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1. Introduction

Welcome!

Thank you for purchasing Nord Modular. We would like to welcome you to the fascinating world of virtual-analog, modular synthesis. Prepare yourself for a journey where your creativity can reach new levels, in a way that has not been conceivable with synthesizers before. Nord Modular is a digital instrument that remains true to the traditional analog concept and as you will find out in a few minutes, it manages to go where no analog synthesizer ever gone before.

About the Nord Modular system

The Nord Modular system consists of two parts. The first part is the synthesizer, which will be called Nord Modular from now on, and the second part is the software editor, which will be called the Editor. Nord Modular comes in three different models, Nord Modular with or without a two octave keyboard and Nord Micro Modular. It is possible to load Nord Modular with patches from the Editor, disconnect it from the computer and then use Nord Modular as a stand-alone instrument.

About this manual

This manual contains a lot of useful information. Please take some time and read it. The manual begins with the necessary information for installing the software and connecting the system parts together. The Getting started section is a quick-start guide on how to create your first sounds and patches. The Basics section explains the fundamental components and how the different parts interact with each other. The Reference section contains information about every function and parameter of the Nord Modular system.

Every time this manual wants your attention to an object on the synthesizer panel, the name of that object will be printed LIKE THIS, e.g. 'click on the STORE button'. The LCD display on Nord Modular is always referred to as the DISPLAY and the computer monitor is always referred to as the 'screen'. Whenever there is a reference to the 'keyboard', that reference will also apply to any incoming MIDI notes of the Nord Modular instrument. Most of the functions described for Nord Modular in the text also applies to Nord Micro Modular unless otherwise is stated.

A left-button mouse click in the Editor is specified as just a 'click'. Any requests for a right-button mouse click will be specified as such. Menu selection sequences are described like this: 'Select Patch|Download To Slot', meaning first select the Patch menu, and from this menu select Download To Slot.

Reading the manual in Adobe Acrobat Reader 3.0

This manual is also available in the digital PDF-file format. It can be downloaded, free of charge, from Clavia's web site at www.clavia.se. When reading the manual as PDF-file, you will need Adobe Acrobat Reader 3.0 or later. This program can be downloaded, free of charge, at www.adobe.com.

With Adobe Acrobat Reader it is possible to use special navigation features like hyperlinks. This means that you can click with the mouse on a word or sentence and automatically get to the location indicated by the word/sentence. To better show what words or sentences are hyperlinked in this manual, these words are written in magenta.

Windows-95, Windows NT

It is beyond the scope of this manual to explain the functions of these operating systems. In order to run the Editor, you need to be familiar with the basic functions of the computer, like mouse functions, saving and loading files to and from disk drives, moving and closing windows, closing dialog boxes etc. It is also important that the MIDI interface connected to the computer, is properly installed.

Clavia on the Internet

If you have access to the World Wide Web, you can check out the Nord Modular section at Clavia's web site. There you will also find a sound library with lots of patches for Nord Modular. Point your browser to www.clavia.se.

2. Overview

Nord Modular Front panel

Left panel section

The **Master Volume** knob controls the level of the four **Out** ports and the **Headphones** output. Pressing the **Panel Split** button assigns the 18 **Knobs** in four separate groups, one group for each of the Slots A, B, C and D.

The 18 **Knobs** can each be assigned to a parameter in Nord Modular. These parameters can then be controlled in real time. The **Knob LED**(s) will be lit when a **Knob** is assigned to a parameter.

Keyboard version

You can quickly transpose Nord Modular keyboard in octave steps with the **Oct Shift** buttons. Any settings that you make with these buttons will be saved together with the other parameters of the patch.

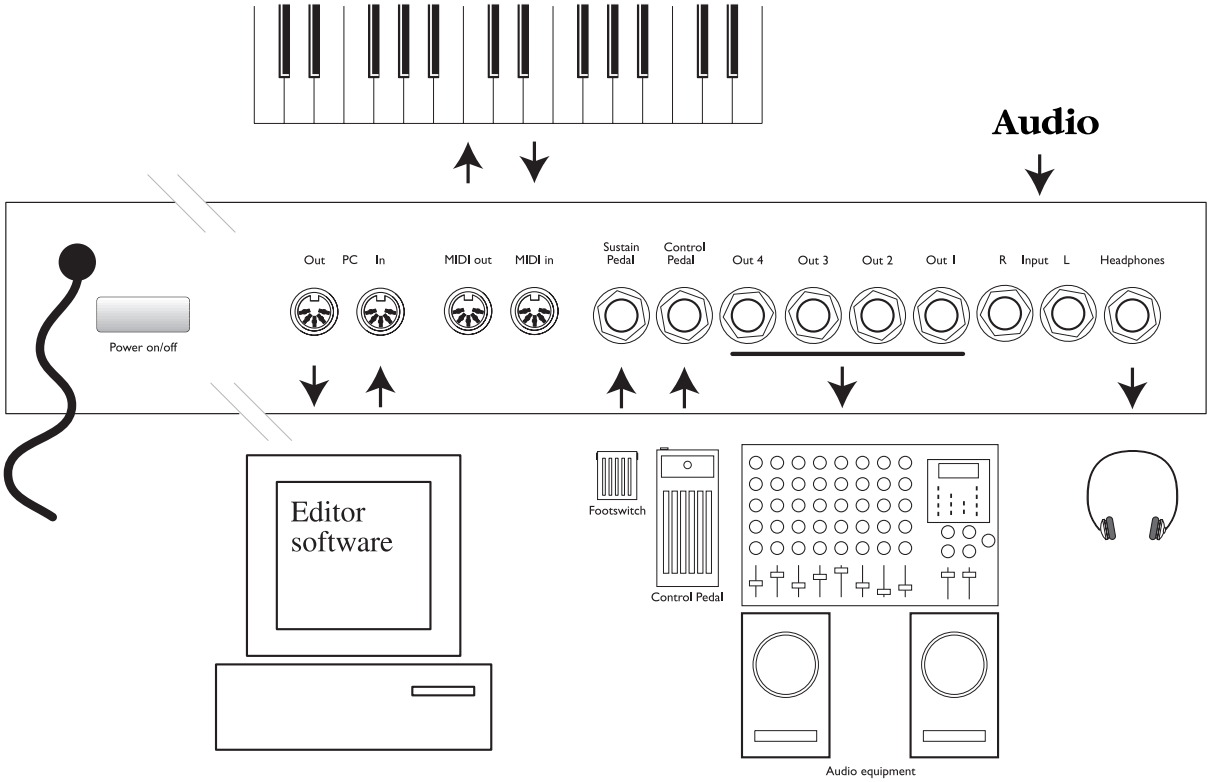
Rackmount version

The **MIDI Active** light will flash when Nord Modular is receiving MIDI messages.

Right panel section

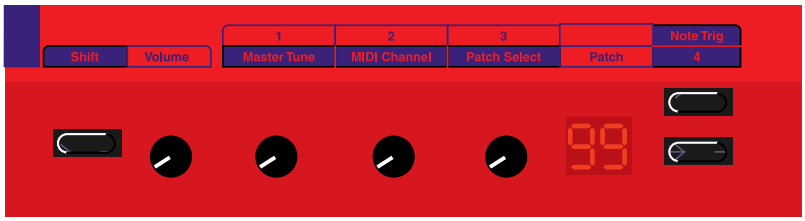
The **Display** shows the name of the active patch, and the polyphony of the selected patch within parenthesis. The polyphony of the other active patches are shown without parenthesis.
The **Store** button allows you to store patches in Nord Modular.
The **System** button gives you access to the Synth or Patch settings.
The **Edit** button puts Nord Modular in Edit mode.
The **Patch/Load** button activates the Patch mode, and is also used when patches are loaded from the internal memory to the slots.
The Slot buttons **A**, **B**, **C** and **D** activate the slots for playing and editing sounds.
The **Shift** button activates a secondary function on some buttons.
The **Assign** button lets you assign a parameter to one of the 18 **Knobs**.
The **Navigator** buttons are used to scroll and select different functions in the menus.
The **Rotary dial** is used to enter data.

NORD MODULAR REAR PANEL



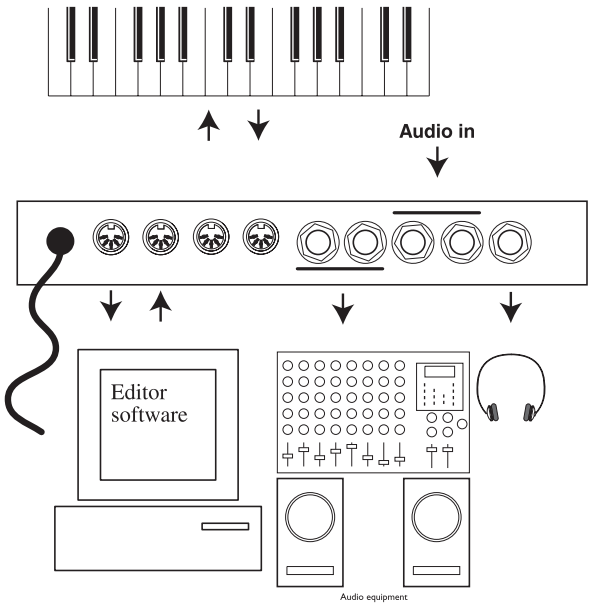
Use the **POWER ON/OFF** button to switch on and off Nord Modular.
Connect the MIDI Interface of the PC that runs the Editor software to the **PC IN** and **PC OUT** ports.
Connect any external MIDI equipment to the **MIDI IN** and **MIDI OUT** ports. This could be a sequencer, a master keyboard or other MIDI devices.
Connect a footswitch to the **SUSTAIN PEDAL/ ON/OFF PEDAL** input. The polarity of the input can be adjusted to suit different types of footswitches.
Connect an continuous control pedal to the **CONTROL PEDAL** input.
The audio outputs **OUT 1-4** route the audio signals from the four virtual mix buses in Nord Modular. Use **OUT 1** if you are going to use Nord Modular with a mono sound system. If only **OUT 1** is connected, it will route the audio from **OUT 2** as well.
By connecting a sound source to the line level inputs **INPUT L** and/or **INPUT R**, you can patch audio from external sound sources and process in Nord Modular.
The **HEADPHONES** output routes audio signals that are assigned to mix buses 1 and 2.

Nord Micro Modular Front panel



The **SHIFT** button activates a secondary function on some buttons and knobs.
The **MASTER VOLUME** knob controls the level of the two **OUT** ports and the **HEADPHONES** output.
The 3 **KNOBS** can each be assigned to a parameter in Nord Micro Modular. These parameters can then be controlled in real time. If **SHIFT** is pressed, the assignable **KNOBS** have the following functions: Master Tune, MIDI Channel and Patch Selector.
The **DISPLAY** shows the patch number.
The two buttons to the right are used for selecting patches. If **SHIFT** is pressed, the upper button is used for trigging notes and the lower button can be assigned to a switch function in a patch.

Nord Micro Modular Rear panel



Connect the MIDI Interface of the PC that runs the Editor software to the **PC IN** and **PC OUT** ports.
Connect any external MIDI equipment to the **MIDI IN** and **MIDI OUT** ports. This could be a sequencer, a master keyboard or other MIDI devices.
The audio outputs **OUT 1 & 2** route the audio signals from the four virtual mix buses in Micro Modular. Use **OUT 1** if you are going to use Micro Modular with a mono sound system. If only **OUT 1** is connected, it will route the audio from **OUT 2** as well.
By connecting a sound source to the line level inputs **INPUT L** and/or **INPUT R**, you can patch audio from external sound sources and process in Micro Modular.
The **HEADPHONES** output routes audio signals that are assigned to mix buses 1 and 2.

3. Getting started

Editor system requirements

The Editor software requires a PC, running Windows-95, Windows-98 or Windows NT (a Pentium 90 MHz or better is recommended), with a hard disk, a 3.5 inch floppy disk drive and a mouse. The computer has nothing to do with the actual sound processing of Nord Modular. It is used only for visual patching and to send instructions to Nord Modular. The Editor also requires minimum SVGA graphics, 800 x 600 resolution. The computer must be equipped with a MIDI interface with previously installed driver routines.

Installation of the Editor software

1. Insert the installation disk into the floppy disk drive.

2. Select Start|Run from the Windows taskbar. Type a:\setup.exe and press Enter. The setup program will start.

3. After the initial setup is complete, the Welcome window will appear. Click on the Next button when you are ready to move on with the installation. The Editor software will be installed in a folder named Clavia in the Program Files folder, on the hard disk. During the installation you will be able to register your user name and you may also select an alternative location for the software.

4. Confirm every window in the installation procedure by clicking on the Next button. The installation may be aborted by clicking on Cancel.

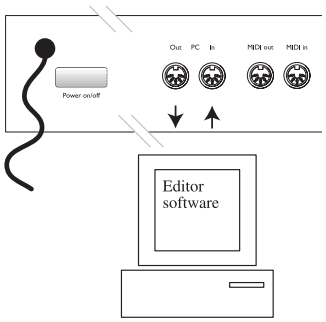
5. When the installation is complete, click on Finish and the computer will return to the Windows desktop.

MIDI Tester

The MIDI tester is a program that tests the MIDI interface connected to the computer. This to make sure that it can handle the density of System Exclusive MIDI messages between the Editor and Nord Modular. You may run the MIDI tester if you have problems with the Editor losing contact with Nord Modular from time to time. You find the MIDI Tester in the Nord Modular folder

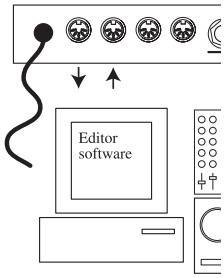
Starting up

Make all the audio connections before turning on any of the devices. The computer that runs the Editor must be connected to both of the PC MIDI ports of Nord Modular (**PC In** and **PC Out**).



Nord Modular

OR



Micro Modular

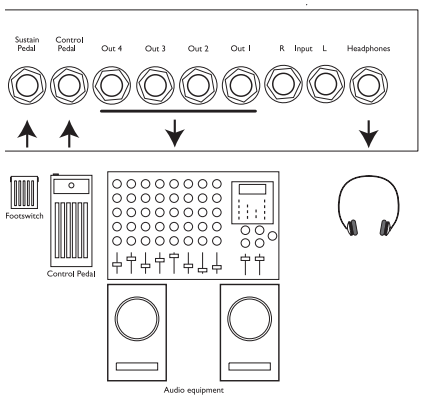
Note! You cannot use the Editor software and the Nord Modular PC ports in a traditional MIDI set-up, using MIDI THRU-boxes or MIDI THRU connections on other instruments. The Nord Modular PC ports have to be used exclusively for the Editor software on the computer.

Multiport MIDI interfaces

The Editor needs a separate set of MIDI ports to run properly. If you are using a sequencer software, running on the same computer as the Editor, you will need a multiport MIDI interface. You must configure the Editor and the sequencer to use separate ports of the multiport MIDI interface.
Most of the sequencer software automatically opens every port of a multiport interface. In these cases you have to deassign one of the ports from the sequencer software and dedicate it exclusively to the Editor software.

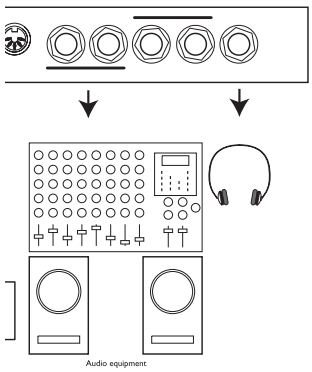
Sound system

Connect the desired outputs of Nord Modular to a sound system. We suggest that you start with connecting output 1 to a left channel and output 2 to a right channel of the sound system. Turn on Nord Modular first, followed by the sound system.



Nord Modular

OR

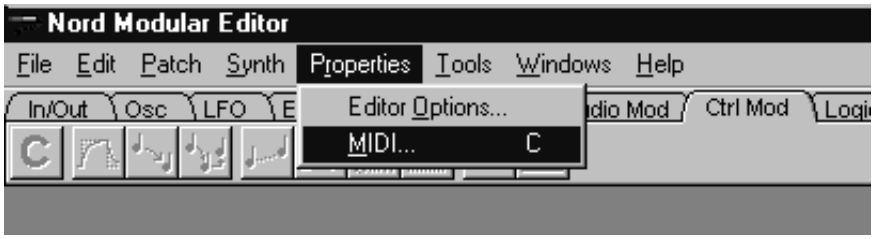


Micro Modular

Launching the Editor

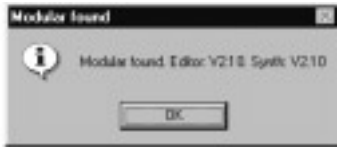
1. From the Start menu in the Windows taskbar, select Program|Nord Modular|Modular Editor V2.10. During the start-up procedure, the Editor software will search for the Nord Modular synthesizer. The very first time you launch the Editor, you need to tell it which MIDI ports to use for communication with Nord Modular.

2. In the Properties drop down menu, select MIDI.



If the MIDI interface drivers have been properly installed, they can be selected in the In- and Out port selectors. After selecting the proper drivers, click on Find Modular.

If Nord Modular is not turned on, or if the connection between Nord Modular and the computer is not working properly, an error message will appear. In that case, check the MIDI connections and cables, make sure that the MIDI interface is properly installed and working, and that Nord Modular is turned on. When the Editor has found the Nord Modular synth, the following message will appear:



Help files

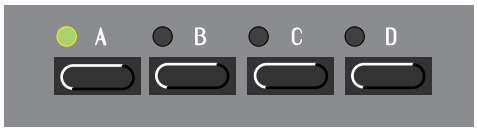
The Editor comes with an extensive help section. To access the Help files, select Index from the Help menu. Every module and parameter has its own pointer to the Help file. The Help files can be accessed with the F1 key or by right-clicking on a module or parameter and selecting Help.

Loading a patch from the internal memory

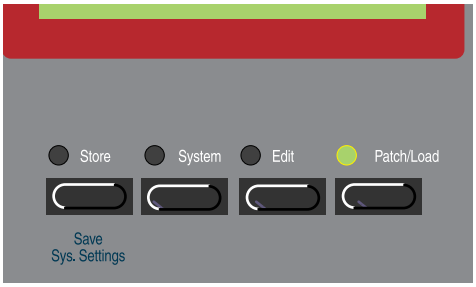
A patch in Nord Modular can be considered the same as a "sound", even though a patch can produce more than just a single sound, but we will return to that later on. Nord Modular has an internal memory of 100 patches. A patch always has to be loaded to a **Slot** (**A**, **B**, **C** or **D** of Nord Modular) before it can be played. This is how you do:

Nord Modular

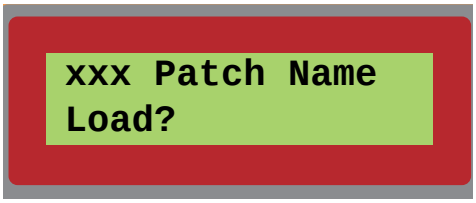
1. Activate a slot with one of the four slot buttons (**A**-**D**) on the Nord Modular front panel.



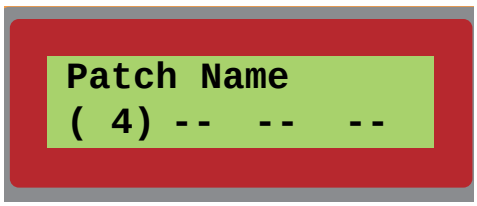
2. Press the **Patch/Load** button on the panel. The **Patch/Load** LED starts flashing



3. Turn the **Rotary dial** and select a patch to load. The names and locations of the patches appears in the **Display** as you turn the dial.



4. Load the patch by pressing the **Patch/Load** button again. The patch is loaded in the active slot and the **Patch/Load** LED becomes solid green. The number within parenthesis indicates the maximum polyphony of the patch (see more in "Patch and voice allocation" on page 178).



It is not necessary to have the instrument connected to the PC if you only want to play the patches from the internal memory or change module parameter values. The PC and Editor is needed only when you want to create new patches or change "cable" connections in a patch.

Micro Modular

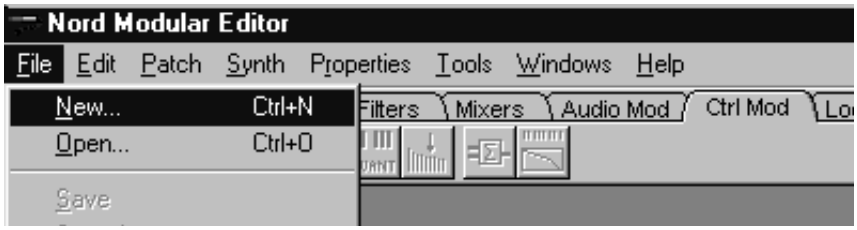
1. Micro Modular do not have any slots to load a patch into. The patch number shown in the **Display** is always active and ready to be played and edited. A red flashing dot between the numbers indicates that the Sound engine is re-calculating and therefore does not produce any sound. The recalculation occurs when you add or remove modules in the patch window in the PC Editor. A red flashing dot to the right in the display indicates that MIDI data is received on the **MIDI In** port.

It is not necessary to have the instrument connected to the PC if you only want to play the patches from the internal memory or change the assigned module parameter values.

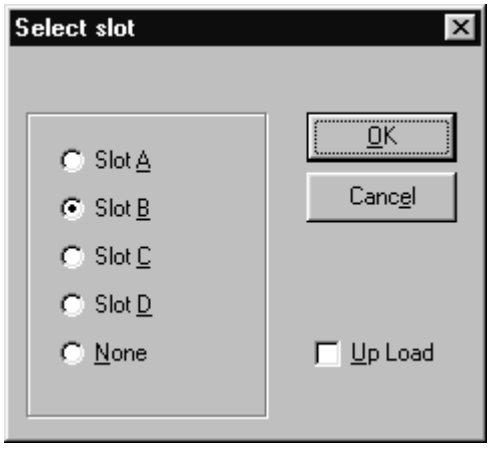
Creating a patch from scratch

When you want to create new patches in Nord Modular you always have to do this in the Editor software on the computer. In this example you will create a basic synthesizer configuration. Open Modular Editor V2.1x from the Start menu in Windows.

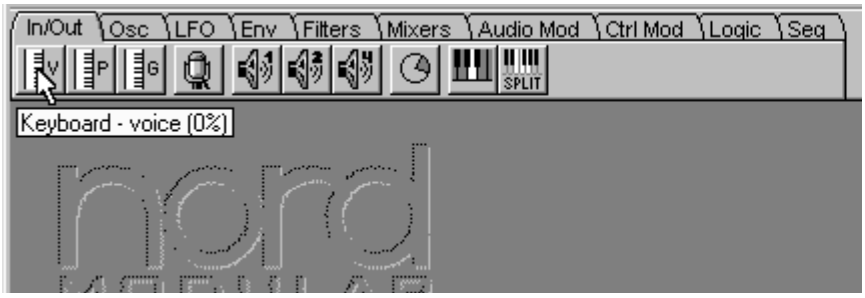
1. In the File menu, select New.



2. The "Select slot" dialog box appears. In this example, select slot B, either by clicking or by pressing the B key on the PC keyboard. Click OK. A new, empty patch window appears. If you use Micro Modular, the dialog bow looks a bit different. Select "Connected" and click OK.



3. Locate the Module tabs in the upper left part of the patch window (In/Out, OSC, LFO etc.). Select the In/Out tab. A brief description appears when you place the cursor over a module icon. The % figure indicates how much Sound engine power the module will use (see more in "Sound engine" on page 178).

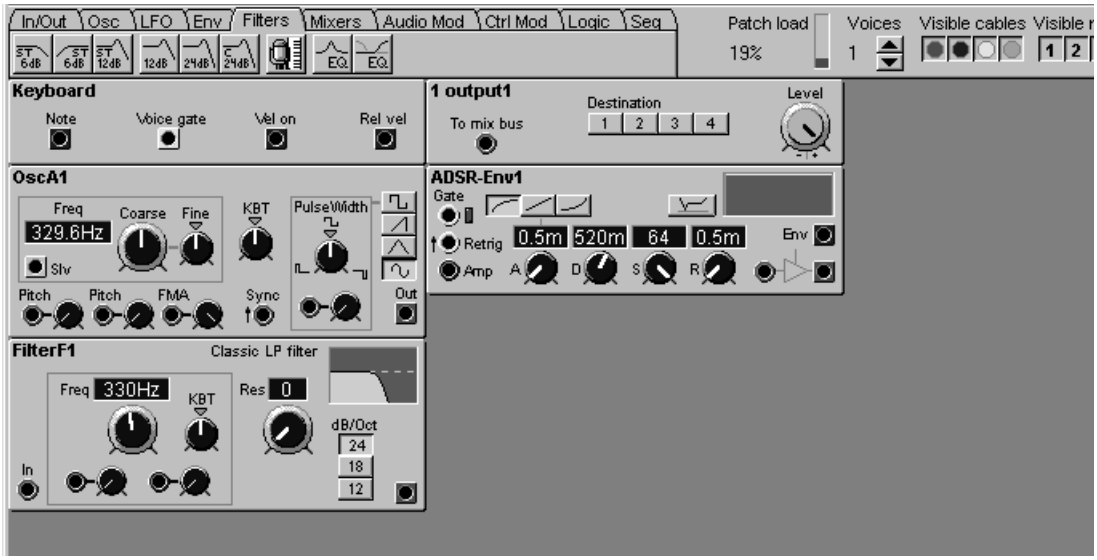


4. Click-drag one 'Keyboard - voice' module and one '1Output' module to the patch window. As you will notice, the modules will self-align when placed near each other. It does not matter where in the patch window you put your modules, but a good idea is to place them in a "natural" flow so it becomes easier to follow the signal paths visually.

5. Click on the Osc tab, and click-drag one 'OSCA' module to the patch window.

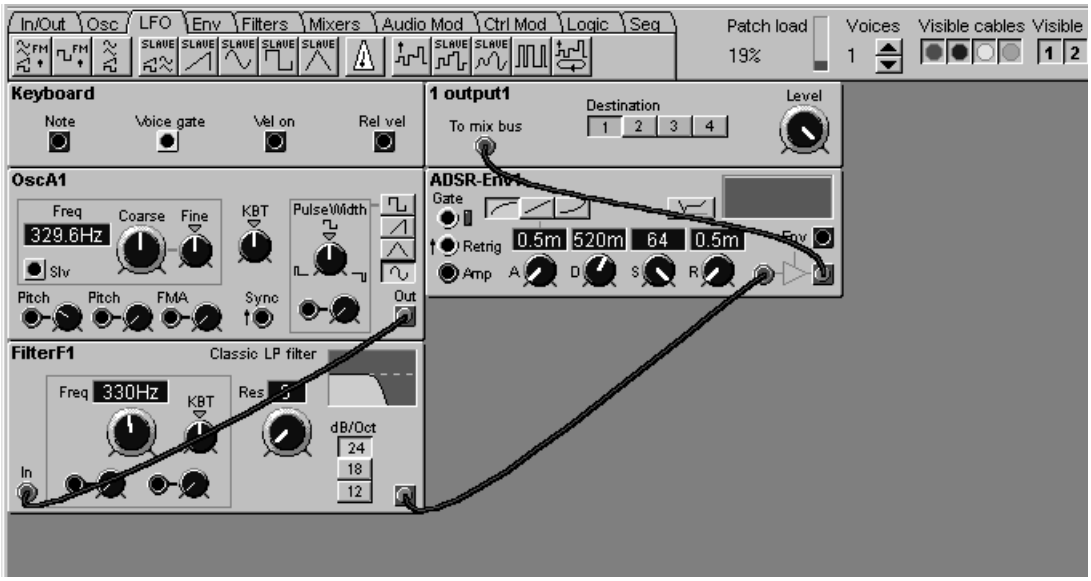
6. Click on the Env tab and click-drag one 'ADSR envelope' to the patch window.

7. Click on the Filters tab and click-drag one '24 dB classic filter' to the patch window. Now your patch window should look something like this:

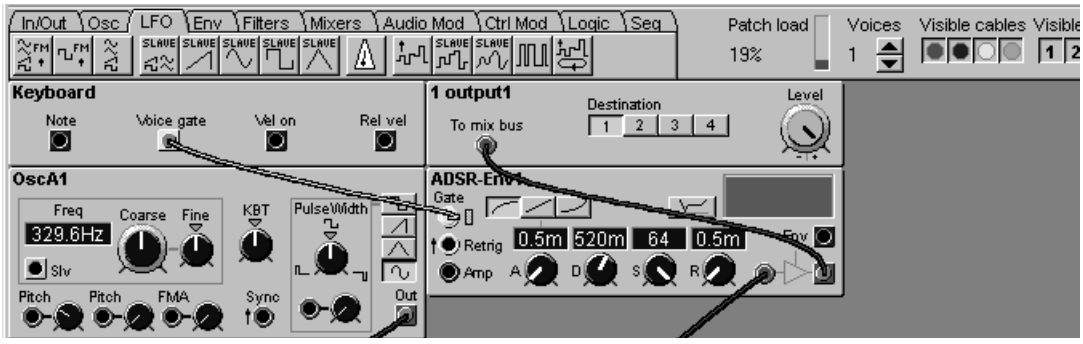


8. Let's settle with these modules for now and start with the cable connections. First of all, let's connect all audio cables to the modules: Place the cursor over the red square output of the 'OscA1' module. Click, hold and drag the cursor to the red circular input of the 'FilterF1' module. Release the mouse button. Now, a red audio cable appears between the two modules. Repeat the procedure and connect the 'FilterF1' output to the 'ADSR-Env1' input and the 'ADSR-Env1' output to the '1 output1' input.

If you should accidentally connect wrong, simply double-click-hold on one of the connectors, drag the cable away from the connector, and release the mouse button. The connection disappears. Finally, click on Destination button 1 of the '1 output1' module to route the audio signal to the physical **OUT 1** port of Nord Modular. Your patch should now look like this.



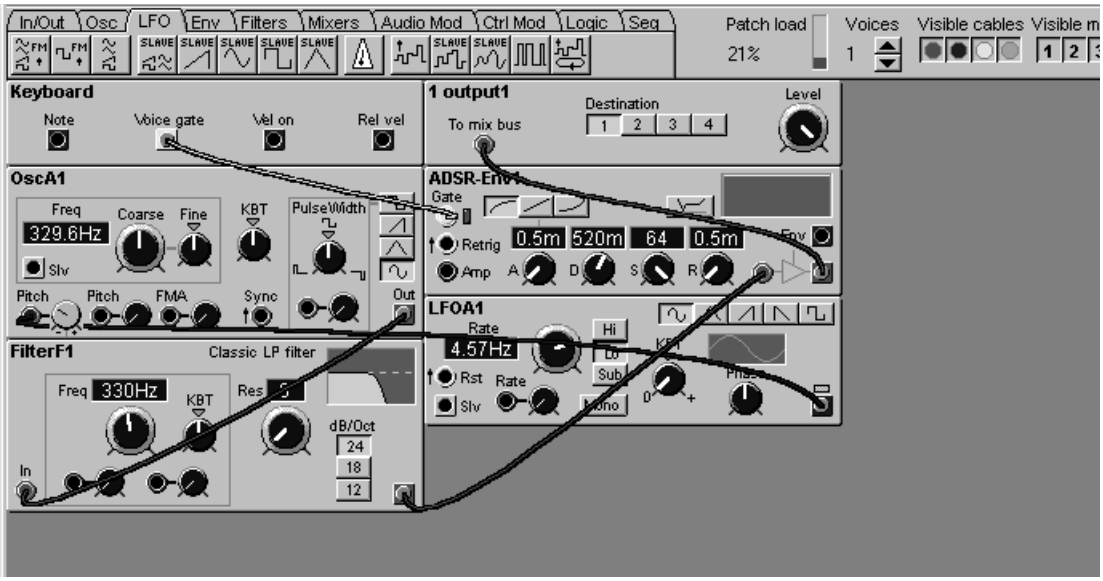
9. Even though all audio cables have been properly connected, no sound is heard. You have to make the envelope generator "open up" for the audio signal. Place the cursor on the yellow Voice gate output of the Keyboard module. Press the left mouse button and drag the cursor to the yellow Gate input of the 'ADSR-Env1' module.



A yellow cable appears between the two connections. If you play on Nord Modular (via the keyboard or **MIDI IN**), the envelope Gate LED is lit and the patch will sound.

10. Now, let's add an 'LFOA' module from the LFO tab to the patch. Connect a cable between the square, blue output of the 'LFOA1' module, to the red, circular Pitch input of the 'OscA1' module. Play the Nord Modular and turn the Pitch input attenuator knob next to the input of 'OscA1' by

click-holding and moving the mouse. This makes 'LFOA1' modulate the pitch of the oscillator, adding vibrato to the patch. Your patch should look something like this:

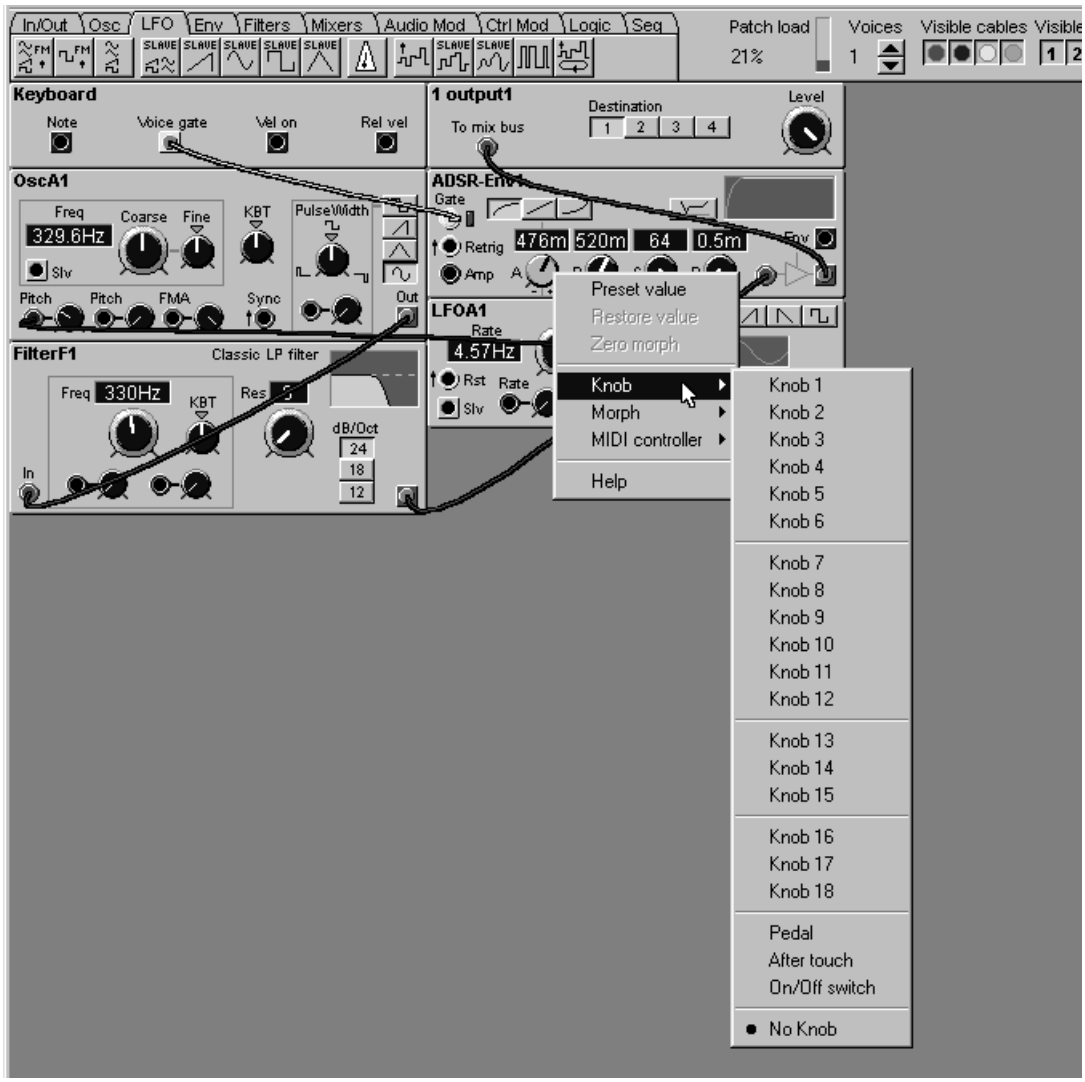


If you like, you can connect a new cable from the Pitch input of the 'OscA1' module, to the circular, red input in the Pulse Width section, located to the right in the same module. This will route the LFO to both the Pitch and the PWM inputs. Select the square wave on the oscillator waveform selector and turn up the modulation knob, next to the PWM input. One single modulator can be connected to several different destinations, either by making a "branch connection" from the original output to every input, or by making a serial connection from the first input to the second input, to the third etc.

11. Now that we are satisfied with the modules and connections in this example, let's make the patch polyphonic. Locate the Voices buttons, to the right of the Patch load indicator in the toolbar. Set the requested number of voices by clicking the up/down buttons. (See more about "voices vs Patch load" relationship in "Patch and voice allocation" on page 178.)

12. To make the patch editable and controllable from the Nord Modular front panel, you can assign any parameter in the patch to any of the 18 KNOBS of Nord Modular (3 KNOBS + 1 button on Micro

Modular). Simply right-click on a module parameter, for example, the Attack knob of the ADSR-Env1 module, and select which **KNOB** to assign it to.



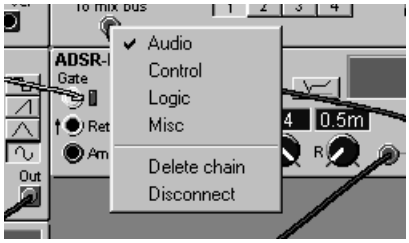
Let's say you want to assign the ADSR-Env1 Attack to Knob 1. Now, when turning **KNOB** 1 of Nord Modular, the attack time will change. Proceed with the knob assigning until you are satisfied. Note that you can also assign **KNOBS** to selector switch parameters (buttons), such as the waveform selector of OscA1, the dB selector of FilterF1 etc. You can deassign any of the **KNOBS** by right-clicking on the parameter and choosing No Knob from the knob popup. You can also reassign a parameter to another knob by right-clicking and selecting an unused knob number.

13. Congratulations! You have just created your first Nord Modular patch from scratch. To (re)name the patch, select Patch Settings from the Patch menu and enter a patch name. Click OK and the patch name is changed in the Editor and in the **DISPLAY** (not on Micro Modular). Save your patch on the computer using Save As from the File menu. To save the patch in the memory of Nord Modular (and Micro Modular), select Synth|Save In Modular Memory. Click on a patch in the list and click Save. **Note that the original patch in the selected memory location will be overwritten by your new patch. Make sure you do not overwrite patches you want to keep! It is a good idea to save a backup of all your patches on the computer, just in case.**

Other useful functions

Remove cables

To remove a cable, right-click on a connection (input or output) and select Disconnect, or double-click-hold or Ctrl-click on a connection (an extra wire appears next to the connector cursor) and "pull out" the connector by dragging the connector symbol away from the input/output and release the mouse button.



Right-click *OR* *Double-click/Ctrl-click*

Move modules

You can move the modules in the patch window by click-holding its gray "panel" and move the frame that appears. Other modules will move if you drop a module onto another. You can also move several modules at the same time by placing the cursor on the patch window background and click-hold and select the modules you want to move. The names of the selected modules are highlighted to indicate that they have been selected.

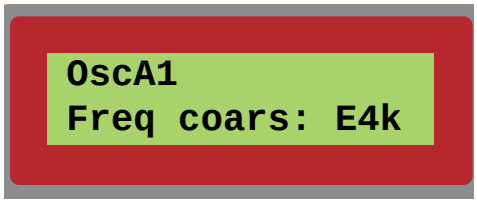
Delete modules

To delete a module from a patch, right-click on the module background and select Delete. Please note that all cable connections made to the module will also be deleted or re-routed. You can also delete several modules by selecting them as described in the example above. Then right-click on one of the selected modules and choose Delete.

Put a parameter "in focus"

Put a parameter "in focus" by clicking on the corresponding knob. Notice how the knob changes color, and the current setting of the parameter displays briefly in a yellow hintbox. Putting parameters in focus is possible only if the patch is active in the synthesizer

Press the EDIT button on the Nord Modular front panel (not Micro Modular). The parameter "in focus" in the Editor will also appear in the DISPLAY and you can now change the value of the parameter with the ROTARY DIAL.



Play on Nord Modular and turn the ROTARY DIAL to instantly hear what is happening with the sound. The Editor will echo any adjustments that you make from the Nord Modular front panel.

Press the left or right NAVIGATOR buttons to change the parameter "focus" within the module. The DISPLAY will display the same parameter that appears on the computer screen.

EDIT A FACTORY PATCH

If you want to edit a factory patch from the instrument's internal memory, load the desired factory patch into a SLOT in Nord Modular. In Micro Modular, select a patch with the Patch selector buttons. A new patch window will be created in the Editor containing the patch of the active SLOT. The patch window gets the same name as the patch in the uploaded SLOT when saved to disk.

4. Basic functions

introduction to Nord Modular

A modular synthesizer could be described as a flexible electronics kit. It contains a lot of parts, the modules, which have various functions. You get to build your own, customized synthesizer by connecting different modules and functions with patch cables. A modular synthesizer has the advantage of being very flexible instrument, leaving you in charge of the routing of the modules and functions included in the synth. Nord Modular takes this concept several steps further, being programmable, polyphonic, and multitimbral. Nord Modular also features a very powerful editing system in the supplied PC Editor software.

Modules

A module in Nord Modular can be, for example, an oscillator, an envelope generator, a filter or a step sequencer. There are over 100 different types of modules available in Nord Modular, and the number is constantly increasing with each software update. You are not limited to use only one module of a specific type in a patch. Several identical modules can be used together, creating, for example, really fat multi-oscillator patches.

