User Manual

MIDI-Universal-Converter
MUC-80x-...
Firmware-Version: SV800x

MUC-800-KIT

MUC-801-Eurorack

MUC-800-Desktop

Table of contents

Congratulations on your new MUC!

The MUC is the professional link between MIDI data output devices such as PCs, sequencers, keyboards and analog sound generators, such as synthesizers, which have analog control inputs.

The special features of the MUC are the versatile control functions and voltage ranges that can be configured independently for each individual output. The large number of 24+8 outputs allows you to control up to 12 VCOs include Trigger/Gate signals simultaneously on any MIDI channel. You can also use the MUC purely as a clock center, or you can create simple ADSR envelopes, whereby you can assign both constant and variable parameters to the voltage values.

With the help of the logical and clearly structured menu navigation on the 8-line display, configuration changes can be made directly on the device, which are automatically saved immediately in an internal flash memory.

Due to the large number of configuration options, we strongly recommend that you study the manual beforehand to fully utilize the full potential. The menu overview on pages 8, 9, and 10 will help you keep track of everything. With that in mind, we wish you much pleasure in exploring!

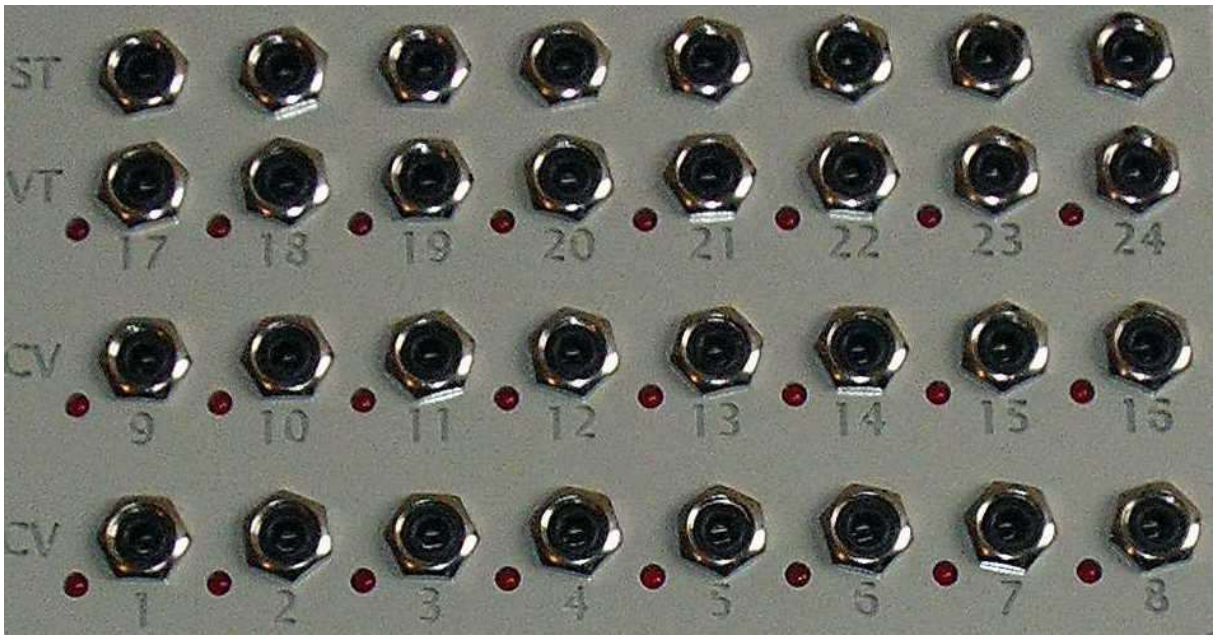
Avoiding damage

Due to the fact that the MUC can be connected to a variety of analog sound generators, some of which work with very different control voltages (3V to approx. 15V), we would like to expressly advise you NOT to exceed the permissible specifications of your sound generator when configuring control voltages on the MUC.

However, if you do not know the maximum permissible trigger or gate voltage, it is advisable to test this via the CV outputs, starting with the lowest control voltage offered by the MUC (3V) and then gradually increasing this by 1V until the signals are continuously well recognized.

Differentiation between two types of control outputs

The MUC has a total of 16 analog and 8 digital control outputs, which are referred to simply as “outputs” below. All of them can be assigned different functions, whereby a distinction must be made between the analog CV outputs (Out 1 - 16) and the digital outputs (Out 17 - 24), as not all functions are available for each output type. Each of the 24 outputs has its own red LED for a simple and quick visual check of the output signals in terms of signal duration and voltage level.



CV-Outputs (Out 1 – 16)

Five voltage ranges (0V..+5V, 0V..+10V, -2.5V..+2.5V, -5V..+5V, -5V..0V) are available for a variable voltage output. However, if such a CV output is configured for trigger, gate or sync signals, you have the option of setting the correct voltage level for your connected sound generator in the range from 3V to 10V. Especially for trigger and gate signals, variable output voltages can also be defined, e.g. depending on the velocity or release value.
The octave spread for volt/octave or Hz/volt function is already calibrated. The tuning, i.e. the setting of the correct offset voltage, is carried out by the software via the menu.

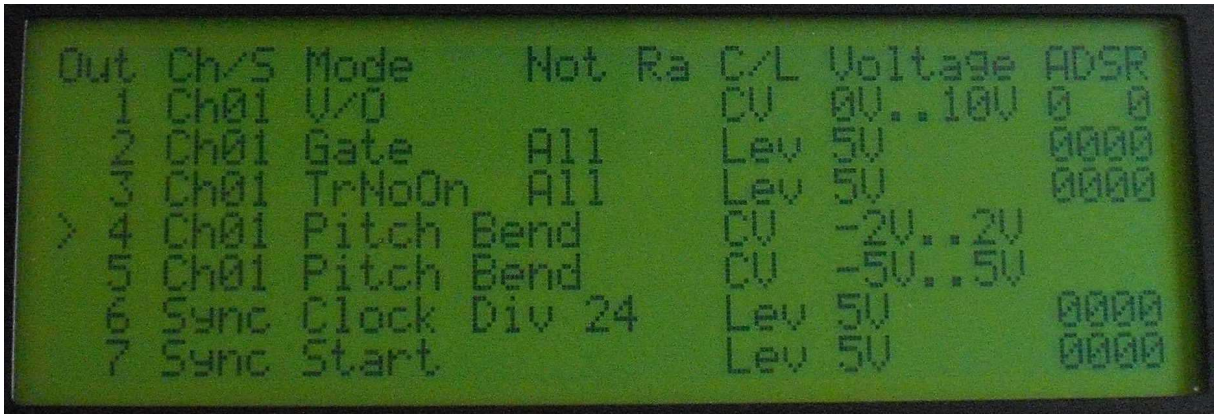
Digital Outputs (Out 17 – 24)

The digital outputs are intended exclusively for the configuration of trigger, gate or sync signals and supply a constant, maximum signal voltage of 5V (default). Optionally, 10V is also possible if the corresponding solder bridges on the solder side of the board are removed. Parallel to these V-trigger outputs, additional S-trigger outputs are provided, which can also be used simultaneously.
However, the S-trigger outputs on the Eurorack version can only be tapped on the circuit board via an additional connector.

Commissioning and operation

Switch-on procedure

After you have established a power supply to the MUC, an “info screen” appears for a second with information on the device type and firmware version. You will then be taken to the so-called “Output overview”, which provides you with the most important information about the current configuration of each individual output (Out 1 - 24).



Thanks to the eight-line, backlit display, you benefit on the one hand from a clear display and on the other hand from very simple menu navigation with just 4 buttons.

The illustration above shows the configurations of outputs 1 to 7. To display the subsequent outputs (Out 8 - 24), use the “Down” button to scroll down the display. Use the “Up” button to move the display back up again.

Basic functions of the 4 menu buttons

To scroll up or down the lines shown on the display, press the corresponding menu button labeled “Up” or “Down”.
To access a subsequent submenu, press the “Enter” button.

Use the “Back” menu button to either exit a previously called up submenu or to call up the “Global Menu” menu page if you were previously in the initial overview (e.g. after every switch-on process).

