be added to the instrument.

Adding one sample

To load a single sample into the instrument you have two options.

You can either double-click on the corresponding instrument in the instrument list or press the **Load Single Sample** button in the upper part of the window.

In both cases a dialog window will open. Use the window to navigate to the folder where your samples are located. Select the sample you want to add to your instrument. Double-click on your selection or confirm by clicking **OK**.

The sample is now internally separated, processed and split into a low-pass filtered (Resonance) sample and a high-pass filtered (Attack) sample. The split point or cutoff is initially set to 450Hz by default but can be changed at any time.

The name of the instrument is taken from the first 8 letters (without spaces and special characters) of the file name.

Use this method if you want to use ready-made samples / drum sounds in your R-8 without changing them.

Alternatively, you can drag and drop 26 samples at once into the instrument list. All 26 instruments will be created automatically, and the samples will be imported as single samples as described above.

Adding two samples

If you want to do more sound design and create your own drums, you have the possibility to load a separate sample for the low-frequency and the high-frequency part.

First press the button **Load LF Sample**. A dialog box opens. Use the window to navigate to the folder where your samples are located. Select the sample you want to add to your instrument as a resonance sample. Double-click on your selection or confirm by clicking **OK**.

Then press the **Load HF Sample** button. A dialog box opens again. Use the window to navigate to the folder where your samples are located. Select the sample you want to add to your instrument as attack sample. Double-click on your selection or confirm by clicking **OK**.

File formats

The Roland R-8 natively uses **mono samples** with a sample rate of 44100 Hz and a bit depth of 16 Bit.

It is not necessary for you to convert your samples before import. This is done by the software editor. We have built in an excellent resampler that converts your samples into the required format with high quality. So, you don't have to worry about the quality of your samples.

It doesn't matter if your samples are stereo, have a higher sample rate or bit depth.

Please note that samples with a sample rate higher than 44100 Hz will be converted to the native sample rate of the R-8 (44100 Hz). Samples with a sample rate lower than 44100Hz will be taken over unchanged (this is only conditionally true, more about this later).

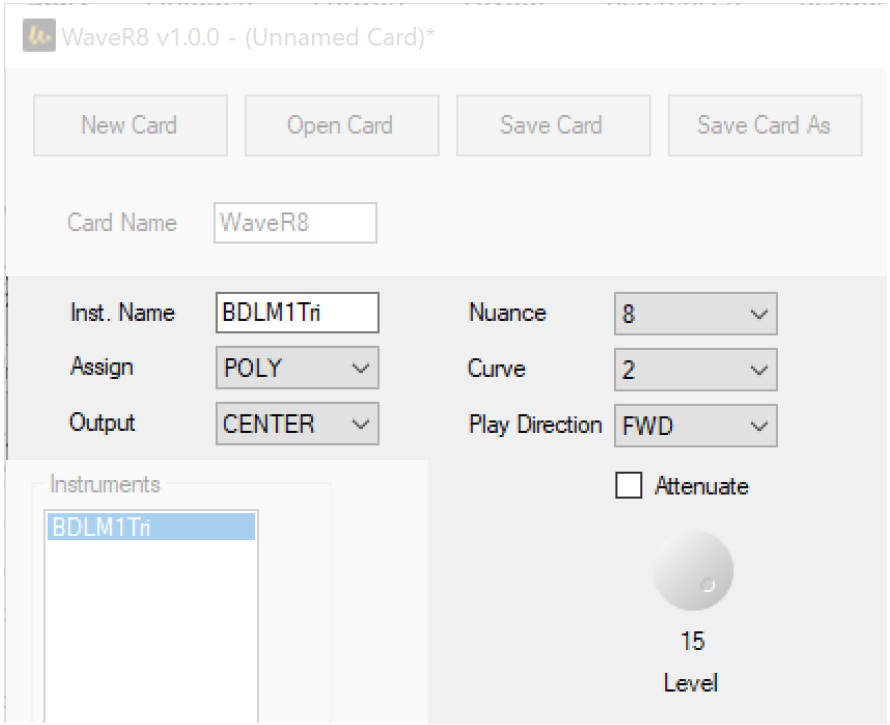
At this point it should be mentioned for those interested that the samples of the R-8 must be provided in a format compressed to 8 Bit. **A higher bit depth than 16 Bit does not help at all to a higher quality.**

In addition, the R-8 can theoretically even play samples up to a sample rate of 192kHz. However, since this is complete humbug for memory reasons and only makes the software unnecessarily complicated, we have not further developed this possibility >

Please note! Currently only .WAV files can be loaded. Other formats will follow soon...

General instrument settings

Now you can make general settings for the instrument. The general instrument settings can be found at the top left of the window.



You have already learned how to edit the name of the instrument in the paragraph **Editing a card**.

All parameters are the same as those you know from the R-8. They can be preset here but can also be changed later on the instrument itself.

These include first the **Assign**. Here, a poly- or mono-phone playing mode of the instrument can be defined or several instruments can be assigned to one bus. This parameter is preset to **POLY**.

The **Output** allows you to place the instrument in the panorama, but only if you also use the stereo outputs of your R-8. This parameter is preset to **CENTER**.