Connections

Every module and nearly every function of a module can be patched to other modules and functions, using virtual cables. Each module has one or more connectors. These connectors come in two different shapes: circular inputs and square outputs, and four different variants: red audio-, blue control-, yellow logic- and gray slave-connectors. Most of the modules share the same basic layout, with the input connector(s) to the left and the output connector(s) to the right.

Parameters

There are usually one or more parameters on each module. A parameter could be a knob, a slider or a selector switch (button). You change the setting of a parameter either with the mouse in the Editor software, with an assigned **Knob** on the front panel or with the **Rotary Dial** (not Micro Modular). A knob parameter in the Editor is "turned" by click-holding it and moving the mouse. A selector switch is toggled by clicking on it.

Windows and graphs

Some modules feature one or more windows that display alphanumeric and/or graphical information. Some oscillator modules, for example, display the frequency. The read-out of the oscillators is selectable between Hz and semitones, by clicking on the display window. Information in other modules can be envelope curves, wave shapes, frequency diagrams etc.

LEDs

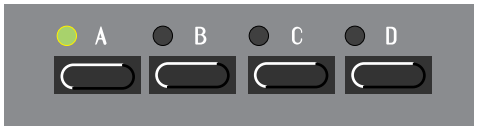
Some modules have one or several LEDs to indicate functions. The rate of an LFO, the opening or closing of an envelope or the current step position in a sequencer module are some examples of where LEDs are used.

The patch

When you have connected a couple of modules together, you have created a patch. A patch can be saved on the computer and/or stored in the Nord Modular internal memory. A patch can produce one particular sound, or several sounds at once, depending on how many sound sources you use in the patch. A patch could be anything from a copy of an existing vintage synthesizer, to a completely unique synthesizer configuration of your own design.

Slots (not Micro Modular)

There are four SLOTS labelled **A**, **B**, **C** and **D**, in Nord Modular. You can load one patch to each slot.



A SLOT can be considered as a temporary memory location which can hold a patch for playing or editing. You activate a SLOT by pressing one of the SLOT BUTTONS on the Nord Modular front panel. The **LED** above the SLOT BUTTON will be solid green to indicate that the SLOT is active. The DISPLAY shows the name of the patch and the **actual** number of voices assigned to the patch within parenthesis.

By pressing SHIFT while turning the ROTARY DIAL, you can change the number of assigned voices of the active SLOT.

You can decide where to route each slot independently for each patch (see "Route slot A, B, C, D" on page 50 and "Routing" on page 65). The SLOTS are **not** hard-wired to the four outputs of Nord Modular.

Playing multitimbrally

The slots can receive MIDI information on separate MIDI channels, making Nord Modular multitimbral. If you want to use Nord Modular multitimbrally you first have to load the patches you want in each SLOT. Then, simultaneously press the SLOT BUTTONS for the slots you want to use. If several SLOT BUTTONS have been pressed, the active SLOT **LED** will flash, the others will be solid green.

You can change the active slot by pressing the corresponding SLOT BUTTON. To deactivate and reactivate slots in a multitimbral setup, press SHIFT and the desired SLOT BUTTON(S). The DISPLAY shows the name of the patch in the active slot and the **actual** number of voices of that patch within parenthesis. The other numbers in the DISPLAY show the **actual** number of voices assigned to the other patches in the setup.

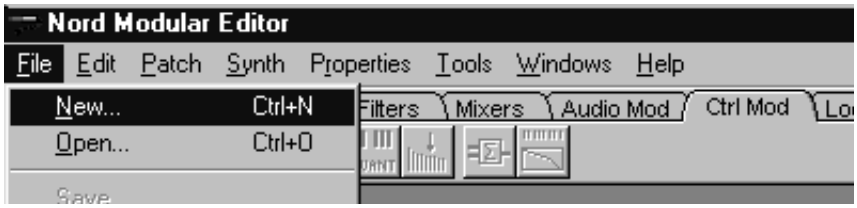
By pressing SHIFT while turning the ROTARY DIAL, you can change the number of assigned voices of the active SLOT.

PATCHES

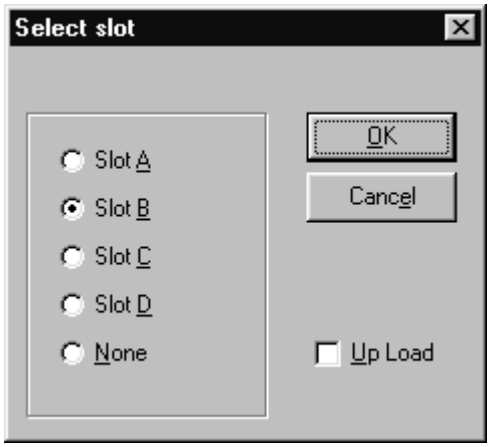
New patches must be created with the Editor software. You can, however, download up to 100 patches to the Nord Modular internal memory (99 in Micro Modular) and play these patches without having the Editor running or even the PC connected. If Nord Modular is in Edit mode (the **EDIT BUTTON** pressed), you can edit a patch by navigating among the various parameters with the **NAVIGATOR** keys, and adjusting the values with the **ROTARY DIAL** (not Micro Modular). There are special functions that apply only to the patches, regardless of which **SLOT** a patch occupies. These functions are described in "Patch settings in the system menu" on page 51 and page 61.

CREATE A NEW PATCH

Create a new patch by selecting File|New.



Select a slot ('Connected' in Micro Modular) in the dialog box that appears and click OK. This opens up a new, empty patch window in the Editor and clears the selected **SLOT** in Nord Modular. You can also choose not to select any **SLOT** in by selecting None (Local in Micro Modular). This means that you work "off-line", i.e. you cannot play the patch, only edit. You may then later download the patch to the synthesizer.



DOWNLOAD A PATCH TO THE SYNTHESIZER

If you selected None (Local in Micro Modular) in the example above, you can easily download the Editor patch to the synthesizer by doing either of the following:

1. Right-click on the gray patch window background and select a slot (Connected in Micro Modular) from the list. This will download your Editor patch, overwriting the patch that is currently loaded to the destination slot.

2. Select Patch|Download To Slot and select slot (not Micro Modular) in the dialog box that appears.

STORE A PATCH

A patch can be stored in two different locations: in the internal memory of the synthesizer, and/or on disk on the computer. The examples below describes three different ways of saving/storing a patch.

1. Save a patch only on the computer by selecting File|Save. File|Save As will let you rename the patch before saving to disk. All patches can be recognized by the extension '.PCH'.

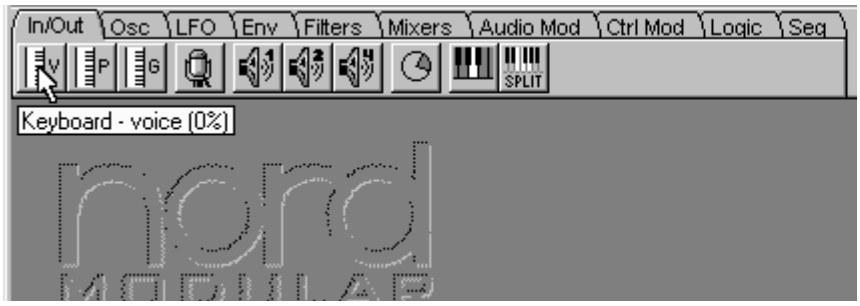
2. Store a patch in one of the Nord Modular internal memory locations by pressing the **STORE** button on the front panel once. The **LED** above the **STORE** button will flash. Select a memory location with the **ROTARY DIAL** and confirm by pressing **STORE** again. Abort by pressing any other button. This example is not valid for Micro Modular.

3. To store a patch in Nord Modular from the Editor, select Synth|Save In Modular Memory. Select a memory location and click OK.

Note that the original patch in the selected memory location will be overwritten by your new patch. Make sure you do not overwrite patches you want to keep!
There is a memory protect function to minimize the risk of accidentally overwriting patches (not in Micro Modular). Read more about the internal memory protection in the section "Memory Protect" on page 51.

ADD MODULES TO A PATCH

The modules are grouped together in module groups. You access these groups by clicking the tabs in the toolbar located above the patch window. The various modules in each group are distinguished by icons.

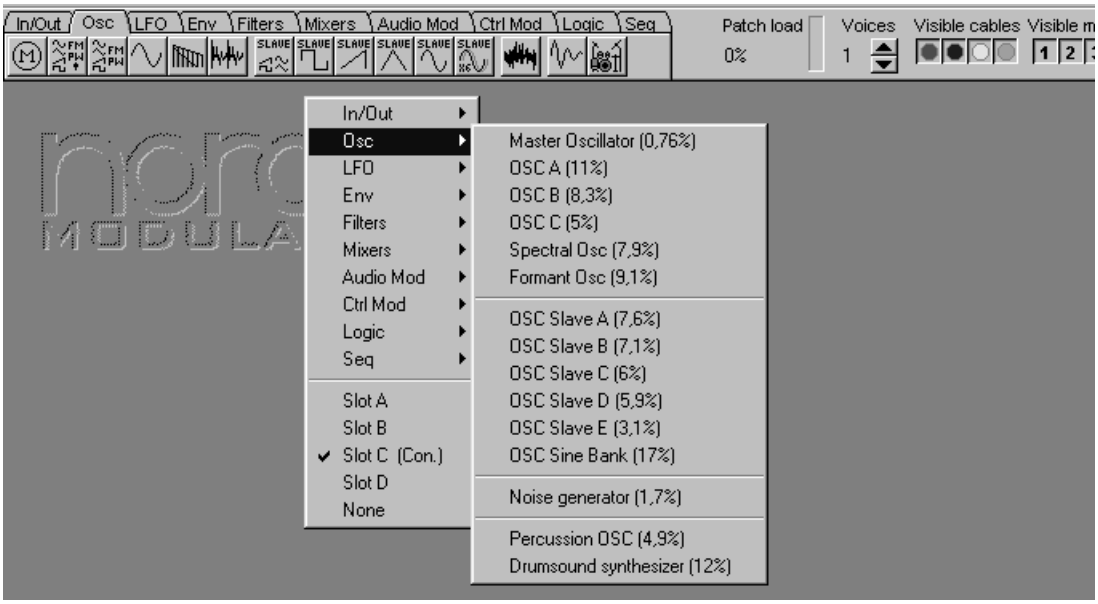


Select a group tab, click-hold on a module icon and drag it to the patch window. When you place the cursor over any of the module buttons, a brief description of the module appears together with information of the amount of Patch load (Sound engine power) it will use.

Drag the "phantom frame" of the selected module to the patch window. The other modules will move, if necessary, when you drop a new one. The modules will automatically snap to a grid in the patch window. The patch window will expand itself when needed and scroll-bars will appear at the bottom and to the right if the patch window becomes larger than the available screen space. As you add modules to the

patch window, the Patch load indicator on the toolbar will increase, indicating the total use of the Sound engines. Maximum Patch load is 100%. See more in "Patch and voice allocation" on page 178.

Another way of adding modules to the patch is by right-clicking on the background of the patch window. A popup of the module groups appears. Select desired module by selecting it from the popup. The cursor gets a plus-sign next to it. Place the cursor where you want the module to be placed and click to drop the module.



Rename a module

Double-clicking on the name of the module lets you rename the module. You can also Right-click on the gray background of the module and select Rename.

Move a module

You can move the modules in the patch window by click-holding on its gray "panel" and move the frame that appears. Any connected cables will extend themselves and other modules will move out of the way automatically. You can also move several modules at the same time by placing the cursor on the patch window background and click-hold and mark the modules you want to move. Another way of selecting several modules is to Ctrl-click on the desired modules. The names of the selected modules are highlighted to indicate that they have been selected.

Delete a module

To delete a module from a patch, right-click on a modules background and select Delete. Note that all cable connections made to the module will also be deleted. You can also delete several modules by selecting them as described in the example above. Then right-click on one of the selected modules and choose Delete.

Patch connections

Inputs and outputs

There are two types of main connectors on the modules of Nord Modular: inputs and outputs. The inputs have circular, and the outputs have square connectors. You can not connect one input to another input, except when connecting a serial cable chain from one output to several inputs.

connector types

There are four different types of connectors that are used for different signals. These connectors are distinguished by different colors:

• audio signal connectors: Red

• control signal connectors: Blue

• logic signal connectors. Yellow

• slave signal connectors: Gray

Connecting cables in a patch

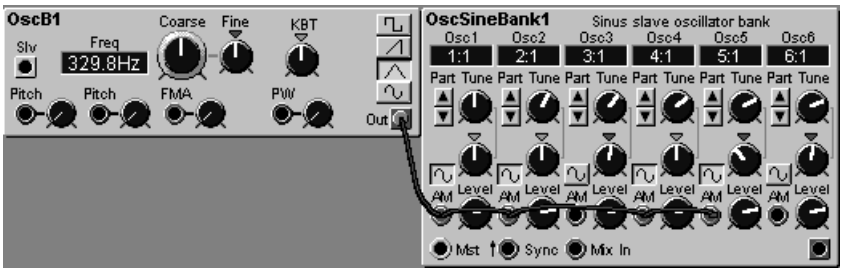
Place the cursor on a connection and click-hold. The cursor will change to a plug.

Drag the cursor to a suitable connection elsewhere in the patch. As you drag the cursor away from the source connector, it will change to an ordinary arrow with a line attached to it. When you reach the destination connector, the cursor will change back to a plug. As you release the mouse button, a cable will appear between the two connections. The color of the output connection will determine the color of the resulting cable. You can later change the cable color if you like.

It is also possible to connect cables between connectors of different colors, e.g. connect an audio signal output to a control signal input etc. This depends on the actual application. If a connection is not possible to make, this will be shown; the cursor will not change to a plug as you reach the "illegal" destination connector. It is not possible to damage the system in any way by connecting "wrong" - feel free to experiment!

You can connect one output to several inputs to make a branch connection.

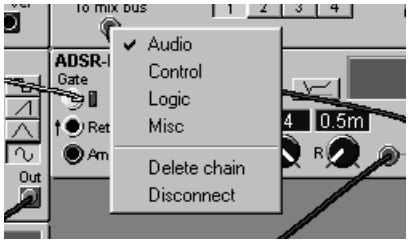
You can also make a serial connection, from input to input, provided that the first input in the chain is connected to an output. The result is exactly the same as in a branch connection. If a module within a serial cable chain is removed, the remains of the cable chain will be re-routed.



It is also possible to combine branch and serial connections in several ways. For example, you could have a serial connection branch off anywhere in the chain.

Disconnect or re-route cables in a patch

To remove a cable, right-click on a connection (input or output) and select Disconnect, or double-click-hold (left mouse button) or Ctrl-click (left mouse button) on a connection (an extra wire appears next to the connector cursor) and "pull out" the connector by dragging the connector symbol away from the input/output and release the mouse button.



Right-click *OR* *Double-click/Ctrl-click*

If you place the "disconnected" plug on another connection instead, the cable will be rerouted.

EDIT PARAMETERS IN A PATCH

FOCUS

A parameter can be a knob or a selector switch (button). When a parameter has been selected by clicking on it in the patch window, it will change color. This is called "putting a parameter in focus". A yellow hint box briefly shows, indicating the current parameter value/setting. Note that to be able to put a parameter in focus, the patch has to be active in the synthesizer.

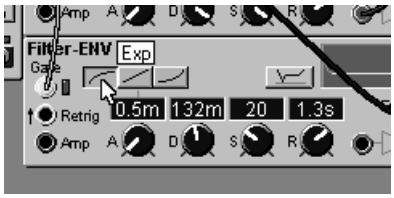
If Nord Modular (not Micro Modular) is in Edit mode (by pressing the **EDIT** button), the parameter will also be active in the Nord Modular **DISPLAY**, and you can adjust it with the **ROTARY DIAL**. You move the focus with the left and right **NAVIGATOR** buttons, or with the left and right arrow buttons on the computer keyboard, or by clicking with the mouse. The left and right **NAVIGATOR** and arrow buttons will only scroll through the parameters of one module.

To move the focus to another module in the patch, press and hold **SHIFT** on Nord Modular, then jump between the modules with the up/down/left/right **NAVIGATOR** buttons. The Ctrl key on the computer keyboard together with the arrow buttons have the same function. Note that you have to use the up/down arrow or up/down **NAVIGATOR** buttons to jump between modules that are placed above/below each other in the patch window.

EDITING

You can edit the parameters with the mouse. Place the cursor over a knob, click-hold it (put it in focus) and then move the mouse. The knobs have no end stops; you may jump from maximum to minimum by turning past the 6 o'clock position. When a knob is in focus, two small sections will appear beneath the knob. Clicking in the '+' section will increment the value for each click and clicking in the '–' section will decrement. Click on a selector switch to select e.g. a waveform of an oscillator. The selected button will be "depressed". If Nord Modular (not Micro Modular) is in Edit mode (by pressing the **EDIT** button), the highlighted parameter will also be active in the Nord Modular **DISPLAY**, and you can edit it with the **ROTARY DIAL**.

Editing a knob



Editing a button

Signals in the patch

Definitions

Just as in a traditional analog system, modules and parameters in Nord Modular interact with each other by means of signals being patched from one place to another. In a typical analog system, these signals are represented by voltages ranging from e.g. -10 to +10 volts. The signal levels in the Nord Modular system are represented by digital "units". Nord Modular uses four types of signals in its patches:

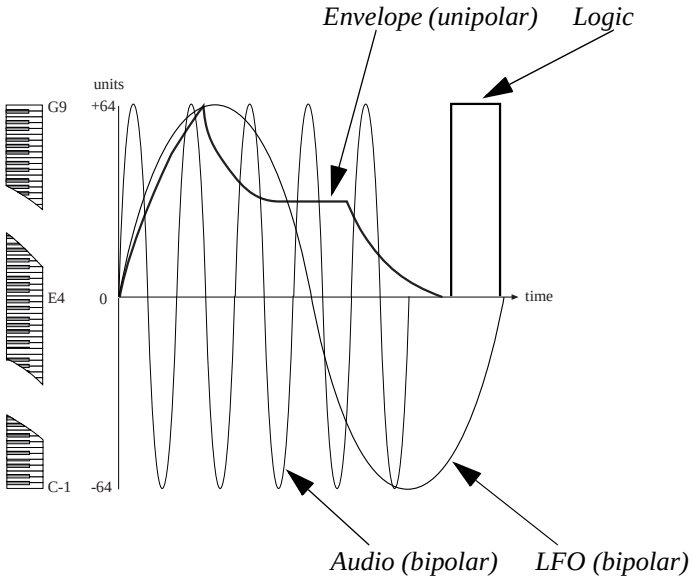
• bipolar audio signals

• bipolar and unipolar control signals

• logic (high or low) control signals

• slave module control signals (fix the coarse pitch between master and slave modules)

The illustration below shows the levels and the polarity of the signals from the keyboard, an LFO, an envelope, an audio signal and a logic signal.



The LFO is an example of a bipolar modulator. Bipolar means that it sends both positive and negative unit levels (peak to peak –64 to +64 units). The keyboard is another example of a bipolar modulator. The key E4 (MIDI note number 64) represents 0 units.

The ADSR envelope generator is an example of a unipolar modulator. It will only modulate in one direction, either positive or negative. In the case of Nord Modular ADSR envelopes, they range from 0 to +64 units.

The Clock generator is an example of a module that sends logic signals. A logic signal is also a unipolar signal but it has only two possible values, two states: low (0 units) or high (+64 units).

The types of output signals of each module in Nord Modular will be described further on in this manual using the definitions: **bipolar**, **unipolar** and **logic**.

Resolution and headroom

The internal resolution of the Nord Modular system is 24 bits. This ensures a supreme audio quality. The headroom of the audio signals in Nord Modular is -12 dB for every sound source. This means that if you mix more than 4 sound sources in a voice, at very high or un-attenuated levels, distortion may occur. This is easily dealt with by attenuating the levels of the sound sources.

The mix bus headroom of the output modules is -6 dB per bus. See the headroom diagram in "Headroom" on page 180.

The amplitude of the audio signals increases for each voice that you play. A monophonic patch with an amplitude that is perfectly within the headroom, might produce distortion in the Output modules if more voices are added and played together.

To determine where any unwanted distortion occurs, first try to lower the level on the Output module(s) in the patch. This action removes any mix bus related distortion. If this does not help, check the input signals to the mixers in the patch for possible distortion

Audio signals, red connectors

Audio signals are bipolar as described above. The audio signals in always uses full audio bandwidth, and they have highest priority in the Sound engines. Audio connectors are distinguished by the red color. Do not let the description "audio" stop you from experimenting with these signals. They can be used to modulate things too. You can, for example, patch the red audio output from an oscillator to the blue PW input of another oscillator.

Control signals, blue connectors

Control signals are sent from envelope generators, LFOs, the keyboard, sequencers etc. The control signals can be either uni- or bipolar. They are used to control or modulate parameters in a patch. The control signals use a quarter of the audio signal bandwidth. This is because they are often low-frequency signals by nature, and do not require a high bandwidth. The control signal connectors are distinguished by the blue color.

Logic signals, yellow connectors

Logic signals are used to clock, trig or gate different functions. They have two possible levels, low (0 units) or high (+64 units). The logic signals use the same bandwidth in Nord Modular as the control signals. Logic signal connectors are distinguished by the yellow color.

The state when a logic signal switches from 0 units to +64 units, is called the positive edge. When the logic signal change back to 0 units again, is called the negative edge. The logic inputs in the system can react to an incoming signal in four different ways. These are easily recognized by one of three symbols or the absence of a symbol, next to the input.

1. A logic input that responds to both edges of the logic signal has no symbol next to it. Please note that even though they respond to both edges, the response is not the same for the positive and the negative edge. An example of this is the Gate input on the ADSR envelope generator. This input "starts"

the envelope when the positive edge of a logic signal appears and "releases" the envelope when the logic signal switches back to 0 units again.

2. A logic input that reacts only to the positive edge has an arrow, pointing upwards, next to it. This is a typical behaviour of a clock input on a sequencer module or a clock divider. This input is only interested in the positive edges of a logic signal.

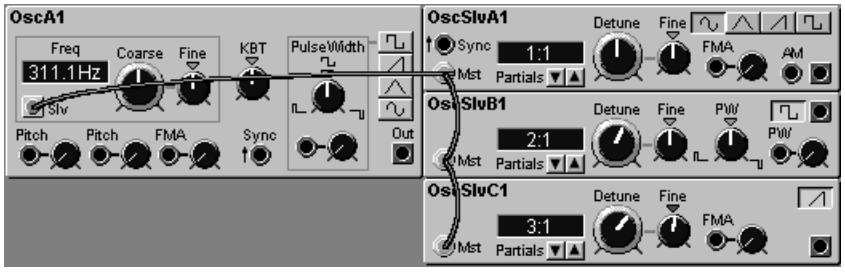
3. There are some logic inputs that will react to the positive edge of a logic signal only if there is a clock signal coming in to the module as well. These inputs have an arrow, pointing upwards towards a horizontal marker, next to them. The Rst input on the various sequencer modules is an example of this. These modules will reset in sync with the next clock signal (on the Clk input) when they receive a positive edge at the Rst input.

4. The logic Clock input on the Clock divider module is an example of an input that reacts the same way to both of the edges of an incoming logic signal. This input has a double-sided arrow next to it.

The different behaviors of the logic inputs are important to remember. It is possible to patch other signals than logic ones to the logic inputs. The output of a LFO, for instance, can be a good clock source or could be used to start envelopes. The logic input will not mind having a control or an audio signal connected to it. The logic inputs interpret any signal with a level of 0 units or less as a low signal and any signal with a level greater than 0 units as a high signal.

Slave signals, gray connectors

There are two types of oscillator and LFO modules in Nord Modular, masters and slaves. These two types of modules are equipped with gray connectors. A slave module must be connected to a master module to receive a frequency reference (the coarse pitch). In practice this means that the slave will follow the master as the frequency changes. A slave module can, however, act on its own without having to be connected to a master. In these cases the slave module transmits a steady frequency.



This signal is not particularly suited to connect to anything else in Nord Modular except another gray connection. The outputs are labelled “Slv” and the inputs are labelled “Mst”.

The master and slave concept

The concept of the master and slave modules is to help you reduce the load on the Sound engines. A slave module requires less Sound engine power, allowing for more modules in the patch, or more voices. They can also make your work a lot easier when building a multi-oscillator patch with one master oscillator and a couple of slaves. If you need to change the over-all tuning of the sound, this can be done for all the oscillators by just changing the master oscillator.

Bandwidth considerations

The two different bandwidths of the signals in Nord Modular are important to keep in mind. You can patch a red audio output to a blue control input and vice versa but sometimes the results might be surprising. Some of the LFOs are capable of producing audible frequencies. Since the output of an LFO is a control signal, updated at the quarter-speed of an audio signal, the quality of an LFO generated signal might not be good enough to be used as an audio signal. If high audio quality is important in a patch, use oscillators as audio signal generators instead. The LFOs can, however, provide excellent signals to be used as a frequency modulators in an FM-type patch. Another example could be the Control Mixer, which could be used to mix audio signals, but with a lower sound quality.

Experiment

You can always try to patch the three different types of signals to wherever you want. You may run into situations where the result of a connection will not be what you expected, but that is part of the beauty with a modular system like this. A blue control signal output can be very useful modulating on a yellow logic signal input, and an audio signal output can certainly produce interesting results connected to a control signal input. The colors are only there to help you identify the various signal types, not to restrict any experiments.

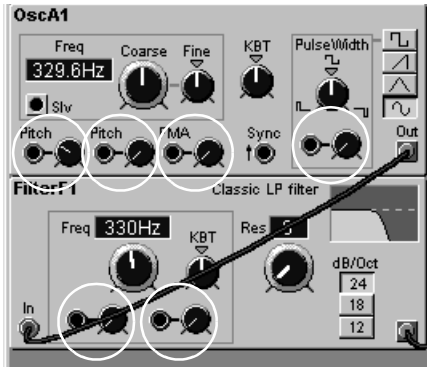
Modulation

The method of controlling one function in a module with another function is called to "modulate". When you play on a keyboard and the oscillator changes its pitch, you are modulating the pitch with the keyboard signal. Another example is an envelope opening up a filter when a key is pressed. Logic signals from the keys tell the envelope to start modulating the cut-off frequency of the filter. Modulation can be positive or negative, e.g. the cut-off frequency of a filter can increase with positive modulation and decrease with negative modulation.

As you will see, there are some modules in Nord Modular that can change the polarity of a modulator signal. Some modules can be set to send either bipolar or unipolar control signals, like the Constant module or the Control Sequencer module.

Modulation inputs

A module that has parameters that can be modulated has modulation inputs with a modulation amount control. This is called a mod-input. The modulation amount control attenuates the incoming signal. The mod-inputs can be red, as in the OscillatorA module, which means it is capable of receiving signals at full audio bandwidth, or they can be blue, as in the FilterF module, working at 1/4 audio bandwidth.



When a modulation signal is routed to a mod-input, the setting of the parameter to be modulated has to be considered to be able to predict the result.

Mod-amount knobs (attenuators)

There are three different response behaviors of the mod-amount knobs in Nord Modular: linear (Type I), exponential (Type II) and amplified linear (Type III). The response type(s) will be indicated for each module in the module reference section starting on page 81.

[Type I]

The mod-amount knobs attenuates the incoming signal in a linear fashion. A setting of 127 (maximum) leaves the incoming signal unaffected, a setting of 64 attenuates the incoming signal by a factor 0.5 (leaving half of the level of the incoming signal to modulate). A setting of 0 shuts off the modulation completely. The pulse width in the aforementioned scenarios is an example of Type I attenuation.

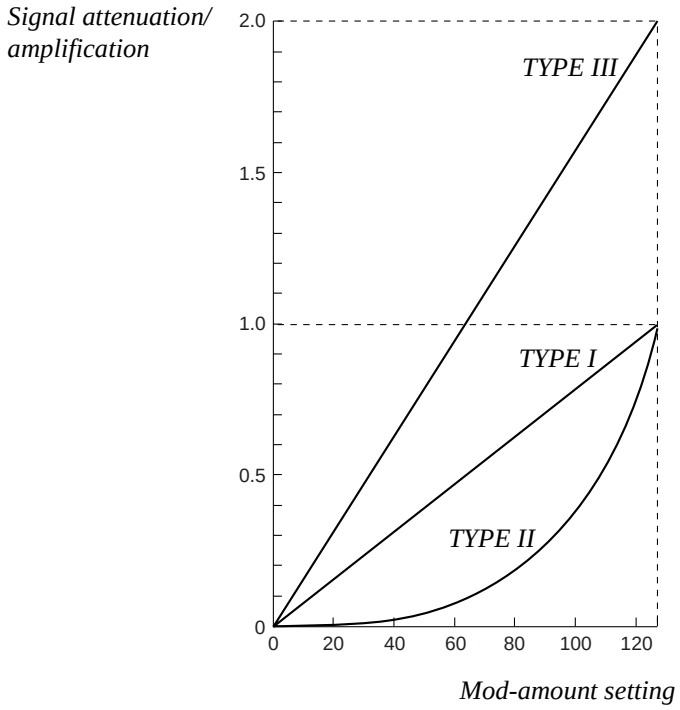
[Type II]

The mod-amount knob attenuates the incoming signal in an exponential fashion. A setting of 127 (maximum) leaves the incoming signal unaffected, a setting of 64 attenuates the incoming signal by a factor considerably less than 0.5 (leaving less than half of the level of the incoming signal to modulate). A setting

of 0 shuts off the modulation completely. The pitch mod-input on the various oscillators are examples of Type II attenuation.

[Type III]

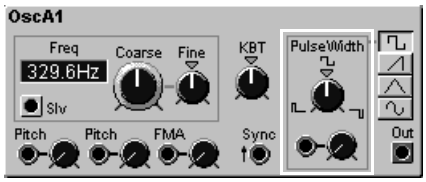
The mod-amount knob affects the incoming signal in an attenuated and amplified, linear fashion. A setting of 127 (maximum) amplifies the incoming signal to twice its original level, a setting of 64 leaves the incoming signal unaffected and a setting of 32 attenuates the incoming signal by a factor of 0.5 (leaving half of the level of the incoming signal to modulate). A setting of 0 shuts off the modulation completely. The frequency mod-input on the various filters are the sole examples of Type III attenuation.



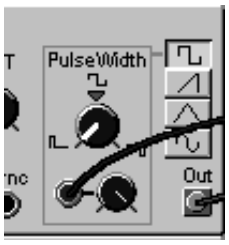
Modulation examples

Pulse width modulation

Let us use the pulse width on the OscillatorA module as an example in two scenarios:

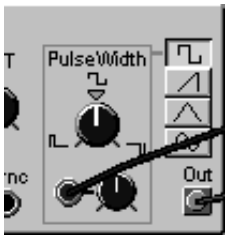


1. If you want to modulate the pulse width from the minimum value (1%) to the maximum value (99%) with a positive envelope (that produces a control signal with a peak to peak level swing from 0 units to +64 units), set the initial pulse width to 1% and the mod-amount to 127.



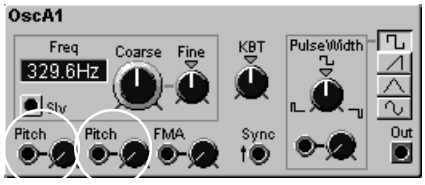
2. If you want to modulate the pulse width from the minimum value (1%) to the maximum value (99%) with an LFO (that produces a bipolar control signal with a peak to peak level swing from –64 units to +64 units), set the initial pulse width to 50% and the mod-amount to 64.

   Increasing the setting of the mod-amount can not push the pulse-width beyond the limits (1% – 99%), but it will make the modulation signal reach the maximum/minimum pulse-width earlier. A mod-amount setting of 127 would result in maximum pulse-width modulation at a control signal of +/– 32 units.

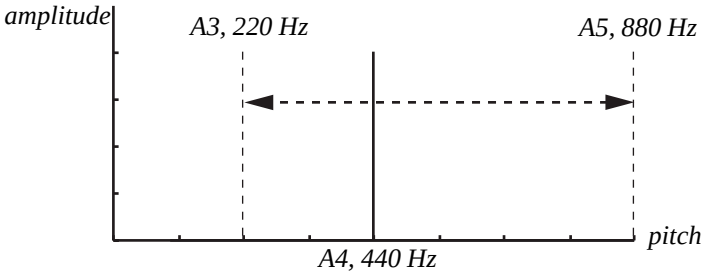


Note the difference between the total amount of modulation from an envelope (unipolar, 64 units) and from an LFO (bipolar, -64 to + 64 units = 128 units). This explains why the first scenario has the mod-amount set to 127, and the second scenario set to 64 for maximum modulation.

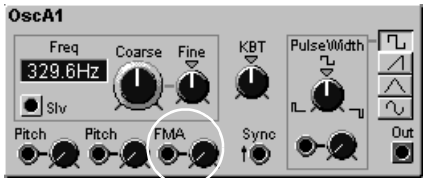
Pitch modulation



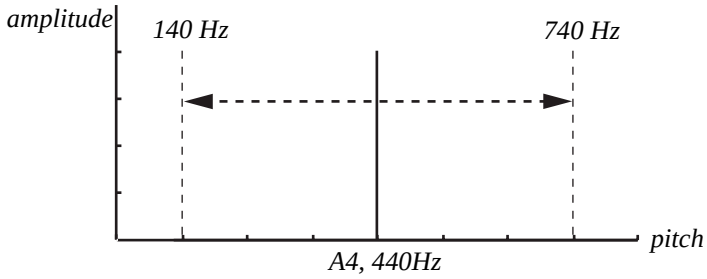
A signal routed to a Pitch input on a module affects the pitch by modulating it linearly in the **note** scale (see figure below). The figure shows an A4 note being pitch modulated by a symmetric bipolar signal.



Frequency modulation (FM)

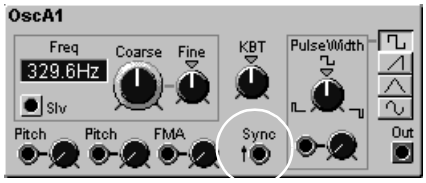


A signal routed to a FM input on a module affects the pitch by modulating it linearly in the **frequency** scale (see figure below). The figure shows an A4 note being pitch modulated by a symmetric bipolar signal.



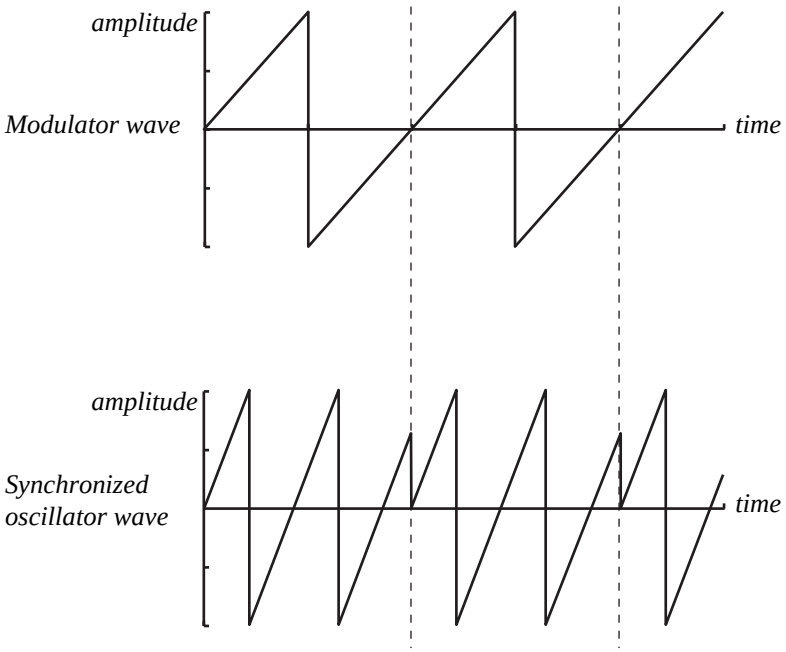
As you can see, FM modulation results in equal pitch shifting, in Herz, on either side of the basic pitch, whereas Pitch shifting is "locked" to equal shifting in the note scale.

Sync



A waveform of an oscillator with a Sync input can be synchronized with a wave of another oscillator. The synchronization forces the wave to restart each time the modulating wave raises above 0. This results in a complex waveform that depends both on its own pitch and on the modulator pitch. When sync is used, the oscillator pitch is locked to the modulator pitch. If you change the modulator pitch, you will affect

the overall pitch, and if you change the oscillator pitch, this will create changes in timbre rather than in pitch.



If you let the synchronized oscillator pitch vary continuously, from an LFO or other modulator, you will change the timbre of the wave in a very interesting and characteristic way.

Maximum modulation

The maximum amount of modulation that a module (with one exception) can accept is +/–64 units from the initial setting of the parameter. The exception to this behaviour are all the Filter frequencies with a mod-input. These can accept +/–128 units of modulation. The modulation amount is the sum of all modulation appearing at the modulation inputs.

Let us use the Master Oscillator module as an example: there are two pitch modulation inputs and the KBT function (see "The KBT parameter" on page 41). The total modulation amount of these three inputs can not be greater than +/–64 semitones. If you turn the coarse tuning down to e.g. E0, add a transpose value of +64 with a Constant module to the first pitch-mod input, you will reach a point, when playing on the keyboard, where the pitch of the oscillator will be fixed. Any additional, positive modulation will have no effect, which could lead to interesting effects. For example, an LFO would be able to modulate the pitch of the oscillator downwards, but not upwards.

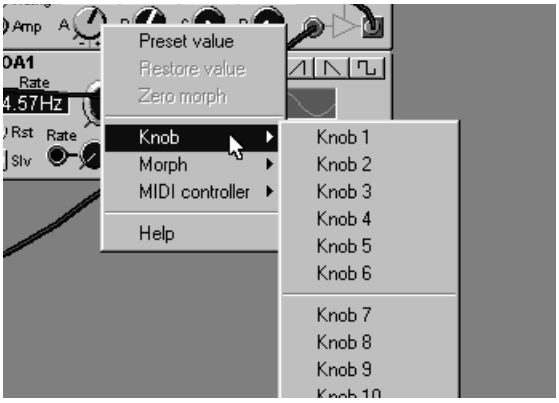
KNOBS AND CONTROLLERS

The 18 KNOBS on the front panel of Nord Modular (3 KNOBS + 1 button on Micro Modular) are useful sources for modulation. Also control- and on/off pedals can be used for modulation (not on Micro Modular). The KNOBS and controllers can be assigned to almost any parameter in Nord Modular. They can also become an important part of the patch itself, controlling, for example, a mod-amount in real time, or affecting the entire path of a signal by controlling a switch module or a mixer.

ASSIGN A KNOB TO A PARAMETER

A parameter can be either a continuous parameter (knob), or a selector switch (button). There are two ways of assigning and deassigning a KNOB to a parameter.

1. Right-click on a parameter in the Editor window, select Knob from the popup menu and select one of the Knobs in the menu.



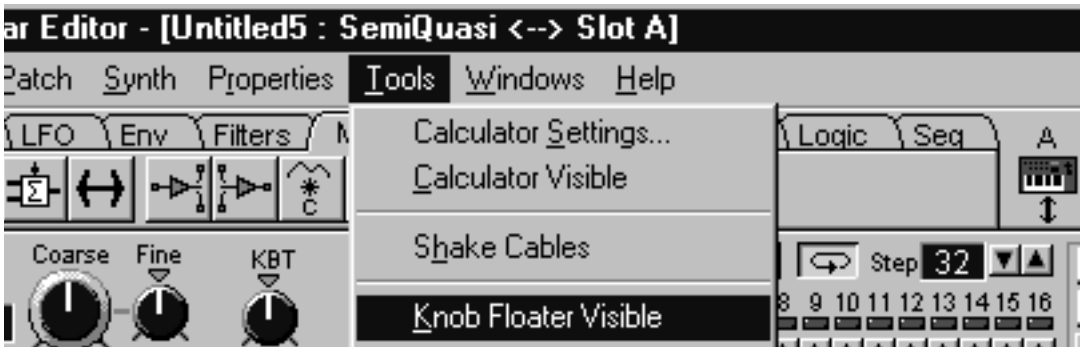
To deassign a KNOB, select No Knob at the bottom of the popup menu. You can also re-assign a KNOB by selecting another (unused) Knob in the popup menu. This method also allows you to assign the other available, external controllers (Pedal, After touch and the On/Off switch) to a parameter. These controllers are found at the bottom of the Knob list.

2. (Not Micro Modular) Put a parameter in the Editor window in focus, press the EDIT button on the front panel, press and hold the ASSIGN button and turn a KNOB. The LED next to the KNOB will light up, indicating an assignment. To deassign a KNOB, press the SHIFT button and turn the KNOB

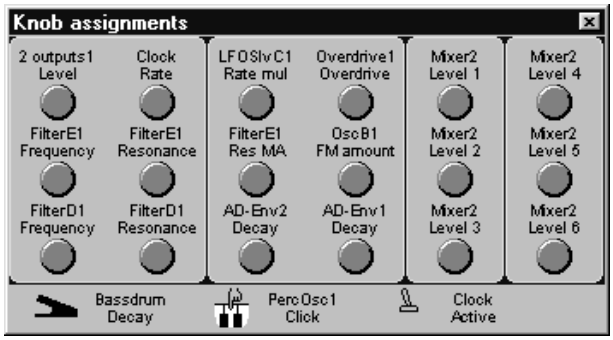
A KNOB or a controller will always control the entire range of a parameter. If you need to control the range as well, use a Morph group instead. The Morph concept is described in "Morph groups" on page 37.

The Knob Floater

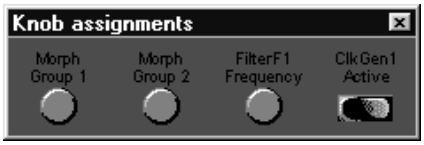
The Knob Floater is a floating window which gives you a visual indication of the parameters currently assigned to a **KNOB**, button or controller. Bring up the Knob Floater by selecting Knob Floater Visible from the Tools menu.