Menu control principle

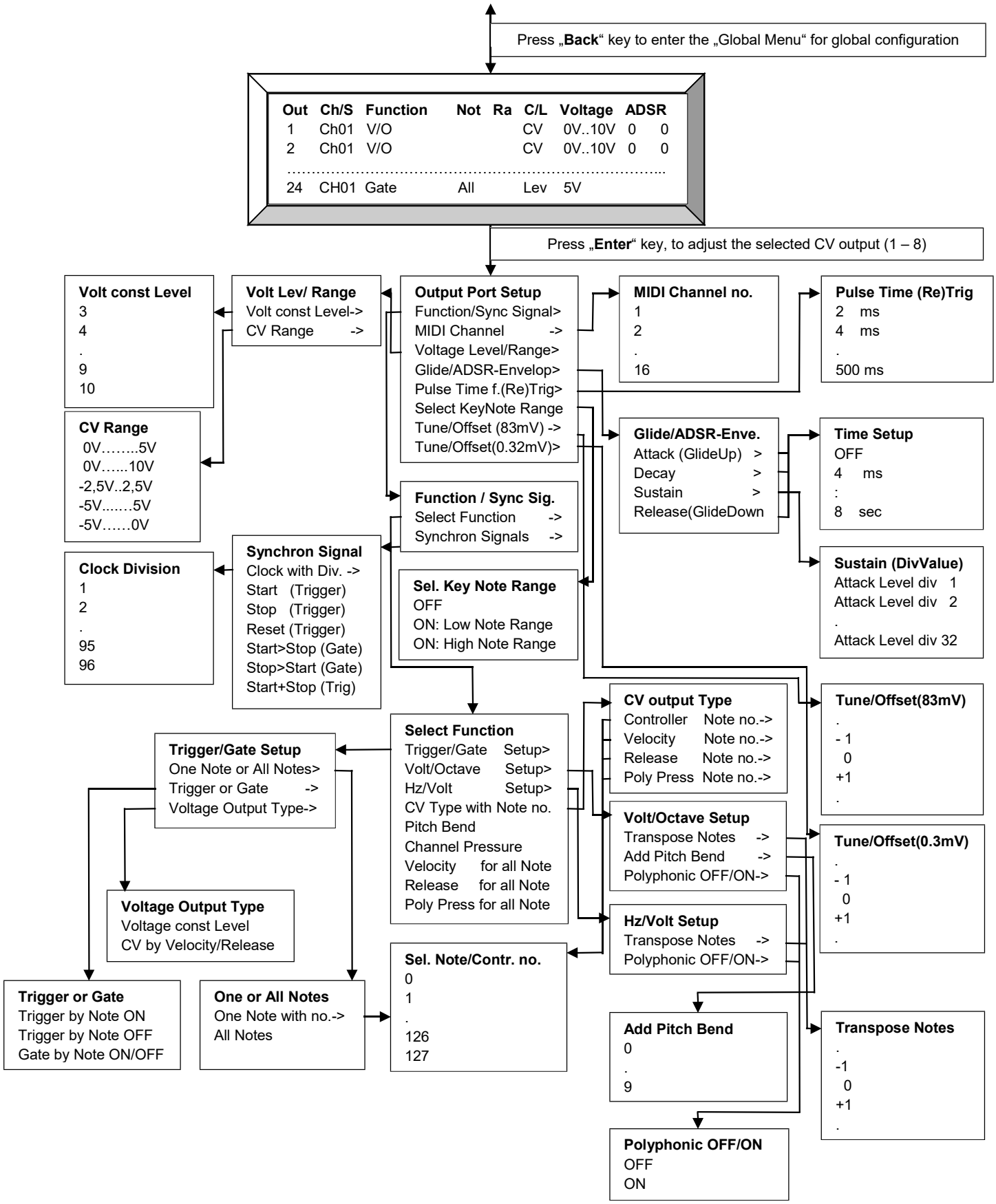
You can change the configuration of an output by first moving the corresponding line with the associated output number in the output overview to the center of the display, where there is a fixed arrow marker “>” on the left edge. Then press the “Enter” button to access a subsequent submenu, where you will receive an initial overview of the other configuration options. To return to the initial overview, simply press the “Back” button. Using this principle, you can access all submenus and exit them step by step.

Submenus can either call up further submenus or you can already carry out a configuration or parameter setting for the output you previously selected. To check which output is currently being edited, its number always appears in the top right-hand corner of the display, preceded by the number sign “#”.

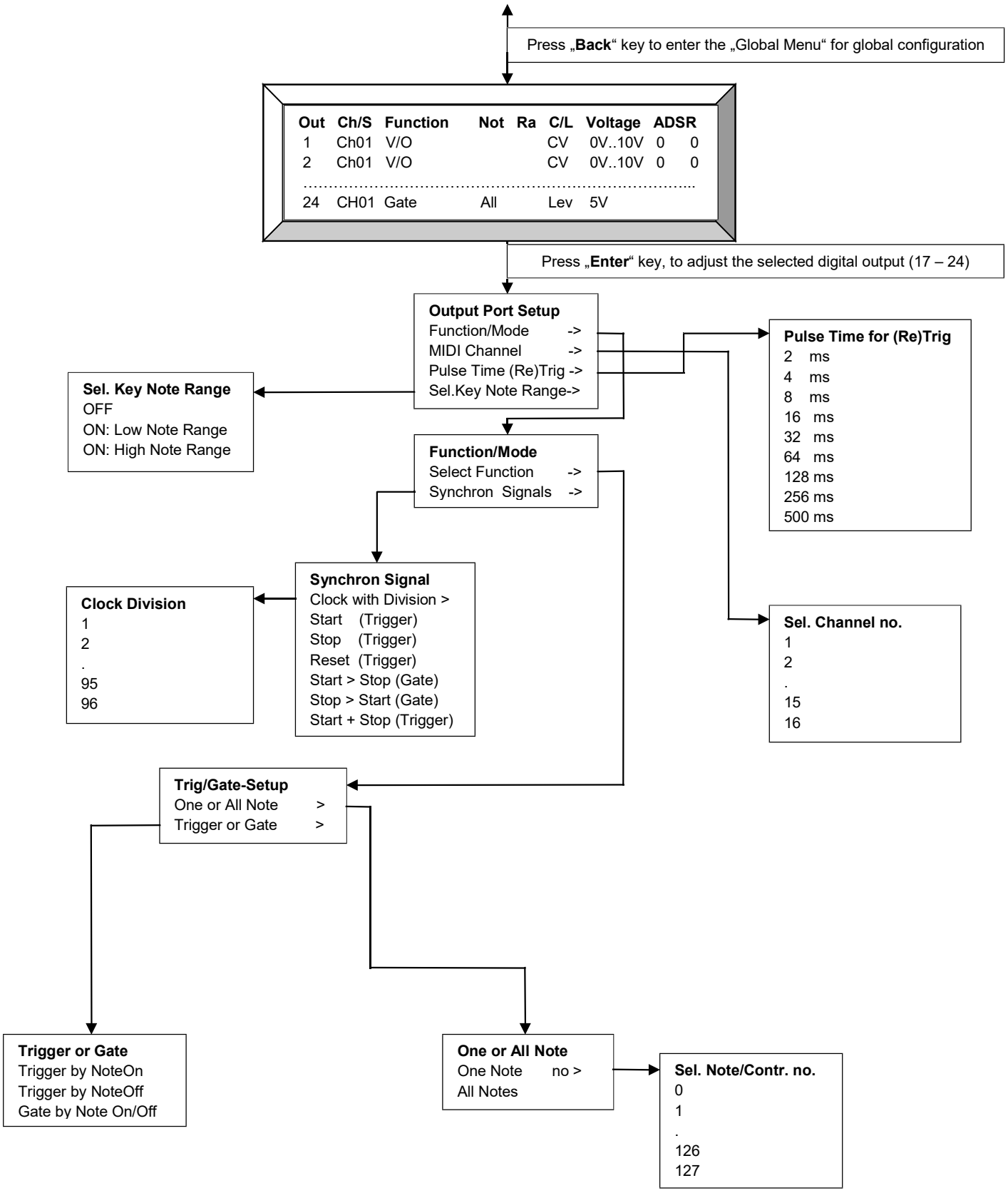
There is a higher-level menu area “Global Menu” where you can make either system-specific or general settings. You can access this higher-level menu when you are in the output overview (e.g. after each switch-on process) and press the “Back” button. Pressing the “Back” button again takes you back to the output overview.