The **Nuance** parameter raises or lowers the resonance sample. Here you have a dynamic range of about +- 3dB. We decided to preset this parameter to 8 and adjust the software to give you leeway in both directions. Alternatively, you would only have had a cut or boost of about 6dB.

Curve is, as usual with all Roland cards, preset to **2** and thus a very dynamic velocity.

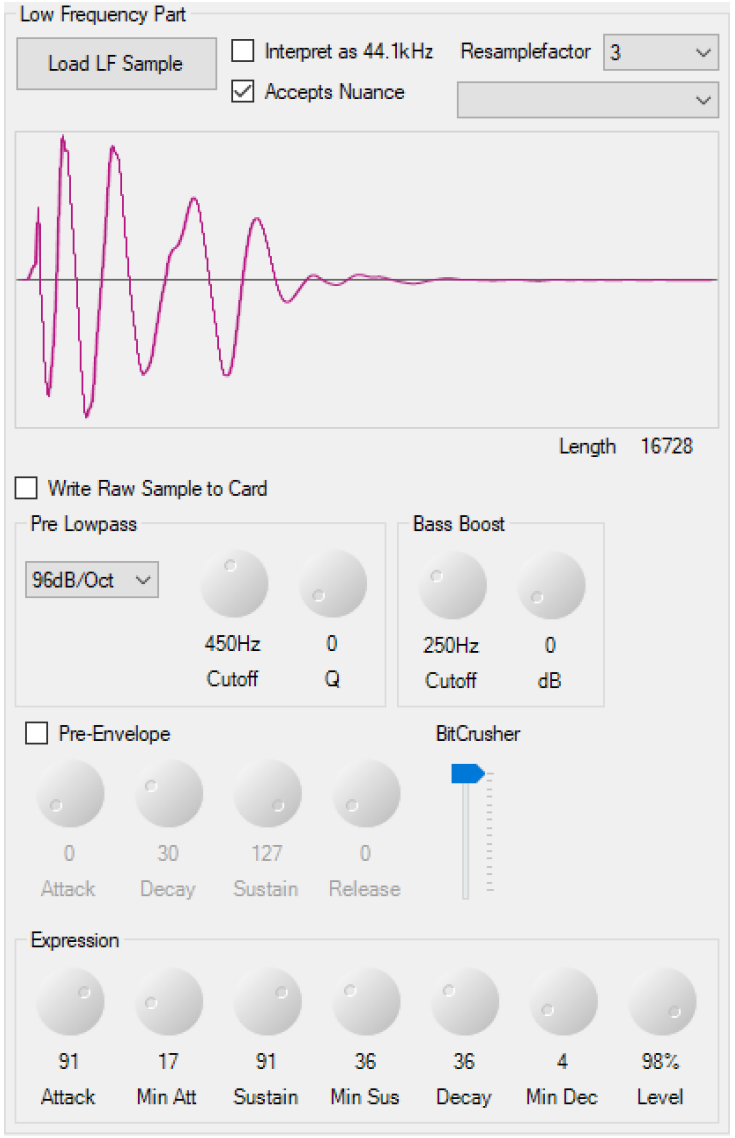
The **Level** slider allows you to preset the instrument volume. This is the same parameter that you find on the R-8 under the Level button.

Exceptions are the parameters **Play Direction** and **Attenuate**. You have no access to these on the device.

As the name suggests, the **Play Direction** parameter allows you to set the playback direction of the sample. This is preset to **forward**. Forwards and backwards are available.

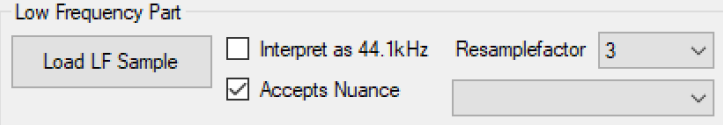
You should not need the **Attenuate** parameter under normal circumstances. Here you can lower the volume of your instrument by 6dB.

Editing the resonance sample



We have already made go-to presets for a quick start, which should fit most use cases.

In the following we will work our way through all fields and parameters from top to bottom. This also represents the signal progression within the software editor.



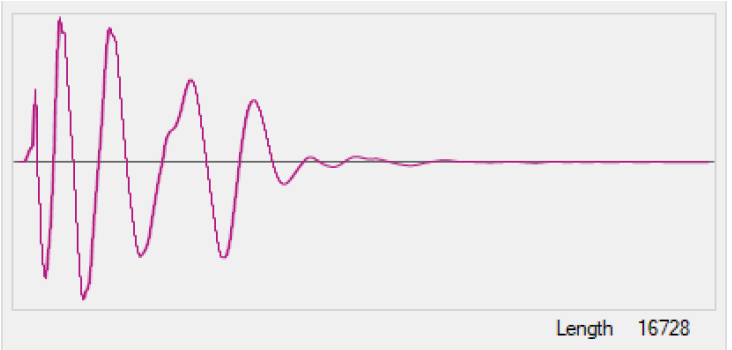
In the upper area you will find the checkbox **Interpret as 44.1kHz** next to the button Load **LF Sample**. If this checkbox is activated, the R-8 interprets the sample with a sample rate of 44100Hz, independent of the actual sample rate of the sample. The checkbox is deactivated by default.