This is a floating window, meaning it can be positioned anywhere in the patch window. The module and parameter names are displayed above every assigned knob.



Nord Modular

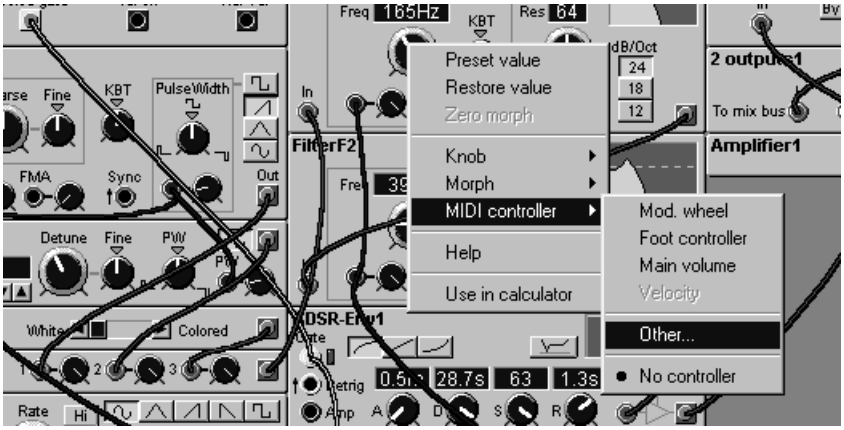


Micro Modular

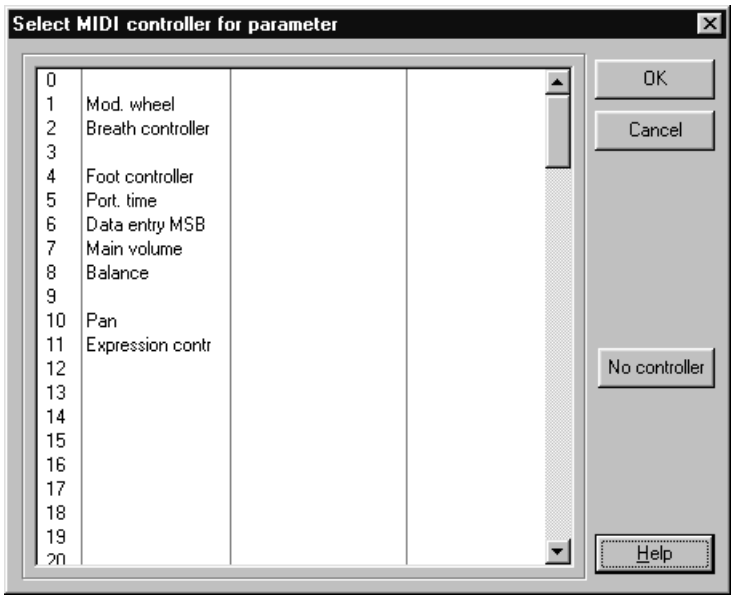
MIDI CONTROLLERS

Almost any parameter in the different modules can be assigned to a MIDI controller number. This is very useful if you want to record filter frequency adjustments to an external sequencer or if you want to control external devices from the **KNOBS**. When a parameter is assigned to a MIDI controller, the parameter will transmit MIDI data when being edited, as well as receive data from external MIDI sources (sequencer, master keyboard, etc.).

Right-click on a parameter and select MIDI controller from the parameter popup. Here you can choose either to assign the parameter to one four pre-defined controllers or to assign to another controller by selecting Other.



Choose Other and pick a MIDI controller from the list that appears.



Some of the MIDI Controllers have designated functions, like controller 1, Modulation Wheel. These functions are just labels to Nord Modular. You are free to assign any of the 120 MIDI controller numbers to any parameter. If you want to control external MIDI devices, these labels may have greater importance.

When you edit a parameter that is assigned to a MIDI controller, it will transmit MIDI controller data. It does not matter if you edit the parameter from the Editor or on the synthesizer with the **ROTARY DIAL** (not Micro Modular).

You may also assign a parameter to a **KNOB** as described earlier. In that a case, turning a **KNOB** will result in editing the parameter, which subsequently generates MIDI controller data. De-assign a parameter from a MIDI controller by highlighting a controller and clicking No controller in the dialog box.

USING THE KNOBS AS MIDI CONTROLLERS

If you want to use one or several **KNOBS** to exclusively transmit MIDI controller data to external devices, you will need to take a detour and assign the **KNOBS** to parameters on modules that are not used (connected) in the patch. Then assign the parameters to MIDI controllers. Very useful for this purpose is the Constant module (see page 155), which does not use any Sound engine resources. You determine which MIDI channel to use in the Synth Settings menu. Read more about MIDI channels in "MIDI channels" on page 50 and page 65.

MORPH GROUPS

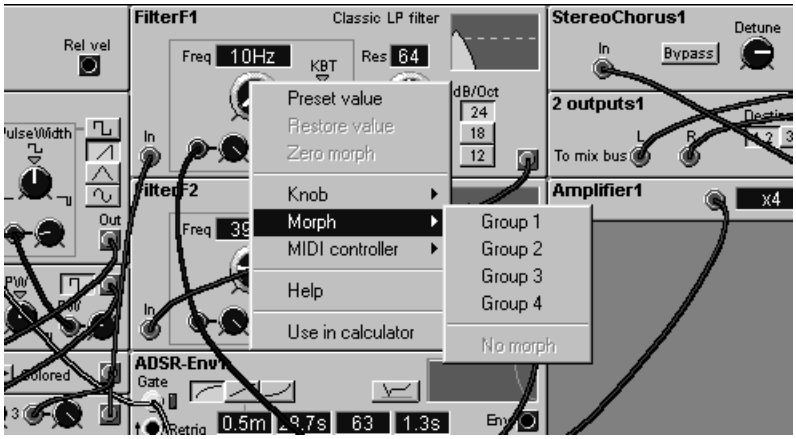
The Morph group concept of Nord Modular is a very powerful feature. To put it simple: a Morph group lets you simultaneously control defined ranges of up to 25 parameters in a patch, using only one control source (a **KNOB** or a MIDI controller, for example). As you have figured out, this lets you produce radical changes in a sound in a very easy way.

There are four Morph groups available in each patch, and you may assign up to 25 different parameters, distributed as you wish among the four Morph groups. Every parameter assigned to a Morph group should also be assigned to a Morph range.

Here is an example on how to assign a parameter to a Morph group:

1. Add the Morph module to a patch. You can only have one Morph module in a patch. The Morph module is found in the In/Out tab.

2. Right-click on a parameter (knob or a selector) you wish to control with a Morph group. Almost any parameter in Nord Modular can be morphed. Select Morph and one of the four Morph groups from the menu. The color of the selected knob will now change to gray.



3. Press and hold the Ctrl key on the computer keyboard and place the cursor on the knob that you assigned to the Morph group. Click-drag the cursor as if you were turning the knob. A red slice will appear, indicating of the Morph range. The range will also appear in a yellow hintbox above the parameter. You can also double-click-hold on a parameter that is assigned to a Morph group to set the range.

If you assign a selector switch (button) to a Morph group, the Morph range will be set by holding down the Ctrl key and clicking on the button in the selector that should be the "last" (end limit) to be controlled by the Morph.

4. Turning the Morph group knob on the Morph module will now control the "morphed" parameter within the selected range.

You can assign a Morph group knob to e.g. a **KNOB** on the front panel, a pedal (not Micro Modular), an external MIDI controller, or, as an exclusive feature of the Morph group knobs, to MIDI note values or keyboard velocity. You will find these two options at the bottom of the MIDI controller list. To deassign a parameter from a Morph group, right-click on it and select No Morph in the Morph menu.

EDITING THE MORPH RANGE

The Morph range will always start at the current position of a knob, slider or selector. The relationship between the setting of the parameter and the Morph range will be fixed, even if you move the setting of the parameter after a Morph range has been set.

You can edit the morph range (the size of the slice) by double-clicking on the parameter or by using the mouse in conjunction with the Ctrl key on the computer keyboard. Another way is to put Nord Modular in Edit mode by pressing the **EDIT** button (not Micro Modular). Put the morphed parameter in focus and simultaneously press- hold the **SHIFT** and **ASSIGN** buttons and set the amount of Morph control with the **ROTARY DIAL**.

VISIBLE MORPH GROUPS

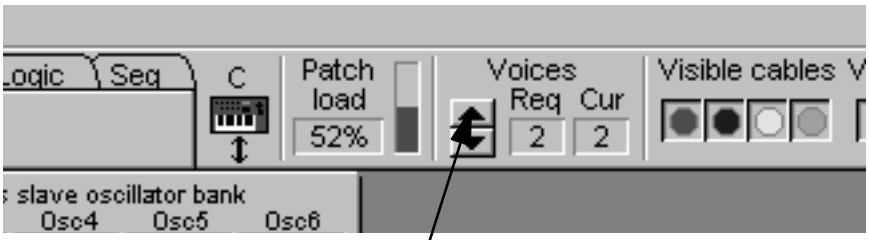
If you assign a lot of parameters to the Morphs groups, it could be useful to visually separate these groups from each other. This can be done by selecting which group or which groups should be visible. Select the group(s) on the tool bar.

You can also get a read-out of any parameters assigned to the four Morph groups by pressing the F7 function key on the computer keyboard.

Voices, mono- and polyphonic patches

A patch can be set to a polyphony between 1 and 32 voices, as long as there is enough Sound engine power available. It is not necessary to duplicate all the modules and settings for each voice to create a polyphonic patch, as it would be in a traditional modular system. All you have to do is change the requested polyphony in the toolbar of the Editor, in the Patch|Patch Setting menu or in the Nord Modular synthesizer (not Micro Modular).

The current actual polyphony of a patch is displayed beside the requested polyphony figure, and in the Nord Modular **Display** (not Micro Modular) in Patch mode (press the **Patch/Load** button). Should your request for polyphony exceed the current capacity of the Sound engine(s), the system assigns the highest possible amount of voices to the patch instead.



Set the requested number of voices by clicking the up/down buttons. The requested number of voices is shown in the 'Req' box and the current actual number of voices is shown in the 'Cur' box.

See the current actual number of voices allocated to the patch

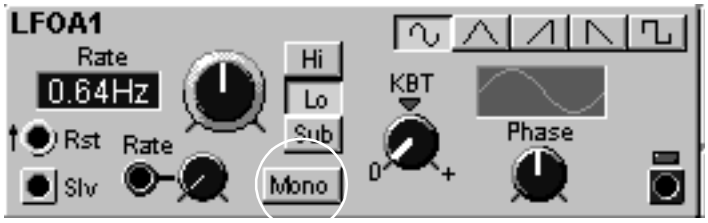
All patches must have a requested number of voices assigned to them. The dynamic allocation method used by other multitimbral hardware synthesizers is not applicable with Nord Modular.

You can adjust the polyphony by selecting a **Slot**, press the **Shift** button and turn the **Rotary Dial** (not Micro Modular). This can be useful if you have a couple of patches loaded to several **Slots** and wish to reallocate the polyphony among the patches.

The Nord Modular note recognition system operates according to the "last note" principle. If you run out of polyphony and continue to play notes, the synthesizer will always add the last note played and remove the first note, with one exception: it will try to keep the lowest note sounding.
See also "Sound engine" on page 178 for more information about the relationship between voices and Sound engine power.

The Mono parameter

If you change a monophonic patch to be polyphonic, there are a few things that you need to be aware of. All modules in the polyphonic patch are independent from each other, performing their functions on a "voice" level. This provides you with a big advantage in comparison to almost any other polyphonic synthesizer. If a traditional polyphonic synth had e.g. 4 voices, it has been common practice to provide the user with only one LFO for all voices. This is not the case with Nord Modular. The LFO of one of the voices in a polyphonic patch is independent from the LFOs of the other voices in the patch.



If you want modules in a polyphonic patch, e.g. 4 LFOs in a 4-voice patch, to be synchronized and behave like one single LFO, this can be done with the Mono parameter. The Mono parameter makes sure that certain functions in a polyphonic patch are "in sync" with the other voices.

The KBT parameter

KBT is short for KeyBoard Tracking. The KBT parameter controls the frequency step response from a keyboard to the module (e.g. the master oscillators, some of the master LFOs and some of the filters). In the oscillator modules, the keyboard can track the pitch, in the LFO modules the keyboard can modulate the rate of the LFO and in the filter modules, the keyboard can track the cut-off frequency. When the KBT parameter in these modules is set to Key (the 12 o'clock position), the keyboard controls the parameter at the rate of one semitone for each key.

Any pitch bend appearing at the MIDI input will be added to the KBT tracking. Read more about scaling the pitch bend in "Bend range" on page 52. If you, for instance, set up a sequencer patch, with KBT active on the oscillators, you can transpose the sequence in realtime by pressing keys on the Nord Modular keyboard. If any filters in a patch have the KBT parameter active, the cut-off frequency will also track the keyboard.

5. Panel reference

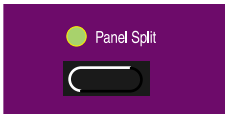
Knobs and buttons of Nord Modular

Master Volume

Adjust the master volume of Nord Modular with this knob. Note that this knob cannot be routed to MIDI Volume or any other controller. It is separated from the rest of the parameters of the synth. To affect the volume from MIDI you have to assign a controller to any of the Level rotary knobs of the output modules (see more about these modules on page 84).

Panel Split

Pressing the **Panel Split** button splits the 18 **Knobs** in four groups, one for each of the Slots **A**, **B**, **C** and **D**. The **A** and the **B** slot will be assigned to six **Knobs** each, the **C** and **D** slot will be assigned to three. The first six or three assigned **Knobs** of each patch will be rerouted to the **Knobs** of the different groups. For example, a patch in slot **C** that originally had parameters assigned to **Knobs** 1-3, will now have them reassigned to **Knobs** 13-15. The Panel Split knob assignment is only temporary for as long as **Panel Split** is active. The original knob assignment in the patch will not be changed.



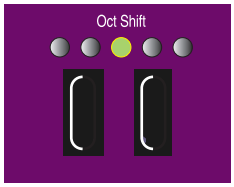
Find/Panic

When a parameter is assigned to a **Knob**, the indicator next to the **Knob** is lit. Pressing and holding **Find** and turning the **Knob** will show the parameter in the **Display**. The arrows that appears will help you to set the physical position of the **Knob** to coincide with the actual setting of the parameter in the patch. As long as you hold down the **Find** button, the value of the parameter will not change. If Nord Modular is in Edit mode, the parameter will stay in focus in the **Display** when you release the **Find** button.

Pressing **Shift**+**Find** activates the panic function. This will send a note off message to all the voices in Nord Modular. Sound sources that are connected directly to an output will not be affected by the **Panic** function.

Oct shift (keyboard version only)

You can quickly transpose the Nord Modular keyboard in octave steps with the **Oct Shift** buttons. The total range of the two-octave keyboard can be extended to six octaves. You can transpose the patches in the four slots individually. This transposition is saved with the other parameters of a patch. The **Oct Shift** buttons are an exclusive feature on the keyboard version only. The MIDI output from Nord Modular is also affected by the **Oct Shift** buttons.

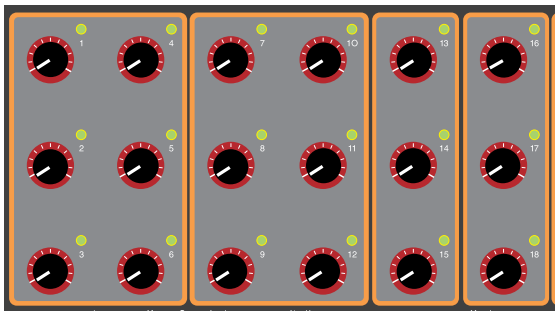


MIDI trig LED (rackmount version only)

The **MIDI trig LED** indicates incoming MIDI messages on the MIDI channels Nord Modular is set to receive.

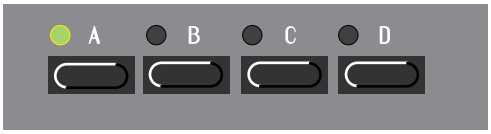
Knobs

The 18 **Knobs** can be assigned to parameters in a patch. The parameters will then be controllable in real time. When a **Knob** is assigned the **Knob LED** is lit. The **Knobs** can also be set to send MIDI controller messages. If you want a **Knob** to control external MIDI devices, without affecting any parameter in Nord Modular, assign the **Knob** to a parameter in a "dummy" module (that is not a part of the sound in the patch) and assign that parameter to the MIDI Controller you wish to transmit. Read more in "MIDI controllers" on page 36.



Slot buttons

Pressing the **Slot buttons A**, **B**, **C** and/or **D** selects the slots for loading, editing or playing. A patch always has to be loaded into a slot, before it can be used. If you select only one slot at a time, the **Slot LED** will indicate this with a solid green light. The Editor software will follow the slot selection (change patch window), provided that the patch is uploaded or opened in the software.



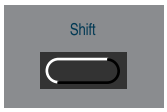
If several slots are selected, by simultaneously pressing several SLOT buttons, a solid green LED will indicate a selected slot and a flashing LED will indicate the currently active SLOT. Every selected SLOT will receive MIDI messages on their set channels, but only the active SLOT will transmit MIDI messages.

To deselect SLOTS in a multi-slot setup, press SHIFT and the SLOT(S) you want to deselect. To deselect all SLOTS simultaneously, you can also press an unused SLOT button (if there are any).

It is also possible to play several Slots simultaneously (layered) from the keyboard. To do that you must first change keyboard mode to "Selected Slots" in "Keyboard mode" of the Synth Settings menu. See "Keyboard mode" on page 49.

SHIFT

The SHIFT button adds secondary functions to other buttons.



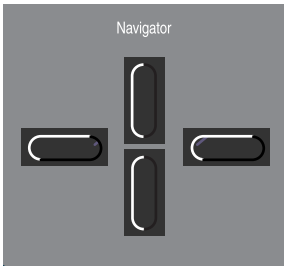
ASSIGN/MORPH

The ASSIGN/MORPH button allows you to assign a parameter in a patch to be controlled by one of the KNOBS. Press and hold assign while the desired parameter is in focus and turn a KNOB. Nord Modular must be in edit mode when you make a KNOB assignment. To deselect a KNOB assignment, turn a KNOB while pressing SHIFT.

SHIFT+ASSIGN allows you to edit the Morph range of the parameter in focus (if it is assigned to a Morph group). Edit the Morph range with the ROTARY DIAL. See more about Morph in "Morph groups" on page 37.

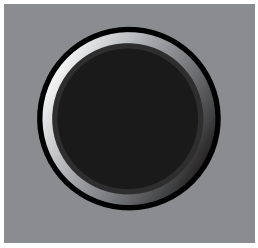
NAVIGATOR BUTTONS

The NAVIGATOR buttons are used to select menus and parameters in the menus. When Nord Modular is in Edit mode, you select parameters within a module by scrolling with the left and right NAVIGATOR buttons. Pressing the SHIFT+NAVIGATOR buttons to set the focus on different modules in a patch, on screen as well as in the DISPLAY.



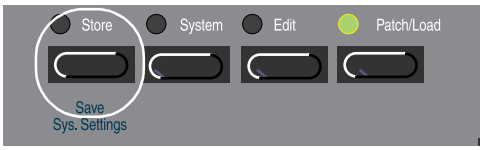
ROTARY DIAL

The **ROTARY DIAL** is used to enter parameter values. Pressing either the left or right **NAVIGATOR** button while turning the **ROTARY DIAL** will scroll through the parameters of a module, one parameter for each step of the **ROTARY DIAL**. Scroll through the menus in Nord Modular by using the up an down **NAVIGATOR** buttons together with the **ROTARY DIAL**.



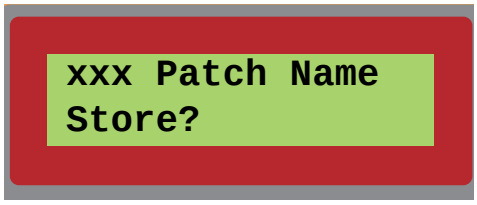
STORE

There are 100 patch memory locations and one Synth Settings memory in the Nord Modular. The **STORE** button allows you to store patches and the Synth Settings.



1. Make a slot with a patch active with the slot button. If the **EDIT** or **SYSTEM LED** is lit, press the **PATCH/LOAD** button once. **You can not store any patches if Nord Modular is in System or the Edit mode.**

2. Press **STORE** once. The **STORE LED** will flash.



3. Select a memory location with the **ROTARY DIAL** and confirm by pressing **STORE** one more time. Pressing any other button will cancel the operation. It is possible to name your patch. The name can be set in the Patch menu.

The Memory Protect function must be turned Off before storing a patch. If not, the following message will appear. Read about memory protection (de)activation in "Memory Protect" on page 51.

If a memory location is occupied by a patch, you will see the name of that patch in the DISPLAY. Pressing STORE will overwrite an existing patch.

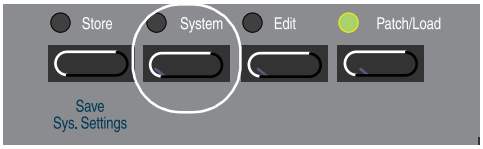
Saving a patch in the Editor software is a completely different operation. This procedure will save a patch only on the computer. See "Save" on page 58.

SAVE SYNTH SETTINGS

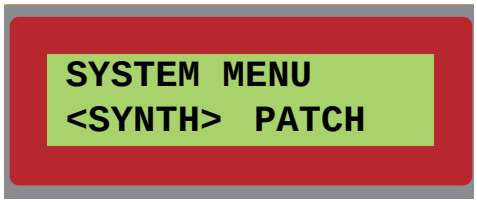
Pressing SHIFT+STORE will store any settings that you have made in the Synth Settings menus of Nord Modular or in the Editor. This function saves the SLOT selection including the patch locations that were loaded to the SLOTS, MIDI channels for the SLOTS and PANEL SPLIT activation. The settings saved with SAVE SYNTH SETTINGS will automatically be recalled when you turn on the Nord Modular. The Synth Settings menus will be described further in "Synth settings in the system menu" on page 47 and page 64.

SYSTEM BUTTON

Press the SYSTEM button below the DISPLAY, to activate the System menu.



Scroll to the desired menu with the NAVIGATOR buttons and enter a value with the ROTARY DIAL.



The System menu is divided in two main parts, Synth- and Patch settings. Every parameter in these two parts are automatically duplicated in the Editor.

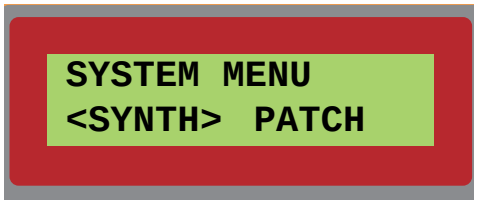
SYNTH

The Synth settings are global, affecting the whole instrument.
If you want to keep any changes that you make in Synth settings, they must be stored in the Synth Settings memory by pressing the SHIFT and the STORE buttons simultaneously. If you use Nord Modular in a multitimbral setup with a sequencer, it can be very useful to store the settings of the MIDI channels etc. in the Synth Settings memory.

Patch

The Patch settings affect the patches in the **Slots** individually and are stored together with the rest of the patch data when you store the patch in the Nord Modular memory or on a computer disk from the Editor.

Synth settings in the system menu



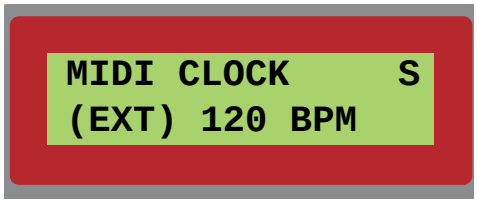
As mentioned above, the Synth Settings are global. To alert you that you are editing Synth Settings, an S is always shown in the upper right corner of the **Display**. Navigate between the sub-menus with the up/down **Navigator** buttons and within the sub-menus with the left/right **Navigator** buttons. Enter data with the **Rotary Dial**.

Master Tune

Use this function to tune Nord Modular to other instruments. The range is from +100 to -100 cents. 100 cents is one semitone. Only the tuning of master oscillators are affected by the Master Tune function. Slave oscillators that are not connected to a master oscillator module will not be affected.

MIDI Clock

Set the MIDI Clock source and, if the clock source is set to INT (internal), set the tempo.

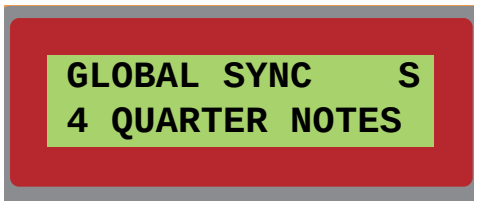


If EXT(external) is selected, any incoming MIDI clock can be used as a clock source in a patch. If INT is activated, the internal clock will be used. Navigate to the tempo indication and set the tempo with the rotary dial.

The MIDI clock will be present at the Clock output of the MIDI Global module and at the synthesizer's **MIDI Out** port.

Global Sync

The MIDI Clock transmits 24 pulses per quarter note. The clock pulses can be divided with this function and be sent as logic signals at the Sync output of the MIDI Global module (see picture above). These logic signals can be used to synchronize the internal sequencer modules to an external MIDI sequencer.



A setting of "4 QUARTER NOTES" will result in one logic Sync pulse for every 96 pulses from the Clock, which is equal to one pulse for every fourth quarter note.

This logic pulse can be used for resetting the sequencer modules in Nord Modular to the "first beat in the bar". If you do not use this function, the sequencer modules have no chance of knowing where they are in a bar. With the Global Sync function activated, it will never take longer than the set number of quarter notes for the sequencer modules to realign themselves, if you decide to start a MIDI sequence in the middle of a song.

If you are synchronizing Nord Modular to an external MIDI Clock source, this function will keep track of any incoming MIDI Song Position Pointer messages.

Local

Turn the MIDI Local Control on or off.

Select Local On to be able to control Nord Modular from the internal keyboard and the pedals. MIDI data is also transmitted via the **MIDI OUT** port.

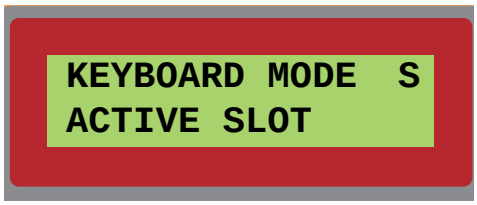
In the Local Off mode, the keyboard and pedal actions are transmitted only via MIDI and do not control Nord Modular itself. Local Off should be used with external sequencers as the **MIDI OUT** port of Nord Modular is routed back, via the external sequencer, to the **MIDI IN** port. If Echo is active in the sequencer program, double notes will occur when playing the keyboard in Local On mode.

Program change

In this sub-menu you select how Nord Modular should handle Program Change MIDI messages. Choose between Off, Send and Receive, Send only or Receive only.

Keyboard mode

Here you choose how the Nord Modular keyboard should control the SLOTS. With Active Slot selected, the keyboard will control only the patch of the active slot, and with Selected Slots activated, all selected slots are controlled. Use the last function to simultaneously play several selected SLOTS "layered".

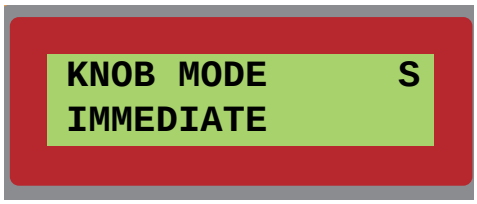


Pedal polarity

Some sustain pedals uses inverted polarity to activate the sustain switch. In this menu you can select between the different sustain pedal polarities.

Knob mode

Here you set how Nord Modular should react to changes of the 18 assignable KNOBS. Immediate means that the value of the assigned parameter will change immediately as you turn the KNOB. Hook means that the parameter value will not change until you have turned the Knob past the current parameter setting.

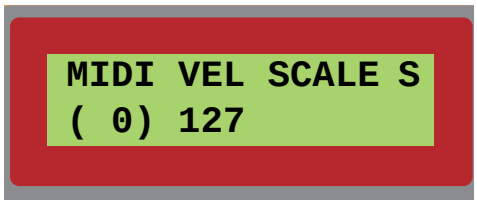


LEDS ACTIVE

When a patch gets complex, the LEDs of modules like the LFOs or Sequencers could become inaccurate in the Editor patch window. A lot of blinking LEDs could also slow down the computer. Select NO to disengage the LEDs in the patch window.

MIDI VEL SCALE

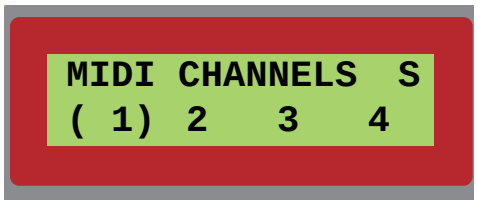
This function is used to rescale the velocity data received at the **MIDI IN** port.



The number to the left is the minimum value and number to the right is the maximum value. If your master keyboard transmits maximum velocity as 112, set the maximum value to 112. This ensures that the velocity response from Nord Modular will properly reflect the velocity transmission of the master keyboard.

MIDI CHANNELS

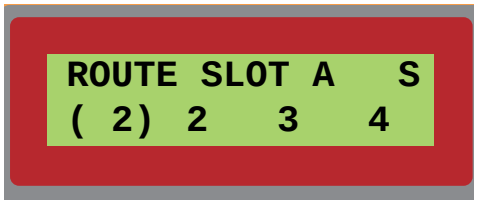
Set the MIDI channel for each **SLOT** (A-D). The set channels will be used for receiving and transmitting MIDI data.



If you select '--' the slot will not receive or transmit any MIDI data at all.

ROUTE SLOT A, B, C, D

Routes the virtual mix buses in the four **SLOTS** to the physical **OUT 1**, **2**, **3** and **4** on the rear panel of Nord Modular. Mix buses routed to outputs 1 and 2 will also be routed to the headphones output. The first **position** in the **DISPLAY** is mix bus 1, the second is mix bus 2 etc. All four mix buses can be routed individually for each **SLOT**. In the display below, mix bus 1 of Slot A is routed to the physical **OUT 2** port.

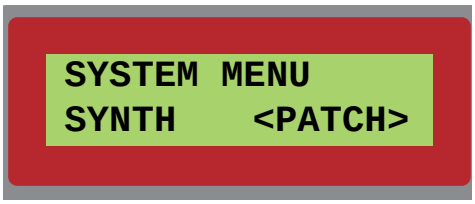


The four mix buses are found on the Out modules of the In/Out tab in the Editor patch window (see the example below).

Memory Protect

Select memory protection ON or OFF for the entire internal patch memory.

Patch settings in the system menu



These functions affect the individual patches loaded into the SLOTS of Nord Modular. Select a patch to edit by loading it into a SLOT. The changes you make in a patch will be stored/saved in Nord Modular or in the computer together with each patch after having selected STORE or Save. (Note that it is possible to jump between the four SLOTS in any of the sub-menus if you wish.)

To alert you that you are editing Patch Settings, a P is always shown in the upper right corner of the DISPLAY. Navigate between the sub-menus with the up/down NAVIGATOR buttons and within the sub-menus with the left/right NAVIGATOR buttons. Enter data with the ROTARY DIAL.

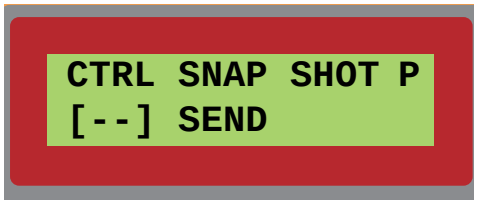
Voices

Set the requested polyphony of the selected patch.

Nord Modular will always try to assign as many voices as you request. The current actual number of voices assigned is displayed to the bottom right in the DISPLAY. Note that voices will only be assigned to the selected SLOT(S) (SLOT LED lit or flashing). See "Patch and voice allocation" on page 178 for more info.

CTRL SNAP SHOT

In this menu you can choose to send a snapshot of the current values of all assigned MIDI Controllers in the active patch. This is very useful if you are recording in a sequencer program and want to make sure the sound sounds exactly as you want. Press the right NAVIGATOR button to send the Controllers. The snapshot is sent on the **MIDI OUT** port of the synthesizer, **not** on the **PC OUT** port. For information on how to automatically assign parameters of a patch to MIDI Controllers, see "Auto Assign MIDI Controllers" on page 63.

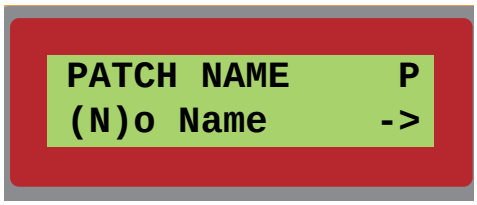


VOICE RETRIG

Here you can select if you want Nord Modular to retrig notes when playing a monophonic patch. In practice this means that if you hold down two keys and release one of them, the other key will automatically retrig.

NAME

With this function you can name a patch.



Select characters with the **ROTARY DIAL** and change the "cursor" position with the left/right **NAVIGATOR** buttons. The memory locations in Nord Modular are identified by the location number, not the patch-name. You can name all the 100 different patches "MyBestSound" if you like, as long as you don't ask us to sort them out for you later...

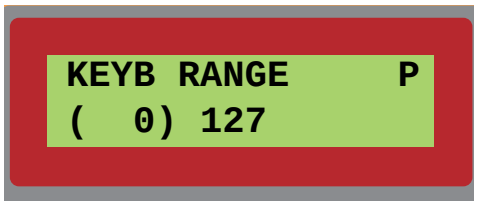
BEND RANGE

Here you set the range of the incoming pitch bend data in semitones.

The pitch bend data will be added to the control signals from the Note outputs on the Keyboard modules and to the KBT (keyboard tracking) function. The range is from 0 to 24 semitones if KBT is set to 1. LFOs and filters using the KBT parameter will be affected by incoming pitch bend data as well.

KEYB RANGE

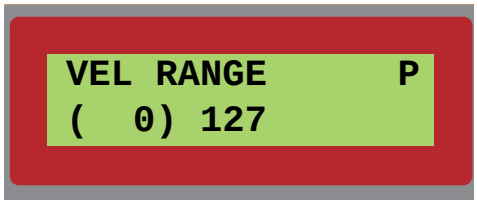
This function is used to define a keyboard range for a patch. Set the lowest and the highest note to respond to note information.



The patch will only receive keyboard information when you play within this range. If you want to use Nord Modular in a split-keyboard situation, select two SLOTS, make sure that the Keyboard Mode is set to Selected Slots, and set the actual split point with the high key for one of the SLOTS and the low key for the other one.

VEL RANGE

With this function you define a velocity range for a patch.



Set the lowest and highest velocity values. The patch will only sound when it receives velocity within this range. If you want to use Nord Modular to switch between two or more patches that are set to receive on the same MIDI channel (velocity switching), select two SLOTS, set them to the same MIDI channel, make sure that the Keyboard Mode is set to Selected Slots, and set the velocity range individually for the patches.

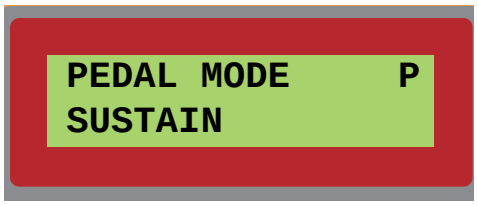
PORTAMENTO

Portamento is an effect where the notes slide from one note to the next when you play consecutive notes on the keyboard. With the Time parameter you set the time it will take to reach the new note.

The portamento has two modes: Normal and Auto. In the Normal mode the portamento is always active, in the Auto mode you activate the portamento by playing legato. This portamento function is available only if a patch is set to 1 voice, monophonic. Note! portamento can also be achieved using the Portamento modules described on page 156. Using the modules, the portamento can be polyphonic as well.

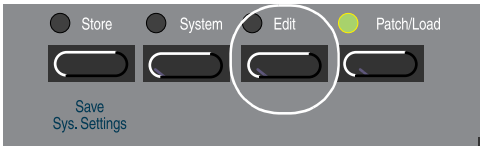
PEDAL MODE

Select if a footswitch connected to the SUSTAIN PEDAL input on the rear panel should act as a sustain pedal or as an on/off switch. If you use it as an on/off switch, you have to assign the switch to a module parameter in a patch.



EDIT

With the EDIT button you put Nord Modular in Edit mode. In this mode you can edit the functions and parameters of a patch without having the computer and Editor software connected to Nord Modular.

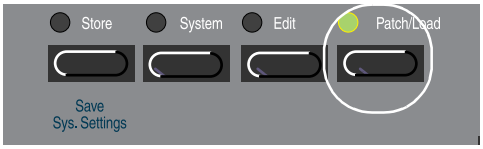


The parameters will appear in the DISPLAY and you can edit them with the ROTARY DIAL. You navigate within a module with the left and right NAVIGATOR buttons. You can jump to other modules in the patch by pressing and holding the SHIFT button and navigating with all four NAVIGATOR buttons. Note that the navigation between the modules in a patch is dependant on how the modules originally were placed in the Editor patch window.

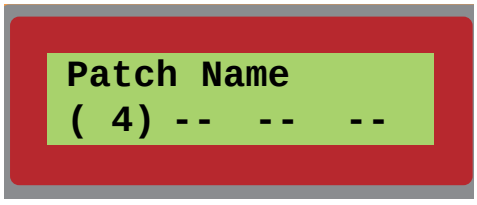
The image on the screen, provided that the Editor is connected, will follow the NAVIGATOR buttons and vice versa. If you select a parameter with the mouse, the DISPLAY on Nord Modular will echo that selection.

PATCH/LOAD

Press the PATCH/LOAD button to put Nord Modular in Patch Mode. This button is also used when you want to load a patch from the internal memory to a SLOT.



The DISPLAY will indicate the name and the number of voices assigned to the current patch.



By pressing **SHIFT** while turning the **ROTARY DIAL**, you can change the number of assigned voices of the active **SLOT**. This is especially useful in multitimbral setups.

To load a patch into a **SLOT**, do as follows:

1. Select the **SLOT** in which you want to load a patch by pressing a **SLOT** button.

2. Press the **PATCH/LOAD** button. The **PATCH/LOAD LED** will flash. A memory location number and the patch name will appear in the **DISPLAY**.

3. Select the desired patch to load with the **ROTARY DIAL** and load the patch to the **SLOT** by pressing the **PATCH/LOAD** button again.

If Nord Modular is in Patch Mode, turning the **ROTARY DIAL** will automatically present the memory locations and patch names in the **DISPLAY**.

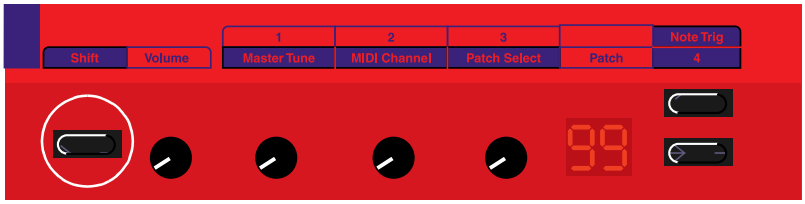
Loading a patch will also send a MIDI Program Change message through the **MIDI OUT** port, if the Program Change function is active. (See “Program change” on page 49.)

You can also load a patch from a memory location to a **SLOT** by sending a MIDI Program Change message to Nord Modular. You have to send on the MIDI channel assigned to the **SLOT**. (See “Program change” on page 49.)

Knobs and buttons of Micro Modular

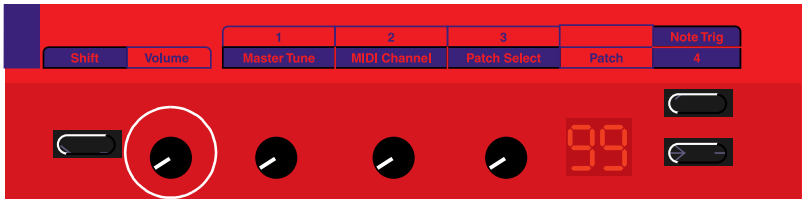
Shift

The SHIFT button is used to access secondary functions of some of the other Knobs and buttons of Micro Modular.



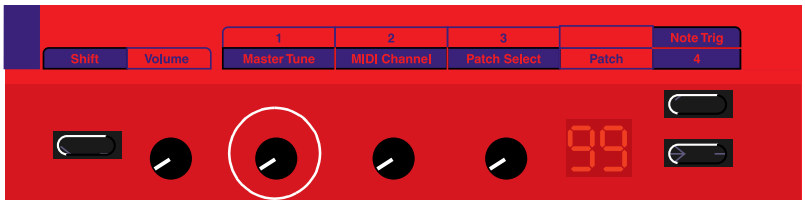
Volume

Adjust the master volume with the VOLUME KNOB. Note that this knob cannot be routed to MIDI Volume or any other controller. It is separated from the rest of the parameters of the synth. To affect the volume from MIDI you have to assign a controller to any of the Level rotary knobs of the output modules (see more about these modules on page 84).



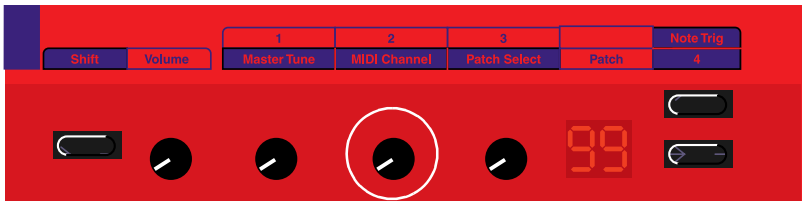
1/Master Tune

The first of the 3 KNOBS that can be assigned to parameters in a patch. The parameter(s) will then be controllable in real time. The KNOBS can also be set to send MIDI controller messages. Read more in "MIDI controllers" on page 36. If Shift is pressed, the knob is used to change the master tune (+/- 1 semitone in steps of 1%).