Note:
A new parameter you have assigned is already taken into account and automatically saved internally in a flash memory when this parameter line is at the height of the arrow marker “>”. You therefore do NOT have to press the “ENTER” button for the new setting to be accepted. This means that you can immediately observe the effect of a newly selected parameter or a newly selected MIDI function on the control LEDs or on your sound generator.

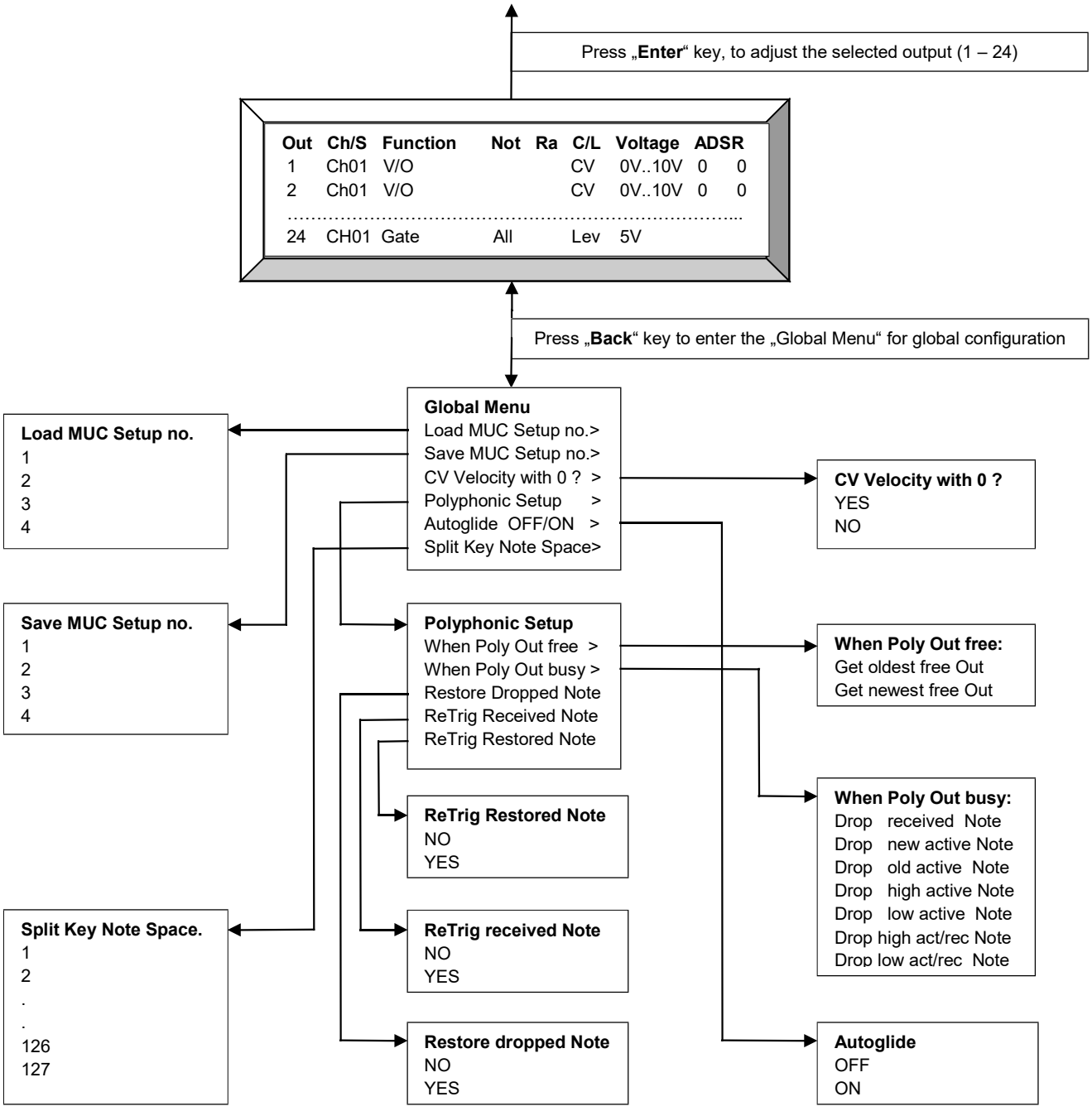
Menu structure for the CV outputs (Out 1 – 16)



Menu structure for the digital outputs (Out 17 – 24)



Menu structure for the system- and global- adjustments



Extract of the important menu items / parameter selection

The most important menu items and their possible parameter selection are explained below. It should be noted once again that a possible parameter value is already selected by moving the corresponding display line to the arrow marker “>” on the left. You therefore do not need to press the “Enter” key to accept the value. This has the advantage that you can use the “Back” button to return to the previous menu and make further parameter settings there. If, on the other hand, you press the “Enter” button after selecting a parameter value, you will be taken directly back to the initial overview.

“Output Port Setup”

The “Output Port Setup” menu is accessed when you are in the output overview (e.g. after switching on) and press the “Enter” button. Depending on which output you have previously selected with the “>” arrow marker, you can define certain configurations for this output in the following submenus.

“Function/Mode“
Calls up a submenu for selecting a MIDI synchronous command or a MIDI function.

“MIDI Channel”
Calls up a parameter selection menu to assign a specific MIDI channel (1 - 16) to the output with the set MIDI function.

“Voltage Level/Range”
Calls up a submenu for defining a voltage range for the CV output or a maximum voltage level for trigger, gate and sync signals.

„Voltage Level/Range“
Calls up a submenu for defining a voltage range for the CV output, or a maximum voltage level for trigger, gate and sync signals.

„Glide/ADSR-Envelope“
Calls up a submenu for defining an attack, decay and release time and a sustain voltage level, which determines the signal output (except for “Pitch Bend”) at the CV output. Only for the volt/octave function are the attack and release times used for the glide function. Attack corresponds to the transition time from a lower to a higher pitch (GlideUp). Accordingly, the release time indicates the transition from a higher to a lower pitch (GlideDown).

„Pulse Time for (Re)Trigger”
Calls up a parameter selection menu for defining the pulse duration (2ms, 4ms,..., 500ms) for the output of a trigger, retrigger or synchronous signal.

„Select Key Note Range”
Calls up a selection menu as to whether and if so which note range (Low Note Range / High Note Range) should be used for the output of a key CV, gate and trigger signals. The note range itself is defined in the “Global menu” under “Split Key Note Space”.

“Function/Mode”

You have the following selection options in this menu:

„Select Function”
Branches to a submenu for the specific selection of a control function such as Trigger, Gate, Volt/Octave, Hz/Volt, CV Type, Pitch Bend, Channel Pressure etc.

„Synchron Signals“
Branches to a submenu for selecting a specific MIDI synchronous command, such as Clock, Start, Stop, Reset or a gate function made up of these commands, such as Start > Stop and Stop > Start.

“Voltage Level/Range”

You have the following selection options in this menu:

„Voltage const Level (Trig/Gate/Sync)“
Definition of a constant maximum signal output voltage for the selected CV output (Out 1-16) in the range from 3V to 10V, if these have been configured as trigger, gate or sync signal.

„CV Range (PitchBend,Contr,Velo,Pres)“
Definition of a voltage range for the selected CV output (Out 1-16) if a variable voltage function, such as Velocity, Release, Pressure or Pitch Bend, has been configured.

“Glide/ADSR-Envelope”

You have the following selection options in this menu:

„Attack (GlideUp)“
Calls up a parameter selection menu for setting the duration of a sliding, linear transition from a lower to a higher voltage value at the selected CV output. In addition to completely deactivating this function, you can individually adjust the time transition in steps of 4ms, 8ms, 16ms to 8sec. Note: However, this setting has no effect on the pitch bend function.
If a trigger or gate signal has been configured for the selected CV output, Attack corresponds to one of 4 components of a complete ADSR envelope.
If a key CV (e.g. volt/octave) has been configured for the selected CV output, Attack corresponds to a glide-up time, which specifies the transition time from a lower to a higher tone.