Below that, you can deactivate the entire low frequency part or the resonance sample using the **Accepts Nuance** checkbox. You can find more information about this in the manual of your R-8. If the checkbox is deactivated, the complete part is grayed out and the waveform display is deactivated. The checkbox is activated by default.

The **Resamplefactor** drop-down box allows you to set four different modes. More about this later. The parameter is preset to 3 and should be suitable for most applications. Please note that the factor affects the size of the sample on the card and the volume of the sample.

The drop-down field below lets you exchange the current resonance sample for another one in the instrument list. In other words, among all the instruments already created, the resonance samples can be freely swapped. This is interesting, for example, to save memory. A much more interesting aspect, however, is sound design. For example, you can use the same resonance sample for all your bass drums and only vary the attack sample to create a recognition value.

Let's go down a bit further. Here is a waveform display that shows you the waveform of your resonance sample (including processing) as it will be loaded onto the card later. You can always see the effect of your parameter changes live in the waveform display.

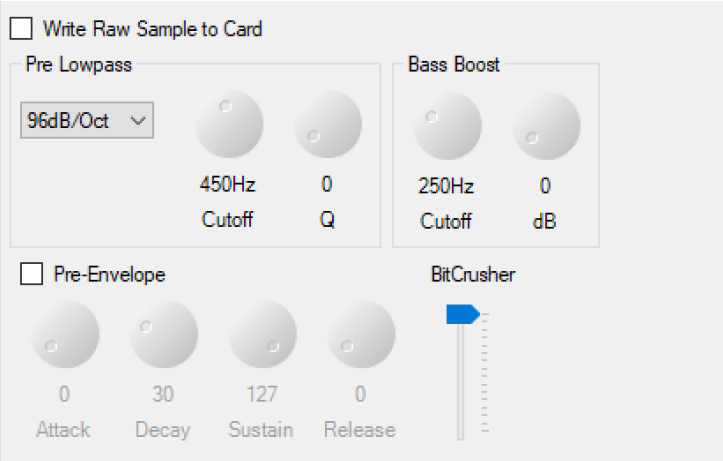


You can see the length of the sample below the display.

The remaining settings concern the processing of the sample and can be divided into the areas Pre-Processing and Post-Processing.

Let's start with the Pre-Processing section.

First you will find a low-pass filter on the left side. This is connected upstream of the entire signal processing. You can change the slope of the filter via the dropdown to the left of the cutoff control. The slope is given in dB/octave.



The **Cutoff** defines the split point between the resonance and attack sample. However, you can freely select the cutoff of the filter between 50Hz and 1000Hz.

Additionally, you can add a resonance of up to 12dB via the **Q** control. Whether this always makes sense, you are free to argue.

Furthermore, we have added another Low Shelf filter to give you the possibility to boost the low end of your sample "a bit". To do this, set the cutoff to the desired frequency below which you want to boost. Then turn the **dB** control to the desired gain. For the bass boost you also have a frequency range of 50 - 1000Hz at your disposal.

Best Practice:

The slope is preset to 96dB/octave. This guarantees a very steep separation between the lowpass filtered resonance sample and the high pass filtered attack sample and is interesting if you want to play back a sample in your R-8 true to the original, without boosts or cuts in the spectrum. For this you should also set the cutoff of the pre-lowpass and the cutoff of the pre-highpass to the same frequency.

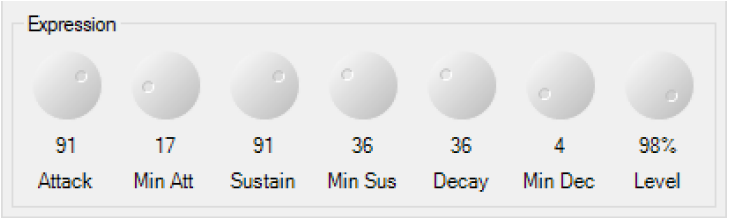
Please note that using resonance or the bass booster may result in boosts or cuts at the cutoff frequency of the filter and the original frequency response of your sample will not be preserved.

Further on in the signal chain, a classic ADSR envelope is available. This allows you to shape your sample in advance. The envelope is deactivated by default and can be activated via the **Pre-Envelope** checkbox.

Last but not least, we've included a classic Bit Crusher/Bit Shifter. This is great for drums, you know it 😉 Each stage of the control represents the reduction by 1 bit. You can reduce to 1 bit. If this always makes sense you are welcome to write Nico.

If you don't want any pre-processing, you can activate the checkbox **Write Raw Sample to Card**. This will skip the complete pre-processing in the software editor and load the sample unprocessed onto the card.

So much for the pre-processing options that only pre-process your sample in the software editor. Now we come to the parameters that are interesting for the R-8 and are NOT available on the device, the expression parameters.



Now you should read the background of the R-8 in the chapter Basics, because it gets more complicated now. If you don't feel like it, we can start right away:

In the R-8, your sample first goes through an AS-envelope. On top of that, a simple D-envelope is applied, which decays to zero. Don't ask...

Say goodbye to the idea that the attack is a timing factor that defines the fade-in of the sample. It is a level. The attack time is fixed in the R-8 at 441 samples or 10ms. So, there we have it.