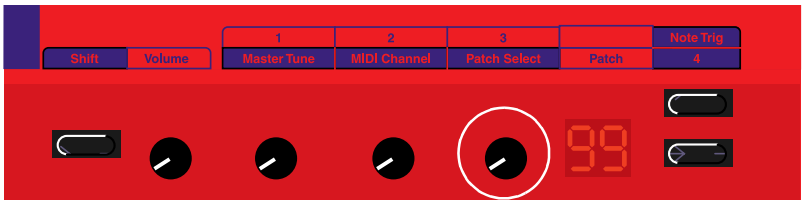
2/MIDI Channel

The second of the 3 KNOBS that can be assigned to parameters in a patch. If Shift is pressed, the knob is used to change the MIDI Channel (1-16).



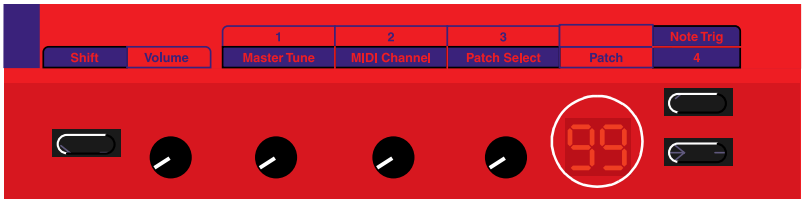
3/Patch Select

The third of the 3 KNOBS that can be assigned to parameters in a patch. If Shift is pressed, the knob is used to select patches from the internal memory (1-99).



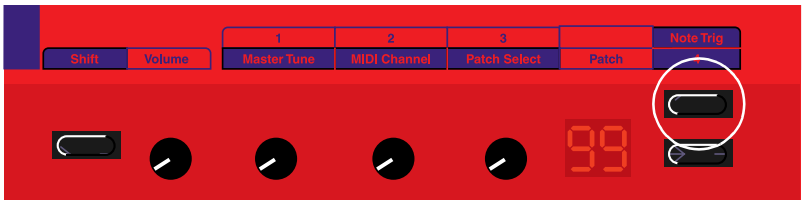
Display

The DISPLAY shows the current patch number. A red flashing dot at the bottom between the numbers indicates that the Sound engine is re-calculating and therefore does not produce any sound. The recalculation occurs when you add or remove modules in the patch window in the PC Editor. A red flashing dot to the bottom right in the display indicates that MIDI data is received on the **MIDI IN** port.



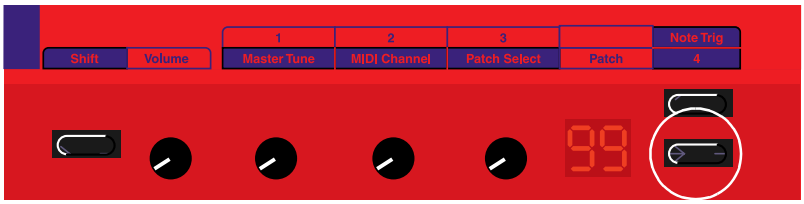
Patch Increment/Note Trig

Use this button to select (increment) patches from the internal memory. If shift is pressed, you can use this button to trig a note. Great for checking the sound of a patch without having a master keyboard connected.



Patch Decrement/4

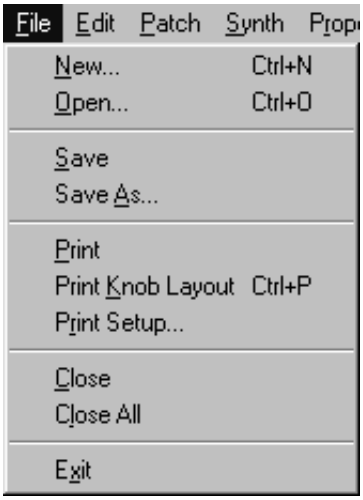
Use this button to select (decrement) patches from the internal memory. If shift is pressed, you can use this button to control an assigned parameter in a patch, similar to the assignable KNOBS described above.



6. Editor reference

The usual Windows-95/NT keyboard commands are available in the Editor software. The drop-down menus are accessed with a combination of the Alt key and the underlined letter in the menu bar. The functions in the menus are accessed by pressing the key corresponding to the underlined letter in the drop-down menus.

File



New

Creates a new, empty patch window. In the dialog box that appears, you can select to either load the patch to a slot of Nord Modular, or choose None to create a patch that will only be active in the Editor. You can later download an inactive patch to the synth. See "Download To Slot" on page 64. You can also upload a patch that is currently in one of the slots by putting a check in the Up Load box.

Open

Brings up the file selector and allows you to open a patch file from disk. Select a file and click Open to download the patch to a slot (A, B, C or D) in Nord Modular. You can also choose to refrain from downloading the patch to the synth by selecting None.

Save

This command will save the current patch to a storage disk on the computer. If the patch has not been saved before, you will be prompted for a file name.

Save As

This command will prompt you for a file-name before saving the patch to disk. This is useful for renaming a patch file before saving it, leaving any original patch intact on the disk.

Print

This command will print out the current patch window.

Print Knob Layout

Use this command to print out the Knob Floater window in the correct size. See also "The Knob Floater" on page 35.

Print Setup

Opens up the standard Windows Print Setup dialog box.

Close

Closes the current patch window. If the patch has been edited, you will be asked if you want to save it before closing.

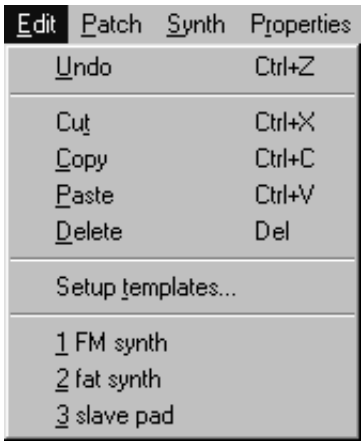
Close All

Closes all the patch windows. If any of them has been edited, you will be asked if you want to save them before closing.

Exit

Exits the Editor software. If any current patches has been edited, you will be asked if you want to save them before exiting. Closing a patch in the Editor or exiting the Editor will not remove patches that have been downloaded to slots in Nord Modular.

Edit



Undo

Click to undo your latest operation/command.

Cut

Cuts out one or several modules, including their common cable connections, and places in the clipboard memory. This function can also be used when creating templates (see "Setup templates" below).

Copy

Copies one or several modules, including their common cable connections, and places in the clipboard memory. This function can also be used when creating templates (see "Setup templates" below).

Paste

Pastes one or several modules, including their common cable connections, that previously have been cut or copied to the clipboard memory. The Paste command results in a cursor with a small '+' sign attached to it. Place the cursor where you want in the patch window and click to paste the module(s).

Delete

Deletes one or several selected modules from the patch window.

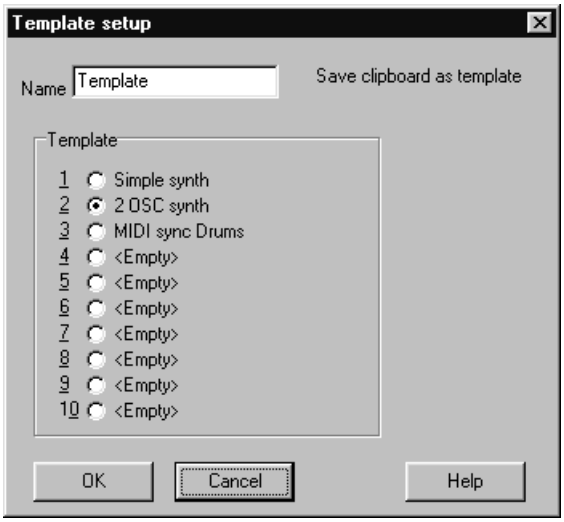
Setup templates

Use this command to create templates. A template is created from the information in the Windows clipboard memory. Do like this to create a template:

1. Mark a set of modules with the cursor in the patch window.

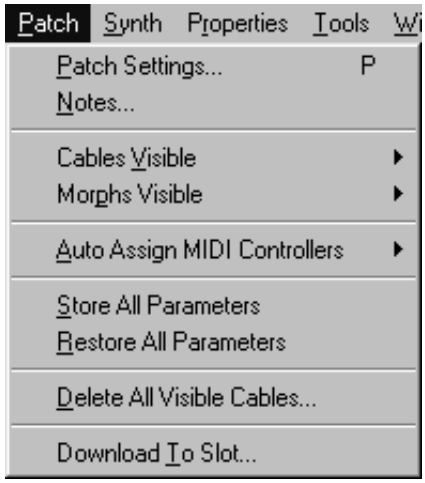
2. Use the Copy command to place the modules, including their common cable connections, in the clipboard memory.

3. Select Setup templates. The following dialog box appears:



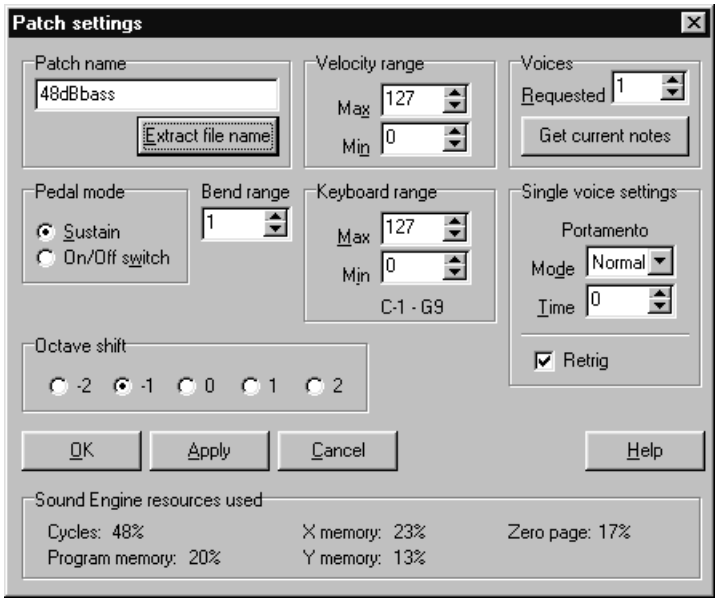
4. Name your template and select one of the ten memory locations. Click OK to save. Now, all saved templates can be selected from the list at the bottom of the Edit main drop-down menu. These templates can be accessed in any patch you edit in the Editor.

PATCH



PATCH SETTINGS

Opens up the Patch settings dialog box. (These functions are also available for editing if you press the SYSTEM button and select the patch settings on Nord Modular). Note that the Patch Settings menu of Micro Modular differs regarding the content.



PATCH NAME

You can assign a patch name to a patch. The name of the patch will appear in the Nord Modular display after you have pressed OK in the Patch settings dialog box (not in Micro Modular). A standard English character set is available. Any illegal characters that you may type will be substituted with empty spaces.

Press Extract file name to use the file name as the patch window name. Note that an Editor patch will only get a file-name after having been saved to disk.

Velocity range

With this function you define a velocity range for a patch. Set the lowest and highest velocity values. The patch will only sound when it receives velocity within this range.

Voices

Set the Requested polyphony of the patch. Nord Modular will always try to assign as many voices as you request. The actual number of assigned voices is displayed in the Editor toolbar and in the Nord Modular **Display** (not Micro Modular). For more info about voices, see "Voice definition" on page 177 and "Patch and voice allocation" on page 178.

Click 'Get current notes' to save the current notes sounding in the patch. This can be used to ensure that a patch with e.g. a continuous drone ("infinite" sound) will sound with the desired notes whenever it is downloaded. This information is saved automatically if you store a patch in the internal memory of the synthesizer.

If you save a patch only in the Editor, these notes have to be requested from the synthesizer. If you have clicked 'Get current notes', the notes will be saved with the patch and transmitted to the synthesizer when the patch is opened in the Editor.

Pedal mode

Select if a footswitch connected to the **Sustain Pedal** input on the rear panel of Nord Modular should act as a sustain pedal or as an on/off switch. If you use it as an on/off switch, you have to assign the switch to a module parameter in a patch.

Bend range

Here you set the range of the incoming pitch bend data in semitones. The pitch bend data will be added to the control signals from the Note outputs on the Keyboard modules and to the KBT (keyboard tracking) parameter. The range is from 0 to 24 semitones. LFOs and filters that are using the KBT parameter will be affected by the incoming pitch bend data as well.

Keyboard range

This function is used to define a keyboard range for a patch. Set the lowest and the highest key. The patch will only recognize keyboard information when you play within this range.

Single voice settings

Here you select Portamento Mode, Time and Retrig. Portamento is an effect where the notes slide from one note to the next when you play consecutive notes on the keyboard. The portamento has two modes: Normal and Auto. In the Normal mode the portamento is always active, in the Auto mode you activate the portamento by playing legato.

With the Time parameter you set the time it will take to reach the new note. The portamento function is available only if a patch is set to 1 voice, monophonic.

Place a check in the Retrig box if you want Nord Modular to retrig notes when playing a monophonic patch. In practice this means that if you hold down two keys and release one of them, the other key will retrig. The retrig function is available only if a patch is set to 1 voice, monophonic.

Octave shift

Here you select the octave setting of the patch. This information is saved with the rest of the patch data in the patch. Note that this setting is active only if you play the patch from a Nord Modular 2-octave keyboard version.

Apply

Click Apply to activate the patch settings without closing the dialog box.

Sound Engine resources used

At the bottom of the Patch settings dialog box, you can view information on how much Sound engine resources the patch is using. In most cases the Cycles information is the most interesting since this is the type of resource often used up first. The Cycle information is the same as the Patch load information in the patch window. This information is very useful when calculating the maximum number of available voices for a patch. See more about voices and Sound engine power in "Voice definition" on page 177 and "Sound engine" on page 178.

Notes

This feature can be used to write comments to a patch. The notes are saved only with the Editor patch on the computer - not in the Nord Modular memory.

Cables Visible

Select which of the cable groups (audio, control, logic and misc) should be visible. Visible cables are indicated with check marks.

Morphs Visible

Select which of the Morph groups should be visible. Visible groups are indicated with check marks.

Auto Assign MIDI Controllers

Here you can choose to automatically assign all parameters in the patch to unused MIDI Controller numbers (All Parameters), or automatically assign all assigned knobs in the patch to unused MIDI Controller numbers (Panel Parameters), or deassign all patch parameters from any MIDI Controllers (Deassign All). This function is very useful if you want to record a MIDI Controller snapshot in a sequencer program. See more about sending MIDI Controller snapshots in "Ctrl snap shot" on page 52 and "Send Controller Snapshot" on page 66. See also "MIDI controller" on page 78 on how to manually assign parameters to different MIDI Controllers.

Store all parameters

Use this command to store any parameter changes made in the patch. Consider this function as a temporary "working memory" when editing or experimenting with a patch.

Restore all parameters

Use this command to restore any parameter settings made in the patch to the original (saved or stored) values.

Delete All Visible Cables

Deletes all the currently visible cables connected in a patch. Any invisible cable groups will remain unaffected.

Download To Slot

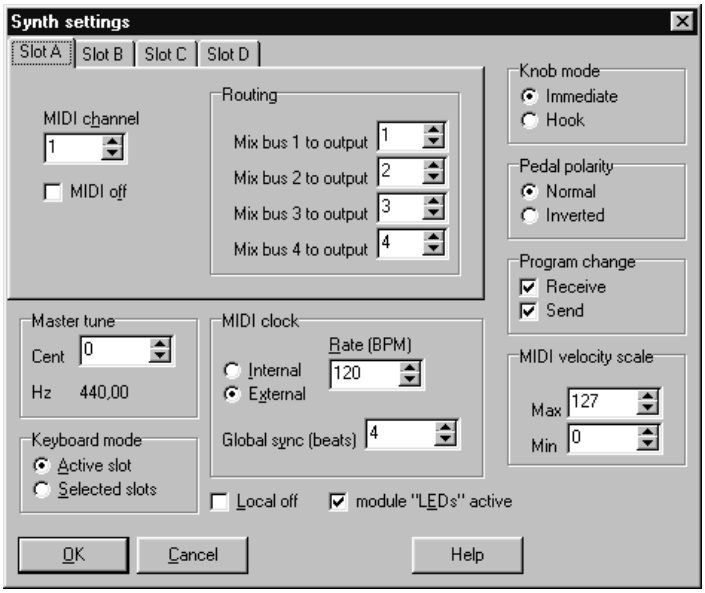
Brings up a dialog box in which you can download the current active Editor patch to the synthesizer.

Synth

Synth Settings

This dialog box provides you with functions that apply to all patches loaded to the four slots in Nord Modular. Select a slot on the tabs. Settings that you make will not be activated until the dialog box is exited with the OK button. (These functions are also available for editing if you press the SYSTEM button and select Synth settings on Nord Modular.)Note that the Synth Settings menu of Micro Modular differs regarding the content.

Note! The changes you make in this dialog box will not be saved together with the patch data on disk. You must use the Store Synth settings function on Nord Modular to save the settings. This is described in "Save Synth Settings" on page 46.



MIDI channel
Set the MIDI channel for each slot. This channel will be used for reception and transmission of MIDI messages.

MIDI Off
This is a short-cut to disengage any slot from reception and transmission of MIDI messages.

Routing
This routes the four virtual mix buses in a patch, to the four line level **OUT** ports on the rear panel of Nord Modular. Mix buses routed to outputs 1 and 2 will also be routed to the headphones output. (The four mix buses are found on the Out modules of the In/Out tab in the Editor patch window.)

Knob mode
Here you set how Nord Modular should react to changes of the 18 assignable **KNOBS**. Immediate means that the value of the assigned parameter will change immediately as you turn the **KNOB**. Hook means that the parameter value will not change until you have turned the Knob past the current parameter setting.

Pedal polarity
Some sustain pedals uses inverted polarity to activate the sustain switch. In this box you can select between Normal and Inverted sustain pedal polarity.

Program change
Here you select how Nord Modular should handle Program Change MIDI messages. Choose between Off (no boxes checked), Send, Receive or Send and Receive (both boxes checked).

Master tune
Use this to tune the Nord Modular to other instruments. The range is +100 to -100 cents. 100 cents is one semitone. Only the tuning of the master oscillators are affected by this function. A slave oscillator that is not connected to a master will not be affected. Below is shown the master tune frequency in Hz.

MIDI Clock
Set the clock source for the MIDI Clock. If External is activated, any incoming MIDI clock can be used as a clock source in a patch. If Internal is activated, set the tempo in BPM (beats per minute).

The MIDI Clock transmits 24 pulses per quarter note. The clock pulses can be divided using the Global sync function, and be sent as logic signals at the Sync output of the MIDI Global module. These logic signals can be used to synchronize the internal sequencer modules to an external MIDI sequencer. A setting of 4 (quarter notes) will result in one logic pulse for every 96 pulses from the System Clock, which is equal to one pulse for every fourth quarter note.

This logic pulse can be used for resetting the sequencer modules in Nord Modular to the “first beat in the bar”. If you do not use this function, the sequencer modules have no chance of knowing where they are in a bar. With the Global sync function activated, it will never take longer than the set number of quarter notes for the sequencer modules to realign themselves if you decide to start a MIDI sequence in the middle of a song.

If you are synchronizing Nord Modular to a MIDI Clock source, this function will keep track of any incoming MIDI Song Position Pointer messages.

MIDI velocity scale

This function is used to rescale the velocity data received at the **MIDI IN** port. Set the maximum and minimum values. If your external master keyboard transmits maximum velocity as 112, set the maximum value to 112. This ensures that the velocity response from Nord Modular will properly reflect the velocity transmission of the master keyboard.

Keyboard mode

Here you choose how the Nord Modular keyboard should control the **SLOTS**. With Active Slot selected, the keyboard will control only the patch of the active slot, and with Selected Slots activated, all selected slots are controlled. Use the last function to simultaneously play several selected **SLOTS** "layered".

Local off

Turn the MIDI Local Control on or off. Select Local On (no check in the box) to be able to control Nord Modular from the internal keyboard and the pedals. MIDI data is also transmitted via the **MIDI OUT** port.

In the Local Off mode, the keyboard and pedal actions are transmitted only via MIDI and do not control Nord Modular itself. Local Off should be used with external sequencers as the **MIDI OUT** port of Nord Modular is routed back, via the external sequencer, to the **MIDI IN** port. Otherwise double notes will occur when playing the keyboard.

module LEDs active

When a patch gets complex, the LEDs of modules like the LFOs or Sequencers could become inaccurate in the Editor patch window. A lot of blinking LEDs could also slow down the computer. Uncheck the box to disengage the LEDs in the patch window.

Upload Active Slot

This command will upload the patch from the currently active slot in Nord Modular to the Editor. A new patch window will be created for the uploaded patch. If you load a new patch from the internal memory to the active slot and choose Upload Active Slot, the previous patch window will be recycled.

Load From Modular Memory

Brings up a dialog box featuring a list of the currently stored patches in the internal memory. Mark desired patch and select a slot to load it to (no slot selection in Micro Modular). When you click Load, the patch will be loaded to the selected slot and also opened in the patch window, if 'Auto upload' has been selected from the 'Others' tab of the Editor Options dialog box (see page 70).

Save In Modular Memory

Use this command to store the currently active patch into a memory location of the synthesizer's internal memory. A box featuring a list of all stored patches of the internal memory is opened. Mark a patch to overwrite and click Save. The patch is now saved with its name in the selected memory location. This command performs the same function as using the **STORE** button on the front panel (not on Micro Modular).

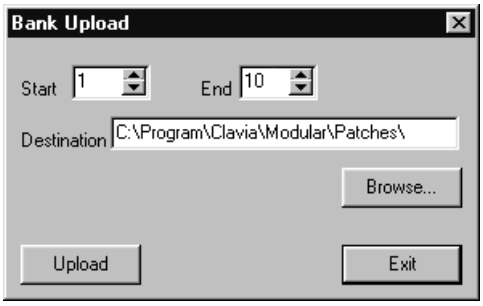
Send Controller Snapshot

Use this command to send all assigned MIDI Controller values to the **MIDI OUT** port of the synthesizer. This is very useful if you are recording in a sequencer program and want to make sure the sound sounds

exactly as you want. Note that the snapshot is sent on the **MIDI OUT** port of the synthesizer, **not** on the **PC OUT** port. For information on how to automatically assign parameters of a patch to MIDI Controllers, see "Auto Assign MIDI Controllers" on page 63.

BANK UPLOAD (FROM MODULAR)

This feature is a quick way of saving a complete patch bank or a section of a patch bank from the Nord Modular memory to disk without needing to upload and save each patch one by one.

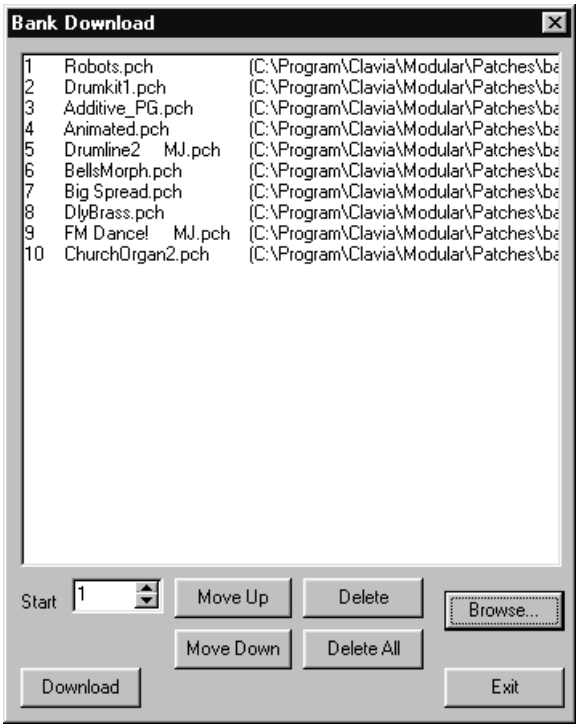


1. Set the start and end Patch number (which patches from the Nord Modular internal memory to upload to the Editor).

2. Choose destination on the PC (it is possible to create a new folder by typing a folder name in the destination field if you wish). Alternatively, click Browse to select a folder from the Windows Folder Selector.

3. Click Upload. Now all the selected Patch files are saved individually together with a patch list file named 'Bank.pchList'. (You can change this patch list filename afterwards in Windows Explorer if you wish.)

Bank Download (To Modular)



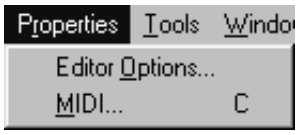
1. Browse and select a pchList file. A list of the patches of the selected pchList file is shown.

2. Here you can delete and move (change the order) of the patches. Any deletion or movement in this list is temporary and does not affect the saved patches or patch list.

3. Select which memory location in Nord Modular to start the download at. Click Download to load all the patches of the list to the Nord Modular internal memory, starting at the selected memory location.

4. Now, the patches are stored in the Nord Modular internal memory. They will remain in the memory as if they were stored one by one using the STORE button.

PROPERTIES



EDITOR OPTIONS

The functions in this dialog box affects the configuration of the Editor. The parameters are automatically saved when you exit the dialog box. Select the different tabs by clicking on them.

CABLES

This is where you can adjust the appearance of the cables available in the Nord Modular. Select Curved or Straight cables. Set the style (3D or 2D) and the width to your liking.

OTHER

Maximize windows:
Check "Maximize windows" to use the whole screen space, whenever a patch window is opened or created in the Editor. The size of the windows can also be adjusted manually.

Recycle windows:
If you make a new Patch window and assign that window to a slot which already is connected to another patch window, the "old" window will still be in the Editor but placed in the background. If you check "Recycle windows" the old patch window will be closed.

Show found message:
When the Editor finds a Nord Modular synth during start-up, it can display a "Modular found" message. Un-check this box to remove that message.

Show warnings:
The Editor can ask for you to confirm your commands when you are deleting modules from a patch. Un-check "Show warnings" to skip that confirmation.

Stop Screensaver:
Check "Stop Screensaver" to deactivate any screensavers while the Editor is the active Windows application.

Only one editor:
The Editor can be connected to one Nord Modular synth at a time. If you have several Nord Modular synths, you can open up to four Editors in one computer, provided that you have MIDI connections for each and everyone of them. Un-check the "Only one editor" if this applies to your setup. Leave it checked if you only have one Nord Modular synth connected.

Value hint timeout:
Whenever a parameter is put in focus, a yellow hint box will appear next to it on the screen, displaying the current setting of the parameter. This function sets the duration of the value hint display.

Knob control:
Here you select if you want the knob parameters in the Editor patch window to respond to Circular, Horizontal or Vertical motions with the mouse.

Auto upload:
Check in this box to automatically upload any patch that you load in a SLOT of Nord Modular. Note that to be able to upload a patch to the Editor, you have to load the patch to a SLOT using the PATCH/LOAD button on the Nord Modular front panel. With Auto upload activated, the Recycle windows box is automatically checked.

Memory list:
Check in this box to automatically get the Memory List visible in the patch window. Note that this function slows down the start of the Editor a bit since it has to communicate with the synthesizer regarding what is stored in all internal memory locations. See "Memory List Visible" on page 74 for more info.

INFO

Informs you of the current software version of Nord Modular and of the Editor.

SHORT-CUTS

Here you can create and assign your own short-cuts to quickly execute various functions in the Editor.

1. Select the function you wish to assign to a short-cut.

2. Place the cursor in the edit box and type the desired keyboard combination on the computer keyboard. You can use one alpha-numeric key (e.g. the "t" key), a combination of two keys (Ctrl+T or Shift+T) or a function key (F3, "Insert" or "BkSp-backspace"). These short-cuts will then be available in the Editor at any time.

To remove a short-cut, select the function and select No short-cut.

Two functions cannot share the same short-cut. If you select a short-cut that is already in use by another function, the first function will lose its short-cut.

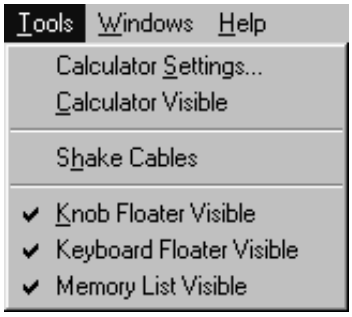
The Alt key is reserved for the Windows operating system and can not be used here.

MIDI

Allows you to choose any MIDI ports available on the computer, to be used exclusively by the Editor. You can also instruct the computer to locate a Nord Modular synth that has been connected to the computer after the Editor was launched.

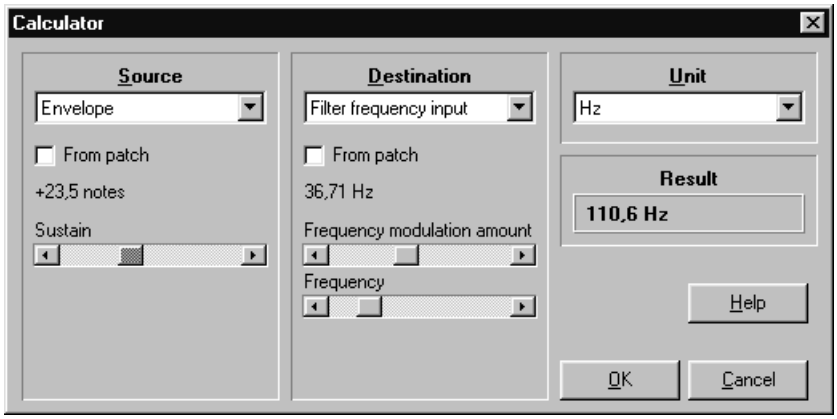
This dialog box will not be accessible if there is a patch window active, and the patch in that window is already "connected" to a Nord Modular synth.

Tools



Calculator Settings

The calculator provides you with a neat way to calculate how much one control signal source would affect another parameter. The result of the calculation can be presented in four different units: Hz, semitones, beats per minute or seconds.



The Calculator dialog box is divided into three main blocks: Source, Destination and Unit. The Source and Destination drop-down lists have a fixed selection of module parameters. You can select any combination of Source and Destination, but you can not add any new module parameters to the lists.

The Calculator can be used in two different ways, either as a separate, stand-alone, calculator (as shown in the picture above), or as an on-line calculator in the patch window.

If you want to use it as a separate calculator, select a control signal source from the Source drop-down list and a destination parameter from the Destination drop-down list. Finally, select unit from the Unit drop-down list. By changing the different Source and Destination parameter sliders you can see how the Result changes.

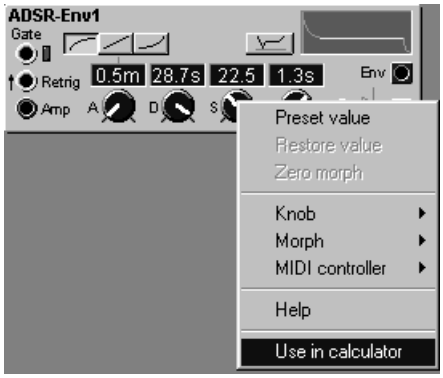
The other way to use the calculator is to select the Source and Destination parameters by right-clicking on the module parameters in the patch window. This is illustrated by the following example:

We are interested in knowing how different envelop Sustain levels would affect an oscillator pitch input. Note that the modules does not have to be connected to each other.

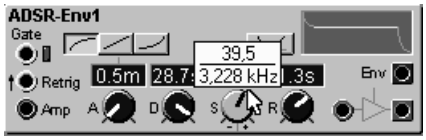
1. Select the desired Unit in the Calculator dialog box and click OK.

2. Right-click on the parameter on the destination module and select Use in calculator from the popup. Note that it is the current parameter value that is being used in the calculation. Therefore, make sure this is set to the proper value before selecting 'Use in calculator'.

3. Right-click on the parameter on the source module and select Use in calculator from the popup.



4. When you change the parameter value on the source (the envelop Sustain in this example), a second row of numbers in the value hint box will indicate what the oscillator frequency would be if the envelop output were connected to the oscillator Pitch input, with its mod amount knob set to 127.



Note that it is always the latest selected source and destination parameters that will be used in the calculation. The latest chosen parameter among these two is where you test the calculation result.

Calculator Visible

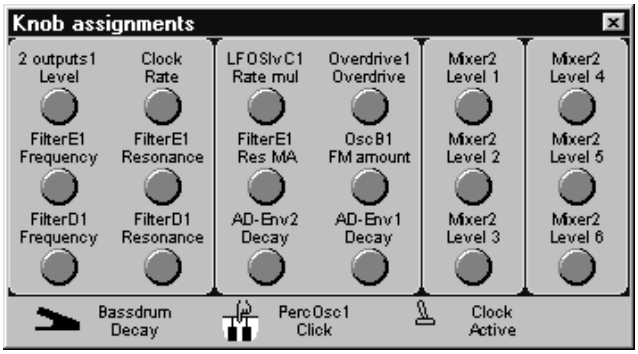
Selects whether or not the calculation results should be visible in the value hint box. This will always be active when you choose to use a parameter in the calculator (by the right-clicking method described above).

Shake Cables

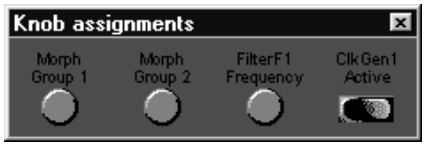
Select this function to reposition the cables in a patch. This can be useful if it is hard to see where the cables are actually connected.

Knob Floater Visible

This activates the Knob Floater window. This window indicates any **KNOB**, Control pedal, Aftertouch or On/Off switch assignments that you have made in a patch.



Nord Modular

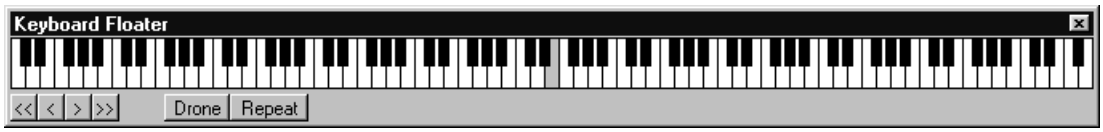


Micro Modular

The Knob Floater only shows the assignment for the current patch. It does not indicate assignment in a Panel Split situation.

Keyboard Floater Visible

This activates the Keyboard Floater window. This window can be used to play a patch without having a master keyboard or similar connected to the synthesizer. Click on the keys of the Keyboard Floater to play single notes the selected note will be indicated by a black dot on the corresponding key. The note will sustain if you keep the mouse button depressed, just like on a real keyboard.



You can expand the keyboard to cover the whole MIDI note range simply by placing the cursor on either side of the window. When the double-arrow appears, press the mouse button and drag horizontally to desired size.

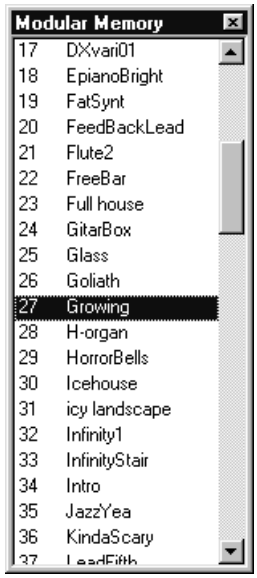
The four buttons to the left are used to scroll up and down the keyboard, either one octave or one note at a time.

Click on the 'Drone' button to make the last played note start sounding "infinitely". Click again to disengage.

Click on the 'Repeat' button to make the last played note play repeatedly. Click again to disengage.

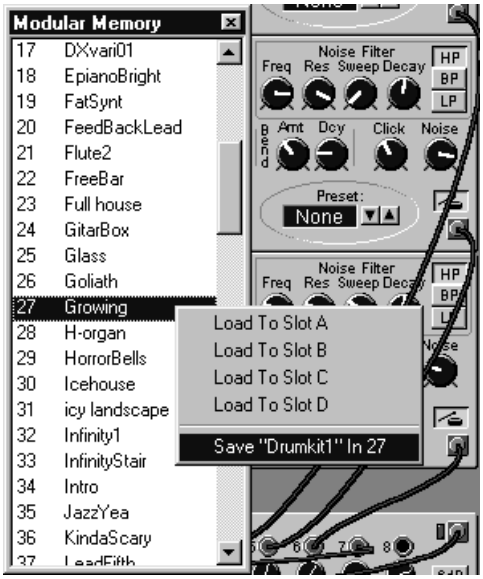
Memory List Visible

This function activates the Memory List. The Memory List is a copy of all current patch names stored in the internal memory of the connected synthesizer. The Memory List can be enabled/disabled in the 'Other' tab of the Properties|Editor Options dialog box, see page 69.



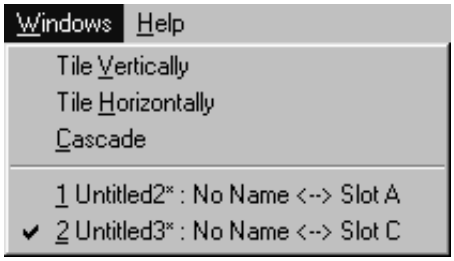
By double-clicking on a patch in the Memory List, you automatically load the patch to the active slot in the synthesizer (and open up the patch in the Editor patch window if 'Auto upload' has been selected from the 'Others' tab of the Editor Options dialog box (see page 70)). This function is exactly the same as using 'Load From Modular Memory' described on page 66.

By right-clicking on a patch in the Memory List the following dialog box appears.



Here you can choose to either load the selected patch to any of the slots, or to store the active Editor patch in the highlighted internal memory location. The last function is exactly the same as using 'Store In Modular Memory' described on page 66.

Windows



Tile vertically

Arrange multiple patch windows in a vertically tiled configuration.

Tile horizontally

Arrange multiple patch windows in a horizontally tiled configuration.

Cascade

Arrange multiple patch windows in a cascaded configuration.

Help

Index

This will launch the help file index. Here you can search by typing in a key-word or just the beginning of a key-word. If you right-click on a module or a parameter in the patch window, you can bring up the help text for individual modules or parameters by choosing Help from the popup menu (see "Module popup" on page 77 and "Parameter popup" on page 78).

Putting a module or parameter in focus and pressing the function key F1will bring up the help text for that specific module/parameter.

Using Help

Brings up the standard Windows help sections. These describe how to use help files in general.

About

Displays a copyright note, tells you about the author and informs you about the software version.

Toolbar

Module group tabs

The Module group tabs are located in the left section of the Toolbar. Click on a tab to select a module group and drag a module to the patch window.

Connection indicator

The red synth icon is highlighted when connection between the Editor and the synthesizer has been established. Above the icon, the slot "connected" to the patch of the patch window is shown.

Patch load

This indicates how much Sound engine resources the patch uses. If you run out of power in a patch (if 100% Patch load is exceed), the indicator turns red and the output(s) of Nord Modular will be muted. Delete one or several modules to reduce the patch load.

It is only the modules themselves that use up Sound engine resources. Cables, connections and settings have no effect on the Patch load.

The Patch load indicator reflects one way (in most situations, the best way) of measuring the resources of the Sound engines. It might, however, turn to red on readings below 100% Patch load, if other system resources are used up first.

When you place the cursor over a module illustration in a tab of the toolbar, a hint box appears with information of how much Patch load the module will use.

Voices

Use the arrow buttons to set the requested polyphony for the patch. The 'Req' box shows requested voices and the 'Cur' box the current actual number of voices. A read-out of the current actual number of voices assigned to a patch is also displayed in the **DISPLAY** on Nord Modular (not on Micro Modular). The voice allocation depends on the usage of the Sound engines, the number of slots selected etc. See"Voice definition" on page 177 and "Patch and voice allocation" on page 178 for more info.

Visible cables

Click on the colored buttons to select which cable group(s) should be visible in the patch. "Invisible" cables will be indicated by a colored dot on the in- and outputs of the connected modules. You can not disconnect or delete an "invisible" cable. To do that you have to make the cable group visible first.

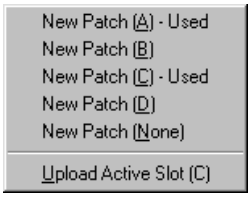
Visible morphs

Click on the numbered buttons to select which morph group(s) should be visible in the patch. Even if a Morph group is not visible, it is still active.

Useful functions in the Editor

Editor background and toolbar popup

Right-clicking on the empty gray background of the Editor window, or on the toolbar background brings up the following popup.



New Patch (A, B, C, D, None)

Lets you create a new patch and activate it on the indicated Slot location.

Upload Active Slot

Lets you upload the patch from the currently active Slot.

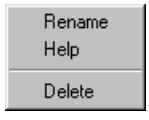
Patch window popup

Right-clicking on the background of the patch window brings up a popup of the module groups including their modules.

Select desired module by clicking on it from the list. The cursor gets a plus-sign next to it. Place the cursor where you want the module to be placed and click to drop the module. You can also select the slot to use for your patch by selecting it from the bottom of this popup.

Module popup

Right-clicking on the gray background of a module brings up the module popup.



Rename

Allows you to rename the module.

Help
Brings up the help-text for the module type.

Delete
Allows you to delete the module from a patch. All the cables that is connected to and from the module will be deleted as well. Any serial connections of cables will be rerouted.

Parameter popup
Right-clicking on a module parameter brings up the parameter popup.

Preset value
Resets the parameter to the fixed parameter preset value.

Restore value
Restores the parameter value to the previously stored value.

Zero morph
Resets any morph range that you have set for the parameter.

Knob
Allows you to assign one of the 18 **Knobs**, the Control pedal input, aftertouch received via MIDI or the On/Off switch to the parameter. The On/Off switch requires that the **Sustain Pedal** input is assigned as an On/Off switch in the patch settings. Selecting No Knob resets an assignment.

Morph
Allows you to assign the parameter to one of the four available morph groups. Selecting No morph resets an assignment.

MIDI controller
Allows you to assign one of the available MIDI controllers to the parameter. A MIDI controller will always affect the entire range of a parameter. Selecting No Controller resets an assignment. Neither velocity nor pitch bend are MIDI Controllers. Velocity must be assigned to a patch with the Vel On output on the Keyboard module with one exception, you can use velocity to affect the knobs on the Morph module.

Pitch bend will be added to the Note signal value and the KBT function on modules that have this activated. The range of the incoming pitch bend is determined by the bend range parameter.

Help
Brings up the help-text file for the selected parameter.