Note:
In general, identical values will be selected for Release, which corresponds to a glide-down time.
This implemented type of glide support is only suitable to a limited extent for the Hz/Volt function, as the voltage change is always linear and not logarithmic.

„Decay“
Calls up a parameter selection menu for defining a time transition (decay time) between 2ms and 8sec. This setting is only used if a trigger or gate signal has been configured for the selected CV output. Decay corresponds to one of 4 components of a complete ADSR envelope.

„Sustain“
Calls up a parameter selection menu for defining a voltage level that is reached after decay

has elapsed. This voltage level depends on the previously reached maximum attack voltage amplitude (Attack-Voltage-Max-Level). However, sustain can only be set in rough increments such as attack level div 1, attack level div 2 to attack level div 32. This setting is only used if a trigger or gate signal has been configured for the selected CV output. Sustain corresponds to one of 4 components of a complete ADSR envelope.

„Release (GlideDown)“
Calls up a parameter selection menu for setting the duration of a sliding, linear transition from a higher to a lower voltage value at the selected CV output. In addition to completely deactivating this function, you can individually adjust the time transition in steps of 4ms, 8ms, 16ms to 8sec. Note: However, this setting has no effect on the pitch bend function.
If a trigger or gate signal has been configured for the selected CV output, Release corresponds to one of 4 components of a complete ADSR envelope.
If a key CV (e.g. volt/octave) has been configured for the selected CV output, Release corresponds to a glide-down time, which specifies the transition time from a higher to a lower tone.

Note:
In general, identical values will be selected for Attack, which corresponds to a glide-up time. This implemented type of glide support is only suitable to a limited extent for the Hz/Volt function, as the voltage change is always linear and not logarithmic.

„Tune/Offset adjust (Step = 83.2mV)“

Calls up a parameter selection menu for setting an offset voltage that is added to the volt/octave function. The step width is 83.2mV, which allows the pitch to be tuned in large increments.

„Tune/Offset adjust (Step = 0.32mV)“

Calls up a parameter selection menu for setting an offset voltage that is added to the volt/octave function. The step size is 0.32mV, which allows the pitch to be tuned in very small increments.

“Select Function”

In this menu, you have the following selection options:

“Trigger/Gate Setup”
The trigger or gate function is specified, while at the same time another submenu is called up in order to make further settings for this type of function.

“Volt/Octave Setup”
Selects the volt/octave function and simultaneously branches to a setup submenu to configure transpose notes, offset voltage, combined pitch bend and polyphony on/off.

“Hz/Volt Setup”
Selects the Hz/Volt function and simultaneously branches to a setup submenu to configure

transpose notes, offset voltage and polyphony on/off.

“CV output Type with Note no.”
A submenu is called up that specifies the exact CV function (velocity, release, controller, poly pressure) and the associated note or controller number.

“Pitch Bend”
Selects the “Pitch Bend” command, whose control voltage is determined by the last 2 bytes (Value1 + Value2). The resolution is 14 bits, which also corresponds to the maximum possible resolution of MIDI.

“Channel Pressure”
Selects the “Channel Pressure” command.

“Velocity output for all Notes”
Selects the velocity whose value is taken from any note received or from any keyboard key played.

“Release output for all Notes”
Selects Release, the value of which is taken from any note received or any keyboard key played.

“Poly Press output for all Notes”
Selects Poly Pressure, the value of which is taken from any note received or from any keyboard key pressed.

„Trigger/Gate Setup“

In this menu, you have the following selection options:

„Activate for ONE Note or All Notes“
Call up a submenu where you can choose between a specific note number “One Note” or “All Notes” regardless of the note number received.

„Trigger or Gate?“
Calls up a submenu where you can choose from various trigger functions or a gate function.

„Voltage output Type?”
Aufruf eines Untermenüs, wo Sie zwischen einem konstanten Spannungswert, oder einer variablen Steuerspannung, die dann vom Velocity- bzw. Release-Wert bestimmt wird, wählen können.

„Activate for ONE Note or ALL Notes“

You have the following selection options in this menu:

“ONE Note with Note no.”

A trigger or gate signal is activated by a specific note value, which is defined in the following selection menu.

“ALL Notes”
A trigger or gate signal is activated by any note value received or by any keyboard key pressed.

“Trigger or Gate?”

You have the following selection options in this menu:

“Trigger by Note ON”
Configure the output as a trigger, which is activated by the MIDI command “Note On”.

“Trigger by Note OFF”
Configure the output as a trigger, which is triggered by the MIDI command “Note Off”.

“Gate by Note ON/OFF”
Configure the output as a gate whose active signal (= pulse length) is determined by the two consecutively received MIDI commands “Note On” and “Note Off”.

„Voltage Output Type?“

You have the following selection options in this menu:

“Voltage const Level”
The trigger or gate signal voltage output corresponds to the value set in the “Voltage const Level (Trig,Gate,Sync)” parameter selection menu.

“CV by Velocity/Release”
The trigger or gate control voltage output corresponds to the velocity or release value received. The corresponding voltage range is set in the “CV Range (PitchBend,Contr,Velo,Pres)” parameter selection menu.

„Volt/Octave Setup“

You have the following selection options in this menu:

“Transpose Notes”
Calls up a parameter selection menu for shifting the pitch in semitone steps. This allows you to shift or adjust note numbers and pitch accordingly. Note: On delivery, the MUC is preset with “Transpose Notes = 0”, so that the corresponding assigned output voltage starts with an integer voltage value (1V, 2V, 3V,...) starting with each octave.

“Add Pitch Bend”
Calls up a parameter selection menu for adding pitch bend to the volt/octave signal at a

freely selectable level. There are 10 settings (0..9) available, whereby 0 deactivates the influence of the pitch and setting 9 corresponds to the maximum influence of the pitch on the volt/octave signal.

“Polyphonic OFF/ON”
Calls up a selection menu to switch the polyphony function for the selected output on or off.

„Hz/Volt Setup“

You have the following selection options in this menu:

“Transpose Notes”
Calls up a parameter selection menu for shifting the pitch in semitone steps. This allows you to shift or adjust note numbers and pitch accordingly. Note: On delivery, the MUC is preset with “Transpose Notes = 0” so that the corresponding assigned output voltage begins with the voltage values of 0.5, 1V, 2V, 4V or 8V starting with each octave. Note: The output of the control voltage is exponential with the Hz/Volt function, which is why the voltage value doubles with each subsequent octave.

“Polyphonic OFF/ON”
Calls up a selection menu to switch the polyphony function for the selected output on or off.

„CV output Type with Note no.“

You have the following selection options in this menu:

“Controller with Note no.”
Selects the “Controller” command whose control voltage is determined by the last MIDI byte (value). In the following parameter selection menu, you specify the corresponding controller number (0 – 127).

“Velocity with Note no.”
Selects the “Note On” command whose control voltage is determined by the last MIDI byte (Velocity). In the following parameter selection menu, you specify the corresponding note number (0 – 127).

„Release with Note no.“
Selects the “Note Off” command, the control voltage of which is determined by the last MIDI byte (release). In the following parameter selection menu, you specify the corresponding note number (0 – 127).

“Poly Pressure with Note no.”
Selects the “Polyphonic Pressure” or “Polyphonic Aftertouch” command, whose control voltage is determined by the last byte (Value). In the following parameter selection menu, you specify the corresponding note number (0 – 127).

„Synchron Signals”

You have the following selection options in this menu:

“Clock with Division (Trigger)”
Selects the MIDI clock as the synchronization signal and branches to a parameter selection menu where you can specify a divider between 1 and 96.

“Start (Trigger)”
Selects MIDI start as the synchronization signal.

“Stop (Trigger)”
Selects MIDI stop as the synchronization signal.