Let's look at the first two attack controls. As you can see, except for the level, all controls are in pairs and should always be seen in context. With both controls the dynamic range of the attack (velocity) can be adjusted. The **Min Att** is the lower offset, i.e. the minimum volume that is played when the pad is at its minimum velocity. The **Attack** sets the maximum volume of the attack. Both knobs add up to a total Attack volume and together can assume a maximum of 127. The range between Min Att and Attack is the dynamic range available to the velocity.

The **Sustain** is the volume level to which the sample settles after it has passed through the attack time. The sustain values behave analogously to the attack values and can add up to a maximum

of 127. The range between the two values is the dynamic range. The sustain is the level as played by the R-8.

Now follows, as already mentioned, the Decay envelope, which acts completely independently of the previous envelope. The **Decay** parameter is the decay time of the sample, which you still have access to later in your R-8. The **Min Dec** parameter, on the other hand, sets the minimum decay time of the sample to limit the user input to the device. If you set this parameter to 4, for example, the user can drag the value to zero using the slider on the R-8, but the decay time will always be at least 4.

I'm sure you've noticed this before on your R-8, but we'd better tell you again here. A decay of 0 is not equal to 0. The R-8 will always play at least 16ms of your sample, even if you drag the slider to 0. So if you want to be able to completely fade out your sample via the Decay parameter, you have to insert about 16ms of silence at the beginning of your sample, but then the attack also goes into the void.

Now we come to the **Level** control and the difference to Sustain. Level is the volume at which the sample is placed on the card. Sustain, on the other hand, is the volume at which the R-8 plays the sample. You wonder what this is for? Well, the level affects the entire sample, the sustain is just part of the envelope. Also, because of the R-8's internal processing, it can distort your sample. Here you should turn the level down slightly.

Who noticed the funny values from 0 to 127 that don't even have a unit?

What does that mean? That's easy to answer:

The unit is **Roland's**, their design and implementation has a value range from 0 to 127 and are so non-linear that we had a hard time providing the user with a function that reveals what they are doing.

The values are logarithmic and correspond to dB values, but not integer ones, so they are not as memorable. We have therefore decided to choose the unit name as Roland.

If you want to know exactly and do all the math, calculate **20* log10 (x * 1 / 127)**. The others may please take the following facts as given:

A halving of the value corresponds to a decrease of 6dB, a doubling of the value corresponds to an increase of 6dB. In the following, briefly exemplary a few values and their correspondence in dB.

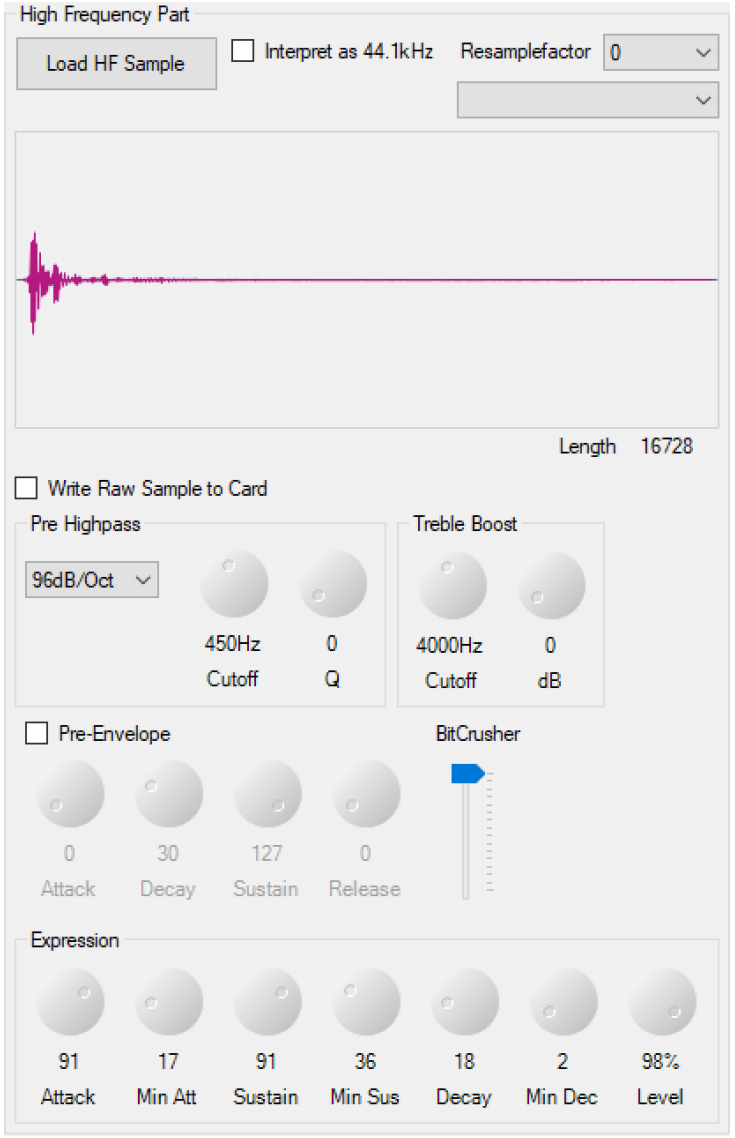
127	=	0dB	= full volume
113	=	approx. -1dB	
101	=	approx. -2dB	
90	=	approx. -3dB	
64	=	approx. -6dB	
32	=	approx. -12dB	
8	=	approx. -24dB	
1	=	approx. -42dB	

Wait... let's go back inside ourselves now and internalize the numbers we just saw!