Cable popup

Right-clicking on a cable connection brings out the cable popup.

The four available cable colors are identified by their names. You can choose another color (name) for a cable in this popup. Changing cable type will not affect the functionality in any way, just the appearance. Cables in a serial cable chain will always have the same color. Cables in a branch connection may have different colors.

Delete chain

Deletes the entire serial cable chain that the connection is part of. If you want to delete a complete branch connection, this must be done from the cable origin of the branch.

Disconnect

Deletes the connection. Any cable chains will be rerouted.

Computer keyboard short-cuts

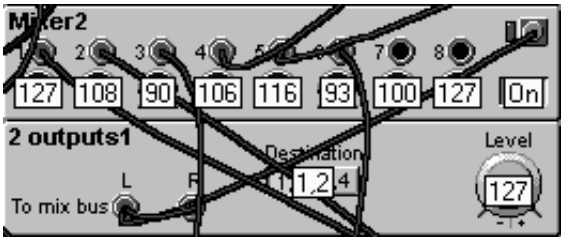
Any commands that may be launched from the computer keyboard are listed in the Properties|Editor Options|Shortcuts menu. Selecting functions with the computer keys is a very powerful and fast method of using the Editor software. Most of the functions in the Editor are available for assigning to a short-cut.

The function keys

You can get a read-out of all parameter settings, Morph range, Morph group assignment, Knob and MIDI controller assignment in a patch by pressing the function keys F5 to F9. This is a short-cut function, and the short-cut keys may be changed in the Properties|Editor Options|Shortcuts menu if you wish.

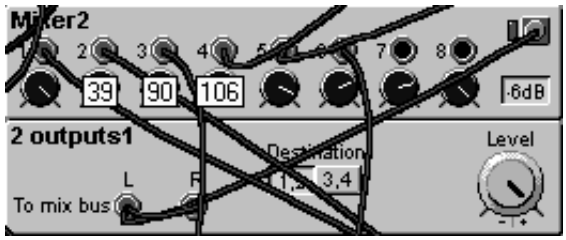
F5

If you press the F5 key, the hintbox of every parameter value in the patch will be displayed on screen.



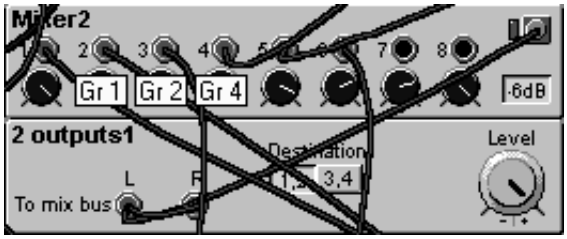
F6

If you press the F6 key, a hintbox with the Morph range end-settings for each parameter assigned to a Morph range will be displayed on screen.



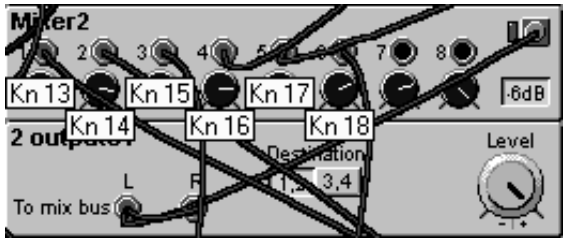
F7

If you press the F7 key, the Morph group assignments will be displayed on screen.



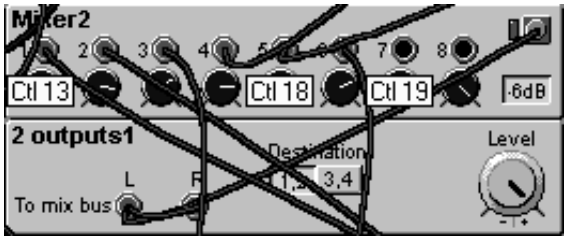
F8

If you press the F8 key, the KNOB assignments will be displayed on screen.



F9

If you press the F9 key, the MIDI Controller assignment will be displayed on screen.



7. Module reference

The modules are grouped in module groups, which you access by clicking on the tabs in the toolbar. The modules are visually identified with illustrations. When you place the cursor over an illustration, a brief description appears together with an indication of how much Sound engine power (Patch load) the module uses. See "Sound engine" on page 178 for more information.

Each time you add a module to a patch, Nord Modular mutes the outputs for a short moment when recalculating the patch data. You can use up to 44 modules in each patch. It is possible to use several modules of the same type in one patch, except from the Keyboard voice, Keyboard Patch, MIDI Global, Audio Input and Morph modules. These modules can only be used once in a patch. A grayed-out illustration indicates that the module in question can not be added to the patch.

In/Out group

This group contains modules that gives you access to incoming MIDI or keyboard information. You will also find modules that can patch the audio signals to the four physical audio **Out** ports of Nord Modular and a module that allows you to patch signals from the two audio inputs of Nord Modular (**Input L** and **Input R**). The three Keyboard modules, the Audio Input module and the Morph module have a limit to their availability. You can only use one of each in a patch.

Keyboard

The Keyboard voice module provides you with access to a few basic and important signals associated with the keyboard on Nord Modular, or a keyboard connected to the synth via MIDI. The signals are generated from each key played and affect one voice at a time.

Note

This blue output provides you with a pitch (note number) signal from the Nord Modular keyboard or from the **MIDI In** port. This signal is hardwired to every module that has a KBT control or switch. There is no need to patch this output to every oscillator you are controlling from the keyboard or via MIDI. This is also the output for any pitch bend data that appears at the Nord Modular **MIDI In** port. The pitch bend will be scaled together with the note information, with the ratio of the pitch bend parameter. This ratio is set in the Patch|Patch Settings menu, see "Bend range" on page 52 and page 62.

E4 (MIDI note 64), which is the middle E on the Nord Modular keyboard when the **Oct Shift** selector is in the center position, represents an output signal level of 0 units. MIDI note 0 (C-1) represents -64 units and MIDI note 127 (G9) represents +63 units.
Signal: **Bipolar**.

GATE
This yellow output sends a high logic signal (+64 units) every time a key is pressed on the keyboard, or a MIDI note-on is received at the **MIDI IN** port. The logic signal switches back to zero (0 units) when the key is released. If a sustain pedal is activated, the logic signal will be high for as long as the pedal is pressed. Signal: **Logic**.

VEL ON
This blue output transmits the note-on velocity signals from the keys that you play on Nord Modular or any velocity that is received on the **MIDI IN** port. The velocity response of the Nord Modular keyboard is linear. Signal: **Unipolar**.

REL VEL
This blue output provides you with the release velocity signal from the keys that you play on the Nord Modular, or any release velocity that is received via MIDI. Signal: **Unipolar**.

KEYBOARDPATCH
This module provides four different control signals. The signals are generated from the latest key played and affect all allocated voices, in contrast to the Keyboard module described above.

LATEST NOTE
This blue output provides you with a pitch (note number) signal from the latest note that was played on the keyboard, or that was received at the **MIDI IN** port.

E4 (MIDI note 64), which is the middle E on the Nord Modular keyboard when the **OCT SHIFT** selector is in the center position, represents a signal level of 0 units. MIDI note 0 (C-1) represents -64 units and MIDI note 127 (G9) represents +63 units.
Signal: **Bipolar**.

PATCH GATE
This yellow output sends a high (+64 units) logic signal every time a key is pressed on the keyboard or a MIDI note-on is received at the **MIDI IN** port. The logic signal switches back to zero (0 units) when the last key is released. You can use this signal to start envelopes in the single-trigger fashion. If a sustain pedal is activated, the logic signal will be high for as long as the pedal is pressed. Signal: **Logic**.

LATEST VEL ON
This blue output provides you with a control signal from the latest note-on velocity. The velocity response of the Nord Modular keyboard is linear. Signal: **Unipolar**.

LATEST REL VEL
This blue output provides you with a control signal from the release velocity of the latest note.
Signal: **Unipolar**.

MIDIGLOBAL

This module generates logic signals that can be used for trigging and synchronizing modules featuring logic inputs.

CLOCK

This yellow output provides you with logic signals from the MIDI Clock in Nord Modular. This output transmits 24 pulses for each quarter note. (The Clock Divider module in the Logic module group can divide these pulses to a division set by you.)
Signal: **Logic**.

- To set the clock speed and the clock source of the MIDI Clock, press the **SYSTEM** button on the Modular panel, select Synth and navigate to the MIDI Clock function. See "MIDI Clock" on page 47 and page 65.

- The MIDI protocol allows MIDI devices to continue to send clock pulses even if they are stopped. This means that if you synchronize Nord Modular with an external sequencer as master, this output may keep on sending clock pulses even if the sequencer is stopped. The MIDI Start, Stop and Continue commands are present at the Active output of this module.

SYNC

This yellow output provides you with a logic signal, which is calculated from the MIDI Clock, at a rate set by the Global Sync parameter, see "Global Sync" on page 48 and "MIDI Clock" on page 65. The Sync function provides a method of telling the Nord Modular sequencer modules where the first beat in a bar is. Patch this output to the Rst (reset) input of a sequencer module. This function is absolutely essential to use if you plan to synchronize patches in different slots to each other, or if you want to synchronize Nord Modular to an external sequencer. Signal: **Logic**.

- Try to make a habit out of always using this function if you are using more than one sequencer module in a patch, especially if you want to mix modules clocked with e.g. triplet resolutions with other modules clocked with eighth or sixteenth notes.

ACTIVE

This yellow output provides you with a logic high signal whenever a MIDI Start or MIDI Continue command is received at the **MIDI IN** port. The logic signal will switch to zero when Nord Modular receives a MIDI Stop signal at the **MIDI IN** port.
Signal: **Logic**.

AudioIn

This module routes the line level audio signals from the inputs on the rear panel of Nord Modular to your patch. Two separate audio channels can be patched into the system. The input meters indicate the level of the incoming signals. If you overload the inputs, the red overload indicators will light up momentarily.

Outputs Left/Right

Signal: **Bipolar**.

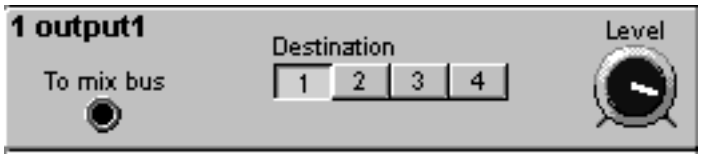
Note: If you want to process a stereo signal, any processing modules (filters etc.) has to be duplicated in the patch.

A word about the Output modules

The output modules of Nord Modular route the audio signals to mix buses. Mix buses are not the same as the physical **OUT** ports of Nord Modular. The mix buses can be routed to any **OUT** port(s). To determine where the mix buses are routed, select Properties|Synth Settings in the Editor or press the **SYSTEM** button on Nord Modular, select Synth and navigate down to set the physical output assignment for each **SLOT**. See more about mix bus routing in "Route slot A, B, C, D" on page 50 and "Routing" on page 65.

1 output

This module takes one signal and routes it to one of the four mix buses.



To mix bus

The red audio input of the module.

Destination

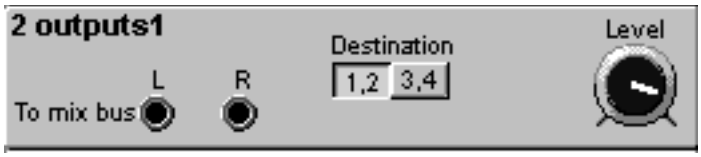
Select a destination mix bus with the buttons. Clicking on an active destination will mute the Output module.

Level

The total audio level to the mix bus can be attenuated with the level knob.

2 OUTPUTS

This module takes two signals and routes them to the mix buses, grouped together as a stereo signal.



TO MIX BUS L, R

The red inputs of the module.

DESTINATION

Select which pair of mix buses to route the incoming signals to. Clicking on an active destination button will mute the Output module.

LEVEL

The total audio level to the mix buses can be attenuated with the level knob.

4 OUTPUTS

This module can route four signals to one mix bus each.

TO MIX BUS

The red inputs of the module.

LEVEL

The total audio level to the mix buses can be attenuated with the level knob.

MORPH

Almost any parameter or function in the Nord Modular modules can be assigned to one of the four available Morph groups. You may assign up to 25 different parameters to the four Morph groups. See "Morph groups" on page 37 for more details.

GRP 1-4

The knobs controls the total amount of Morph control. Right-click on a Morph knob to assign a KNOB or an external controller to it. As an exclusive feature, the Morph knobs may be assigned to MIDI note values or keyboard velocity. These two functions are found at the bottom of the controller list.

NoteDetect

This module can detect a note, either from the Nord Modular keyboard or via the MIDI input. A logic high signal will be transmitted, together with a velocity control signal, when the selected key is detected. The logic signal will switch to zero, and a release velocity control signal will be sent, when the selected key is released. The Note Detect module is global and affects all voices assigned in a patch. The behavior is similar to the Keyboard Patch module described earlier in this chapter.

The Note detect module is not affected by the polyphony of the patch. It will detect notes, even if you run out of polyphony.

Slider

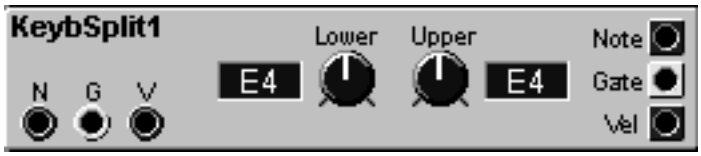
Select the note to be detected. Range: C-1 to G9.

Outputs

Gate signal: **Logic**.
Velocity signal: **Unipolar**.
Release velocity signal: **Unipolar**.

KeybSplit

Keyboard split gives you the possibility to create split sounds using only one patch. It functions as a "key filter" in which you set the limits for the key range that should pass through.



N, G and V inputs

N is the note control signal input. Patch the Note output of the Keyboard Patch or Keyboard Voice module to this input. G is the logic gate input. This input must always receive a gate signal to activate the module. Connect it to the Gate output of the Keyboard Patch or Keyboard Voice module, for instance. V is the velocity control signal input. If a gate signal and a note control signal that lies within the Lower and Upper limits are received, the velocity value of the V input will be transmitted to the Vel output.

Lower, Upper

Here you set the lower and upper limit of the keyboard range. Only notes played within the set limits will pass through to the output(s). Ranges: C-1 to G9.

Note, Gate and Vel outputs

These are the outputs for the note, gate and velocity signals.
Note signal: **Bipolar**
Gate signal: **Logic**
Velocity signal: **Unipolar**

Oscillator group

There are two main types of oscillators in Nord Modular, master oscillators and slave oscillators. The master oscillators has more parameters and provide you with more control options, but they require more power from the Sound engine than the slaves. The pitch of a slave oscillator can be controlled from a master oscillator. If you run short on Sound engine power, try to find a way to replace a master oscillator with a slave.

The oscillators (except from the Master Oscillator) produce a constant sound. If you connect an oscillator output to a mix bus, the waveform will sound constantly. If you want the behaviour of a traditional synthesizer, remember to control the output of the oscillator with an envelope generator.

MasterOSC

The Master Oscillator does not generate any waveforms itself. Instead it can be used to control one or several slave oscillators. For that purpose it is very useful since it offers an easy way of controlling global functions, such as coarse tuning and pitch modulation, of the connected slave oscillators. A big advantage with the Master Oscillator is that it saves Sound engine power compared to other oscillators.

Slv output

This is the gray slave output for controlling the pitch of slave oscillators. Patch this output to a Mst input of a slave module. It is also possible to control a slave LFO with this signal. The LFO rate will then be five octaves below the master oscillator pitch.

Info window

Click on the info window to change the display from Hz to Notes. Range: C-1 to G9 (7.94 Hz to 12910 Hz).

Coarse

Sets the coarse tuning of the oscillator. Range: C-1 to G9 in steps of one semitone.

Fine

Sets the fine tuning of the oscillator. The range is +/- one quarter of a semitone divided into 128 steps. Click on the triangle above the control to reset the fine tuning to 0, which is the preset value.

KBT

KBT is the hardwired connection between the oscillator and the keyboard (and the MIDI input). If KBT is activated the oscillator will track the keyboard at the rate of one semitone for each key. If KBT is not activated, the keyboard will not affect the oscillator frequency.

Pitch modulation inputs [Attenuator Type II]

There are two blue modulation inputs for modulating the oscillator pitch on this module. The modulation amount is attenuated with the rotary knob next to each input. See "Pitch modulation" on page 31 for more info.

OscA

This oscillator can produce one of four waveforms, Sine, Triangle, Sawtooth or Square/Pulse. This oscillator has two pitch modulation inputs, one frequency modulation (FMA) input, a sync input and an input to modulate the width of the Pulse wave.

Slv output

This is a gray control output for controlling the pitch of a slave oscillator. Patch this output to a Mst input on a slave module. If you control a slave LFO with this signal, the pitch of the LFO will be 5 octaves below the pitch of the master oscillator.

Info window

Click on the info window to change the display from Hz to Notes. Range: C-1 to G9 (7.94 Hz to 12910 Hz).

Coarse

Sets the coarse tuning of the oscillator. Range: C-1 to G9 (8.18 Hz to 12540 Hz).

Fine

This control fine-tunes the oscillator. The range is +/– a quarter of a semitone, divided into 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

KBT

This is the hardwired connection between the oscillator and the keyboard. At the Key value, the oscillator will track the keyboard at the rate of one semitone for each key. Turning the KBT control to the maximum clockwise position (2.0) will produce a two-octave span from one octave on the keyboard, a value of 0.50 will produce a one octave span from two octaves played on the keyboard. Off removes the keyboard tracking completely. Click on the triangle above the knob to reset the KBT setting to Key, which is the preset value.

Pitch modulation inputs [Attenuator Type II]

There are two red modulation inputs for modulating the oscillator pitch on this module. The modulation amount is attenuated with the rotary knob next to each input. See "Pitch modulation" on page 31 for more info.

FMA modulation input [Attenuator Type II]

A red modulation input where a signal will affect the frequency of the oscillator. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

Sync input
This red input is used for synchronizing the oscillator to a control source, which could be another oscillator, an LFO or the keyboard. Synchronization forces the oscillator to restart its waveform cycle, in sync with the waveform cycle of the controlling device. The oscillator will restart whenever a signal present at the sync input increases from 0 units to anything above 0 units.

The pitch of the controlling oscillator will interact with the controlled oscillator pitch. For a traditional synthesizer sync-sound, start with the two oscillators to the same pitch and connect only the sync-controlled oscillator to an output. Turning the tuning knob or modulating the pitch of the sync-controlled oscillator will produce radical changes in the timbre. See "Sync" on page 32 for more information.

Pulse Width
Sets the initial width of the two sections of a Pulse waveform period. The range is from 1% to 99%. Click on the triangle above the knob to reset the initial pulse width to 50%, which is the preset value.

Pulse Width modulation input [Attenuator Type I]
This is a red input for controlling the width of a Pulse waveform with a modulator, starting at the initial width you have set with the Pulse Width control. The modulation amount is determined by the rotary knob next to the input. See page 30 for modulation examples.

Waveform selectors
Selects one of the four available waveforms. Clicking on a selected button will mute the audio output of the oscillator.

Out
Signal: **Bipolar**.

OscB
This oscillator can produce one of four waveforms, Sine, Triangle, Sawtooth and Square/Pulse. This oscillator has two pitch modulation inputs, one frequency modulation (FMA) input and a Pulse width modulation input.

Slv output
This is a gray control output for controlling the pitch of a slave oscillator. Patch this output to a Mst input on a slave module. If you control a slave LFO with this signal, the pitch of the LFO will be 5 octaves below the pitch of the master oscillator.

Info window
Click on the info window to change the display from Hz to Notes. Range: C-1 to G9 (7.94 Hz to 12910 Hz).

Coarse
Sets the coarse tuning of the oscillator. Click on the Freq window to change the display from Hertz to notes. The range is from C-1 to G9 (8.18 Hz to 12540 Hz).

Fine
This control fine-tunes the oscillator. The range is +/– a quarter of a semitone, divided in 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

KBT
This is the hardwired connection between the oscillator and the keyboard (and the MIDI input). At the "Key" value, the oscillator will track the keyboard at the rate of one semitone for each key. Turning the KBT control to the maximum clockwise position (2.0) will produce a two-octave span from one octave on the keyboard, a value of 0.50 will produce a one octave span from two octaves played on the keyboard. Off removes the keyboard tracking completely. Click on the triangle above the knob to reset the KBT setting to Key, which is the preset value.

Pitch modulation inputs [Attenuator Type II]
There are two blue modulation inputs for modulating the oscillator pitch on this module. The modulation amount is attenuated with the rotary knob next to each input. See "Pitch modulation" on page 31 for more info.

FMA modulation input [Attenuator Type II]
A red modulation input where a signal will affect the frequency of the oscillator. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

Pulse Width modulation input [Attenuator Type I]
This is a blue input for modulating the width of the Pulse waveform, starting at the initial width of 50%. The modulation amount is determined by the rotary knob next to the input. See page 30 for modulation examples.

Waveform selectors
Selects one of the four available waveforms. Clicking on a selected button will mute the audio output of the oscillator.

Out
Signal: **Bipolar**.

OscC

This oscillator produces a Sine wave. It has one pitch modulation input, one amplitude modulation input and one FMA modulation input.

Slv output

This is a gray control output for controlling the pitch of a slave oscillator. Patch this output to a Mst input on a slave module. If you control a slave LFO with this signal, the pitch of the LFO will be 5 octaves below the pitch of the master oscillator.

Info window

Click on the info window to change the display from Hz to Notes. Range: C-1 to G9 (7.94 Hz to 12910 Hz).

Coarse

Sets the coarse tuning of the oscillator. Click on the Freq window to change the display from Hertz to notes. The range is from C-1 to G9 (8.18 Hz to 12540 Hz).

Fine

This control fine-tunes the oscillator. The range is +/– a quarter of a semitone, divided in 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

KBT

This is the hardwired connection between the oscillator and the keyboard (and the MIDI input). When this function is activated, the oscillator will track the keyboard at the rate of one semitone for each key.

Pitch modulation input [Attenuator Type II]

There is one red modulation input for modulating the oscillator pitch on this module. The modulation amount is attenuated with the rotary knob next to the input. See "Pitch modulation" on page 31 for more info.

AM modulation input

This red input allows you to modulate the amplitude of the oscillator wave. The amount of this modulation is fixed at a ratio of 1:1.

FMA modulation input [Attenuator Type II]

A red modulation input where a signal will affect the pitch of the oscillator in a linear way. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

Waveform selector

This acts as an on/off switch of the audio output of the oscillator.

Out

Signal: **Bipolar**.

SpectralOSC

The Spectral shape oscillator is an oscillator with a built-in overtone generator. The oscillator generates a signal that contains either odd and even partials or only odd partials. It is possible to control the amount of overtones generated.

Slv output

This is a gray slave output for controlling slave oscillators. Patch this output to a Mst input of a slave module. If you control a slave LFO with this signal, the rate of the LFO will be five octaves below the pitch of the master oscillator.

Info window

Click on the info window to change the display from Hz to Notes. Range: C-1 to G9 (7.94 Hz to 12910 Hz).

Coarse

Sets the coarse tuning of the oscillator. Click on the frequency window to change the display from Hz to notes. The range is from C-1 to G9 (8.18 Hz to 12540 Hz).

Fine

Sets the fine tuning of the oscillator. The range is +/- one quarter of a semitone divided into 128 steps. Click on the triangle above the control to reset the fine tuning to 0, which is the preset value.

Pitch modulation inputs [Attenuator Type II]

There are two blue modulation inputs for modulating the oscillator pitch on this module. The modulation amount is attenuated with the rotary knob next to each input. See "Pitch modulation" on page 31 for more info.

FMA modulation input [Attenuator Type II]

A red modulation input where a signal will affect the frequency of the oscillator. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

KBT

KBT is the hardwired connection between the oscillator and the keyboard (and the MIDI input). If KBT is activated the oscillator will track the keyboard at the rate of one semitone for each key. If KBT is not activated, the keyboard will not affect the oscillator frequency.

Spectral shape

With the Spectral shape function you select the amount of overtones of the waveform. Use the rotary knob to set the amount. There is also a blue modulation input for controlling the overtone amount from an external source. The rotary knob next to it attenuates the modulation amount.

Partials
By pressing one of the buttons All or Odd, you determine whether you want the wave to contain either odd and even partials or only odd partials.

Out
Signal: **Bipolar**

FormantOSC
The Formant oscillator is used for generating vocal-sounding waveforms. It generates a new type of "non-transposed" spectrum with strong "body resonance" character. 127 timbre variations can be selected.

Slv output
This is a gray slave output for controlling slave oscillators. Patch this output to a Mst input of a slave module. If you control a slave LFO with this signal, the rate of the LFO will be five octaves below the pitch of the master oscillator.

Info window
Click on the info window to change the display from Hz to Notes. Range: C-1 to G9 (7.94 Hz to 12910 Hz).

Coarse
Sets the coarse tuning of the oscillator. Click on the frequency window to change the display from Hz to notes. The range is from C-1 to G9 (8.18 Hz to 12540 Hz).

Fine
Sets the fine tuning of the oscillator. The range is +/- one quarter of a semitone divided into 128 steps. Click on the triangle above the control to reset the fine tuning to 0, which is the preset value.

KBT
KBT is the hardwired connection between the oscillator and the keyboard (and the MIDI input). If KBT is activated the oscillator will track the keyboard at the rate of one semitone for each key. If KBT is not activated, the keyboard will not affect the oscillator frequency.

Pitch modulation inputs [Attenuator Type II]
There are two blue modulation inputs for modulating the oscillator pitch on this module. The modulation amount is attenuated with the rotary knob next to each input. See "Pitch modulation" on page 31 for more info.

Timbre
Use the rotary knob to select different timbres. There is also a blue modulation input for controlling timbre changes from an external source.

On/off
By pressing this “waveform” button you switch on and off this module

Out
Signal: **Bipolar**

A word about slave oscillators
A slave oscillator can be controlled by any of the three master oscillators for multi oscillator setups. Any pitch modulation or keyboard tracking that affects a master oscillator pitch will also affect a connected slave oscillator pitch. If you do not connect a master oscillator to a slave, it will produce a waveform with a fixed pitch, starting at E4 (329.6 Hz). You can control the fixed pitch with the Detune and Fine controls.

- A slave oscillator is not affected by the Master Tune function unless it is connected to a master oscillator.

OscSlvA
This slave oscillator can produce one of four waveforms. You can select Sine wave, Triangle wave, Sawtooth or a Square/Pulse wave. It has a FMA modulation input and an amplitude modulation input.

Sync input
This red input is used for synchronizing the oscillator to a control source, which could be another oscillator, an LFO or the keyboard. Synchronization forces the oscillator to restart its waveform cycle, in sync with the waveform cycle of the controlling device. The oscillator will restart whenever a signal present at the sync input increases from 0 units to anything above 0 units.

The pitch of the controlling oscillator will interact with the controlled oscillator pitch. For a traditional synthesizer sync-sound, start with the two oscillators to the same pitch and connect only the sync-controlled oscillator to an output. Turning the tuning knob or modulating the pitch of the sync-controlled oscillator will produce radical changes in the timbre. See “Sync” on page 32 for more information.

Mst input
The gray control input from a master oscillator. Connect this input to a Slv output from a master module. If you connect a master LFO to this input, the slave oscillator will track the LFO, five octaves above the pitch of the LFO.

Info window
Click on the info window to change the display between Semitones, Hz and Ratio. Range: C-1 to G9 (7.94 Hz to 12910 Hz or x 0.0241 to x 39.152).

Partials
Select a preset transposition value of the slave oscillator. The transposition ratio will be displayed as multiples of the frequency of the master oscillator. Range 1:32 to 32:1.

Detune
Set the detune of the slave oscillator, in semitone steps. The tuning will relate to the tuning of the master oscillator connected to the Mst input. Click on the window to select a display of a ratio, Hz or semitones. The preset value is 0 (1:1). If you select the semitone display, a second number inside a parenthesis will indicate a musical interval (a fifth, a seventh etc.).

Fine
Fine-tunes the slave oscillator. The range is +/– a quarter of a semitone, divided in 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

Waveform selectors
Selects one of the available waveforms. Clicking on a selected button will mute the output of the oscillator.

FMA modulation input [Attenuator Type II]
A red modulation input where a signal will affect the pitch of the oscillator in a linear way. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

AM modulation input
This red input allows you to modulate the amplitude of the slave oscillator. The amount of this modulation is fixed at a ratio of 1:1.

Out
Signal: **Bipolar**.

OscSlvB
This slave oscillator produces a Square/Pulse waveform. The pulse width can be modulated.

Mst input
The gray control input from a master oscillator. If you connect a master LFO to this input, the slave oscillator will track the LFO, five octaves above the pitch of the LFO.

Info window
Click on the info window to change the display between Semitones, Hz and Ratio. Range: C-1 to G9 (7.94 Hz to 12910 Hz or x 0.0241 to x 39.152).

Partials
Select a preset transposition value of the slave oscillator. The transposition ratio will be displayed as multiples of the frequency of the master oscillator. Range 1:32 to 32:1.

Detune
Set the detune of the slave oscillator, in semitone steps. The tuning relates to the tuning of the master oscillator connected to the Mst input. Click on the window to select a display of a ratio, Hz or semitones.

The preset value is 0 (1:1). If you select the semitone display, a second number inside a parenthesis will indicate a musical interval (a fifth, a seventh etc.).

Fine
Fine-tunes the slave oscillator. The range is +/– a quarter of a semitone, divided in 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

PW
Sets the initial width of the two periods of a Pulse waveform. The range is from 1% to 99%. Click on the triangle above the knob to reset the initial pulse width to 50%, which is the preset value.

PW Modulation input [Attenuator Type I]
This is a red input for modulating the width of the Pulse waveform, starting at the initial width set with the PW control. The modulation amount is determined by the rotary knob next to the input. See page 30 for modulation examples.

Waveform selector
This acts as an on/off switch of the audio output of the oscillator.

Out
Signal: **Bipolar**.

OscSlvC
This slave oscillator produces a Sawtooth wave. It has a FMA modulation input.

Mst input
The gray control input from a master oscillator. If you connect a master LFO to this input, the slave oscillator will track the LFO, five octaves above the pitch of the LFO.

Info window
Click on the info window to change the display between Semitones, Hz and Ratio. Range: C-1 to G9 (7.94 Hz to 12910 Hz or x 0.0241 to x 39.152).

Partials
Select a preset transposition value of the slave oscillator. The transposition ratio will be displayed as multiples of the frequency of the master oscillator. Range 1:32 to 32:1.

Detune
Set the detune of the slave oscillator, in semitone steps. The tuning relates to the tuning of the master oscillator connected to the Mst input. Click on the window to select a display of a ratio, Hz or semitones. The preset value is 0 (1:1). If you select the semitone display, a second number inside a parenthesis will indicate a musical interval (a fifth, a seventh etc.).

Fine
Fine-tunes the slave oscillator. The range is +/– a quarter of a semitone, divided in 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

FMA modulation input [Attenuator Type II]
A red modulation input where a signal will affect the pitch of the oscillator in a linear way. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

Waveform selector
This acts as an on/off switch of the audio output of the oscillator.

Out
Signal: **Bipolar**.

OscSlvD
This slave oscillator produces a Triangle wave. It has a FMA modulation input.

Mst input
The gray control input from a master oscillator. If you connect a master LFO to this input, the slave oscillator will track the LFO, five octaves above the pitch of the LFO.

Info window
Click on the info window to change the display between Semitones, Hz and Ratio. Range: C-1 to G9 (7.94 Hz to 12910 Hz or x 0.0241 to x 39.152).

Partials
Select a preset transposition value of the slave oscillator. The transposition ratio will be displayed as multiples of the frequency of the master oscillator. Range 1:32 to 32:1.

Detune
Set the detune of the slave oscillator, in semitone steps. The tuning relates to the tuning of the master oscillator connected to the Mst input. Click on the window to select a display of a ratio, Hz or semitones. The preset value is 0 (1:1). If you select the semitone display, a second number inside a parenthesis will indicate a musical interval (a fifth, a seventh etc.).

Fine
Fine-tunes the slave oscillator. The range is +/– a quarter of a semitone, divided in 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

FMA modulation input [Attenuator Type II]
A red modulation input where a signal will affect the pitch of the oscillator in a linear way. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

Waveform selector
This acts as an on/off switch of the audio output of the oscillator.

Out
Signal: **Bipolar**.

OscSlvE
This slave oscillator produces a Sine wave. It has a FMA- and an amplitude modulation input.

Mst input
The gray control input from a master oscillator. If you connect a master LFO to this input, the slave oscillator will track the LFO, five octaves above the pitch of the LFO.

Info window
Click on the info window to change the display between Semitones, Hz and Ratio. Range: C-1 to G9 (7.94 Hz to 12910 Hz or x 0.0241 to x 39.152).

Partials
Select a preset transposition value of the slave oscillator. The transposition ratio will be displayed as multiples of the frequency of the master oscillator. Range 1:32 to 32:1.

Detune
Set the detune of the slave oscillator, in semitone steps. The tuning relates to the tuning of the master oscillator connected to the Mst input. Click on the window to select a display of a ratio, Hz or semitones. The preset value is 0 (1:1). If you select the semitone display, a second number inside a parenthesis will indicate a musical interval (a fifth, a seventh etc.).

Fine
Fine-tunes the slave oscillator. The range is +/– a quarter of a semitone, divided in 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

FMA modulation input [Attenuator Type II]
A red modulation input where a signal will affect the frequency of the oscillator. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

AM input
This red input allows you to modulate the amplitude of the slave oscillator. The amount of this modulation is fixed at a ratio of 1:1.

Waveform selector
This acts as an on/off switch of the output of the oscillator.

Out
Signal: **Bipolar**.

OscSineBank

The Sine slave oscillator bank oscillator features six sine wave oscillators. These can be tuned and controlled independently. It is also possible to sync all the waves from an external source.

Info windows

The info windows display the transposition ratio for each of the six sine wave oscillators. Range: 0.0241 to 39.152 times the master oscillator pitch.

Part

Click on the up or down button to select a partial number based on the frequency of the master oscillator connected to the module (see Mst input below). The partial number selection ranges from 1:32 to 32:1 times the master oscillator frequency.

Tune and Fine Tune

With the Tune rotary knob you can select partials in steps of one semitone. With the Fine Tune rotary knob below you can change the pitch in steps of 1/128 of a semitone. Clicking on the green triangle above the knob resets the Fine Tune to 0.

On/off

Clicking on the sine wave button to the left of the Fine Tune knob switches on or off each oscillator.

AM input

This red input allows you to modulate the amplitude of the slave oscillator. The amount of this modulation is fixed at a ratio of 1:1.

Level

This rotary knob is used for controlling each oscillator´s output level.

Mst input

This gray master input is used to connect the module to a master oscillator.

Sync input

This red input is used for synchronizing the oscillators to a control source, which could be another oscillator, an LFO or the keyboard. Synchronization forces the oscillators to restart their waveform cycles, in

sync with the waveform cycle of the controlling device. The oscillators will restart whenever a signal present at the sync input increases from 0 units to anything above 0 units.

The pitch of the controlling oscillator will interact with the controlled oscillator pitches. Turning the Tune knobs of the sync-controlled sine wave oscillators will produce radical changes in the timbre. See "Sync" on page 32 for more information.

Mix In
Use this input to mix in another audio signal. The input signal will be mixed with the sine wave oscillator signals and sent to the output.

Out
Signal: **Bipolar**

OscSlvFM
This slave oscillator produces a Sine wave. It has a sync and a special FMB-modulation input. This oscillator is especially suitable for creating classic FM sounds.

Sync input
This red input is used for synchronizing the oscillator to a control source, which could be another oscillator, an LFO or the keyboard. Synchronization forces the oscillator to restart its waveform cycle, in sync with the waveform cycle of the controlling device. The oscillator will restart whenever a signal present at the sync input increases from 0 units to anything above 0 units.

The pitch of the controlling oscillator will interact with the controlled oscillator pitch. For a traditional synthesizer sync-sound, start with the two oscillators to the same pitch and connect only the sync-controlled oscillator to an output. Turning the Detune knob of the sync-controlled oscillator will produce radical changes in the timbre. See "Sync" on page 32 for more information.

Mst input
The gray control input from a master oscillator. If you connect a master LFO to this input, the slave oscillator will track the LFO, five octaves above the pitch of the LFO.

Info window
Click on the info window to change the display between Semitones, Hz and Ratio. Range: C-1 to G9 (7.94 Hz to 12910 Hz or x 0.0241 to x 39.152).

Partials
Select a preset transposition value of the slave oscillator. The transposition ratio will be displayed as multiples of the frequency of the master oscillator. Range 1:32 to 32:1.

Detune
Set the detune of the slave oscillator, in semitone steps. The tuning relates to the tuning of the master oscillator connected to the Mst input. Click on the window to select a display of a ratio, Hz or semitones.

The preset value is 0 (1:1). If you select the semitone display, a second number inside a parenthesis will indicate a musical interval (a fifth, a seventh etc.).

Fine

Fine-tunes the slave oscillator. The range is +/– a quarter of a semitone, divided in 128 increments. Click on the triangle above the control to reset the fine-tuning to 0, which is the preset value.

FMB modulation input [Attenuator Type II]

A red modulation input where a signal will affect the oscillator pitch creating classic FM-type sounds. The FM amount is attenuated with the rotary knob next to the input. See "Frequency modulation (FM)" on page 32 for more info.

-3 Oct

Transposes the coarse pitch of the oscillator to three octaves below the master oscillator.

Waveform selector

This acts as an on/off switch of the output of the oscillator.

Out

Signal: **Bipolar**.

Noise

This sound source generates noise, selectable from white to colored.

Slider

Set the color of the noise with the control slider. Colored noise contains less high frequency energy than white noise.

Out

Signal: **Bipolar**.

PercOsc

This is a sound source that produces percussive sounds. The amplitude and pitch of the sound can be modulated from external sources.

Trig input

Use this input to trig the sound. Any signal that increases from 0 units or less, to anything above 0 units will trig the sound. The red color of the input indicates that it also accepts full audio frequency signals.

Amp input
A signal at this red input modulates the amplitude of the sound. The attenuation is fixed at a 1:1 ratio.

Click
Add a click to the sound by turning the rotary knob.

Decay
Sets the decay time of the sound.

Info window
Click on the info window to change the display between notes and Hz. Range: C-1 to G9 (7.94 Hz to 12910 Hz).

Pitch modulation inputs [Attenuator Type II]
There is a blue modulation input for modulating the oscillator pitch on this module. The modulation amount is attenuated with the rotary knob next to the input. See "Pitch modulation" on page 31 for more info.

Pitch
Sets the coarse pitch of the oscillator. Click on the info window to change the display from Hz to notes. The range is from C-1 to G9 (8.18 Hz to 12540 Hz).

Fine
Sets the fine tuning of the oscillator. The range is +/- one quarter of a semitone divided into 128 steps. Click on the triangle above the control to reset the fine tuning to 0, which is the preset value.

Punch
Changes the characteristics of the sound and adds a more distinct attack.

On/off
Switches on and off the module.

Out
Signal: **Bipolar**.

DrumSynth

The Drum synth module is designed to generate classic analog drum sounds. It consists of a master and a slave oscillator in combination with a noise source and a multimode noise filter. The global parameters include a bend function and a click and noise mixer. (See "Voice definition" on page 177 for an example on how to build a multi drum synth patch using only one single voice in Nord Modular.)

Trig

The yellow Trig input trigs the Drum synth module each time it receives a signal that changes from 0 units or below to anything above 0 units. This signal could come from a gate output of a Keyboard or Sequencer module, for example. A green LED indicates when a trig signal is received.

Vel modulation input

This blue control input is used to receive velocity information from an external source. The input velocity signal will affect Master and Slave Oscillator Level, Noise Filter Sweep, Bend Amount, Click Level and Noise Level. Maximum input velocity will force the parameters to reach their current settings.

Pitch modulation input

This blue control input is used to receive pitch data from an external module such as a Keyboard or Sequencer module, for example.

Master and Slave Info windows

The Master window displays the master pitch in Hz, and the Slave window displays the pitch ratio related to the master pitch. Range: Master: 20.0 Hz to 784 Hz. Slave: 1:1 to 6.26.

Master and Slave knobs

These are the two oscillators that generate the basic drum waveform.

Tune:

The tune of the Master can be set between 20.0 and 784 Hz. The Slave ranges from 1 to 6.26 times the Master frequency.

Decay:

Decay determines the decay time for each oscillator. Range: 0.5 ms to 45 s.

Level:

With the Level knobs you set the respective volume of the two oscillators.

Noise Filter

Here you can filter and affect the noise component of the Drum synth module.

Freq:

With the Freq knob you set the cutoff frequency of the noise. Range: 10 Hz to 15.8 kHz.

Res:
With the Res knob you set the resonance amount around the cutoff frequency.
Sweep:
With the Sweep knob you set a sweep range for the cutoff frequency. The setting results in a sweep from a high cutoff frequency down to the frequency you set with the Freq knob. Range: 0 to 5 octaves.
Decay:
The Decay knob sets the noise sweep and decay time. Range: 0.5 ms to 45 s.
HP/BP/LP:
Click on the HP, BP or LP button to select filter mode: highpass, bandpass or lowpass.

Bend
Bend is a global function for the Master and Slave oscillators.
Amt:
With the Amt knob you set the bend amount, i.e. the frequency range to bend through. The bending always start from the higher frequency and sweeps down in frequency. Range: 0 to 5 octaves.
Dcy:
With the Dcy knob you set the bend decay time. The bend time can be considered more as a bend rate, since the actual decay time is determined by the Decay knobs of the two oscillators. Range: 0.5 to 45 s.

Click
With the Click knob you can add a clicking sound to the attack of the sound.

Noise
With the Noise knob you set the noise level in the total mix.

Preset
Here you can choose between a number of factory presets by clicking on the up or down buttons.

On/off
Click on this button to switch on or off the Drum synth module.