“Reset (Trigger)”
Resets the MUC first, as after the switch-on process. If an output has been configured with this reset command, a trigger signal is subsequently output.

“Start > Stop (Gate)”
Selects a gate function whose pulse duration depends on the two consecutively received MIDI Start and MIDI Stop commands.

“Stop > Start (Gate)”
Selects a gate function whose pulse duration depends on the two consecutively received MIDI Stop and MIDI Start commands. This signal is used, for example, when resetting a sequencer.

“Start + Stop (Trigger)”
Selects MIDI start and MIDI stop as a synchronization signal, whereby a trigger pulse is always generated at the selected output.

„Global Menu“

You can access the “Global Menu” when you are in the output overview (e.g. after switching on) and press the “Back” button. In this menu area, you can make either system-specific or general settings.

„Load MUC Setup from Number:“
Calls up a submenu that allows you to load up to 4 setups.

„Save MUC Setup to Number:“
Calls up a submenu that allows you to save up to 4 setups.

„**CV Velocity output when Value = 0?**“
To communicate the end of a played note (release of the corresponding key) via MIDI, the classic NoteOff command is generally used. However, there are also systems that send a NoteOn command with the velocity value 0 as an alternative. This would reset a previously set velocity value to 0, although only the information that the previously played note has

ended should actually be transmitted. You can prevent the velocity from being reset to 0 by selecting the “NO” setting in the following submenu.

„Polyphonic priority Setup“
Calls up a submenu to define the procedure for selecting polyphony outputs that have become free or are already assigned.

„Autoglide for Volt/Octave?“
Calls up a submenu to switch Autoglide for Volt/Octave on or off. The autoglide function can also be used with restrictions for the Hz/Volt output.

„Split Key Note Space“
Calls up a submenu for defining a lower note range “Low Note Range” or upper note range “High Note Range”, for the possibility of playing two different sound generators via a MIDI keyboard. In this submenu, you simply select a note number, which defines the note limit of the two note ranges of “Low Note Range” and “High Note Range”. In other words, the entire note range (0-127) is divided into a lower and upper note range by selecting this note number, whereby this note number is assigned to the upper note range. Note: The actual activation and selection of the desired note range for a specific output takes place in the “Output Port Setup” menu under the “Select Note Range” menu item.

„Polyphonic priority Setup”

You have the following selection options in this menu:

“What doing when Polyphonic Out free?”
If a new note has been received and several free polyphony outputs are available, use the following submenu to specify which of these free polyphony outputs should be assigned to the new note.

„What doing when Polyphonic Out busy?“
If a new note is received and all polyphony outputs are already assigned, you can specify which note is to be ignored or replaced in the following submenu.

„Restore dropped Note?“
In a subsequent submenu, you specify whether a note that has been discarded by the polyphony system but is still active (= the corresponding button is still pressed) should be saved so that it can be reactivated as soon as a previously occupied polyphony output is free.

„ReTrigger received Note?“
In a subsequent submenu, you specify whether a retrigger is to be generated at the polyphony gate output whose previous note has been replaced by the newly received note.

„ReTrigger restored Note?“
In a subsequent submenu, you specify whether a retrigger is to be generated at the polyphony gate output whose previous note was replaced by the note temporarily stored by the polyphony system.

„What doing when Polyphonic Out free?“

In this submenu, you can specify the type of selection for polyphony outputs that have become available. If a newly played note has to be assigned to one of several available polyphony outputs, you can determine the selection procedure here.

„Get oldest free Out“
The oldest available polyphony output is used.

„Get newest free Out“
The last available polyphony output is used.

„What doing when Polyphonic Out busy?“

In this submenu, you can define the type of selection for polyphony outputs that are already occupied. If another note is played and there are no more free polyphony outputs available because they are already occupied by active notes, you can use this to determine the selection procedure.

„Drop received Note“
The newly received note is not taken into account and is lost.

„Drop newest active Note“
The polyphony output is used and the last note played is discarded for the newly received note.

„Drop oldest active Note“
The polyphony output is used and the oldest note played is discarded for the newly received note.

„Drop highest active Note“
The polyphony output is used and the note that is still present with the highest pitch is discarded for the newly received note.

„Drop lowest active Note“
The polyphony output is used and the note that is still present with the lowest pitch is discarded for the newly received note.

„**Drop highest active/received Note**“
The note with the highest pitch is discarded. If this is a note that is already active at a polyphony output, it will be replaced by the newly received note. However, if the newly received note has the highest pitch, no change is made to the polyphony outputs and the newly received note is discarded.

„Drop lowest active/received Note“
The note with the lowest pitch is discarded. If this is a note that is already active at a polyphony output, it will be replaced by the newly received note. However, if the newly

received note has the lowest
pitch, no change is made to the polyphony outputs and the newly received note is discarded.

Application of more complex functions

Splitting the note range

By splitting the available note space (0-127) into two ranges (low note range and high note range), it is possible to play two synthesizers separately with the left and right hand using just one keyboard.
In the “Global Menu” under the menu item “Split Key Note Space”, the separation of the two note ranges can be defined individually by selecting a note number.
Notes:
The selected note number is still assigned to the upper note space.
The actual activation and selection of the desired note range for a specific output takes place in the “Output Port Setup” menu under the “Select Note Range” menu item.

Polyphonie with velocity

The MUC-800 supports up to 8 voices (8xCV + 8xVelo + 8xGate), which you can assign to one or more freely selectable MIDI channels with or without taking a note range into account. Configuration example D shows that you can divide the keyboard into two sections (Low Note Range and High Note Range), allowing you to play two synthesizers with the left and right hand independently of each other using just one keyboard. If a certain note range has been activated, this is shown in the output overview with “Lo” (activated low key note range) or “Hi” (activated high key note range), for example.

4 examples for possible configuration of polyphonie outputs:

- 8 x polyphony outputs on MIDI channel 2, without note range
- 4 x polyphony outputs on MIDI channel 2, without note range
  4 x polyphony outputs on MIDI channel 5, without note range
- 3 x polyphony outputs on MIDI channel 2, without note range
  2 x polyphony outputs on MIDI channel 5, without note range
  3 x polyphony outputs on MIDI channel 10, without note range
- 4 x polyphony outputs on MIDI channel 2, lower note range
  4 x polyphony outputs on MIDI channel 2, upper note range

  Note:
  The note range (low/high) is switched on and selected in the “Volt/Octave Setup” and “Hz/Volt Setup” menus. The exact note range (note splitting) is defined in the “Global Menu” under the “Split Note Range” setting.

Assigning polyphony channels / defining the number of voices
The assignment is made by first defining the MIDI channel number for one of the CV outputs

(1 - 8) and then selecting one of the two functions Volt/Octave or Hz/Volt, whereby you switch on the polyphony function in the subsequent setup submenu and also define a note range if required. The number of voices now results from the number of activated polyphony outputs that have the same Midi channel with an identical note range.

Note:
If the MIDI channel number is changed at a later time, the previously set polyphony function is automatically deactivated and MUST be reactivated by the user if desired.
You can specify how the automatic assignment of a polyphony output should take place after a “Note On” has been received in the “Global Menu” under the menu item “Polyphonic priority Setup”.
Outputs that have not been configured for polyphony can still be used for all functions available from the MUC.

Assignment of the polyphony velocity/gate outputs
The necessary associated velocity and gate outputs are configured automatically by the system and are located directly above the CV outputs. If, for example, you have configured CV output 7 with a polyphony function, the associated velocity output has the number 15 and the associated gate output the number 23.
The previously assigned function for this output is suppressed until the polyphony of the associated polyphony CV output is deactivated again.

Glide function and ADSR envelope

In the “Output port setup” menu under the “Glide/ADSR envelope” menu item, you have the option of defining the time transitions (attack, decay, release) of an output voltage and a voltage level to be reached (sustain). If trigger or gate signals have been configured at a CV output, an ADSR envelope results from the transition times previously defined in this menu and the sustain voltage value.

Possible transition times that can be set are 2ms, 4ms, 8ms, 16ms, 32ms, 64ms, 128ms, 250ms, 500ms, 1sec, 2sec, 4sec and 8sec.