-42dB?! So, we have a dynamic range of 42dB!. The R-8 even works with only 7-bit samples!

Worse is always possible thought the programmer when he created the **Decay** parameter. This is also non-linear and even stepwise. So, up to a value of 10 (no, these are not Roland units this time!), each step corresponds to a decay time of 16.2ms. Up to a value of 40 the steps increase to about 42ms. The next stage is then about 100ms and we'll spare the rest. This much more: The maximum decay time is about 17 seconds.

Editing the attack sample



Since the attack sample is processed in the same way as the resonance sample, we will limit ourselves to the differences between the two parts.

You have already learned that you can deactivate the resonance sample with the **Accepts Nuance** checkbox. The absence of this for the attack sample is therefore only too logical and saves us many annoying emails to support.

The **Resamplefactor** is set to 0 by default. You can find more information about this in the Basics chapter.

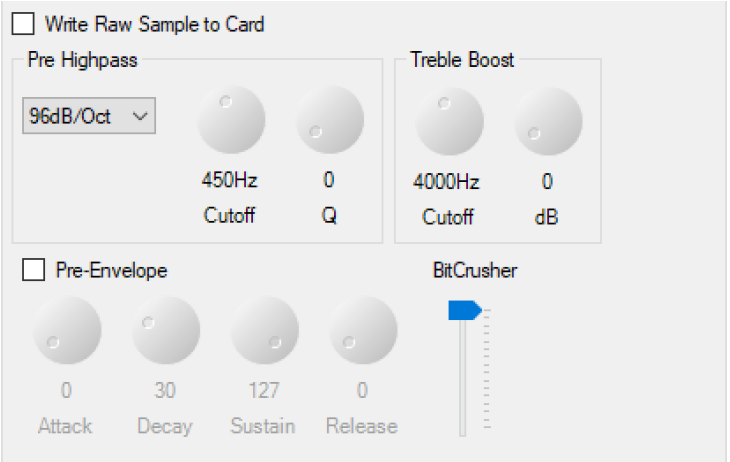
The dropdown field below lets you replace the current attack sample with another one in the instrument list. In other words, you can freely swap the attack samples among all the instruments you have already created.

Here, too, a waveform display shows you the waveform of your sample in the processed state. You can see the length of the sample below the waveform display.

Now we come to the real difference between resonance sample and attack sample, the pre-processing section.

Here you will find a high-pass filter, as it should be for a high-pass filtered sample. This has the same parameters as the low-pass filter of the resonance sample. Since you can use the attack sample without the resonance sample, the cutoff has a frequency range of 10 - 1000Hz. All frequencies below the cutoff are cut away.

In addition, you can "slightly" boost the treble with a treble booster (high shelf filter). Here you can select a frequency range from 1000 - 10000Hz. Please note that especially the treble has a significant influence on the Tricky-Special-Compression-Algorithm of the R-8. You will have to lower the volume here and there via the level control.

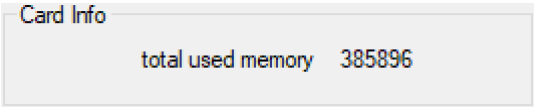


Pre-Envelope, Bit Crusher as well as all expression parameters of the Post-Processing section behave analogously to those of the Resonance sample and shall not be explained again here.

Transferring a card

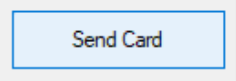
When you have completed all settings to your satisfaction, you can transfer the card to your WaveR8.

Check if your configuration fits on your WaveR8. Remember: you have 512kB of memory available. You can see how much space your configuration takes up under **Card Info**.



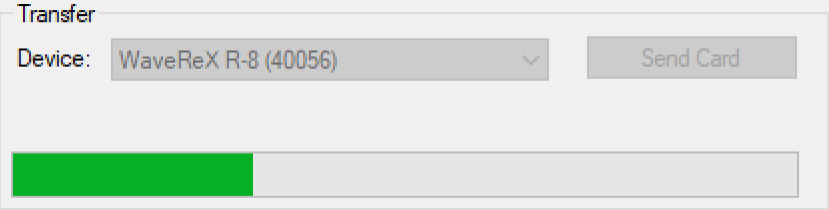
Here you can see the size of the card in bytes. Please note that even with an empty card 12288 bytes of the card are always occupied by the card format.

Click on **Send Card** in the lower right corner to start the transfer.

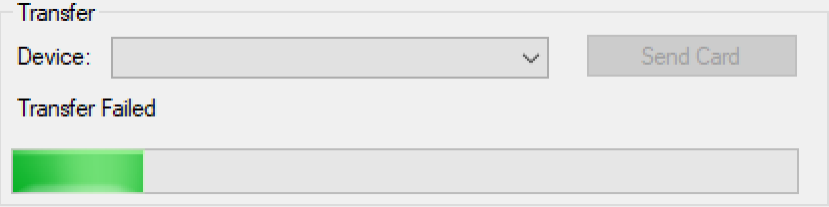


The left corner of the WaveR8 will flash blue to indicate that the transfer is in progress. You can see the progress of the transfer on the progress bar of the software. After a few seconds the transfer should be completed, and the blue LED will turn off.