Out
Signal: **Bipolar**

LFO GROUP

LFOs, Low Frequency Oscillators are good sources for periodic modulation. The waveforms that they produce can be used for vibrato, tremolo or as clock sources. Some of the LFOs in Nord Modular have a very wide frequency range, from very low to audible frequencies. The output of the control signal coming from a LFO, ranges from -64 to +64 units, peak to peak.

There are two main LFO groups, master LFOs and slave LFOs. The master LFOs feature more parameters and provide you with more control but they also require more power from the Sound engine than the slaves. The pitch of a slave LFO can be controlled by a master LFO. You will also find a couple of clock generators in this module group.

LFOA

This LFO produces one of five different modulation waveforms. The rate of the LFO can be modulated from an external source. The wave can be forced to restart, and the phase of the wave can be set.

Rst input

The yellow Rst input forces the LFO to restart each time it receives a signal that changes from 0 units or below to anything above 0 units. This signal could come from a gate output of a Keyboard or Sequencer module, for example.

Slv output

This is a gray output for controlling the rate of a slave LFO. Patch this output to a Mst input on a slave module. If you control a slave oscillator, it will track the LFO five octaves above the LFO rate.

Info window

The info window displays the LFO rate, either in seconds/cycle or in Hz depending on current rate. Range: 699 seconds/cycle to 392 Hz.

Rate

Set the frequency of the LFO, the rate with the knob. The LED will show you an approximation, while the info window will indicate the exact frequency in Hertz, or in seconds if the range is set to Low or Sub.

Rate modulation input [Attenuator Type II]

Input for a modulation source to control the rate of the LFO. The modulation amount is attenuated by the rotary knob next to the input.

Hi, Lo, Sub

Selects one of three ranges of the LFO rate, high, low or sub. The Hi range is from 0.26 Hz to 392 Hz, the Lo range is from 0.02 Hz to 24.4 Hz and the Sub range is from one cycle completed in 699 seconds to one cycle completed in 5.46 seconds.

Mono
Synchronizes voices in polyphonic patches to each other. See "The Mono parameter" on page 41 for details. The preset setting of this parameter is Off.

KBT
This is the keyboard tracking function. If this is set to Key, the LFO will track the keyboard with a doubling of the LFO frequency for each octave. Turning clockwise from the center position will increase the tracking, turning counter clockwise, will decrease it. Off disconnects the keyboard tracking completely. Click on the triangle above the control to set the keyboard tracking to Key. The preset value is Off.

Waveform selectors
Selects one of the five available waveforms. Clicking on a selected button will mute the output of the LFO.

Info graph
The info graph illustrates one cycle and its phase.

Phase
Sets the starting point of the LFO cycle. Range: -180 to +177 degrees.

Out
Signal: **Bipolar**.

LFOB
This LFO produces a square/pulse wave. The width of the pulse can be controlled and modulated. The rate of the LFO can be modulated by a modulation source and the keyboard. The wave cycle can be forced to restart and the phase of the waveform can be controlled.

Rst input
The yellow Rst input forces the LFO to restart each time it receives a signal that changes from 0 units or below to anything above 0 units. This signal could come from a gate output of a Keyboard or Sequencer module, for example.

Slv output
This is a gray output for controlling the rate of a slave LFO. Patch this output to a Mst input on a slave module. If you control a slave oscillator, it will track the LFO five octaves above the LFO rate.

Info window
The info window displays the LFO rate, either in seconds/cycle or in Hz depending on current rate. Range: 699 seconds/cycle to 392 Hz.

Rate
Set the frequency of the LFO, the rate with the knob. The LED will show you an approximation, while the info window will indicate the exact frequency in Hertz, or in seconds if the range is set to Low or Sub.

Rate modulation input [Attenuator Type II]
A blue Input for a modulation source to control the rate of the LFO. The modulation amount is set by the rotary knob next to the input.

Hi, Lo, Sub
Selects one of three ranges of the LFO rate, high, low or sub. The Hi range is from 0.26 Hz to 392 Hz, the Lo range is from 0.02 Hz to 24.4 Hz and the Sub range is from one cycle completed in 699 seconds to one cycle completed in 5.46 seconds.

Mono
Synchronizes modules in polyphonic patches to each other. See "The Mono parameter" on page 41 for details. The preset setting of this parameter is Off.

Phase
Sets the starting point of the LFO cycle, the phase. Range: -180 to +177 degrees.

Info graph
The info graph illustrates one cycle and its phase.

KBT
This is the keyboard tracking function. If this is set to Key, the LFO will track the keyboard with a doubling of the frequency for each octave. Turning clockwise from the center position will increase the tracking, turning counter clockwise, will decrease it. Off disconnects the keyboard tracking completely. Click on the triangle above the control to set the keyboard tracking to Key. The preset value is Off.

PWM modulation input [Attenuator Type I]
This is a blue input for modulating the width of the pulse wave, starting at the initial width set with the PW control. The modulation amount is determined by the rotary knob next to the input.

PW
Sets the initial width of the waveform. The range is from 1% to 99%. Click on the triangle above the knob to reset the initial pulse width to 50%. This is the preset value.

Out
Signal: **Bipolar**.

LFOC

This LFO produces one of four selectable waveforms. The rate of the LFO can be modulated by a modulation source.

Slv output

This is a gray control output for controlling the rate of a slave LFO. Patch this output to a Mst input on a slave module. If you control a slave oscillator, it will track the LFO five octaves above the LFO rate.

Info window

The info window displays the LFO rate, either in seconds/cycle or in Hz depending on current rate. Range: 699 seconds/cycle to 392 Hz.

Mono

Synchronizes modules in polyphonic patches to each other. See "The Mono parameter" on page 41 for details. The preset setting of this parameter is Off.

Rate

Set the frequency of the LFO, the rate with the knob. The LED will show you an approximation, while the window will indicate the exact frequency, in Hertz or in seconds if the range is set to Sub.

Hi, Lo, Sub

Selects one of three ranges of the LFO rate, high, low or sub. The Hi range is from 0.26 Hz to 392 Hz, the Lo range is from 0.02 Hz to 24.4 Hz and the Sub range is from one cycle completed in 699 seconds to one cycle completed in 5.46 seconds.

Waveform selectors

Selects one of the four available waveforms. Clicking on a selected button will mute the output of the LFO.

Rate modulation input [Attenuator Type II]

A blue input for a modulation source to control the rate of the LFO. The modulation amount is set by the rotary knob next to the input.

Out

Signal: **Bipolar**.

A word about slave LFOs

The rate of slave LFOs can be controlled by a master LFO. The gray Slv output of a master module should be connected to the gray Mst input of the slave module. If you refrain from connecting a master LFO to a slave, it will produce a waveform at the rate set with the Rate knob.

LFOSlvA

This slave LFO produces one of five selectable waveforms. The rate can be controlled from a master LFO, the cycle can be forced to restart and the phase of the waveform can be controlled.

Mst input

A gray control input, for the frequency of the slave LFO to be controlled by a master module. Patch this input to a Slv output on a master module. If you connect a master oscillator to this input, the slave LFO will track the oscillator five octaves below the pitch of the oscillator.

Rst input

The yellow Rst input forces the LFO to restart each time it receives a signal that changes from 0 units or below to anything above 0 units. This signal could come from a gate output of a Keyboard or Sequencer module, for example.

Info window

Displays either the LFO ratio related to the master rate, or the rate in Hz or seconds. Click to switch unit.

Mono

Synchronizes modules in polyphonic patches to each other. See "The Mono parameter" on page 41 for details. The preset setting of this parameter is Off.

Rate

Sets the frequency of the LFO. The frequency will be displayed as a ratio, in relation to the master module connected to the Mst input. The rate LED will show you an approximation of the frequency. Range: 0.025 to 38.05 times the master rate or 62.9 seconds/cycle to 24.4 Hz.

Waveform selectors

Selects one of the five available waveforms. Clicking on a selected button will mute the LFO output.

Phase

Sets the starting point of the LFO cycle, the phase. Range: -180 to +177 degrees.

Info graph

The info graph illustrates the wave and its phase. It also display the number of wave cycles according to set ratio.

Out

Signal: **Bipolar**.
The green LED indicates the output frequency.

LFOSlvB

This slave LFO produces a Sawtooth waveform.

Mst input

A gray control input, for the frequency of the slave LFO to be controlled by a master module. Patch this input to a Slv output on a master module. If you connect a master oscillator to this input, the LFO will track the oscillator five octaves below the pitch of the oscillator.

Info window

Displays either the LFO ratio related to the master rate, or the rate in Hz or seconds. Click to alter.

Slider

Sets the frequency of the LFO. The frequency will be displayed as a ratio, in relation to the master module connected to the Mst input. The rate LED will show you an approximation of the frequency. Range 0.025 to 38.05 times the master rate, or 62.9 seconds to 24.4 Hz.

Out

Signal: **Bipolar**.
The green LED indicates the output frequency.

LFOSlvC

This slave LFO produces a Sine wave.

Mst input

A gray control input, for the frequency of the slave LFO to be controlled by a master module. Patch this input to a Slv output on a master module. If you connect a master oscillator to this input, the LFO will track the oscillator five octaves below the pitch of the oscillator.

Info window

Displays either the LFO ratio related to the master rate, or the rate in Hz or seconds. Click to alter.

Slider

Sets the frequency of the LFO. The frequency will be displayed as a ratio, in relation to the master module connected to the Mst input. The rate LED will show you an approximation of the frequency. Range 0.025 to 38.05 times the master rate, or 62.9 seconds to 24.4 Hz.

Out

Signal: **Bipolar**.
The green LED indicates the output frequency.

LFOSlvD

This slave LFO produces a Square wave.

Mst input

A gray control input, for the frequency of the slave LFO to be controlled by a master module. Patch this input to a Slv output on a master module. If you connect a master oscillator to this input, the LFO will track the oscillator five octaves below the pitch of the oscillator.

Info window

Displays either the LFO ratio related to the master rate, or the rate in Hz or seconds. Click to alter.

Slider

Sets the frequency of the LFO. The frequency will be displayed as a ratio, in relation to the master module connected to the Mst input. The rate LED will show you an approximation of the frequency. Range 0.025 to 38.05 times the master rate, or 62.9 seconds to 24.4 Hz.

Out

Signal: **Bipolar**.
The green LED indicates the output frequency.

LFOSlvE

This slave LFO produces a Triangle wave.

Mst input

A gray control input, for the frequency of the slave LFO to be controlled by a master module. Patch this input to a Slv output on a master module. If you connect a master oscillator to this input, the LFO will track the oscillator five octaves below the pitch of the oscillator.

Info window

Displays either the LFO ratio related to the master rate, or the rate in Hz or seconds. Click to alter.

Slider

Sets the frequency of the LFO. The frequency will be displayed as a ratio, in relation to the master module connected to the Mst input. The rate LED will show you an approximation of the frequency. Range 0.025 to 38.05 times the master rate, or 62.9 seconds to 24.4 Hz.

Out

Signal: **Bipolar**.
The green LED indicates the output frequency.

ClkGen

The clock generator module generates a number of logic signals. The module can also act as a master to slave LFOs.

Reset input

The yellow Reset input forces the clock generator to restart each time it receives a signal that changes from 0 units or below to anything above 0 units. This signal could come from a gate output of a Keyboard or Sequencer module, for example. When the clock generator is reset, it transmits a high logic signal on the Sync output.

Slv output

A gray slave signal output for controlling the rate of slave LFOs. If the ratio of the slave LFO is set to 1:1, 1 BPM on the clock generator module corresponds to 1 Hz on the slave LFO. Patch this output to a Mst input on a slave LFO.

Info window

Displays the rate in beats per minute, BPM. Range: 24 to 214 BPM.

Rate

Set the desired rate, in beats per minute, with the slider. Range: 24 to 214 BPM.

On/Off

Starts and stops the generation of clock pulses.

24 pulses/beat

This yellow output transmits 24 clock pulses for each quarter note.
Signal: **Logic**.

4 pulses/beat

This yellow output transmits 4 clock pulses for each quarter note.
Signal: **Logic**.

Sync output

This yellow output transmits a logic signal when the generator is reset or started.
Signal: **Logic**.

ClkRndGen

The Clocked Random Step Generator module generates a random control signal. The module transmits a new random value for each logic signal received at the Clk input.

Mono

Synchronizes modules in polyphonic patches to each other. See "The Mono parameter" on page 41 for details. The preset setting of this parameter is Off.

Col

This sets the "color" of the random control signal. The colored setting is more gentle and contains less radical differences between adjacent values. The "white" setting is completely random.

Clk input

A logic signal or a periodic control signal from e.g. a clock generator or an LFO can be used to clock the output of the module.

Out

Signal: **Bipolar**.

RndStepGen

The Random Step Generator module generates a random control signal. The control signal is "colored". This means the effect is more gentle than a true, random signal. It contains less radical differences between adjacent values.

Mst

A gray control input, for the generator to be controlled by a master module.

Info window

Displays either the LFO ratio related to the master rate, or the rate in Hz or seconds. Click to alter.

Slider

Sets the frequency of the LFO. The frequency will be displayed as a ratio, in relation to the master module connected to the Mst input. The rate LED will show you an approximation of the frequency. Range 0.025 to 38.05 times the master rate, or 62.9 seconds to 24.4 Hz.

Out

Signal: **Bipolar**.
The green LED indicates the output frequency.

RandomGen

The Random Generator is a slave LFO that generates smooth random control signal steps at a steady frequency.

Mst

This gray input is used to connect the module to a master LFO.

Info window

Displays either the LFO ratio related to the master rate, or the rate in Hz or seconds. Click to alter.

Slider

Sets the frequency of the LFO. The frequency will be displayed as a ratio, in relation to the master module connected to the Mst input. The rate LED will show you an approximation of the frequency. Range 0.025 to 38.05 times the master rate, or 62.9 seconds to 24.4 Hz.

Out

Signal: **Bipolar**.
The green LED indicates the output frequency.

RndPulsGen

The Random Pulse Generator module generates a random logic signal with a selectable density.

Density

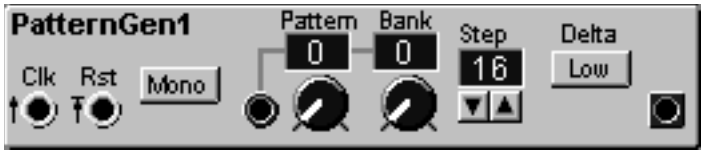
Sets the average frequency and average pulse width of the logic signal. Low density results in few but longer pulses, and high density results in more but shorter pulses. The interval between the high and low logic signal levels are completely random.

Out

Signal: **Logic**.
The green LED indicates the output frequency.

PatternGen

The Clocked Pattern Generator generates 16384 different patterns (127 banks with 127 patterns each) with selectable length.



Clk input

The yellow logic Clk input can be connected to a Clk output of an external module, such as the Clock generator. At each clock pulse the Pattern generator advances one step.

Rst input

The yellow logic Rst input is used to restart the selected pattern. When receiving a logic restart signal, the Pattern generator restarts at step one. The restart isn't performed until the next the clock pulse is received at the Clk input. This guarantees perfect timing.

Mono

Synchronizes the voices in polyphonic patches to each other. This means that if you play a chord, the Pattern Generator will control all voices simultaneously (see "The Mono parameter" on page 41 for details).

Pattern and Bank Info window

Displays selected Pattern and Bank number.

Pattern and Bank

With the rotary buttons you select Pattern (0-127) and Bank (0-127). Pattern and Bank selection can also be controlled externally using the blue control signal input to the left of the buttons.

Step Info window

Displays the selected number of Steps in the pattern(s).

Step

Click on the up and down arrow to select number of steps in the pattern (1-128).

Delta

Click to select High or Low. High Delta value produces great difference in output level between steps, and Low Delta produces low difference.

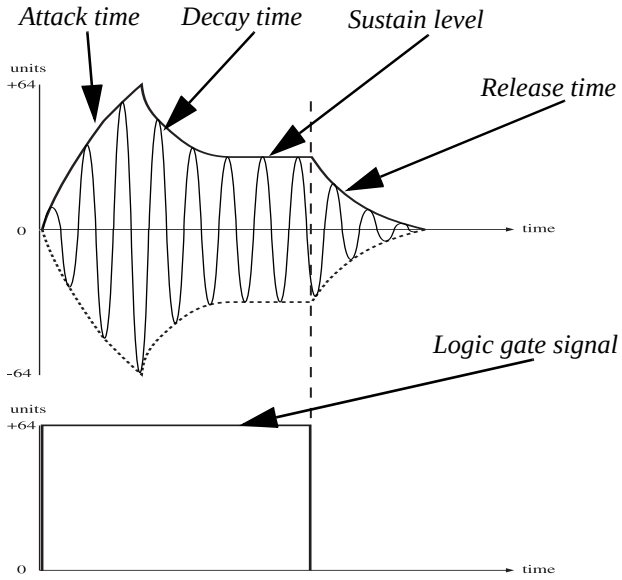
Out

Signal: **Unipolar**

Envelope group

An envelope generator affects the sound in some way over time. The envelope starts when it receives a trig or gate signal and it closes when the trig/gate signal switches back to zero. During the active stages, the envelopes can be retriggered. You have control over certain time-dependent parameters and levels (ADSR and Multi-envelope only) in the Nord Modular envelopes. The output signal from an envelope is usually unipolar, from 0 to + 64 units (or if inverted, from +64 to 0 units), but can also be bipolar.

The figure to the right describes the different segments of an ADSR envelope. The sine wave represents the audio signal that is being controlled by the envelope.



The figure to the right describes the gate signal that starts and holds the envelope.

- If the logic gate signal at the Gate input on an ADSR envelope generator switches to zero before the envelope has completed one or more of the stages, the envelope will jump directly to the release stage.

- If an envelope is restarted before all the stages were completed, it will restart the attack from the current envelope level.

ADSR-Env

This is a four-step ADSR envelope (Attack, Decay, Sustain and Release). The envelope contains a gain control function, which is automatically modulated by the envelope. This enables you to control the amplitude of an external audio- or control signal.

Gate input

A high logic signal appearing at this yellow input will start and can keep the envelope in an open-gate state. The LED lights up while the envelope is receiving a high logic signal.

Retrig input
The envelope can be restarted by a high logic signal connected to the yellow Retrig input. The envelope Gate input must be receive a gate signal to make the envelope retrig.

Amp input
A blue control signal input used for controlling the overall amplitude of the envelope.

Attack characteristics buttons
Set the characteristics of the attack part of the envelope with one of the three buttons, logarithmic, linear or exponential. (This selector can not be assigned to a Morph group).

A
Sets the attack time. When the envelope receives a high logic signal at the Gate input, the output control signal from the envelope rises up to the maximum output, +64 units. The time to get from 0 to +64 units is the attack time. If the logic Gate signal drops to zero before the envelope has completed the attack stage, it will skip the decay and sustain stages and immediately proceed with the release stage. The attack time is displayed in milliseconds or seconds in the corresponding info window. Range: 0.5 ms to 45 s.

D
Sets the decay time. After the envelope has completed the attack part, it will drop down to the sustain level with the decay time. The decay is exponential. If the sustain level is 64, the decay stage will not be needed, there is simply nothing to decay down to. If the logic Gate signal drops to zero before the envelope has completed the decay stage, it will immediately proceed with the release stage. The decay time is displayed in milliseconds or seconds in the corresponding info window. Range: 0.5 ms to 45 s.

S
Sets the sustain level. This level will be held (sustained) for as long as the logic Gate signal is high. When the logic Gate signal drops to zero, the envelope will proceed with the release stage. The sustain level is displayed in 'units' in the corresponding info window. Range: 0 to 64 units.

R
Sets the release time. When the logic Gate signal drops to zero, the envelope will decrease from the sustain level to zero with the release time. The release is exponential. The release time is displayed in milliseconds or seconds in the corresponding info window. Range: 0.5 ms to 45 s.

Invert
This inverts the control signal of the envelope.

Info graph
The info graph shows an approximation of the envelope gain curve. The yellow line represents the sustain level, which is not defined in time since it depends on the gate signal hold time.

Input
The red audio signal input. Here you patch a signal to the envelope controlled amplifter.

Envelope output
The blue control signal output from the envelope generator.
Signal: **Unipolar**.

Output
The red output from the envelope controlled amplifter. Signal: **Bipolar**.

AD-Env

This is a smaller envelope with two stages, attack and decay. If the envelope finishes the attack stage while still receiving a high Gate signal, the envelope proceeds with the decay stage. If the logic Gate signal drops to zero during the attack stage, the envelope starts the decay stage with the set decay time.

Gate/Trig selector

This determines whether the envelope should behave like a gated envelope or like an unconditional envelope. The gated (Gate mode) envelope needs a high logic signal for at least a short period of the attack stage. The unconditional (Trig mode) envelope only needs a short high logic signal to start. When the envelope has started after a Trig signal, it will proceed to the very end of the cycle even if the Trig signal drops to zero. Please note the arrow that appears next to the yellow input when Trig mode is selected.

Gate/Trig Input

A high logic signal at this yellow input will start the envelope.

Amp input

A blue control signal input used for controlling the overall amplitude of the envelope.

Attack

Sets the attack time. When the envelope receives a high logic signal at the Gate/Trig input, the output control signal from the envelope rises up to the maximum output, +64 units. The time to get from 0 to +64 units is the attack time. The attack is linear. If the logic Gate signal drops to zero before the envelope has completed the attack stage, it will immediately proceed with the decay stage. If the logic input is set to Trig, the entire attack phase will be completed. The attack time is displayed in milliseconds or seconds. Range: 0.5 ms to 45 s.

Dcy

Sets the decay time. After the envelope has completed the attack part, it will drop down to 0 units with the decay time. The decay is exponential. If the logic Gate/Trig signal drops to zero before the envelope has completed the decay stage, it will still continue through the whole decay stage. Range: 0.5 ms to 45 s.

Info graph

The info graph shows an approximation of the envelope gain curve.

input

The red audio signal input. Here you patch a signal to the envelope controlled amplifter.

Envelope output

The blue control signal output from the envelope generator.
Signal: **Unipolar**.

Output

The red output from the envelope controlled amplifter.
Signal: **Bipolar**.

Mod-Env

The Mod Envelope is an ADSR envelope with inputs to control attack, decay, sustain and release from external sources.

Amp input

A blue control signal input used for controlling the overall amplitude of the envelope.

Gate input

A logic control signal input that is used to start and hold the envelope for as long as the logic signal is high. A green LED indicates when a gate signal is received.

Retrig input

The envelope can be restarted with a logic signal at this input. Note that the envelope must receive a gate signal at the gate input to be able to retrig.

A

Sets the attack time. When the envelope receives a high logic signal at the Gate input, the output control signal from the envelope rises up to the maximum output, +64 units. The time to get from 0 to +64 units is the attack time. If the logic Gate signal drops to zero before the envelope has completed the attack stage, it will skip the decay and sustain stages and immediately proceed with the release stage. The attack time is displayed in milliseconds or seconds in the corresponding info window. Range: 0.5 ms to 45 s.

D

Sets the decay time. After the envelope has completed the attack part, it will drop down to the sustain level with the decay time. The decay is exponential. If the sustain level is 64, the decay stage will not be needed, there is simply nothing to decay down to. If the logic Gate signal drops to zero before the envelope has completed the decay stage, it will immediately proceed with the release stage. The decay time is displayed in milliseconds or seconds in the corresponding info window. Range: 0.5 ms to 45 s.

S

Sets the sustain level. This level will be held (sustained) for as long as the logic Gate signal is high. When the logic Gate signal drops to zero, the envelope will proceed with the release stage. The sustain level is displayed in 'units' in the corresponding info window. Range: 0 to 64 units.

R

Sets the release time. When the logic Gate signal drops to zero, the envelope will decrease from the sustain level to zero with the release time. The release is exponential. The release time is displayed in milliseconds or seconds in the corresponding info window. Range: 0.5 ms to 45 s.

A, D, S, R control inputs [Attenuator Type I]

Each of the attack, decay, sustain and release values can be controlled externally by using the corresponding control signal input below the A, D, S and R knobs. You can adjust the level of each control signal

by turning the corresponding rotary knob. Note that the A, D and R control inputs handles bipolar control signals. Positive control signals shortens the times and negative control signals increase the times.

Info graph
The info graph shows an approximation of the envelope gain curve. The yellow line represents the sustain level, which is not defined in time since it depends on the gate signal hold time.

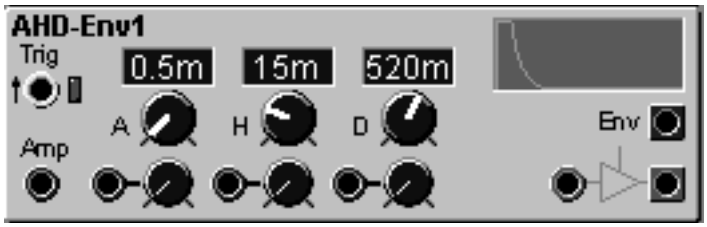
Invert
This inverts the control signal of the envelope.

input
The red audio signal input. Here you patch a signal to the envelope controlled amplifter.

Envelope output
The blue control signal output from the envelope generator.
Signal: **Unipolar**.

Output
The red output from the envelope controlled amplifter.
Signal: **Bipolar**.

AHD-Env
The Attack-Hold-Decay envelope is an envelope with inputs to control attack, hold and release times.



Trig input
A logic control signal input that is used to start the envelope. Note that this is a Trig input and not a gate input. This means the envelope will always complete all the envelope stages. A green LED indicates when a trig signal is received

Amp input
A blue control signal input used for controlling the overall amplitude of the envelope.

A
Sets the attack time. When the envelope receives a high logic signal at the Trig input, the output control signal from the envelope rises up to the maximum output, +64 units. The time to get from 0 to +64 units is the attack time. The attack is linear. The attack time is displayed in milliseconds or seconds in the corresponding info window. Range: 0.5 ms to 45 s.

H
Sets the time the envelope should remain at +64 units.

D
Sets the decay time. After the envelope has completed the hold stage, it will drop down to 0 units with the decay time. The decay is exponential. Range: 0.5 ms to 45 s.

A, H, D control inputs [Attenuator Type I]
Each of the attack, hold and decay times can be controlled externally by using the corresponding control signal input below the A, H and D knobs. You can attenuate the level of each control signal by turning the corresponding rotary knob. Note that the A, H and D control inputs handles bipolar control signals. Positive control signals on the A and D control inputs shortens the times and negative control signals increase the times. With the H parameter it is the other way around.

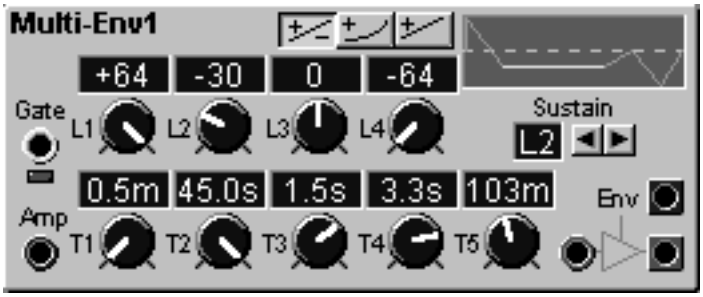
Info graph
The info graph shows an approximation of the envelope gain curve.

Input
The red audio signal input. Here you patch a signal to the envelope controlled amplifter.

Envelope output
The blue control signal output from the envelope generator.
Signal: **Unipolar**.

Output
The red output from the envelope controlled amplifter.
Signal: **Bipolar**.

Multi-Env
The Multi stage envelope is a 5-segment time and level envelope with selectable sustain segment.



Gate input
A logic control signal is used to start and hold the envelope for as long as the logic signal is high. A green LED indicates when a gate signal is received.

Amp input
A blue control signal input used for controlling the overall amplitude of the envelope.

Bipolar linear/Unipolar exponential/Unipolar linear buttons
Click on the radio buttons to switch between Bipolar with linear time segments characteristics, Unipolar with exponential attack time segment(s) characteristics, or Unipolar with linear attack time segment(s) characteristics. Note that it is only the attack segments of the unipolar envelopes that can be selected to be linear or exponential. The decay segments of the unipolar envelopes are always exponential. An attack segment is defined as a level shift from a low value to a higher value, and a decay segment is defined as a level shift from a high value to a lower value.

L1-L4
By clicking on the rotary knobs L1 to L4 you can set the amplitude of each of the four level segments in the envelope. Your levels can be either unipolar or bipolar as described above. Ranges: 0 to +64 units (unipolar) or -64 to +64 units (bipolar).

T1-T5
Here you set the times between the four levels plus a fifth release time from L4 to zero. Ranges: 0.5 ms to 45 s.

Info graph
The info graph shows an approximation of the envelope gain curve. The yellow line represents the sustain level, which is not defined in time since it depends on the gate signal hold time. If 'bipolar' is selected, a horizontal broken line represents the 0 units output level.

Sustain
By clicking on the left and right button you define the sustain segment. This segment can be any of the four level segments, or, if you wish, none at all. The sustain segment works like in an ordinary ADSR envelope, i.e this is the level that sustains when holding down the key(s). After releasing the key(s) the envelope will continue till the end of T5. Range: None and L1 to L4.

Input
The red audio signal input. Here you patch a signal to the envelope controlled amplifter.

Env Output
The blue control signal output of the envelope.
Signal: **Unipolar or Bipolar**

Output
The red output from the envelope controlled amplifter.
Signal: **Bipolar**.

EnvFollower
This module will extract an envelope from a signal, i.e follow the amplitude envelope of an incoming signal. When a signal at the input of this module increases in amplitude, this module "follows" the amplitude with the time set as Attack time. When a signal decreases, it "follows" the amplitude with the time set as Release time.

Input
The red audio signal input.

Attack
Sets the time it should take for the envelope follower to track increasing amplitude of the input signal. Range: Fast(0.5 ms) to 767 ms. The set value is shown in the corresponding info window.

Release
Sets the time it should take for the envelope follower to track decreasing amplitude of the input signal. Range: 40 ms to 3.26 s. The set value is shown in the corresponding info window.

Output
The output of the generated envelope signal.
Signal: **Unipolar**.

Filter group

A filter is one of the primary tools for shaping and coloring the sound in a synthesizer. It can attenuate and amplify different frequencies in oscillator waveforms and other signals, and drastically change the timbre of the sound. Most of the Nord Modular filters can be dynamically controlled from various sources.

In Nord Modular you have several different filter modules to choose from, ranging from traditional LP/HP/BP filters to complex special filters such as the vocoder.

FilterA

This is a static lowpass filter with a slope of 6 dB/octave.

Input
The red audio signal input.

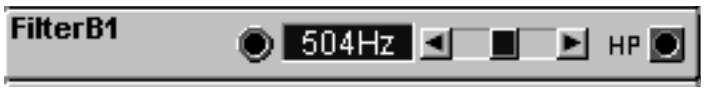
Info window
Shows the set cut-off frequency. Range: 12 Hz to 20 kHz.

Frequency slider
Sets the cut-off frequency of the filter. The cut-off frequency is indicated in the info window. Range: 12 Hz to 20 kHz.

Output
Signal: **Bipolar**.

FilterB

This is a static highpass filter with a slope of 6 dB/octave.



Input
The red audio signal input.

Info window
Shows the set cut-off frequency in Hz. Range: 12 Hz to 20 kHz.

Frequency slider
Sets the cut-off frequency of the filter. The cut-off frequency is indicated in the info window. Range: 12 Hz to 20 kHz.

Output
Signal: **Bipolar**.

FilterC
This is a static multimode filter with a slope of 12 dB/octave and resonance control. It is a multi-mode filter with three outputs: one highpass, one lowpass and one bandpass.

Input
The red input of the filter module.

GC
This is the Gain Compensation parameter. When activated, it will lower the gain of the signal inside the filter if the resonance is increased, something that otherwise will boost the level within the filter. If several sound sources are processed in a filter and the resonance control is raised, clipping of the signal might occur inside the filter. Activating the GC parameter will reduce the levels, to reduce the risk of any unwanted clipping.

Freq Info window
Displays the cut-off frequency in Hz or notes. Range: E-1 to B9 or 10 Hz to 15.8 kHz. Click in the window to change unit.

Frequency knob
Sets the cut-off frequency of the filter. Range: E-1 to B9 or 10 Hz to 15.8 kHz.

Resonance Info window
Displays the resonance in 'units'. Range: 0 to 127 units.

Resonance
This is a function that emphasizes the frequencies that is at, or close to, the set cut-off frequency. If set to 127, the filter starts to self-oscillate and produces a sine wave. Range: 0 to 127 units.

Outputs
Three filter characteristics are available at these red outputs. You can use all three at the same time if you like. **HP** is a Highpass filter, **BP** is a Bandpass filter and **LP** is a Lowpass filter.
Signals: **Bipolar**.

FilterD

This is a dynamic multimode filter with a slope of 12 dB/octave and resonance control. It is a multi-mode filter with three outputs: one highpass, one lowpass and one bandpass. The cut-off frequency can be modulated from an external source.

Input

The red audio input.

Freq Info window

Displays the cut-off frequency in Hz or notes. Range: E-1 to B9 or 10 Hz to 15.8 kHz. Click in the window to change unit.

Frequency modulation input [Attenuator Type III]

The blue input for modulating the cut-off frequency from a control source. The modulation amount is determined by the rotary knob next to the input. Read more about the modulation types in "Modulation inputs" on page 29.

Frequency knob

Sets the initial cut-off frequency of the filter. The cut-off frequency is indicated in the info window. Range: E-1 to B9 or 10 Hz to 15.8 kHz.

KBT

This is a hardwired connection between the cut-off frequency and the keyboard. At the preset value "Key", the keyboard will control the cut-off frequency at a rate of one semitone for each key. Turning clockwise from the center position will increase the tracking, turning counter-clockwise, will decrease it. Off disconnects the keyboard tracking completely. Click on the triangle above the control to reset the keyboard tracking to Key.

Resonance Info window

Displays the resonance in 'units'. Range: 0 to 127 units.

Resonance

This is a function that emphasizes the frequencies that is at, or close to, the set cut-off frequency. If set to 127, the filter starts to self-oscillate and produces a sine wave. Range: 0 to 127 units.

Outputs

Three filter characteristics are available at these red outputs. You can use all three at the same time if you like. **HP** is a Highpass filter, **BP** is a Bandpass filter and **LP** is a Lowpass filter.
Signal: **Bipolar**.

FilterE

This is a dynamic synthesizer filter with a slope of either 12 or 24 dB/octave. It is a multi-mode filter, providing a highpass, a lowpass, a bandpass or a bandreject filter. The cut-off frequency and the resonance can be modulated from external sources.

Input

The red audio input of the filter.

Filter selector

Select the filter type with the buttons. Clicking on a selected filter type will bypass the filter, leaving any signal unaffected at the output. (This selector cannot be assigned to a Morph group). HP is a Highpass filter, BP is a Bandpass filter and LP is a Lowpass filter. BR is a Band reject filter. When this filter is selected, the Resonance knob will control the width of the frequency band to be rejected.

Frequency modulation inputs [Attenuator Type III]

The two red inputs for connecting cut-off frequency modulators. The modulation amount is determined by the rotary knobs next to each input. Read more about the modulation types in “Modulation inputs” on page 29.

Freq Info window

Displays the cut-off (or center in BR mode) frequency in Hz or notes. Range: E-1 to B9 or 10 Hz to 15.8 kHz. Click in the window to change unit.

Frequency knob

Sets the initial cut-off (or center in BR mode) frequency of the filter. The frequency is indicated in the info window. Range: E-1 to B9 or 10 Hz to 15.8 kHz.

KBT

The connection between the filter cut-off frequency and the keyboard. At the preset value “Key" the keyboard will control the cut-off frequency at a rate of one semitone for each key. Turning clockwise from the center position will increase the tracking, turning counter clockwise, will decrease it. Off disconnects the keyboard tracking completely. Click on the triangle above the control to reset the keyboard tracking to Key.

dB/Oct

Select the roll-off slope of the filter, 12 or 24 decibels for each octave.

Info graph

Displays a schematic graph of the selected filter characteristics. The Y-axis represents level and the X-axis the frequency. The broken line represents the 0 dB level.

Resonance Info window
Displays the resonance in 'units'. Range: 0 to 127 units.

GC
This is the Gain Compensation parameter. When activated, it will lower the gain of the signal inside the filter if the resonance is increased, something that otherwise will boost the level within the filter. If several sound sources are processed in a filter and the resonance control is raised, clipping of the signal might occur inside the filter. Activating the GC parameter will reduce the levels, to reduce the risk of any unwanted clipping.

Resonance modulation input [Type I]
The red input for modulating the resonance from a control source. The modulation amount is determined by the rotary knob next to the input.

Resonance
This is a function that emphasizes the frequencies that is at, or close to, the set cut-off frequency in LP, HP, and BP mode. If set to 127, the filter starts to self-oscillate and produces a sine wave. In BR mode this controls the width of the frequency band to be rejected. Range: 0 to 127 units.

Output
Signal: **Bipolar**.

FilterF
This is a lowpass filter which simulates classic synthesizer filters. The slope is selectable between 12, 18 or 24 dB/octave. The cut-off frequency can be modulated from two external sources.

Input
The red audio input.

Freq Info window
Displays the cut-off frequency in Hz or notes. Range: E-1 to B9 or 10 Hz to 15.8 kHz. Click in the window to change unit.

Frequency knob
Sets the initial cut-off frequency of the filter. The frequency is indicated in the info window. Range: E-1 to B9 or 10 Hz to 15.8 kHz.

KBT
The connection between the filter cut-off frequency and the keyboard. At the preset value "Key" the keyboard will control the cut-off frequency at a rate of one semitone for each key. Turning clockwise from

the center position will increase the tracking, turning counter clockwise, will decrease it. Off disconnects the keyboard tracking completely. Click on the triangle above the control to reset the keyboard tracking to Key.

Frequency modulation inputs [Attenuator Type III]
Two blue inputs for modulating the cut-off frequency with a control source. The modulation amount is determined by the rotary knobs next to the inputs. Read more about the modulation types in "Modulation inputs" on page 29.

Resonance Info window
Displays the resonance in 'units'. Range: 0 to 127 units.

Resonance
This is a function that emphasizes the frequencies that is at, or close to, the cut-off frequency. If you set the control to 127 the filter will start to self-oscillate and produce a sine wave. Range: 0 to 127 units.

Info graph
Displays a schematic graph of the selected filter characteristics. The Y-axis represents level and the X-axis the frequency. The broken line represents the 0 dB level.

dB/Oct
Select the roll-off slope of the filter, 12, 18 or 24 decibels for each octave.

Output
Signal: **Bipolar**.

VocalFilter
The Vocal Filter module is designed to simulate the vocal tract. You can select between a number of preset vowels and change and modulate them to generate really amazing effects. Waveforms with a lot of overtones, such as sawtooth or pulse waves, are best suited to be used with the Vocal Filter.

Input
The audio input of the filter module. The knob next to it is used for attenuating the input level.

Res
This function emphasizes the frequency peaks of the vowels. The more resonance, the more clearly the vowels appear. Click on the green triangle above the rotary knob to reset to a medium value.

Freq
Sets the initial center frequency offsets of the vowels. The practical result of turning this knob would be like pitch-shifting a sampled voice. Click on the green triangle above the rotary knob to reset to a medium value.

Frequency modulation input [Attenuator Type II]
The input for modulating the center frequency offset from a control source. The modulation amount is determined by the rotary knob next to the inputs.

Vowel Info windows
Displays the three different selected vowels. Presets: A, E, I, O, U, Y, AA, AE, OE.

Vowel navigator buttons
Selects the vowels to be used. You can select up to three vowels and navigate between these with the navigator knob (see below). Presets: A, E, I, O, U, Y, AA, AE, OE.

Vowel navigator knob
Navigates between the vowels you selected with the vowel selectors. Note that this is a transformation function - not a mix function.

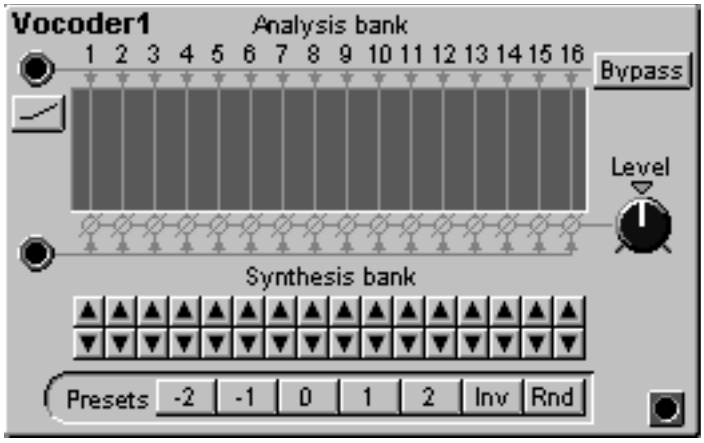
Vowel modulation input [Attenuator Type I]
The input for modulating the navigation between the selected vowels. The knob next to the input is used for attenuating the input level.

Output
Signal: **Bipolar**.

Vocoder
The Vocoder module is a 16 band vocoder with the ability to reroute the analysis bands. The basic principle of a vocoder is to filter a synthesizer sound with the help of another sound - a human voice for example. The result when filtering a synth sound with a voice would be a “singing” synthesizer.The actual notes that come out of the vocoder are the notes played on the synthesizer. To reach this effect the analysis frequency spectrum is divided into separate frequency bands, in this case 16. These 16 frequency bands work like 16 bandpass filters, each controlling a corresponding frequency band of the synthesizer bank. An envelope follower for each band determines the amplitude of the modulated sound.

With this vocoder module it is possible to reroute the analysis bands to any of the frequency bands of the synthesis bank, creating really interesting frequency combinations.

Of course you can use any kind of sound in the analysis bank to shape the synthesizer sound. Some like to use drum sounds to get percussive synth sounds, for example. Feel free to experiment.



