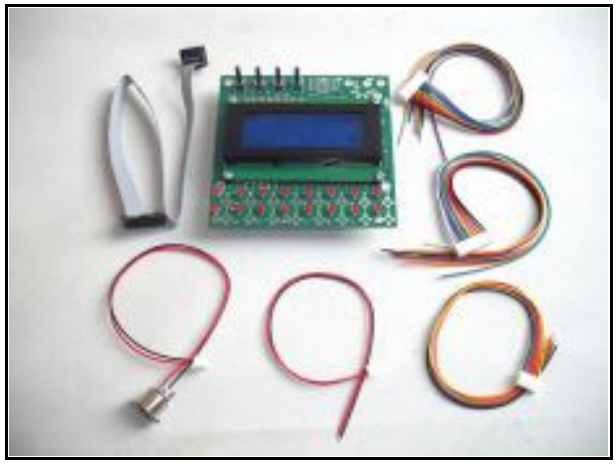
USER MANUAL

MIDI Universal Converter

MUC-4xx/5xx Series (Firmware: SV4x7x , SV5x7x)



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Introduction

The MUC is the professional link between MIDI data issuing devices such as PC , sequencers , keyboards and analog sound sources , such as Synthesizer , which feature analog control inputs.

The special features of the MUC, the control functions provided are versatile and voltage ranges that flexibly configured independently for each individual output can be. The large number of 16 outputs allows it to simultaneously control up to 8 synthesizers / VCOs on any MIDI channels. Also use the MUC as a pure clock headquarters, or create simple ADSR envelopes, where you can assign both constant and variable parameters to the voltage values.

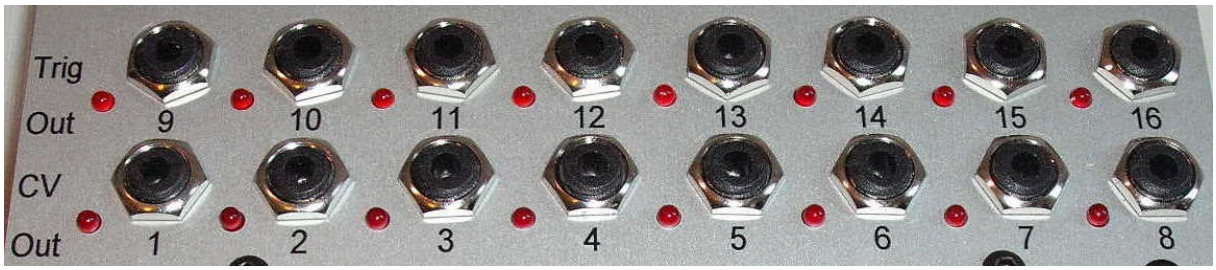
With the help of logically and clearly structured menu system on the four-line display , configuration changes can be made directly on the device , which will automatically be applied immediately in an internal flash memory.

Prevent damages

Due to the connectivity of the MUC to diverse analog sound generators that operate in part with quite different control voltages (3V to 15V) , we would like to explicitly point out when configuring control voltages on the MUC, NOT to exceed the allowable specifications of your tone generator. However, if you do not know the maximum allowable trigger or gate voltage , so it is recommended to test this on the CV outputs , where you start with the lowest offered by the MUC control voltage (3V) and then increase it gradually to 1V , up the signals detected continuously good. However, you should make sure that it actually is V- trigger inputs on your sound module. Please understand that we all liability for damages which may arise on the MUC itself, as well as to the adjoining equipment in case of improper use of the MUC, mutually exclusive.

Differentiation of two types of control outputs

The MUC has a total of 16 analog and digital control outputs, which can be simplified only referred to as "outputs" below. All can be assigned different functions, where we distinguish between the analog CV outputs (Out 1 - 8) and the digital outputs (Out 9 - 16) must be distinguished, as are not available for each output type, all functions are available. Each of the 16 outputs of its own has red LED, for a simple and quick visual inspection of the output signals with respect to the signal duration and voltage level.