The status display informs you if the transfer was successful.



If the transfer was not successful, the status **Transfer Failed** is displayed. In this case, check if your WaveR8 is connected to the computer and is displayed as described above under Device.



And now into the R-8...

If the transfer was successful, close the software editor. Now unplug the micro USB connector from your WaveR8 and make sure your R-8 is off.

Caution!

Never plug your WaveR8 into your R-8 while it is live, especially when the R-8 is powered on. This can cause serious damage to your R-8.

Insert your WaveR8 into the MEMORY CARD 1 (ROM) bay of the R-8 with the label up and the golden contacts (bottom) in front. Here you will feel a slight resistance.

Slide your WaveReX straight into the shaft to the stop. The card is correctly inserted when the **Sound Library** lettering is at the level of the chassis.

Turn on your R-8 now.

If the card sits correctly in the bay, the upper right corner of WaveR8 lights up green, signaling that WaveR8 is powered by the R-8.

Pay attention to whether you see a small 1 in the display under Card. This signals that WaveR8 has been recognized as a card AND the card content is valid.

According to the function of the R-8, the card must first be loaded into the internal memory of the R-8. To do this, select the Card Menu by pressing the **Card** button. Now press the key 4 on the number field of the R-8 for **LOAD ROM** and then the key 1 for **SOUND** if you only want to load the card sounds or 2 for

SOUND&DEMO if you want to transfer the card sounds and all patterns and songs of the card to the internal memory.

The R-8 now shows you under LOADED the card that is already in memory and under LOAD the card that is to be loaded into the memory. Then confirm with the key **Enter**.

The R-8 now copies all relevant data (parameters, names, pattern and song data, etc.) into the internal memory. The sample data is not loaded from the card but read from the card when playing on-the-fly.

If the copy operation was successful, this will be displayed with the message "Completed" on the display. The card content is now available for use in the R-8.

You can now assign the instruments of the card (Card Sounds) to the pads of the R-8. Note that the card sounds start with the prefix **E** (!), C are the copy instruments.

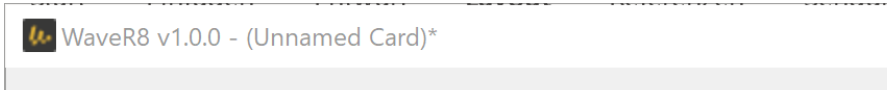
If, in wise foresight, you have already assigned Card Sounds to the pads in advance, you can play your instruments directly after loading the card.

Save a card

You can save your compilation at any time. To do this, click on the **Save Card** button in the main window.

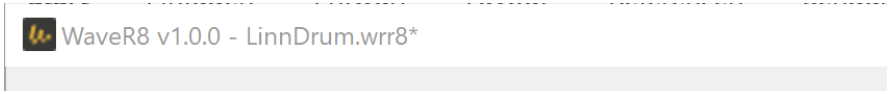
A dialog box opens. Navigate to your preferred location from the window. Enter the name of your compilation and click **OK** to save it.

You can see that your compilation is unsaved by the fact that "Unnamed Card" is displayed in the title bar of the window.



As soon as you have saved them, the file name will be displayed here.

If your composition has changed, this will be indicated by a * after the file name. You should now save again so as not to lose your changes.



Patterns and Songs

The card format also allows you to store up to 100 patterns and, consisting of these, 10 songs on the card.

We will make this feature available to you in a future software version. It is currently still too unstable to be published. That's why we initially disabled them.

Please be a little lenient with us. For the development of your WaveR8, we had neither design nor function plans or even the software of the R-8 itself at our disposal. All the work you have in front of you is reverse engineered by byte by byte, sometimes bit by bit. That is, we had to find out and interpret all the functions ourselves.

In places, you come across functions that you cannot understand at first or whose exact sequence you only understand to the full extent later. Accordingly, we still have a bug somewhere with the patterns that can cause your R-8 to freeze. As long as it is not eliminated, we would rather hold back this function.

Basics

Basic principle of the R-8

The R-8 can read up to 26 instruments from one card. This limitation exists from the card format itself and cannot be changed. The minimum is one instrument.

Depending on the setting, each instrument consists of one or two samples, which can initially be pre-processed separately in the software and stored separately on the card. Both samples are read separately by the R-8 on-the-fly from the card, mixed together and then played.

In principle, three use cases can be distinguished:

Resonance and Attack Sample

The main use case is to separate a sample into a low-pass filtered part, the resonance sample, and a highly-pass filtered part, the attack sample. Your sample is broken down into the above parts by internal filters in the software. Through the software you have the possibility to edit or change both parts independently of each other. As already mentioned above, both parts are stored separately on the card and mixed together by the R-8 and played back together.

If you want to use a specific sample as an instrument in your R-8 that should sound exactly like the original sample, load the sample into your instrument via the **Load Single Sample** button or by **double-clicking on** the instrument in the instrument list. The software separates your sample into the two parts, according to the settings. You can change the settings such as cutoff of the filters etc. at any time.