The sustain voltage that is reached after the decay time has elapsed depends on the previously reached maximum attack voltage level (attack voltage max level) and an adjustable divider ratio. In this, admittedly simple form of ADSR envelope support, the resulting sustain voltage can only be set in rough steps such as attack level div 1 (sustain corresponds to the attack voltage max level), attack level div 2 (sustain corresponds to half of the attack voltage max level) up to attack level div 32.

Note:
Depending on which voltage type you select for your trigger or gate signal, the maximum amplitude of the envelope curve is either dependent on a constant preset voltage value (3V, 4V,..., 10V) or variable depending on the velocity value received.

In the output overview, the previously set values (Attack, Decay, Sustain, Release) are displayed as a single-digit number or letter code (0,1,2,...,9,A,B,C) in the “ADSR” column.

Code for Attack, Decay and Release:
“0“ corresponds to a time of 0ms, which corresponds to deactivation.
“1“ corresponds to a time of 2ms.
“2” corresponds to a time of 4ms.
“3“ corrosponds to a time of 8ms, etc.

The numerical code of Sustain shows the relationship to the maximum voltage value reached after the Attack time:
“0” corresponds to the maximum voltage value reached divided by 1. In this case, Sustain corresponds to the maximum voltage value reached.
“1” corresponds to the maximum voltage value reached divided by 2.
“2” corresponds to the maximum voltage value reached divided by 4.
“3” corresponds to the maximum voltage value reached divided by 8, etc.

Special case: Glide function
The glide function is a special case. This can be applied to almost all CV output voltages, e.g. for volt/octave, controller values etc., for stepless, i.e. gliding transitions. For this, only the decay time must be deactivated (=“OFF”). Attack therefore corresponds to the time of an increase in voltage, which in turn means a “glide up”, while release corresponds to the time of a decrease in voltage, i.e. a “glide down”. In general, identical time values are selected for attack and release when using the glide function.

Note:
This implemented type of glide support is only suitable to a limited extent for the Hz/Volt function, as the voltage change is always linear with glide and not logarithmic, as would be necessary with the Hz/Volt function.

Autoglide

Autoglide automatically activates the glide function for the set volt/octave function when at least one note is already active and another note is played. The transition to the new pitch then takes place smoothly, the change time of which corresponds to the time in the menu item “Attack (GlideUp)” and “Release (GlideDown)”.
If Autogide has been activated for a volt/octave function, this is shown in the output overview with “AuGl”.
You can activate Autoglide in the “Global Menu” under the menu item “Autoglide for Volt/Octave?”. Please remember to also set the corresponding glide times in the “Attack (GlideUp)” and “Attack (GlideDown)” menus. Generally, identical times will be selected for this.

Appendix

The Bootloader-Menu

If you press and hold the “Enter” button for 5 seconds during the switch-on process, you will be taken to the so-called “Bootloader” menu. From there you can, for example, load the latest firmware into the MUC, i.e. carry out an “update”. You can also reset the entire setup memory in the MUC, as in the delivery state. The following 3 menu items are available, the functions of which you can execute by pressing the corresponding selection buttons “Up”, “Down” and ‘Back’:

“**Up**” button: Start the MUC firmware update process.

“**Down**” button: Reset the MUC setup memory.

“**Back**” button: Start the MUC program.

Update MUC-Firmware

With the following procedure, you can always load the latest firmware, which is available for download on the website www.edv-technik-ts.de, into the MUC converter:

1. Save the MUC firmware (SVxxxx.syx), which is available as a syx file, in a directory of your choice on your computer.
2. Make sure that a functioning MIDI interface is installed on your computer.
3. Start the upload program “C6”, which can be found on the enclosed CD.
4. Assign the already installed MIDI interface in the upload program C6.
5. Press the “Load” button and open the previously loaded MUC firmware syx file.
6. Establish a MIDI connection between your computer (MIDI Out) and the MUC (MIDI In).
7. Press and hold the “Enter” button for at least 5 seconds while switching on the MUC. The bootloader will then appear and you can release this button again.
8. Now briefly press the “Up” button to activate the MUC for data reception.
9. Immediately after you press the “Send” button of the C6 upload program, the actual upload process is initiated. A corresponding confirmation will now appear on the display.
10. After approx. one minute, the upload process should be completed and you will again receive a corresponding message on the display.

You must then switch off the MUC and disconnect the MIDI connection. As soon as you switch the MUC on again, the MUC will immediately start up with the new firmware. After this upload process, any data you may have previously stored in the setup memory is no longer valid, which is why it is now automatically reset to its default values.

Important note:
Please avoid interrupting the MIDI connection or even the power supply during the upload process. In the worst case, the data in the flash memory can get so “mixed up” that the device can no longer perform a new upload and must be sent in for servicing.

Resetting the MUC setup memory

Once you are in the bootloader menu, you can prepare the MUC for resetting its setup memory by pressing the “Down” button. Only when you then switch the MUC off and on again will the setup memory of the MUC be reset to its default values after the start.

Configuration options for the 16 CV and 8+8 digital outputs

The MUC has a total of 16 outputs, all of which can be assigned different functions. A distinction must be made between the first group (Out 1 - 8) and the second group (Out 9 - 16), as the last group does not provide all functions. The individual configuration options for the two groups are explained in detail below.

CV-Outputs (Out 1 – 16)

Trigger-Signals

- Trigger signals can be generated by the MIDI command “Note On” or “Note Off”.
- Freely selectable constant voltage level 3V - 10V or variable setting, the voltage level of which is then determined by the velocity or release value.
- Assignment of a freely selectable note (0 - 127), or a trigger signal is activated for each note value received.
- Assignment of a freely selectable MIDI channel (1 - 16).
- Freely selectable pulse duration from 2ms to 0.5sec. The standard 4ms is preset.
- Glide can be switched on.

Gate-Signals

- Gate signals (and their pulse duration) are generated by the successive MIDI commands “Note On” and “Note Off”.
- Freely selectable constant voltage level 3V - 10V or variable setting, whose voltage level is then determined by the velocity.
- Assignment of a freely selectable note (0 - 127), or a gate signal is activated for each note value received.
- Assignment of a freely selectable MIDI channel (1 - 16).
- Possibility of activating glide.

MIDI-Synchron-Signals

- Trigger signals are generated when MIDI clock, start, stop and reset are received.
- Freely selectable pulse duration from 2ms to 0.5sec. The standard 4ms are preset.
- A division factor of 1 to 96 can also be defined for MIDI clock.
- Generation of gate signals whose pulse duration is determined by the successively received MIDI synchronization commands start/stop or stop/start.
- Freely selectable constant voltage level 3V - 10V
- Possibility of switching on glide.

Control voltage with 7-bit resolution

- These control voltages can be created using the MIDI commands “Note On” and its velocity value, the MIDI command “Note Off” and its release value and any controller value.
- Assignment of a freely selectable note or controller number (0 - 127).
- Assignment of a freely selectable MIDI channel (1 - 16)
- Freely selectable voltage range (0..5V, 0..10V, -2.5V..2.5V, -5V..5V, -5V..0V).
- Glide can be switched on.

Volt/Octave

- Voltage range 0 - 10V (10 octaves)
- Pitch bend can be switched on in 9 different strengths.
- Glide, Autoglide

Hz/Volt

- Voltage range 0.5V - 10V
- Possibility of switching on Glide/Autoglide.
  Note: This function can only be used to a limited extent, as the Glide/Autoglide function works linearly and not logarithmically like the Hz/Volt function.

Pitch Bend

- Freely selectable voltage range (0..5V, 0..10V, -2.5V..2.5V, -5V..5V, -5V..0V) which operates with the maximum possible resolution of 14 bits.

Digital Outputs (Out 17 – 24)

Trigger-Signals

- Trigger signals can be generated by the MIDI command “Note On” or “Note Off”.
- Fixed voltage level of 5V (preset) or 10V after removing an internal jumper (individually adjustable for each output). Additional 8 S-trigger outputs that can be used simultaneously.
- Assignment of a freely selectable note (0 - 127), or a trigger signal is activated for each note value received.
- Assignment of a freely selectable MIDI channel (1 - 16).
- Freely selectable pulse duration from 2ms to 0.5sec. The standard 4ms are preset.