Analysis bank input
Patch the signal you want to use as "modulator" to the red audio signal input on the upper left of the module.

High frequency emphasis
Press the button below the Analysis bank input to emphasize the high frequencies of the analysis signal. This is a very useful function to get a more even frequency response in the modulated sound.

Info graph
This graph shows the routing between the Analysis and Synthesis bands.

Synthesizer input
The red audio signal input below the High frequency emphasis button is where you patch the synthesizer audio signal.

Synthesizer bank
Click on the up and down buttons to reroute each of the synthesizer signal's frequency bands to any of the frequency bands of the Analysis bank.

Presets
Click on the Preset buttons to reroute all Synthesis bands the number of steps indicated on the buttons. The Inv button inverts the band routing, i.e routes the Analysis band 1 to Synthesis band 16 and so on. The Rnd button reroutes all bands completely randomly - great for experiments.

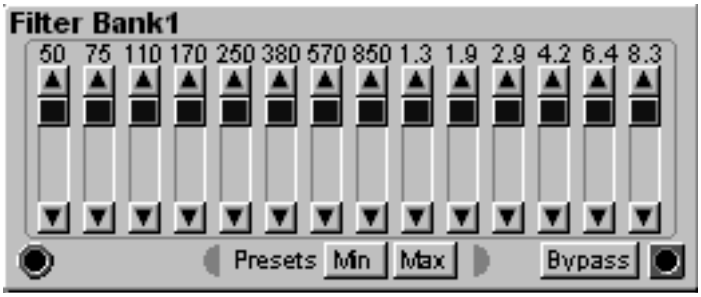
Bypass
With this button bypass the synthesizer signal and leave it unaffected.

Level
Use this rotary knob to adjust the level of the synthesis signal. Range: 0.25 to 4 times the input level. Click on the green triangle to leave the signal unaffected.

Out
Signal: **Bipolar**

Filter Bank

The Filter Bank is a 14-band static filter with attenuation controls for each frequency band. The Filter Bank is very suitable for simulating different kinds of body resonance (formants).



Input

The red audio input.

Band attenuator sliders

Attenuate each filter band with the sliders, or by clicking the up and down arrow buttons. Above each slider, the center frequency of each band is shown in Hz or kHz.

Min & Max

With these buttons you can set all bands to Min or Max output level.

Bypass

Press the Bypass button to disable the filter effect and leave the signal unaffected.

Output

Signal: **Bipolar**

EqMid

EqMid offers parametric equalization with center frequency, gain and bandwidth controls.

Input

This is the red audio input of the equalizer. With the rotary knob to the right of the input you can attenuate the input signal [Attenuator Type I].

Freq Info window

Displays the center frequency in Hz. Range: 20 Hz to 16 kHz.

Freq knob

With the big rotary knob you change the center frequency. Range: 20 Hz to 16 kHz.

Gain Info window
Displays the gain in dB. Range -18 to 18 dB.

Gain knob
With the Gain rotary knob you change the gain at the center frequency. Range -18 to 18 dB.

BW Info window
Displays the bandwidth in octaves. Range 2 to 0.02 octaves.

BW knob
Use the BW rotary knob to set the bandwidth around the center frequency. Range 2 to 0.02 octaves.

Info graph
Displays a schematic graph of the equalization characteristics. The Y-axis represents level and the X-axis the frequency. The horizontal line in the middle represents the 0 dB level.

Bypass
Press the Bypass button to disable the equalization and leave the signal unaffected.

Output
The multi-color LED to the left of the output indicates the output level and have the following meaning: Green: normal signal level, Yellow: signal reaching headroom, Red: overload.
Signal: **Bipolar**

EqShelving
The Hi and Lo Shelving EQ is a treble and bass equalizer with cutoff frequency, gain and Hi/Low selector.

Input
This is the red audio input of the envelope. With the rotary button to the right you can attenuate the input signal [Attenuator Type I].

Freq Info window
Displays the cut-off frequency in Hz. Range: 20 Hz to 16 kHz.

Freq knob
With the big rotary knob you change the cut-off frequency. Range: 20 Hz to 16 kHz.

Gain Info window
Displays the gain in dB. Range -18 to 18 dB.

Gain knob
With the Gain rotary knob you change the gain below or above the center frequency (depending on if the Hi or Lo button is depressed). Range -18 to 18 dB.

Hi and Lo
Select if you want the gain control to affect the lower or upper frequency range.

Info graph
Displays a schematic graph of the equalization characteristics. The Y-axis represents level and the X-axis the frequency. The horizontal line in the middle represents the 0 dB level.

Bypass
Press the Bypass button to disable the equalization effect.

Output
The multi-color LED to the left indicates the output level and have the following meaning: Green: normal signal level, Yellow: signal reaching headroom, Red: overload.
Signal: **Bipolar**

Mixer group

The mixer modules in Nord Modular can mix audio signals as well as control signals. If you connect several sound sources to a mixer with high or amplified levels, the signal may distort. If this happens, attenuate the input signals.

3 inputs mixer

This mixer has three inputs and one output. Each input is equipped with an attenuation control.

Inputs

Connect audio or control signals to these red inputs. Attenuate the signals with the corresponding knobs [Attenuator Type I].

Output

Signal: **Bipolar**.

8 inputs mixer

This mixer has eight inputs and one output. Each input is equipped with a separate attenuation control.

Inputs

Connect audio or control signals to these red inputs. Attenuate the signals with the corresponding knobs. The preset attenuation value is set to 100 to reduce the risk of distortion [Attenuator Type I].

-6 dB

This function attenuates the output signal with -6 dB. If you experience distortion when mixing several signals, try activating this function.

Output

The multi-color LED to the left of the output indicates the output level and have the following meaning: Green: normal signal level, Yellow: signal reaching headroom, Red: overload.
Signal: **Bipolar**.

GainControl

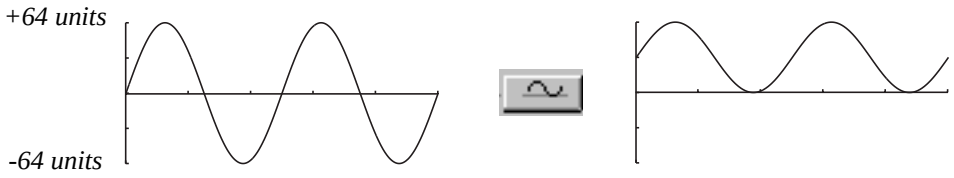
This module perform the same functions as a traditional VCA, a voltage controlled amplifier, in a analog system would do. It provides you with modulation control over the amplitude of an incoming signal. It can also function as a ring- and amplitude modulator (see example below). See also the RingMod module on page 151

Control input

Connect a modulator to this red input. A signal with a level of 0 units will close the gain control function, a signal with a level of +64 units will open the gain control function completely. A signal with a level of -64 units will invert the polarity of the modulated signal.

Unipolar button

The Unipolar function changes a bipolar signal at the Control input to a unipolar signal by dividing the signal at the control input by 2 and adding a bias of +32 units (see figure below).



Input

Connect the signal to be modulated to this red input.

Output

The output of the Gain control module. Signal: Bipolar.

Ring-/Amplitude modulator patch example

You can easily create a ring- or amplitude modulator by using two oscillators and the GainControl module described above. Connect the modules according to the figure below. See also the module "RingMod" on page 151.

OscA is the modulator and OscB the carrier in this example. With the Unipolar button on the GainControl module not depressed, the setup functions as a ring modulator. With the Unipolar button depressed the setup works as an amplitude modulator.

X-Fade

This mixer can be modulated by a control signal to produce a crossfade between two incoming signals.

Input 1, 2

The red audio inputs.

X-fade modulation input [Attenuator Type I]

The red modulation input of the X-fade module. Connect a modulator here. The amount of modulation is controlled with the knob.

1/2 knob

Sets the initial mix of the two signals. If you set the knob towards 1, the initial mix will have more of the signal connected to the number 1 input, if you set it towards 2, the initial mix will have more of the signal connected to the number 2 input. Clicking on the triangle will set the mix to an equal amount of both signals.

Output

Signal: **Bipolar**.

Pan

This module takes a signal and places it somewhere in a stereo panorama.

Input

The red audio input.

Pan modulation input [Attenuator Type I]

The red modulation input of the Pan module. Connect a modulator to modulate the position of the signal in the two outputs. The amount of modulation is controlled with the knob.

L/R knob

Sets the initial pan position. Click on the triangle to reset the initial position to an equal amount of the incoming signal at both the outputs.

L/R outputs

Signal: **Bipolar**.

1To2Fade

This is a fader with one input and two outputs, and a fader rotary knob to fade the input signal between the two outputs.

Fade

With the Fade rotary knob you fade the input signal between the two outputs. In the 12 o'clock position both outputs are silent.

Input

This is the red audio input.

Output 1 and 2

Signal: **Bipolar**

2To1Fade

This is a fader with two inputs and one output, and a fader rotary knob to fade between the two input signals.

Fade
With the Fade rotary knob you fade the between the two input signals. In the 12 o'clock position the output is silent.

Input 1 and 2
The two red audio inputs.

Output
This is the red audio signal output. Signal: **Bipolar**

LevMult
The Adjustable gain control module is a signal attenuator.

Uni
Select if the control signal should be Unipolar or Bipolar.

Gain control
Set the gain control signal value with the rotary button. Range: -127 to +127 units or 0 to 127 units if Unipolar is selected. A setting of +127 leaves the input signal unaffected. A negative value in the Bipolar mode results in a 180 degree phase-shift of the output signal.

Info window
Displays the gain value. Range: -127 to +127 units or 0 to 127 units if Unipolar is selected.

Input
The red audio input.

Output
Signal: **Bipolar**.

LevAdd
The Adjustable offset module can is used to add or subtract an offset (bias) to a signal.

Uni
Select if the control signal should be Unipolar or Bipolar.

Offset control
Set the offset value with the rotary button. Range: -64 to +64 units or 0 to +64 units if Unipolar is selected.

Info window
Displays the offset value. Range: -64 to +64 units or 0 to +64 units if Unipolar is selected.

Input
The red audio input.

Output
Signal: **Bipolar**.

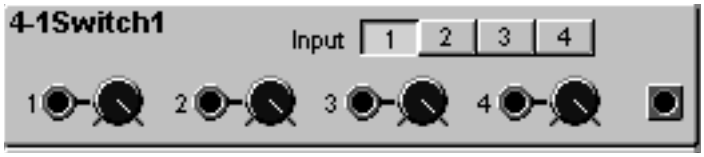
OnOff
This is a one input, one output module with an on/off switch, If no signal is patched to the input, the output produces a signal with the value 0 units when the switch is set to Off, and a signal with the value +64 units when switched On.

Input
The red audio input.

Input selector
Selects whether the incoming signal should pass through to the output or not. If no signal is patched to the input, Off outputs 0 units and On +64 units.

Output
Signal: **Bipolar**, **Unipolar** or **Logic** depending on the input signal.

4-1 Switch
This module allows you to route an incoming signal from one of the four inputs, to the output.



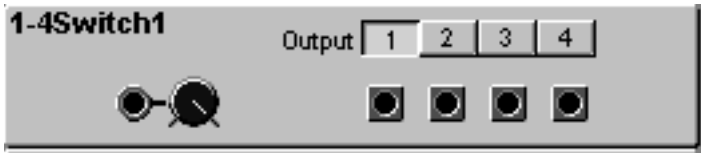
Inputs
The red audio inputs. You can attenuate the incoming signal with the knobs next to the corresponding input [Attenuator Type I].

Input selector
Routes one of the inputs to the output. Clicking on a selected input will mute the output of the module.

Output
Signal: **Bipolar**.

1-4Switch

This module allows you to route an incoming signal to one of the four outputs.



Input

The red audio input with attenuation control [Attenuator Type I].

Output selector

Routes the input to one of the four outputs. Clicking on a selected output will mute the output of the module.

Output

Signal: **Bipolar**.

Amplifier

This module can amplify or attenuate a signal.

Input

The red audio input.

Info window

Displays the attenuation or amplification. Range: x0.25 to x4.0

Slider

Select the desired amplification/attenuation with the slider. Any value above 1.0 amplifies the signal, any value below attenuates it. Range: 0.25 to 4.0 times the input level.

Output

Signal: **Bipolar**.

Audio Modifier group

These modifiers are useful tools for changing and transforming audio signals. Feel free to experiment with these on control signals as well.

Clip

This module can produce digital distortion by decreasing the clip level limit(s) below the normal headroom.

In

The red audio input.

Sym

Toggle switch for the symmetrical mode. If this is set to Off, only the positive peaks of a signal will be clipped. If this is set to On, both the positive and the negative peaks of a signal will be clipped.

Modulation input [Attenuator Type I]

Connect a modulator to this red input. The amount of modulation is attenuated with the knob.

Clip

Sets the initial clip limit(s).

Info graph

Displays the initial clip limit(s) graphically. The Y-axis represents the output signal values, and the X-axis the input signal values.

Out

Signal: **Bipolar**.

Overdrive

This module distorts an audio signal by amplifying the input signal and force it to hit the headroom. The special amplification characteristics makes this module produce a warm distortion.

In

The red audio input.

Modulation input [Attenuator Type I]

Connect a modulator to this blue input. The amount of modulation is attenuated with the knob.

Overdrive
Sets the initial overdrive amount.

Info graph
Displays the initial overdrive amount graphically. The Y-axis represents the output signal values, and the X-axis the input signal values.

Out
Signal: **Bipolar**.

WaveWrapper
This module amplifies a signal until it hits the headroom. Instead of clipping the signal, it folds down, “wraps around". The waveform of the signal will be heavily transformed, with a lot of new overtones, which gives it distortion- or FM-like characteristics.

In
The red audio input.

Modulation input [Attenuator Type I]
Connect a modulator to this red input. The amount of modulation is attenuated with the knob.

Wrap
Sets the initial wrap amount.

Info graph
Displays the initial wrap amount graphically. The Y-axis represents the output signal values, and the X-axis the input signal values.

Out
Signal: **Bipolar**.

Quantizer
The Quantizer module modifies an incoming signal by changing its bit resolution to a selected value. This module can e.g. transform a smooth envelope to a jagged curve, or quantize a clean, audio signal down to a dirty 7 bit signal.

In
The red audio input.

Info window
Displays the selected bit resolution. Range: Off, 12 to 1 bits.

Bits
Select a bit resolution value with the buttons. Range: Off, 12 to 1 bits. Off leaves the signal unmodified.

Out
Signal: **Bipolar**.

Delay
The Delay module can delay an audio signal. The delay time can be modulated from an external source. This allows you to do e.g. flanger and phaser effects.

In
The red audio input.

Modulation input [Attenuator Type I]
You can modulate the delay time with a modulation source connect to this blue input. The amount of modulation is attenuated with the knob.

Info window
Displays the initially set delay time. Range: 0 to 2.65 ms.

Slider
Set the delay time with the slider or by clicking on the arrow buttons on either side. Range: 0 to 2.65 ms.

2.65 ms output
The fixed delay-time output of the Delay module with the maximum possible delay time, 2.65 ms.
Signal: **Bipolar**.

Output
The variable delay time output.
Signal: **Bipolar**.

Sample&Hold

This module takes samples of the values of an incoming signal. The sampling occurs every time a signal shifting from 0 units or below to anything above 0 units appears at the yellow logic input. Inbetween these trig signals, the module transmits the value of the latest sample to the output.

To create the traditional Sample & Hold or random LFO synthesizer effect, connect the output of a white noise generator module to the input of the Sample & Hold module and trig the sampling with any LFO.

Trig input
Connect the signal to activate the sampling process to this yellow input.

Input
The red audio input.

Out
Signal: **Bipolar**.

Diode

The Diode Processing module can change a bipolar signal to a unipolar signal. You can choose whether you want to discard of any negative levels, or if you want to transform these to positive levels.

In
The red audio input.

Selector
Sets the operation of the module. The leftmost position leaves the signal unchanged (bypass), the middle (Half) position discards of any negative values and the right (Full) position transforms any negative signal levels to the corresponding positive levels.

Out
Signal: **Bipolar or Unipolar**.

StereoChorus

This module simulates the effect of multiple stereo voices.

In

The red audio input.

Bypass

Click to bypass the signal and leave it unaffected.

Detune

Sets the detune depth of the chorus effect.

Amount

Adjusts the balance between the dry signal and the wet "chorused" signal.

L, R outputs

Signal: **Bipolar**.

Phaser

This is a 14 pole phaser with peak spread control and adjustable feedback. It features six allpass filters which displace the phase 180 degrees each. It is possible to mix the "wet" signal with the dry signal after any of these filters (1-6), giving from one to six peak resonance frequencies.

Input

To the bottom left of the module is the red audio input together with an input level attenuator [Attenuator Type I].

Rate Info window

Displays the internal LFO rate in Hz or seconds. Range: 62.9 s to 24.4 Hz.

Rate

With the Rate knob you set the rate of the built-in LFO. Range: 62.9 s/cycle to 24.4 Hz.

Depth
With the Depth rotary knob you set the LFO depth. A high depth amount results in greater changes of the phaser effect.

LFO on/off
Below the Depth knob is the LFO on/off button. Use it to switch on and off the LFO.

Center Freq Info window
Displays the set center frequency in Hz. Range 100 Hz to 16 kHz.

Center Freq
With the big Center Freq rotary knob you set the center frequency. Range 100 Hz to 16 kHz.

Center freq Modulation input [Attenuator Type I]
The center frequency can be controlled externally using the blue control signal input and the attenuator.

Feedback
With the Feedback rotary knob you set the phaser feedback, i.e the feedback to the allpass filters. You can have a negative or positive feedback. At the 12 o'clock position feedback is zero. Click on the green triangle above the knob to set the feedback to 0.

Spread
With the Spread rotary knob you set the distance between the peaks.

Spread Modulation input [Attenuator Type I]
The peak distance can be modulated from an external source using the blue control signal input and the level attenuator below the Spread knob.

Info graph
Displays the selected phaser characteristics graphically. The Y-axis represents level and the X-axis the frequency.

Peaks
By clicking on the up and down arrow buttons you select the number of resonance peaks (allpass filters). 1 to 6 peaks can be selected.

Bypass
With this button you switch on and off the phaser effect.

Output
To the bottom right of the module is the red audio signal output. The LED next to it indicates the output level and have the following meaning: Green: normal signal level, Yellow: signal reaching headroom, Red: overload.
Signal: **Bipolar**

InvLevShift

This is a combined level shifter and inverter module. You can use it either to change polarity of the incoming signal, or change it from a bipolar to a unipolar signal (positive or negative), or both.

Inv

Click the Inv button to change polarity of the incoming signal. This button can be used in combination with any of the other three buttons to the right.

Bipolar

Click the Bipolar button (the leftmost) if you want to keep the incoming signal bipolar. Use this button in combination with the Inv button to just change polarity of the signal.

Unipolar, Negative

Press this button (in the middle) to change the incoming signal from bipolar to a negative unipolar signal. This function divides the signal by 2 and subtracts a bias of 32 units. If Inv is pressed, the polarity will be inverted but the signal will still be negative unipolar.

Unipolar, Positive

Press this button (the rightmost) to change the incoming signal from bipolar to a positive unipolar signal. This function divides the signal by 2 and adds a bias of 32 units. If Inv is pressed, the polarity will be inverted but the signal will still be positive unipolar.

Input

The red audio input.

Output

Signal: **Bipolar or Unipolar (Negative or Positive)**

Shaper

This module transforms a signal using one of five different amplification/attenuation characteristics. The curves on the buttons describes the transformation functions, i.e the amplification/attenuation of each value of the input signal. The middle button can be considered as a "bypass" function, i.e the amplification/attenuation is 1:1 on all input signal values.

In

The red audio input.

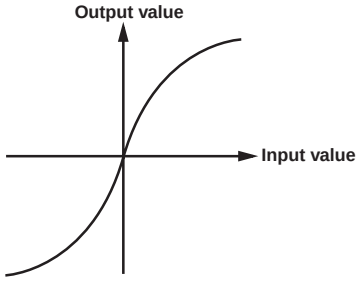
Shape buttons

Set the desired transformation characteristics with the selectors, Log1, Log2, Linear, Exp1 or Exp2.

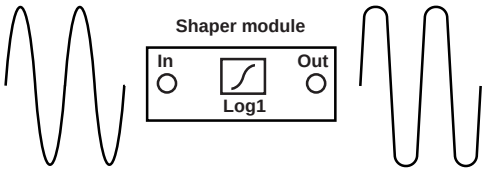
Out

Signal: **Bipolar**.

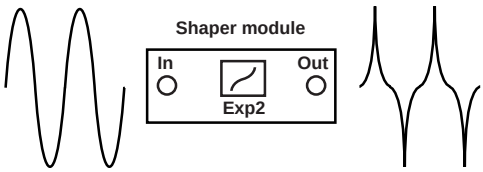
• As mentioned, the Shaper modulates each single value of an incoming signal, not the total level. To show this more clearly, please take a look at the figures below. The X-axis in the diagram represents the incoming signal values, and the Y-axis the output values.



If a sine wave is sent to the input of the Shaper, and the Log1 curve is selected, the resulting wave on the output would be more like a square wave.



If the Exp2 curve is selected, a sine wave on the input would result in a triangle-like wave on the output.



Compressor

The Compressor module is a combined stereo compressor and limiter. The theory behind a compressor is to decrease the dynamic range of a signal with high dynamic range. The compressor decreases strong signals and increases weak signals according to the module settings.

Input L, R

The red stereo audio inputs.

Side Chain, Act, Mon

The Side Chain input is used for an external audio signal to control the compressor. The Side Chain signal will not be mixed with the other input signals, it will just be used to control the compressor. Activate the Side Chain function by pressing the Act button. If you want to listen to the Side Chain signal, press the Mon button.

Info graph

Shows the selected compression characteristics graphically. The Y-axis represents the output values and the X-axis the input values. The broken diagonal line represents 1:1 amplification. The cross hair indicates the set reference level (se explanation below).

Gain Reduction LEDs

This LED chain shows the gain reduction of the left and right channel in dB.

Bypass

Press this button to deactivate the compressor effect.

Lim Active

This LED is lit when the limiter is active.

Attack

With the Attack rotary knob you set the response time of the compressor, i.e the time between input signal above the Threshold level and compressor activation. Range: Fast (0.5 ms) to 767 ms.

Release

With the Release rotary knob you set the release time, i.e the time it takes for the compressor to return to the original input level. Range: 125 ms to 10.2 s.

Threshold

With the Threshold rotary knob you set the threshold above which compression is activated, i.e the minimum input value to activate the compression. Range: -30 to 11 dB and Off.

Ratio
With the Ratio rotary knob you set the compression ratio above the set Threshold level. 1.0:1 means no compression and 80:1 maximum compression. Range: 1.0:1 to 80:1.

Ref Level
With the Ref Level rotary knob you set the compression reference level. This is the level that the signals will be compressed towards. The higher the Ref Level, the stronger the output signal(s). Range: -30 to 12 dB.

Limiter
With the Limiter rotary knob you can set a maximum output level. If set lower than the Ref Level, it will decrease the output level to the Limiter value. Range: -30 to 11 dB and Off.

Output L, R
Signal: **Bipolar.**

Expander
The Expander module is a combined stereo expander and gate. The theory behind an expander is to increase the dynamic range of a signal with low dynamic range. The expander does not affect strong signals but decreases weak signals according to the settings.

Input L, R
The red stereo audio inputs.

Side Chain, Act, Mon
The Side Chain input is used for an external audio signal to control the expander. The Side Chain signal will not be mixed with the other input signals, it will just be used to control the expander. Activate the Side Chain function by pressing the Act button. If you want to listen to the Side Chain signal, press the Mon button.

Info graph
Shows the selected expansion characteristics graphically. The Y-axis represents the output values and the X-axis the input values. The broken diagonal line represents 1:1 amplification.

Gain Reduction
This LED chain shows the gain reduction of the left and right channel in dB.

Bypass
Press this button to deactivate the expander effect.

Gate Active
This LED is lit when the gate is active.

Attack
With the Attack rotary knob you set the response time of the expander, i.e the time between input signal below the Threshold level and expander activation. Range: Fast (0.5 ms) to 767 ms.

Release
With the Release rotary knob you set the release time, i.e the time it takes for the expander to return to the original input level. Range: 125 ms to 10.2 s.

Threshold
With the Threshold rotary knob you set the threshold below which expansion is activated, i.e the maximum input value to activate the expansion. Range: Off and -83 to 0 dB.

Ratio
With the Ratio rotary knob you set the expansion ratio below the set Threshold level. 1:1.0 means no expansion and 1:80 maximum expansion. Range: 1:1.0 to 1:80.

Gate
With the Gate rotary knob you set the threshold below which gating is activated, i.e the maximum input value to activate gating. Range: Off and -83 to -12 dB

Hold
With the Hold rotary knob you set the gate hold time. This is used to avoid that fluctuating signals open and close the gate too often. Range: Off and 4 to 508 ms.

Output L, R
Signal: **Bipolar.**

RingMod
The Ring/Amplitude modulator can be used to create sounds featuring new overtones. The module has a function which lets you transform the signal gradually from unmodified, via amplitude to ring modulation.

Mod depth input [Attenuator Type I]
You can modulate the AM/RM depth with a modulation source connect to this input. The amount of modulation can be attenuated with the knob.

AM/RM
Set the modulation amount with this rotary knob. In the 12 o'clock position you get maximum amplitude modulation, and past this position, ring modulation occurs.

Mod
Patch the modulator (oscillator or other sound generator) to this input.

In
Patch the carrier (oscillator or other sound generator) to this input

Out
Signal: **Bipolar.**

- To illustrate what ring- and amplitude modulation actually does to a sound, we have created an example with three sine waves, one carrier and two different modulators (Ring and Amplitude). The graphs to the left show the amplitude as a function of time, and to the right the amplitude as a function of the frequency.

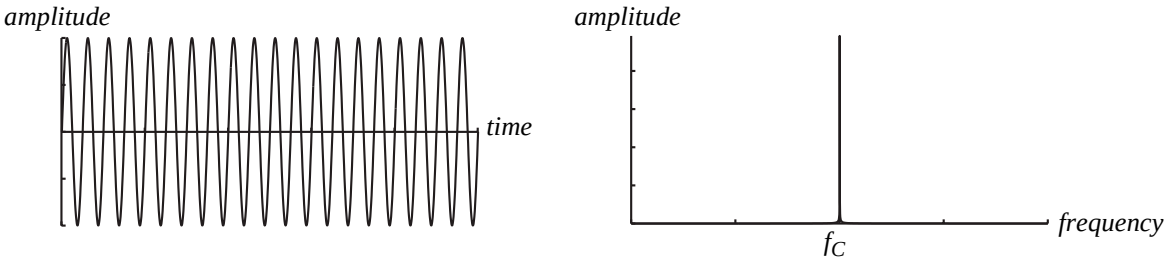


Fig 1. Carrier wave

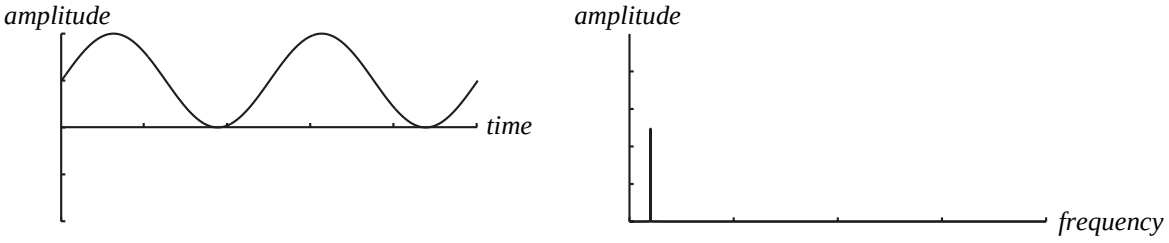


Fig 2. AM Modulator wave

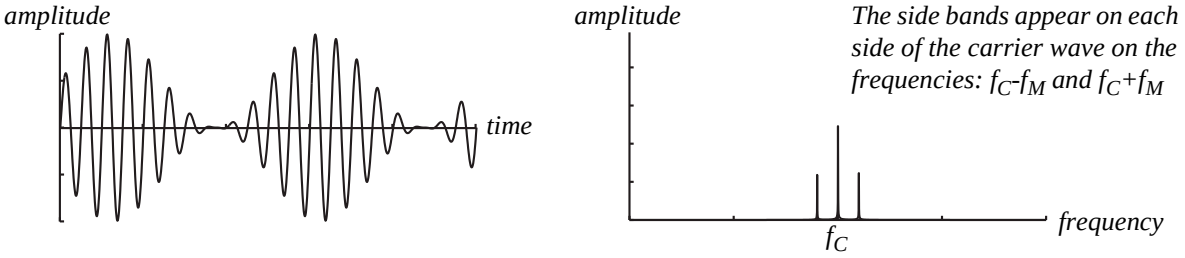


Fig 3. Amplitude Modulation

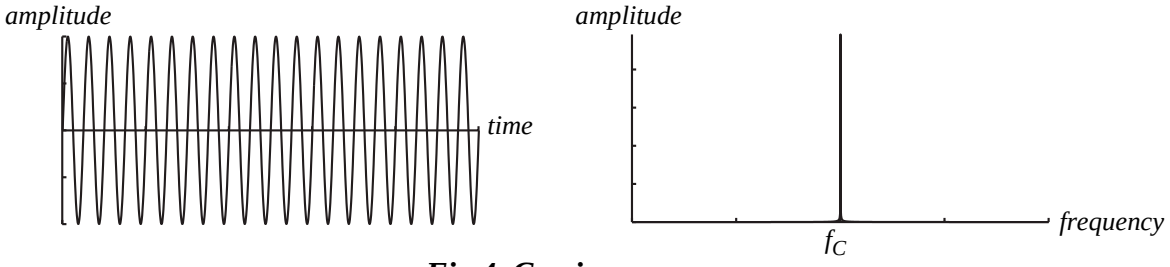


Fig 4. Carrier wave

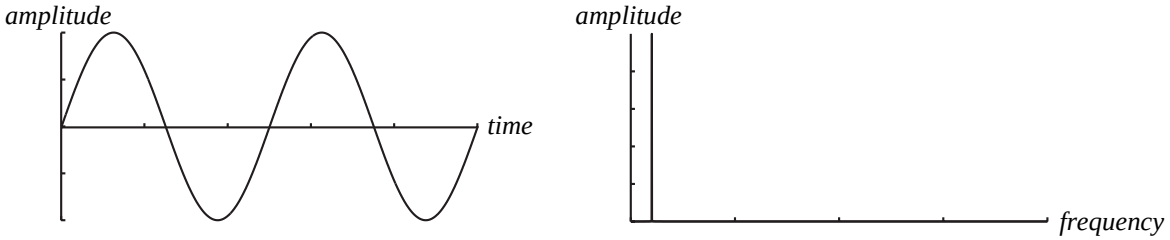


Fig 5. RM Modulator wave

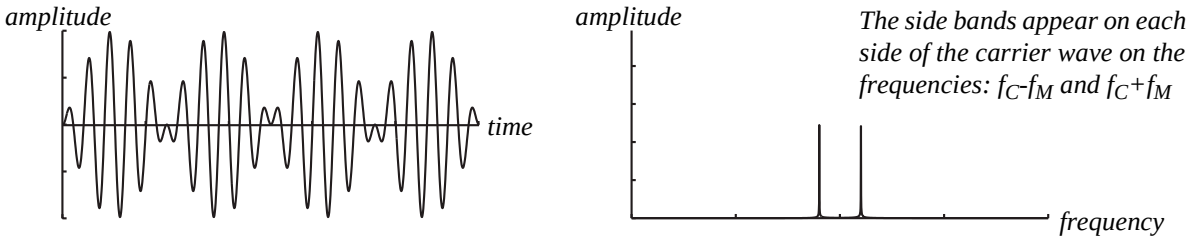


Fig 6. Ring Modulation

As you can see in the figures above, the main practical difference between amplitude- and ring modulation is the sideband amplitudes and the appearance of the carrier wave. Another difference is that the resulting ring modulation wave phase-shifts 180 degrees every half modulator period.

If more complex waveforms are used for amplitude- or ring modulation, sidebands will be generated for each partial of the wave.

Digitizer

The Digitizer module continuously samples an incoming signal at a selectable sample rate and bit resolution. The module can e.g. sample a clean audio signal and transform it down to a dirty 8 bit, 5 kHz signal. Great for "low-fi" effects with lots of aliasing.

In

The red audio input.

Resolution Info window

Displays the bit resolution. Range: 1 to 12 bits.

Resolution

Select the bit resolution with the arrow buttons. Range: 1 to 12 bits.

Resolution Off

Clicking this button leaves the signal resolution unmodified.

Sample rate Info window

Displays selected initial sample rate in Hz. Range: 32.70 Hz to 50.18 kHz.

Sample rate

Set desired sample rate in Hz. Range: 32.70 Hz to 50.18 kHz.

Sample rate Off

Clicking this button disables the sample rate transformation and leaves the signal at full audio bandwidth.

Sample rate modulation input [Attenuator Type I]

You can modulate the sample rate from a modulation source patched to this input. Attenuate the input signal with the knob.

Out

Signal: **Bipolar**.

Control Modifier group

This group features a number of control signal generators and modifiers.

Constant

This module produces a control signal at a selectable value.

Uni switch

Selects whether to send unipolar or bipolar signals. In bipolar mode you can send from -64 to +64 units in increments of 1 unit. In unipolar mode you can send from 0 to +64 units in increments of 0.5 units.

Info window

Displays set control signal value. Range: 0 to +64 units or -64 to +64 units.

Slider

Set the control signal value with the slider or by clicking on the arrow buttons on either side. Range: 0 to +64 units or -64 to +64 units.

Output

Signal: **Unipolar** or **Bipolar**.

Smooth

The Smooth module can smooth out transitions in control signals. Set the time it should take for the module to gradually output the input signal level after a transition. An application could be to input a logic signal, and smooth out its "sharp" edges.

Input

The blue control signal input.

Info window

Displays set smooth time. Range: 0.32 to 318 ms.

Time slider

Set the time it should take for the module to smooth out the transitions. Range: 0.32 to 318 ms.

Output

Signal: **Bipolar**.

PortamentoA

This module can provide a smooth, gliding transition between the values of a incoming control signal. The transition is activated by a high logic signal at the On input.

In

The blue input of the PortamentoA module.

On

Patch a high logic signal here to activate the gliding transition between the input signal levels. If no connection is made, the portamento will be constantly active.

Time

Set the transition (glide) time with the slider. Range: 5.3 to 1355 ms.

Output

Signal: **Bipolar**.

PortamentoB

This module can provide a smooth, gliding transition between the values of a control signal. The transition can be temporarily interrupted by a high logic signal at the Jmp input.

In

The blue input of the PortamentoB module.

Jmp

Patch a high logic trig signal to this yellow input to temporarily interrupt the portamento transition, leaving the signal unaffected. If no connection is made, the portamento will be constantly active.

Time

Set the transition (glide) time with the slider. Range: 5.3 to 1355 ms.

Output

Signal: **Bipolar**.

- To make a legato introduced portamento, patch the Patch gate from the Keyboard Patch module to the Jmp input of the Portamento module. Make sure that the KBT function is turned off on oscillators that you are using. Patch the Note output from the Keyboard module to the input of the Portamento module, and from the output of the Portamento module to the pitch-mod input of the oscillators that you wish to control with the keyboard. Set a desired portamento time with the slider and activate the portamento by playing the keyboard in a legato fashion.

NoteScaler

This module works like a control signal attenuator. You set the output peak-to-peak limits in semitones. This could be useful if you want to "tune" the output from a controller. The Note Scaler works with either uni- or bipolar signals.

In

The blue control signal input.

Info window

Displays the note range limits. Useful musical intervals will be indicated in the parenthesis (octaves, fifths etc.). Range: 0 to +/-64 semitones. Note that for the info window to display the correct limits, it is assumed that the input signal uses the full range -64 to +64 semitones.

Slider

Set the semitone range with the slider. Range: 0 to +/-64 semitones.

Output

Signal: **Bipolar**.

NoteQuant

This module will quantize the values of a continuous control signal to produce discrete, semitone steps. The total range of the incoming signal can be attenuated at the input.

In

The blue control signal input. Attenuate the signal with the knob next to the input [Attenuator Type I].

Info window

Displays the note range. Range: 0 to +/-64 semitones. Note that for the info window to display the correct limits, it is assumed that the input signal uses the full range -64 to +64 semitones.

Notes

Set the desired quantization grid (interval), in semitones, with the buttons. Range: Off and 1 to 127 semitones.

Out

Signal: **Bipolar**.

KeyQuant

This module quantizes the values of a continuous control signal and generates note values according to a user-defined key. It is great for arpeggio-like effects.

In

The Range control signal input. Attenuate the signal with the knob [Attenuator Type I].

Range Info window

Displays the key range set with the attenuator knob. For the display to show the correct note value, it is assumed that the input signal uses its whole dynamic range (+/- 64 units).

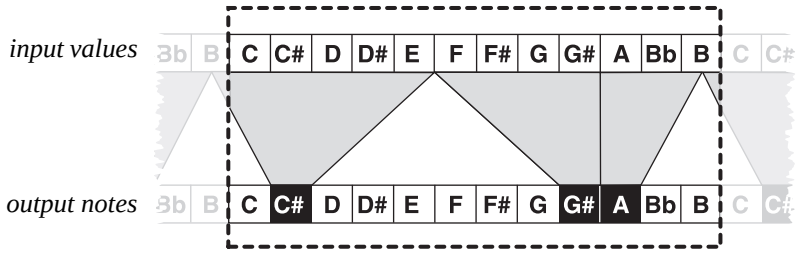
Notes

Set the desired key by clicking the notes you want to quantize to. The note interval for the shown octave is automatically duplicated across the whole key Range.

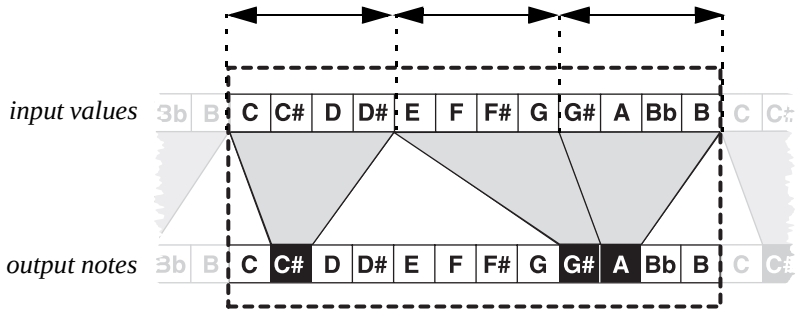
Cont

Click this button to force the module to "split up" the key quantization grid in equally big sections per octave. This makes it easier to output the selected notes at a steady rate when using a linear control signal.

*We have selected the notes C#, G# and A to quantize to in every octave. We do **not** use the Cont function. As you can see, the quantization will be to the closest matching note.*



Here we have activated the Cont function. As you can see, the input signal will be quantizatized to the selected notes in equal sections, per octave, across the selected range.



Out

Signal: **Bipolar**.

PartialGen

This module generates a control signal that will transpose an OSC to one of its harmonic partials. The range of the partial generator is 0 to +/- 64 partials in steps of 0.5 partials. Note that the practical limit of Nord Modular is +/- 32 partials. If the range is set above +/- 32 partials, the oscillator will remain on its 32nd partial until the control signal amplitude has decreased below +/- 32 partials.

Input

The blue control signal input. Attenuate the signal with the rotary knob [Attenuator Type I].

Range Info window

Displays the control signal range set with the attenuator knob. For the display to show the correct range, it is assumed that the input signal uses its whole dynamic range (+/- 64 units). Values exceeding +/- 32 partials are shown with an asterisk, indicating that the practical output limit is exceeded.

Out

Signal: **Bipolar**.

ControlMixer

This is a mixer for control signals. You can select between linear and exponential attenuator characteristics to better suit your modulation needs. It can also invert the polarity of an incoming signal.

Lin switch

Switch between linear [Type I] and exponential [Type II] characteristics for the two attenuators. See "Mod-amount knobs (attenuators)" on page 29 for more info.

Inv switches

Inverts the polarity of the incoming control signal.

Inputs

Patch signals to these two blue inputs. You can attenuate the signal with the corresponding knobs.

Output

Signal: **Bipolar**.

NoteVelScal

This is a note and velocity scaler for control signals. You can use it to produce control signals based on input note and velocity values. You can set a break point key and different amplification/attenuation slopes for the two key sections. This module is very suitable for controlling the amplitude in modules featuring amplitude modulation input(s).

Vel

Patch this input to e.g. the velocity output of any of the Input modules (Keyboard voice or Keyboard Patch).

Note

Patch this input to e.g. the note output of any of the Input modules (Keyboard voice or Keyboard Patch).

Vel Sens [Attenuator Type I]

With this rotary knob you set how much the input velocity should affect the output value. If set to min (0) the velocity output component is always 64 units. If set to max (127) the output can vary between 0 and 85 units. If set to max (127), a velocity input of 48 units results in an output value of 64.

L Gain

Set the amplification/attenuation slope for the lower key section with the knob. The value is displayed in the corresponding info window. Range: +/-24 dB per octave.

Brk Pnt

Set the break point key. The value is displayed in the corresponding info window. Range: C-1 to G9.

R Gain

Set the amplification/attenuation slope for the upper key section with the knob. The value is displayed in the corresponding info window. Range: +/-24 dB per octave.

Info graph

Displays the two gain slopes and the break point graphically. The Y-axis represents the output level (logarithmic) and the X-axis the entire note range (C-1 to G9). the broken line represents the +64 units (0 dB) output level. See figure below for further explanation.

Output

The output value is the combined result of the note and velocity input values.
Signal: **Bipolar**.

• The figures below illustrate the output signals for different Gain and Velocity Sensitivity settings.