You can also load a separate sample for each part, for example, to create interesting new drum sounds. For example, you can combine the low-frequency part of one sample with the attack of another sample. To import your sample, use the buttons in the respective Part **Load LF Sample** and Load **HF Sample**.

If you use both parts of your sample according to this method, the decay parameters for both parts are available to you as usual on the R-8. You can also amplify or lower the resonance sample using the **Nuance** parameter on the R-8. Here you should pay attention to the cutoff of your filters! If you only want to raise or lower a frequency range below 80Hz via the Nuance, you must also set the cutoff of your pre-filters to 80Hz.

The use of both parts is preset. This is especially useful for kicks, snares and toms. But you will certainly find even more possible applications.

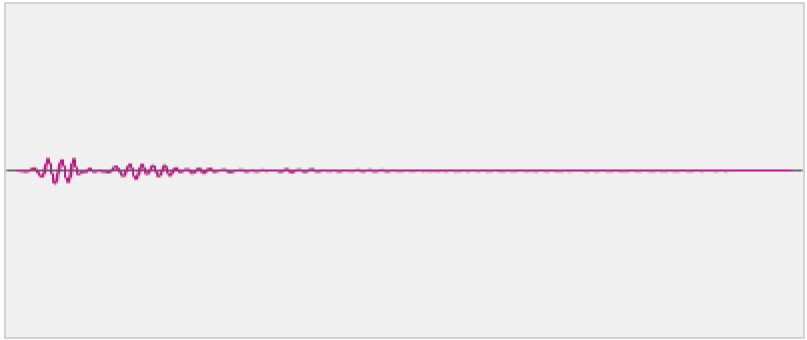
Deactivation of the resonance sample

If you do not want to use the resonance sample, deactivate the check mark at **Accepts Nuance** of the resonance sample. The sample is then not saved on the card. This saves storage space.

This is especially useful for cymbals, hi-hats, clicks, etc., where the samples have naturally little depth and if it is not desirable to separate the resonance and attack parts.

In this case, you can turn the cutoff of the attack sample down to the desired frequency according to your taste.

An indicator that you do not need the resonance sample is when you can hardly see a vibration in the waveform display of the resonance sample. These frequencies are then of such little importance for the sound of your sound that you can safely omit them.



We could have installed an automatic for this, but we did not want to patronize the user and thus give it into your hands whether you still want to use the part or not.

Blending samples

Another way to use the parts is to blend samples, for example with cymbals. For example, you can load a pelvis in one part, which has been struck further inside, and in the other part a pelvis, which has been struck further out. With the decay parameters on the R-8 you can then dazzle back and forth between both parts.

In this case, it is better to disable the internal filters by ticking **Write Raw Sample to Card,** as both samples require the full frequency response.

Resamplefactor

Due to the limited storage space on the card, Roland has implemented an innovative way to save storage space. Thus, both samples can be stored on the card with a reduced sample rate. This reduces the amount of data of the sample, not significantly, but quite noticeably.

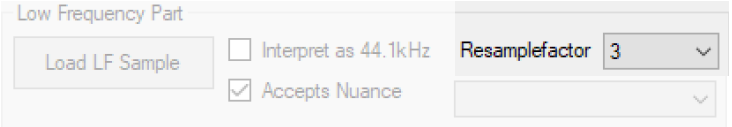
The sample rate conversion or resampling can only be set in fixed steps and is an integer factor of the sample rate 44100Hz. The resample factor behaves as follows:

Resample factor	Sample rate
0	44100 Hz
1	22050 Hz
2	11025 Hz
3	5512 Hz (actually 5512.5 Hz)

For the interested and tech-savvy reader:

The resulting sample rate results from **44100 Hz << resample factor** or simply **44100 Hz / 2$^{\text{resample factor.}}$**

You can set the **Resamplefactor** in the upper right corner of the two sample parts.



It is preset to 3 for the resonance sample and 0 for the attack sample. These settings should work well for most use cases.

For the resonance sample it is usually useful to use the internal resampling. Qualitatively, this affects your sample only imperceptibly, but reduces, with a factor of 3, the sample length on the card to 1/8 of the original size.

For the attack sample, you should only use resampling if your sample has a sample rate of 22050Hz or lower.

What should be considered? The Nyquist frequency! If we set a factor of about 1, the sample rate of the sample is reduced to 22050Hz. Thus, the Nyquist frequency is 11025Hz. All frequencies above the Nyquist frequency are filtered out and not played back (anti-alias). If we reduce the sample rate to 5512Hz by a factor of 3, the Nyquist frequency is around 2.756Hz. All frequencies above this frequency are filtered out and cannot be restored later. For the resonance sample this is completely uncritical, since our pre-lowpass only allows an upper cutoff of 1000Hz anyway. The resonance sample thus does not suffer any relevant loss of information.

As mentioned above, this is not always applicable to the attack sample, as the sample suffers a loss of altitude due to resampling, which can no longer be recovered. For example, if we set the resampling factor for Attack Sample to 1, we reduce the sample rate to 22050Hz. Thus, all frequencies above 11025Hz are filtered out and not played in the R-8. If your sample already has a sample rate of 22050Hz, you can confidently set the factor to 1, as your sample already lacks all frequencies above 11025Hz due to the sample rate.