Gate-Signals

- Gate signals (and their pulse duration) are generated by the successive MIDI commands “Note On” and “Note Off”.
- Fixed voltage level of 5V (default) or 10V after removing an internal jumper (individually adjustable for each output). Additional 8 S-trigger outputs that can be used simultaneously.
- Assignment of a freely selectable note (0 - 127), or activation of a gate signal for each note value received.
- Assignment of a freely selectable MIDI channel (1 - 16).

MIDI-Synchron-Signals

- Trigger signals are generated when MIDI clock, start, stop and reset are received.
- Freely selectable pulse duration from 2ms to 0.5sec. The standard 4ms are preset.
- A division factor of 1 to 96 can also be defined for MIDI clock.
- Generation of gate signals whose pulse duration is determined by the successively received MIDI synchronization commands Start/Stop or Stop/Start.
- Fixed voltage level of 5V (preset) or 10V after removing an internal jumper (individually adjustable for each output). Additional 8 S-trigger outputs that can be used simultaneously.

Soft reset and read out error code

To set outputs 1 - 24 to a defined initial state and to read out the error code, you can perform a soft reset. To do this, press both the “Back” and “Down” buttons simultaneously when you are in the output overview. This action has the same effect as switching the MUC off and on again. Your previously saved setups will be retained. The error code is then reset to 0.

The error code, which appears for approx. 1 second during this soft reset, provides information about possible misinterpretations of MIDI commands or whether the memory reserved by the system for polyphony processing was insufficient and has overflowed.

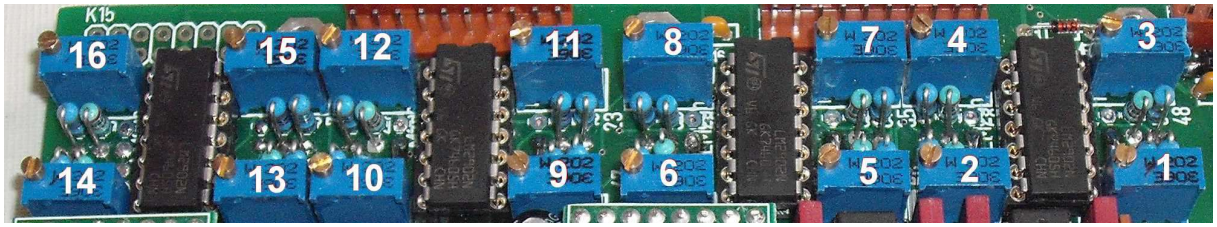
Error-Code = 0
Everything is fine, all data has been received and evaluated correctly so far.

Error-Code = 1
There is a synchronization error. Data of individual MIDI commands could not be processed completely. A new MIDI command has been received although the previous command has not yet been completely received and processed. Such an error mainly occurs if, for example, MIDI commands were not sent correctly one after the other by the transmitter.
Consequence: This could result in incorrect output from the MUC.

Error-Code = 2 or 4
Intermediate storage of active notes within the polyphony function could no longer be carried out correctly due to a memory overflow.
Consequence: Notes that are still active are lost.

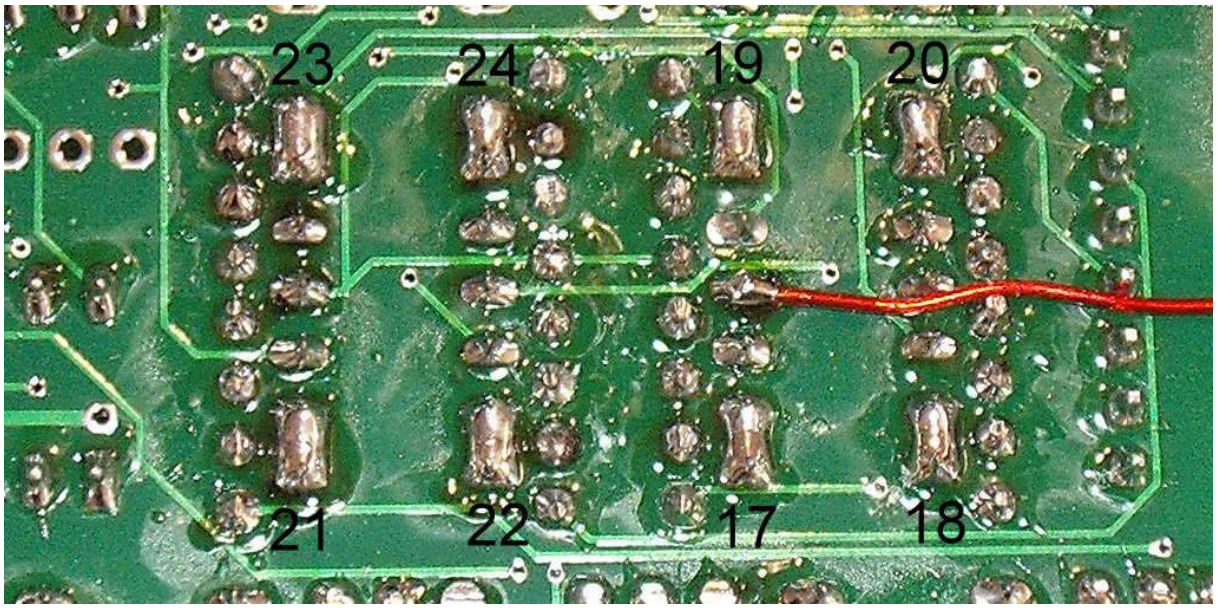
Spread from note value to control voltage

The spread between the note value of a volt/octave or Hz/volt function and the control voltage output has already been calibrated at the factory. However, there are cases where slight deviations on your analog synthesizer need to be compensated for. In such a case, you can make a corresponding adjustment using a potentiometer on the MUC circuit board. The number indicated on the 16 potentiometers shown below is assigned to the 16 CV outputs (Out 1 - Out 16).
Note:
After recalibration, it is usually also necessary to check the offset voltage or to readjust it under the menu item “Tune/Offset 83.2mV” or “Tune/Offset 0.32mV”.