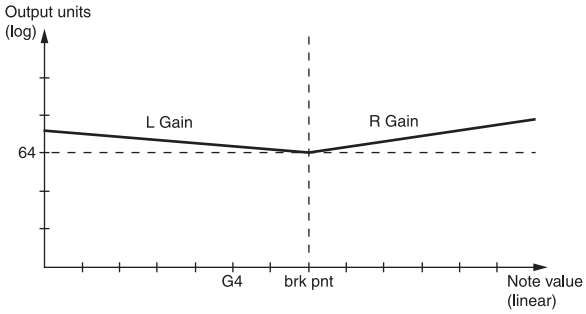


Figure 1. Velocity sensitivity is set to zero, which means that note values affect the output according to the set Gains, beginning at the offset 64 units (0 dB) at the break point.

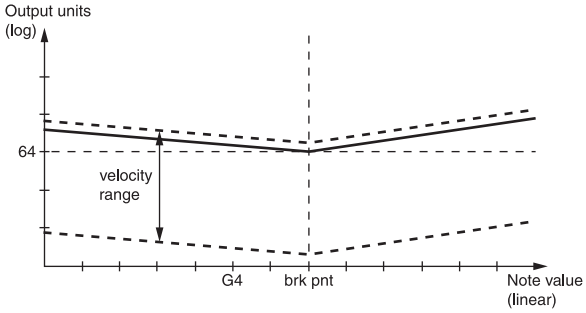


Figure 2. Velocity sensitivity is increased, which means that note values affect the output according to the Gains, but the offset has now become a velocity range. The velocity range is controlled with the Vel Sens knob.

Logic group

These modules can modulate and generate logic signals in a number of different ways. Read more about logic signals in "Logic signals, yellow connectors" on page 26.

PosEdgeDelay

This module will delay the positive edge of a logic signal. Set the delay time with the slider. The negative edge of the logic signal will not be affected.

Input

The yellow input of the module. Any signal changing from 0 units or below to anything above 0 units will activate the delay and then produce a high logic output signal.

Info window

Displays selected delay time. Range: 1.0 ms to 18 s.

Slider

Set the desired delay time with the slider or with the arrow buttons on either side. The module will not transmit a delayed positive edge if the incoming signal switch to zero before the delay time has elapsed. Range: 1.0 ms to 18 s.

Output

Signal: **Logic**.

NegEdgeDelay

This module will delay the negative edge of a logic signal. Set the delay time with the slider. The positive edge of the logic signal will not be affected.

Input

The yellow input of the module. Any signal changing from 0 units or below to anything above 0 units will generate a high logic output signal. When the input signal switches back to 0 units, the delay time activated.

Info window

Displays selected delay time. Range: 1.0 ms to 18 s.

Slider

Set the delay time with the slider. The range is from 1.0 milliseconds to 18 seconds. If the module receives a new positive edge before it has completed a delay cycle, the module will simply extend the duration of the high level signal with the time set with the slider.

Output

Signal: **Logic**.

Pulse

This module can use a signal that increases from 0 units to anything greater than 0 units, to produce a high logic signal. You set the duration of the generated high logic signal with the slider.

Input

The yellow input of the module. Any signal changing from 0 units or below to anything above 0 units will generate a high logic output pulse.

Info window

Displays selected pulse time. Range: 1.0 ms to 18 s.

Slider

Set the duration of the produced high logic signal with the slider. If the module receives another level change, from 0 units to anything greater than 0 units during the duration of the produced high signal, it will extend the duration, with the value set with the slider. Range: 1.0 ms to 18 s.

Output

Signal: **Logic**.

LogicDelay

This module delays a signal that increases from 0 units to anything greater than 0 units, and produces a high logic output signal. The cycle length of the input signal is unaffected.

Input

The yellow input of the module. Any signal changing from 0 units or below to anything above 0 units will generate a high logic output signal after the set delay time. When the input signal switches back to 0 units, the output generates a low logic signal after the set delay time.

Info window

Displays selected pulse delay time. Range: 1.0 ms to 18 s.

Slider

Set the pulse delay time with the slider. Range: 1.0 ms to 18 s.

Output

Signal: **Logic**.

LogicInv

The Logic Inverter module produces a logic low or high signal depending on the input value. When an incoming signal is between +1 and +64 units, the module transmits a low logic signal. When an incoming signal is between 0 and -64 units it transmits a logic high signal.

Input

When an incoming signal is between +1 and +64 units, the module transmits a low logic signal on the output. When an incoming signal is between 0 and -64 units it transmits a logic high signal.

Output

Signal: **Logic**.

LogicProc

This Logic Processor module transmits a high logic signal whenever any incoming signals meet a condition set by you. The input signals are considered "high" at any value equal to, or above, +1 unit. The transmitted logic signal will be high for as long as the incoming signals meet the condition.

Inputs

The two yellow inputs of the Logic processor module.

Conditions

AND produces a high logic signal when the two incoming signals, each with a level greater than 0 units, is present at the two inputs at the same time.

OR produces a high logic signal if at least one signal, with a level greater than 0 units, appears at the input(s).

XOR produces a high logic signal when **only one** signal, with a level greater than 0 units, appears at one of the inputs.

Output

Signal: **Logic**.

CompareLev

This module produces a high logic signal by comparing a control signal level to a level limit set by you. If the value of a signal appearing at the input equals, or is greater than the value set in the window, the module produces a high logic signal. The logic signal will switch back to zero when the incoming signal drops to a level below the value set in the window.

A

The blue control signal input. Patch the signal to be compared to the selected value.

Info window

Displays the set level limit in units. Range: -64 to +64 units.

Slider

Set the level limit for the comparison with the slider or by clicking on the arrow buttons on either side. Range: -64 to +64 units.

Out

Signal: **Logic**.

CompareAB

This module produces a high logic signal by comparing two control signals. If the value of a signal appearing at the A input equals, or is greater than the value of a signal appearing at the B input, the module produces a high logic signal. The logic signal will remain high for as long as the incoming control signals meet the condition.

A, B

The two blue control signal inputs.

A>=B

The output. Signal: **Logic**.

ClkDiv

The Clock Divider module can be used for dividing incoming clock pulses by a factor set by you. The module transmits a high logic signal after it has received a user-defined number of signals containing high/low transitions.

Clock

Connect an incoming signal to this yellow input.

Rst

Any high logic signal appearing at this yellow input will reset the counter in the Clock divider.

Divider

Set the desired division with the buttons, 1-128. If you want to divide the MIDI clock (which transmits 24 pulses for each quarter note from the clock output on the MIDI Global module) to 16 pulses at a 4/4 time signature, use the division of 6. If you want to use 8 note triplets (12 pulses for one bar of 4/4), divide the clock by 8. Range: 1 to 128.

Output

Signal: **Logic**.

ClkDivFix

The Fixed Clock Divider module divides an incoming clock signal to three fixed resulting signals. This provides you with an easy way of extracting 8 note, 8 note-triplets and 16th note clock pulses from the MIDI clock.

MIDI cl

The yellow clock input of the module.

Rst

Any high logic signal appearing at this input will reset the counter in the module.

8

The output where 24 incoming pulses are divided to 2 pulses.
Signal: **Logic**.

T8

The output where 24 incoming pulses are divided to 3 pulses.
Signal: **Logic**.

16

The output where 24 incoming pulses are divided to 4 pulses.
Signal: **Logic**.

Sequencer group

The sequencer modules can perform different functions during the course of a specified time. The sequencer modules in the Nord Modular system has 16 steps. They can be linked together in series to provide longer sequences and they can be clocked by various clock sources, originating from other modules or from the MIDI clock. The sequencer modules can be synchronized to each other in a number of ways. The performance of the sequencer modules is not transmitted at the MIDI output. Read more about some of the possible combinations with the sequencer modules at the end of this chapter.

EventSeq

This is a trigger sequencer. Each step can send two separate logic pulses on the two separate outputs. Activate a step by clicking on one or more of the 32 available trigger buttons.

Clk

This is the yellow input for the clock pulses. These pulses will advance the sequencer one step for each pulse.

Rst

This is a yellow input where a high logic signal will reset the sequencer (force it to step 1 again). The restart isn't performed until the next the clock pulse is received at the Clk input. This guarantees perfect timing.

Snc

This yellow output transmits a high logic signal whenever a sequence starts from step 1.
Signal: **Logic**.

Clr

Pressing this button will reset every trigger button in the two rows.

Loop button

If the loop mode is on, the Event sequencer will automatically restart from step 1 after the last step. If the loop mode is off, the sequencer will stop at the last step.

Step

This sets the last step in the sequence. The sequencer will return to step 1 if loop mode is on, or stop if loop mode is off. Set the last step with the buttons. Range: 1 to 128 steps.

Trigger buttons

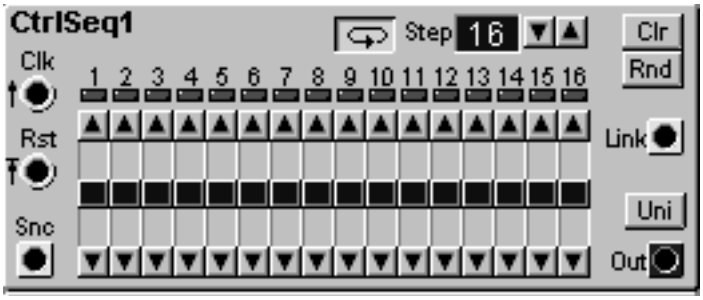
Click on the buttons to make the sequencer send a pulse each time it passes the step. Note that the two Trigger Button rows work parallel on the two different outputs.

Link
This yellow output transmits a high logic signal whenever the Event sequencer goes beyond step number 16. This is used for linking several Event sequencers in series. See more about linking at the end of this chapter.
Signal: **Logic**.

G buttons
Toggle between the trigger and the gate mode with these buttons. In the trigger mode, every step transmits its own logic signal, at a 50% duration cycle. In the gate mode, two or more adjacent activated steps will mix into a “longer" logic signal.

Out
Signal: **Logic**.

CtrlSeq
This is a Control Sequencer which sends one control signal value for each step.



Clk
This is the yellow input for the clock pulses. These pulses will advance the sequencer one step for each pulse.

Rst
This is a yellow input where a high logic signal will reset the sequencer (force it to step 1 again). The restart isn’t performed until the next the clock pulse is received at the Clk input. This guarantees perfect timing.

Snc
This yellow output transmits a high logic signal whenever a sequence starts from step 1.
Signal: **Logic**.

Loop
If the loop mode is on, the Control sequencer will automatically restart from step 1 after the last step. If the loop mode is off, the sequencer will stop at the last step.

Step
This sets the last step in the sequence. The sequencer will return to step 1 if loop mode is on, or stop if loop mode is off. Set the last step with the buttons. Range: 1 to 128 steps.

Clr
Pressing this button will reset all control values to 0.

Rnd
This produces a random set of control signal values for each of the 16 steps.

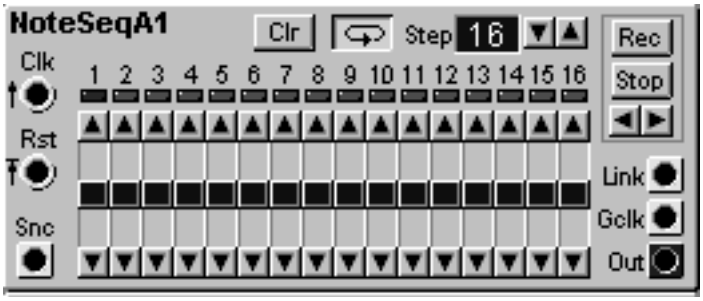
Sliders
You set the control signal level of each step by moving the vertical slider or clicking the arrow buttons above and below each step.

Link
This yellow output transmits a high logic signal whenever the Control sequencer goes beyond step number 16. This is used for linking several Control sequencers in series. See more about linking at the end of this chapter.
Signal: **Logic**.

Uni
Selects uni- or bipolar control signals of the output of the Control sequencer.

Out
Signal: **Unipolar** or **Bipolar**.

NoteSeqA
This is a Note Sequencer which sends one bipolar control signal value for each step. It also sends a logic gate signal for each step on a separate output.



Clk
This is the yellow input for the clock pulses. These pulses will advance the sequencer one step for each pulse.

Rst
This is a yellow input where a high logic signal will reset the sequencer to step 1. The restart isn't performed until the next the clock pulse is received at the Clk input. This guarantees perfect timing.

Snc
This yellow output transmits a logic signal at the high level whenever a sequence starts from step 1.
Signal: **Logic**.

Clr
Pressing this button will reset all the control values to 0.

Loop
If the loop mode is on, the Note Sequencer will automatically restart from step 1 after the last step. If the loop mode is off, the sequencer will stop at the last step.

Step
This sets the last step in the sequence. The sequencer will return to step 1 if loop mode is on, or stop if loop mode is off. Set the last step with the buttons. Range: 1 to 128 steps.

Rec
Activating the record function enables you to use the keyboard or incoming MIDI messages to program the steps in the sequence. The step to be recorded, the edit point, is indicated with a dark red LED. Pressing a key will advance the edit point to the next step. The control signal from the keyboard will be present at the sequencer output. When the sequencer reaches step 16, the record function will be deactivated and the sequencer will return to step 1. The sequencer may be sequencing while you program the steps, if the Stop selector is in the Go position.

You can move the edit point back and forth by using the arrow keys beneath the Stop button. The edit point can also be selected by clicking on a step LED.

Stop
Activating Stop stops the sequencer module, even if it is receiving a clock pulse at the Clk input. If you activate the record function when the sequencer is stopped, it may be programmed in a step mode fashion. Activating Go will put the sequencer back under the influence of a clock, connected to the Clk input.

< >
Use these buttons to scroll through the steps. A green LED indicates the step that is currently transmitting a control signal, a dark red LED indicates the edit point. The dark red LED will be bright red when the edit point and the current position coincide. You may also scroll with the rotary dial if these buttons are in focus.

Sliders
You can set a bipolar control value for each step by moving the vertical slider or by clicking the arrow buttons above and below each step.

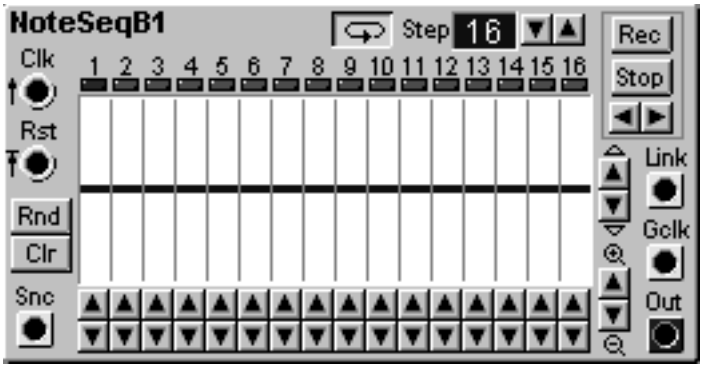
Link
This yellow output transmits a high logic signal whenever the Note Sequencer goes beyond step number 16. This is used for linking several Note Sequencers in series. See more about linking at the end of this chapter.
Signal: **Logic**.

Gclk
This output transmits a high logic signal when the sequencer moves from one step to another. If the sequencer is stopped and you scroll manually through the steps, the Gclk will transmit one logic signal for each step, even if you scroll backwards. It will also transmit a logic signal when you are recording with the keyboard, if the Stop selector is in the stop position.
Signal: **Logic**.

Out
Signal: **Bipolar**.

NoteSeqB

This is a Note Sequencer with one bipolar control value for each step and a grid pattern for easy note editing. It also sends a logic gate signal for each step on a separate output.



Clk

This is the yellow input for the clock pulses. These pulses will advance the sequencer one step for each pulse.

Rst

This is a yellow input where a high logic signal will reset the sequencer to step 1. The restart isn't performed until the next the clock pulse is received at the Clk input. This guarantees perfect timing.

Rnd

This will produce a random set of control signal values for each of the 16 steps. The values generated will be inside the boundaries of the visible grid.

Clr

Pressing this button will reset all the note values to 0.

Snc

This output transmits a high logic signal whenever a sequence starts from step 1.
Signal: **Logic**.

Loop

If the loop mode is on, the Note Sequencer will automatically restart from step 1 after the last step. If the loop mode is off, the sequencer will stop at the last step.

Step

This sets the last step in the sequence. The sequencer will return to step 1 if loop mode is on, or stop if loop mode is off. Set the last step with the buttons. Range: 1 to 128 steps.

Rec

Activating the record function enables you to use the keyboard or incoming MIDI messages to program the steps in the sequence. The step to be recorded, the edit point, will indicated with a dark red LED. Pressing a key will advance the edit point to the next step. The control signal from the keyboard will be present at the sequencer output. When the sequencer reaches step 16, the record function will be deactivated and the sequencer will return to step 1. The sequencer may be sequencing while you program the steps, if the Stop selector is in the Go position.

You can move the edit point back and forth by using the arrow keys beneath the Stop button. The edit point can also be selected by clicking on a step LED.

Stop
Activating Stop stops the sequencer module, even if it is receiving a clock pulse at the Clk input. If you activate the record function when the sequencer is stopped, it may be programmed in a step mode fashion. Activating Go will put the sequencer back under the influence of a clock, connected to the Clk input.

< >
Use these to manually scroll through the steps. A green LED indicates the step that is currently transmitting a control signal, a dark red LED indicates the edit point. The dark red will be bright red when the edit point and the current position coincide. You may also scroll with the rotary dial if these buttons are in focus.

Grid position
With these two buttons, you move the grid up or down in the window. The guide lines in the grid indicates the "E" notes of a six octave range.

Grid zoom
With these two buttons, you can zoom in or out of the grid. Choose an overview from 1 to 6 octaves.

Link
This yellow output transmits a high logic signal whenever the Note Sequencer goes beyond step number 16. This is used for linking several Note Sequencers in series. See more about linking at the end of this chapter.
Signal: **Logic**.

Gclk
This output transmits a high logic signal when the sequencer moves from one step to another. If the sequencer is stopped and you scroll manually through the steps, the Gclk will transmit one logic signal for each step, even if you scroll backwards. It will also transmit a logic signal when you are recording with the keyboard, if the Stop selector is in the stop position.
Signal: **Logic**.

Control signal arrow buttons
You set the control signal value for each step in the sequence with the arrow buttons below each step.

Out
Signal: **Bipolar**.

Sequencing examples

General information

- Gate or trigger the envelopes in the patch with something if you want the sequencer to play notes. If you are using every step in the sequence, you can use the same clock source as a trigger for the envelopes, as well as the clock source for the sequencer modules. A more versatile way is to synchronize an Event sequencer, running parallel to a sequencer and use the Event sequencer as a programmable gate source.

- If the oscillators are still under the keyboard tracking control, KBT, you are able to transpose a sequence by playing keys on the Nord Modular keyboard or by using incoming MIDI notes. The resulting key of such a transposition is calculated from the "middle" E key (MIDI note number 64) on Nord Modular, when the octave shift function is in the middle position. If a filter is using the keyboard tracking control, a transposition might close the filter and reduce the sound from Nord Modular.

- Each sequencer module can represent one control signal for each step, a total of 16 different signals for each module. If you want a polyphonic performance, use two or more sequencers, running parallel, with oscillators and envelopes, filters etc., to match the number of sequencers. You can also try to use a polyphonic patch with a sequence. If you play a chord, the entire chord will follow the sequence, if the oscillators are under keyboard tracking control.

- If you are going to have multiple sequencer modules synchronized to each other in a patch, it is good practice to use only one clock source. Connect a cable from the clock source to the first module and continue to the next etc. It is also important that you reset the sequencers or the Clock generator so they can be aligned properly.

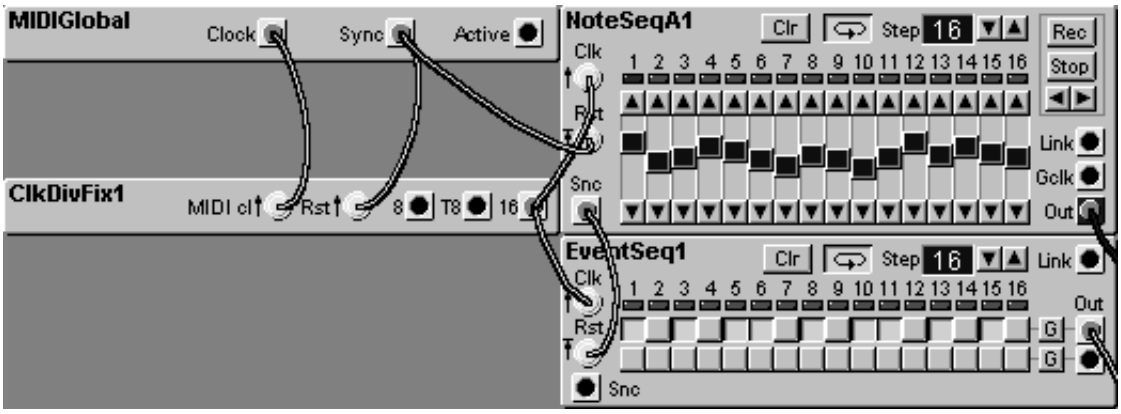
- If you want to synchronize the Nord Modular sequencers with an external MIDI sequencer, you must use the System Clock as the clock source in the patch. The System Clock is available at the clock output on the MIDI Global module.

- The clock output from the MIDI Global module transmits 24 pulses for every quarter note. Be prepared to use a clock divider module directly after that output unless you want to use extremely high tempos. When tempos get high, or the system load builds up, the indicator lights on the sequencer modules will no longer be accurate. The modules themselves will however remain in sync.

- It is possible to have sequencers with different Last step values, running in parallel or in series. You can also use different clock divisions to e.g. mix 16th notes with 8th note triplets.

Parallel connection

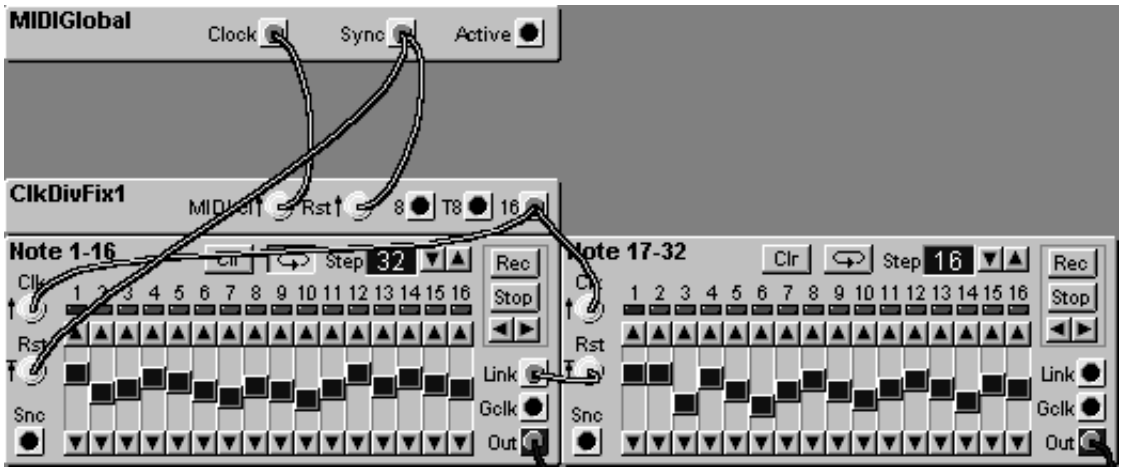
Connect the sequencer modules to the same clock source. If you want to make sure that the sequencers are aligned to each other, connect a logic signal to the Rst inputs. This signal will reset the sequencers to the first step. The Snc output will transmit a logic signal when a sequencer module starts the #1 step.



In this example the Rst signal to the sequencers is taken from the MIDI Global module to the Note Sequencer, then transmitted from the Snc output to the Event Sequencer. The Event Sequencer in this example has the loop mode turned on. This doesn't matter in this setup since the Rst signal received from the Note Sequencer Snc output will reset it to step 1 after each loop of the Note Sequencer.

Serial connection

The last step setting of the first sequencer must be set to the **total** number of steps that you want in a serial connection - if the loop mode is on. The Link output from the first sequencer will send a high logic signal when it has completed step 16. This output should be connected to the next sequencers Rst input.

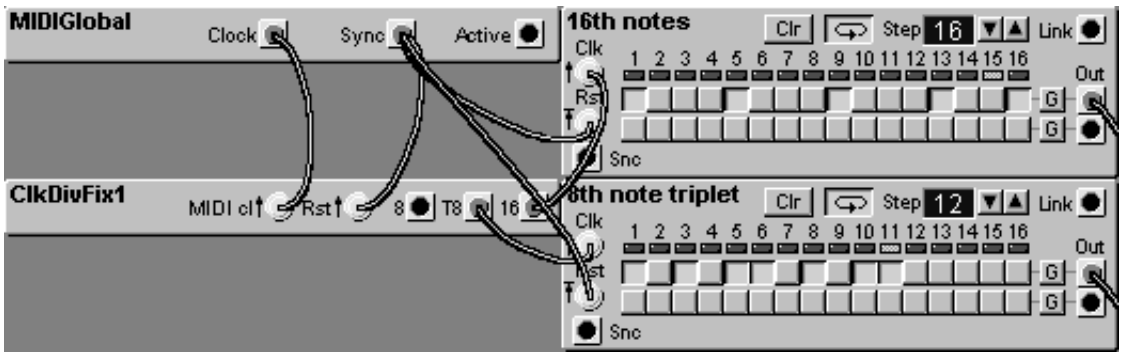


The loop mode of the second sequencer in this example is off. When the signal from the first sequencer's Link output resets the second sequencer, the second sequencer will start sequencing its 16 steps. The first sequencer, which was set to 32 steps, will be inactive during these 16 steps. When the second sequencer has performed its 16 steps, the first sequencer restarts again.

Note that in this example you must make sure the Global sync parameter is set to 8 beats. If set to the default 4 beats, the first sequencer will automatically restart after 16 steps even though you set it to 32 steps. (See page 48 and "MIDI Clock" on page 65 for info about Global sync setting).

Mixing different time signatures

You may mix different divisions of the clock pulses. The beauty of having 24 pulses for each quarter note is that 24 is divisible with 3 and 4.



In this example, the clock is taken from the MIDI global module, at 24 pulses for each quarter note. It is divided with the fixed divider module with two different division ratios, 16 and T8. The divider module is reset by the logic signal from the Sync output on the MIDI global module. This reset signal is also used on the two sequencer modules. The Global Sync function which is found in the Synth parameters determines the rate of the pulse at the Sync output.

The upper module is set to a 16th note performance with 16 as the Last step. It receives the clock pulse from the "16" output of the Clock Divider module, which in this example divides the System Clock to 4 pulses for every quarter note. The lower module is set to a 8 note triplet performance. The Last step is set to 12 and it receives its clock from the T8 output, 3 pulses for each quarter note. The lower module will sequence 12 steps during the same time as the upper module sequences 16.

The loop mode in both of the modules could be on or off, they will reset to step 1 when they receive the Rst signal from the Sync output in any case.

By combining the settings of the loop mode, the Last step and the signals at the Rst inputs and the Snc and Link outputs on various sequencer modules, you may assemble quite advanced sequencer performances.

Synchronizing sequencers in different patches to each other

It is absolutely necessary that the sequencers in a patch use the System Clock as the clock source if the patch is to be synchronized to another patch, in another slot. They should also use the Sync output from the MIDI global module as the Rst source to ensure proper alignment to the first beat in the bar.

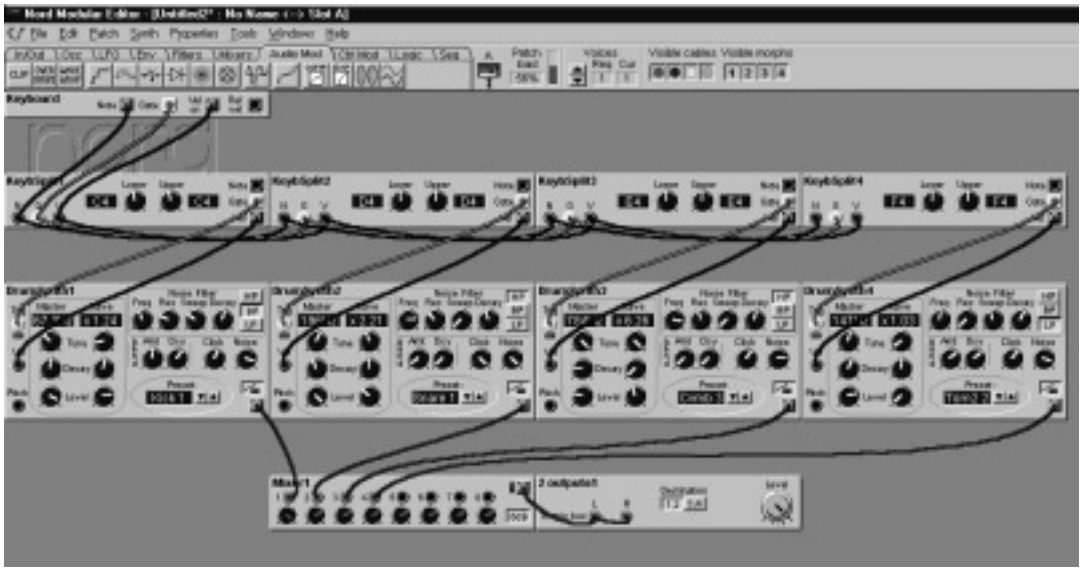
In this example, slot C is loaded with a patch performing triplets and the patch in slot D is playing quarter notes. Please observe the connections of the clock sources and the Rst signals.

8. Appendix

Voice definition

The number of 'voices' in a synthesizer is often defined as equal to the instrument's polyphony, i.e an 8-voice instrument is 8-note polyphonic. With Nord Modular it is a bit different. A single voice in Nord Modular can consist of many different sound sources. These sound sources can be controlled individually from separate notes or note ranges of a keyboard, and be played simultaneously, depending on how the patch is created. This means that a single voice in Nord Modular can actually be played 'multi-timbrally'.

To illustrate this, we created a 'drum' patch featuring four drum synth modules. Each drum synth module is controlled from a separate key, C4 to F4, and can sound together with the other modules if the keys are pressed simultaneously. Do not forget to un-check the Retrig box in the Patch|Patch Settings dialog box to get the best result (see "Single voice settings" on page 62).



First, a Keyboard Voice module is used to be able to patch Note, Gate and Velocity signals to the other modules in the patch. To filter out four separate keys to trig each of the four Drum synth modules, we use four Keyboard Split modules. We make a serial connection of the Note, Gate and Velocity cables from the Keyboard Voice module to the corresponding inputs of the four Keyboard Split modules.

We also set a key range on each of the Keyboard Split modules. In this example, the 'range' represents only a single key on each module, C4, D4, E4 and F4. You can, of course, select a wider note range if you wish. The Gate and Velocity cables are patched to the corresponding inputs of each Drum synth module. We don not patch the Note signal since we use only one key per Drum synth module.

We then adjust the knobs of the four Drum synth modules to create four different sounds. We then patch the audio output of the modules to the 8 Inputs Mixer module, and from there to the 2Output module.

Now it is possible to play all four keys simultaneously and get all drum sounds to sound at the same time. Since we also patched Velocity signals to the Drum synth modules, the sounds become velocity sensitive. And last, do not forget to un-check the Retrig box in the Patch|Patch Settings dialog box.

Sound engine

A standard Nord Modular is powered by four Sound engines (DSPs). The Sound engine power can be expanded to a total of eight DSPs with the Modular Voice Expansion kit. The allocation of the Sound engine resources is totally automatic and cannot be changed by the user.

Micro Modular has got one Sound engine (DSP) and cannot be expanded.

Patch and voice allocation

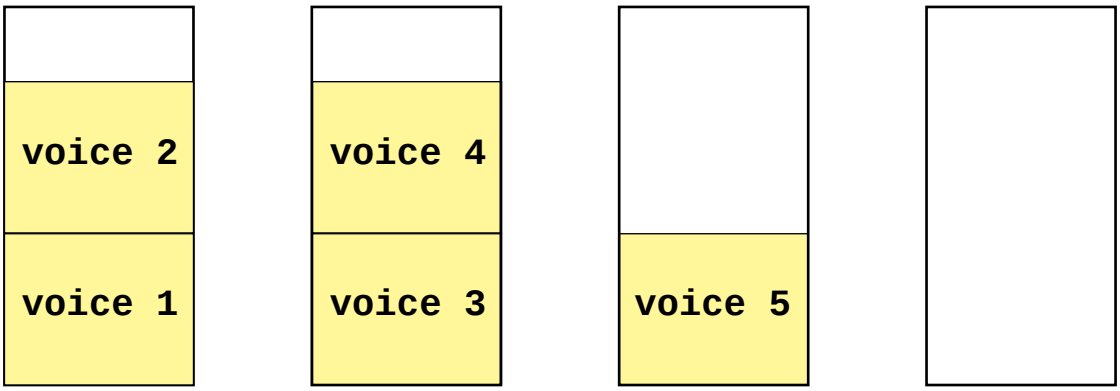
When a patch is created or loaded from the memory/disk, the system assigns a section of one or several Sound engines to that patch. The Sound engine resources used for **one voice** in the active patch is shown in the Patch load indicator on the Editor toolbar. The Patch load cannot exceed 100%, i.e one voice in a patch can never use more than one Sound engine. The only way for a patch to use more than one Sound engine is when it comes to adding more voices. Adding voices in a patch is simply the same thing as adding exact copies of the module setup used for one voice (what you see in the patch window in the Editor).

When you load a patch to a SLOT, or when you add a module to a patch, Nord Modular recalculates and optimizes the usage of the four Sound engines. When this recalculation is performed, the outputs will be mute for a brief moment. During the calculation, Nord Modular distributes the voices of a patch among the four Sound engines, starting with Sound engine 1.

The voice assignment is a bit different depending on if you use only one patch or several patches. This is described in detail below.

A single patch example

This example shows how the Sound engine resources are distributed when you have loaded a single patch to a SLOT of Nord Modular. In the Micro Modular case, only Sound engine 1 exists. The patch in our example uses a Patch load of 40%, i.e 40% Sound engine power for each voice of the patch. We have requested 5 voices, and no other patches have been loaded to any other SLOTS.



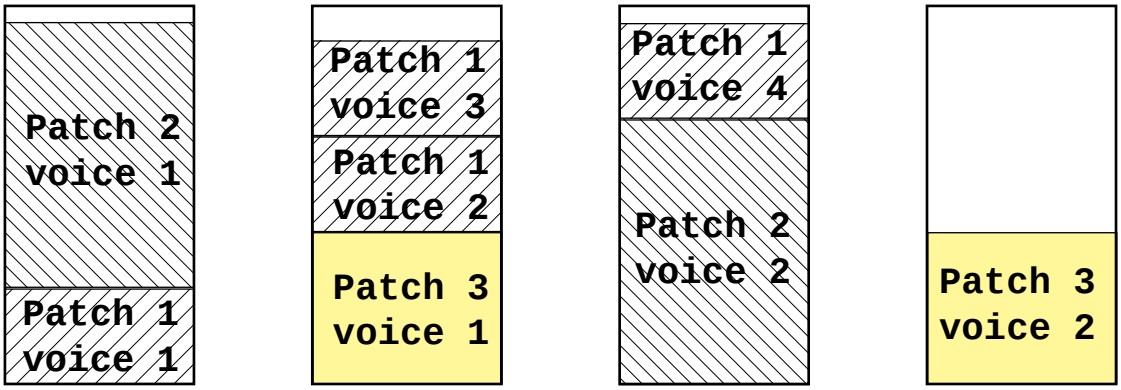
Sound engine 1 *Sound engine 2* *Sound engine 3* *Sound engine 4*

A voice cannot “overflow” from one Sound engine to another - it must always fit “in one piece” in one Sound engine. According to this, a single patch that uses more than 50% Patch load can only play a maximum of four voices in a standard Nord Modular, and one voice in Micro Modular.

A MULTI PATCH EXAMPLE

This example shows how the Sound engine resources are distributed when you have loaded three patches to three SLOTs of Nord Modular (3 SLOT LEDS lit). The following data applies for the three patches:

Patch 1, loaded in SLOT **A**, uses 25% Patch load and 4 voices have been requested.
Patch 2, loaded in SLOT **B**, uses 70% Patch load and 7 voices have been requested.
Patch 3, loaded in SLOT **C**, uses 25% Patch load and 2 voices have been requested.



Sound engine 1 *Sound engine 2* *Sound engine 3* *Sound engine 4*

In a multi-patch situation the distribution of Sound engine resources is made according to the following priority:

1. Voice 1 of Patch 1 is always assigned to Sound engine 1.
2. Voice 1 of Patch 2 is assigned to the next available Sound engine part - in this case Sound engine 1.
3. Voice 1 of Patch 3 is assigned to the next available Sound engine part - in this case Sound engine 2.
4. Voice 2 of Patch 1 is assigned to the next available Sound engine part - in this case Sound engine 2.
5. Voice 2 of Patch 2 is assigned to the next available Sound engine part - in this case Sound engine 3.
6. Voice 2 of Patch 3 is assigned to the next available Sound engine part - in this case Sound engine 4.
7. Voice 3 of Patch 1 is assigned to the next available Sound engine part - in this case Sound engine 2.
8. Voice 3 of Patch 2 is assigned to the next available Sound engine part - but as you can see, no Sound engine has room left for a 70% Patch load voice. Consequently Patch 2 gets only 2 actual voices in this multi-patch setup.
9. Patch 3 only requested 2 voices, and therefore does not get any more.
10. Voice 4 of Patch 1 is assigned to the next available Sound engine part - in this case Sound engine 3.

As you can see in this example, each Patch gets one voice at a time until all patches has got one voice each. Then the voice distribution starts over again with the second voice of each Patch, starting with Patch 1.

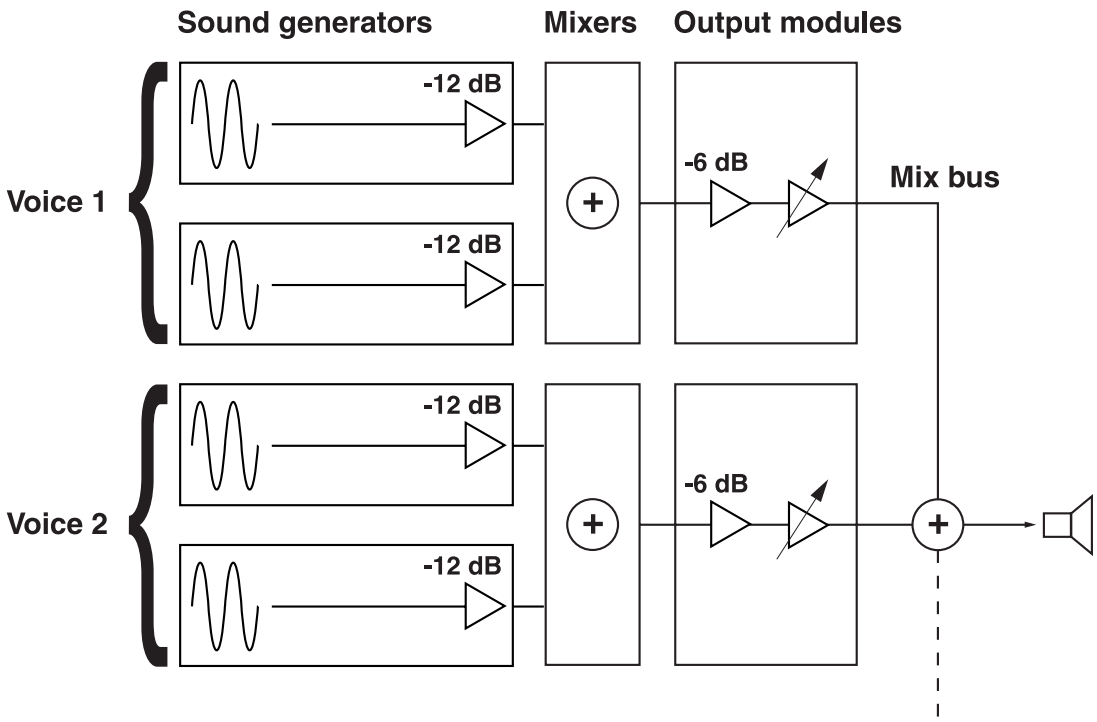
This continues until all requested voices have been assigned, or no more Sound engine power is available. This distribution system guarantees that every Patch in a multi-patch setup gets at least one voice.

In our example, only Patch 1 got all the requested voices. This because there were enough room left in some of the Sound engines. If we had wanted to, we could have requested another 2 voices for Patch 1 - and got it without problems.

Headroom

The headroom of the audio signals in Nord Modular is -12 dB for every sound generating module. Examples of sound generating modules are oscillators and LFOs. If you mix more than four sound generating modules in a voice, at high or un-attenuated levels, distortion may occur. This can easily be dealt with by attenuating the level of each sound generating module.

The headroom in the mix buses of the output modules is -6dB.



MIDI IMPLEMENTATION CHART

Functions	Transmitted	Recognized	Remarks
Basic Channel Default Changed	 1 1-16	 1 1-16	
Mode Default Messages	 Mode 3 X	 Mode 3 X	
Note Number	0-127	0-127	
Velocity Note ON Note OFF	 v=0-127 v=0-127	 v=1-127 v=0-127	
After touch Key Channel	 X X	 0-127 X	
Pitch Bender	X	O	
Control Change	0-120	0-120	
Program Change	0-99	0-99	
System Exclusive	X	X	
System Common Song Position Song Select Tune	 X X X	 O X X	
System Real Time Clock Commands	 O X	 O O	
Aux Messages Local ON/OFF All Notes OFF Active Sense Reset	 X X X X	 X X X X	
Notes			

Mode 1: OMNI ON, POLY **Mode 2**: OMNI ON, MONO O: YES
Mode 3: OMNI OFF, POLY **Mode 4**: OMNI OFF, MONO X: NO

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