Roland units to Decibel Conversion

Rolands	Dezibel
127	**0**
126	-0.0686634853
125	-0.1378741
124	-0.207640618
123	-0.277972043
122	-0.348877639
121	-0.4203668
120	-0.492449254
119	-0.565134943
118	-0.6384345
117	-0.7123574
116	-0.7869148
115	-0.862117767
114	-0.9379775
113	**-1.01450562**
112	-1.091714
111	-1.16961479
110	-1.24822068
109	-1.32754433
108	-1.40759921
107	-1.48839867
106	-1.5699569
105	-1.6522882
104	-1.73540735
103	-1.81933022
102	-1.90407121
101	**-1.98964715**
100	-2.0760746
99	-2.16337061
98	-2.251553
97	-2.34063983
96	-2.43064976
95	-2.52160239
94	-2.61351728
93	-2.70641541
92	-2.80031776
91	-2.89524627
90	**-2.991224**
89	-3.088274
88	-3.18642068
87	-3.28568888
86	-3.38610578
85	-3.48769617
84	-3.590489
83	-3.69451284
82	-3.79979753
81	-3.90637422
80	-4.0142746
79	-4.123533
78	-4.23418236
77	-4.34625959
76	-4.45980263
75	-4.574849
74	-4.69143963
73	-4.809617
72	-4.92942429
71	-5.050908
70	-5.174114
69	-5.299093
68	-5.42589664
67	-5.554579
66	-5.685196
65	-5.817807
64	**-5.952475**
63	-6.08926344
62	-6.22824049
61	-6.36947775
60	-6.513049
59	-6.659034
58	-6.80751467
57	-6.95857763
56	-7.11231375
55	-7.268821
54	-7.42819929
53	-7.59055662
52	-7.756007
51	-7.924671
50	-8.096675
49	-8.272153
48	-8.45125
47	-8.634117
46	-8.820918
45	-9.011824
44	-9.207021
43	-9.406705
42	-9.611089
41	-9.820397
40	-10.0348749
39	-10.2547827
38	-10.480402
37	-10.71204
36	-10.9500237
35	-11.1947136
34	-11.446496
33	-11.7057962
32	**-11.9730749**
31	-12.24884
30	-12.5336494
29	-12.8281145
28	-13.1329136
27	-13.4487991
26	-13.7766075
25	-14.1172743
24	-14.4718494
23	-14.8415174
22	-15.22762
21	-15.6316881
20	-16.0554752
19	-16.5010014
18	-16.970623
17	-17.4670963
16	-17.9936752
15	-18.5542488
14	-19.153513
13	-19.7972069
12	-20.4924488
11	-21.24822
10	-22.0760727
09	-22.9912243
08	**-24.0142746**
07	-25.1741123
06	-26.5130482
05	-28.096674
04	-30.034874
03	-32.53365
02	-36.0554733
01	**-42.07607**

Specifications

Compatibility:	Roland R-8, R-8M, R-8 MK2
Number of sounds on card:	maximum 26
Number of patterns on card:	100
Number of songs on card:	10
Storage Capacity:	512kB
Length of samples:	total 11.6 seconds
USB Port:	USB-B-Micro
Native sample format of the R-8:	44100 kHz, 16 Bit (7Bit compressed), Mono

Troubleshooting

Glitches

In the current software version, glitches may still occur, especially if you play internal and external sounds quickly. We are already working on fixing the bug.

My R-8 is frozen!

In our experience, it can happen from time to time that the R-8 „crashes“ or freezes. The firmware of the R-8 seems to have some bug that we have not yet been able to skillfully circumvent.

We have observed this bug when you play patterns live and change the quantization. The bug also occurs when a pattern on the card is incorrect. For this reason, we have currently deactivated the function.

If your R-8 freezes, don't panic! It is neither defective nor can it be destroyed by WaveR8.

Turn off the R-8,

hold down the **CURSOR PAGE** and **PARAMETER SELECT** keys

and restart the R-8.

This initializes the R-8 and it can go on again.

This is one of the first functions roland describes in the R-8 manual. Certainly, the connection is only coincidental... 😉

My card is not recognized in the R-8

First, make sure there is readable content on your WaveR8. Without content, the card is of course unreadable for your device. You can see that the R-8 has recognized your card by a small 1 in the display next to **CARD.**

Don't let yourself be driven crazy! All WaveR8 have been tested and have left the house fully functional. Maybe you didn't pay attention to something.

If you continue to have problems, please contact support.

The software editor does not display my WaveR8

Please make sure that your WaveR8 has been installed correctly. See **Installing the USB Driver**.

If this is not the cause of the error, make sure your USB cable is not defective. Just swap it for another one.

In fact, USB cables have pure charging cables (here the data lines are missing) and data cables. Make sure you're actually using a data cable.

If this does not help, please contact support.

I have discovered a bug

Feel free to report this to support. We will immediately initiate a bug fix.

support@waverex.de

Don't hesitate to tell us any suggestions for improvement. We made WaveR8 for YOU.