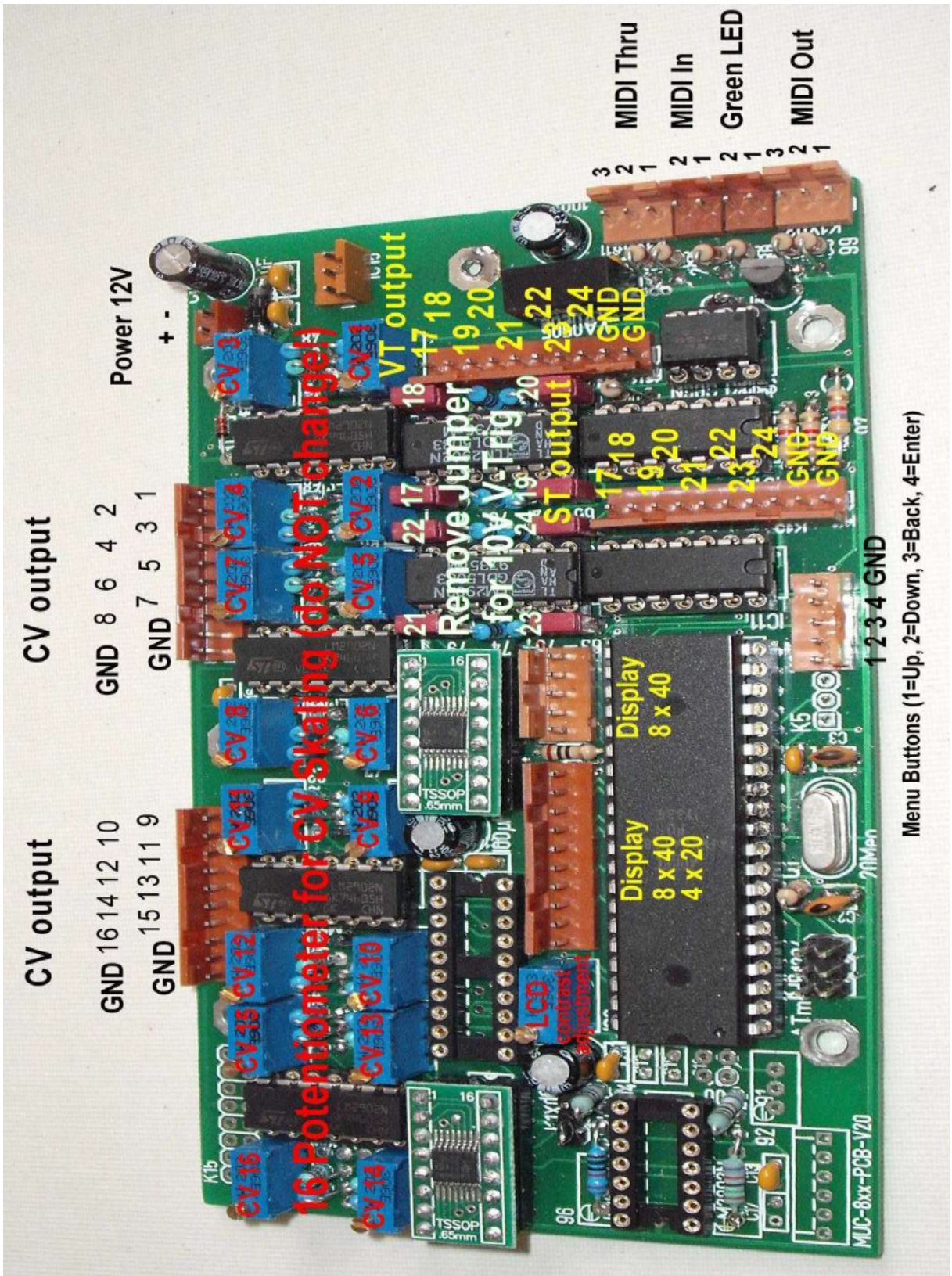
Increasing the output voltage of the V-Trig outputs Out 17 - 24

The maximum output voltage of the V-Trig outputs Out 17 - 24 is preset to 5V on delivery. This can be increased to 10V by removing a solder jumper assigned to the output on the underside of the circuit board (see illustration below).



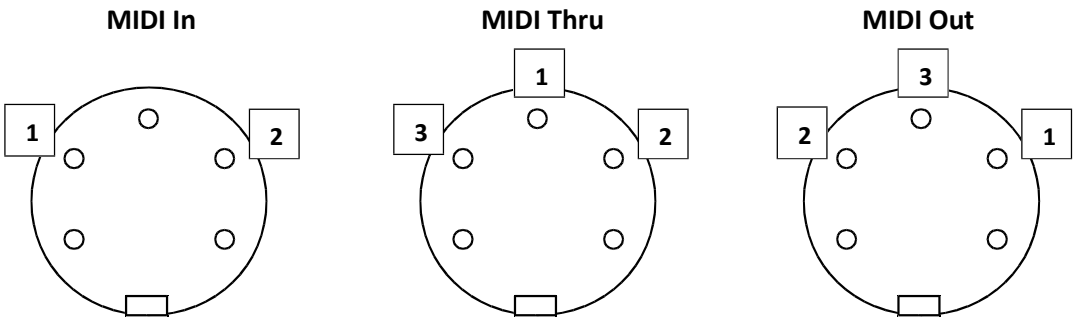
Pin assignment of the MUC converter board

Note: Not all connections shown are available for the MUC-810 Eurorack/KIT version.

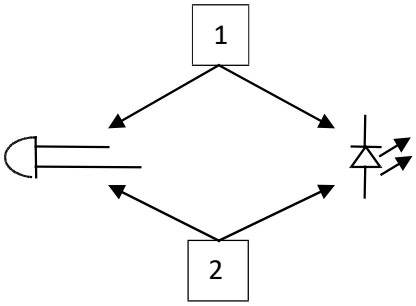


Wiring diagram for connection sockets, LEDs and menu buttons

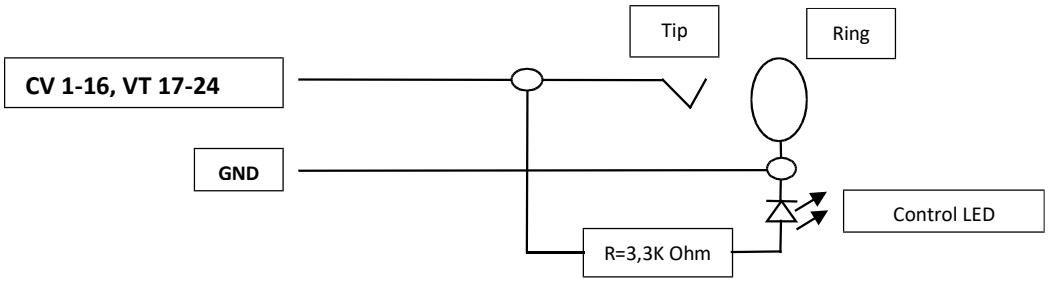
MIDI In, MIDI Thru, MIDI Out (5-pin DIN Connector, View: Soldering side)



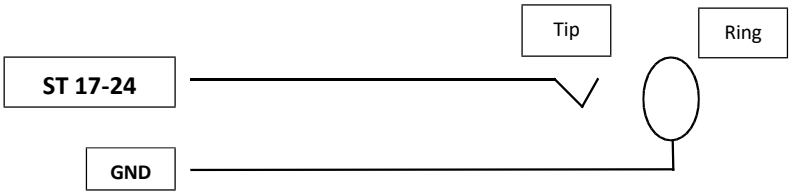
Green LED connection (Control display for incoming MIDI In data)



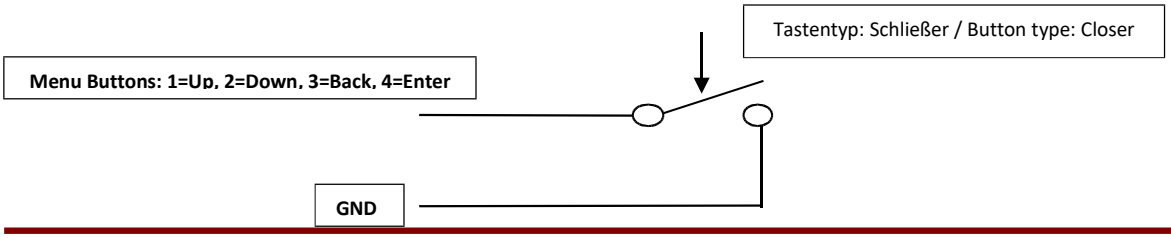
CV connection (**CV 1-16**) and V-Trig connection (**VT 17-24**) with optional control LED



S-Trig connection (**ST 17-24**)



Connection of the 4 menu buttons



Technical Data

	MUC-8xx-...
CV Output (MUC Out 1 – 16)	Resolution: 16 bit Maximum voltage: 10V Voltage range: 0-5V, 0-10V Tune resolution: 0,325mV Functions: V/Oct (0-10V, Add Pitch Bend + Autoglide) Hz/Volt (0,5V – 10V) Velo,Release, Pitch, Contr,Pressure (Glide support) Trig, Gate, Sync (3V-10V, Step 1V, ADSR-Envelope support)
Digital Output (MUC Out 17 – 24)	Functions: Trig, Gate, Sync V-Trig 5V (or 10V if you remove jumper) S-Trig
Split Note Range	Individual splitting in two note ranges (Low Note Range, High Note Range) for playing two synthesizer simultaneously (polyphonic, mono)
Polyphonic	Up to 8 channels with Velocity
Glide	Glide function for each CV output Autoglide support for V/Oct
ADSR Envelope	Add on each CV output
Spread Volt/Note adjustment	With 16 potentiometer inside of the MUC
Number of setups	4 setups
Firmware update	With bootloader support. You will find the newest firmware for free download at: www.edv-technik-ts.de
Material	Desktop: Synthetic Eurorack: ALU-Plate
Jack type	Desktop, Eurorack: 3,5mm
Power connection	12V, 150mA

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