CV outputs (Out 1 – 8)

For a variable voltage output, there are two voltage ranges: 0-5V and 0-10V available. However, if such a CV output for trigger, gate or sync signals configured, so you have the option of setting the correct for your connected sound generator voltage level in the range of 3V to 10V (3V to 15V MUC-5xx). Especially for trigger and gate signals and variable output voltages, for example, from the velocity or release value may depend, to be defined.
The Volt/Octave- or Hz / V function has already been adjusted for the most popular synthesizer. Nevertheless, you have to make the possibility of an individual spread of scores and voltage value (octave spread) over 8 potentiometers (trimmers) for each CV output on the back of the MUC. Thus, any existing mild upsets your analog tone generator can be corrected. But even tone generators, which may require a Oktavspreizung of 1.02 V / Octave to be adapted accordingly. The tuning , so hiring a correct offset voltage is accomplished by software via the menu.

Digital outputs (Out 9 – 16)

The digital outputs are provided solely for the configuration of trigger , gate or sync signals and deliver a dependent of the type of device constant , maximum signal voltage of 5V (MUC- 400 (Eurorack) / 430/500/550) , 10V (MUC -410/430/510/550) or S- trigger outputs (MUC-420/430/5xx).

Commissioning and Operation

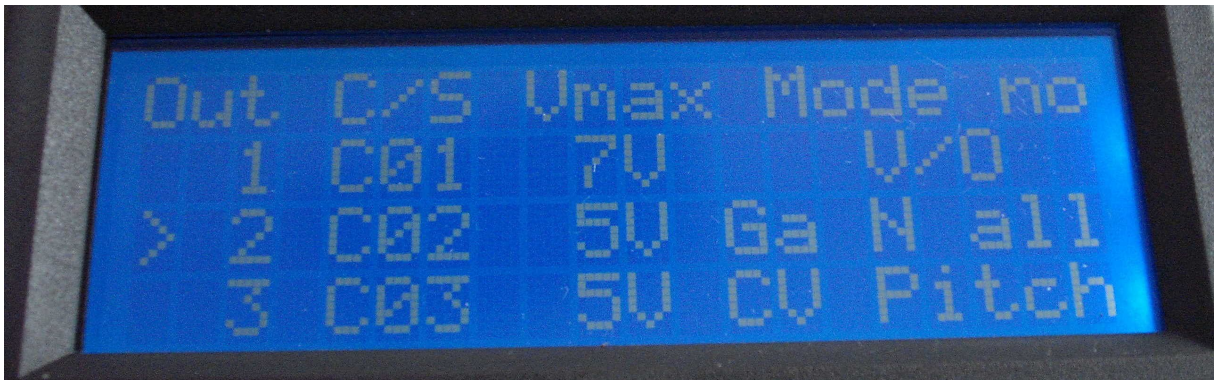
If a power supply is supplied with a voltage selector switch , make sure to check that this is set to 12 V (18.5 V at the MUC- 5xx series). The associated power plug must face outwards (ring) mass , and the inner contact (tip) lead the positive voltage. Now connect the power plug to the power jack located on the back and press the "Power" button to switch the MUC on.

Special note to the power supply of the MUC-400-Eurorack
The MUC-400-Eurorack module requires only + 12V at a power. The connection can be done via the power connection cable included in the delivery, or above the industry standard 16-pin connector.
But don't use both connections at the same time!

It should be noted that the red mark on the 16-pin ribbon cable to the PIN no. 1 corresponds to the- 12V terminal on the power bar of your rack system. Although the MUC has an electronic reverse pole protection, but could for example take your power supply by a possible short circuit damage.
Power is supplied via the power connector cable, so the ribbon cable on the MUC must remain nevertheless still connected, because only so the forwarding of the voltage supply to the individual boards is ensured. The 2-pin power connector from the MUC is located on the top circuit board next to the outgoing 16-pin flat ribbon cable.

After the power-on process

Once you have a power supply made to the MUC, appears for a second on "info screen" with information about the device type and firmware version. You then enter the so-called "output overview", providing you with the most important information about the current configuration of each output (out 1-16) supplies.



Thanks to the four-line , backlit display , you benefit on the one hand by a clear presentation and on the other hand, from a very simple menu system , which makes do with only 4 buttons.

In the figure above, the configurations of outputs 1, 2 and 3 are visible. For a display of the following outputs (out 4-16), scroll the presentation down by pressing the "Down" button. Accordingly, you move the presentation up by pressing the "Up" button.

Basic functions of the 4 menu buttons

To scroll the lines shown in the display up or down , press the corresponding menu button labeled " Up" or " Down". To enter into a subsequent submenu , press the "Enter" key. With the menu "Back" button to exit either a previously invoked submenu , or call the menu page "Global Menu" if you have previously been in the output list (after each power-up).

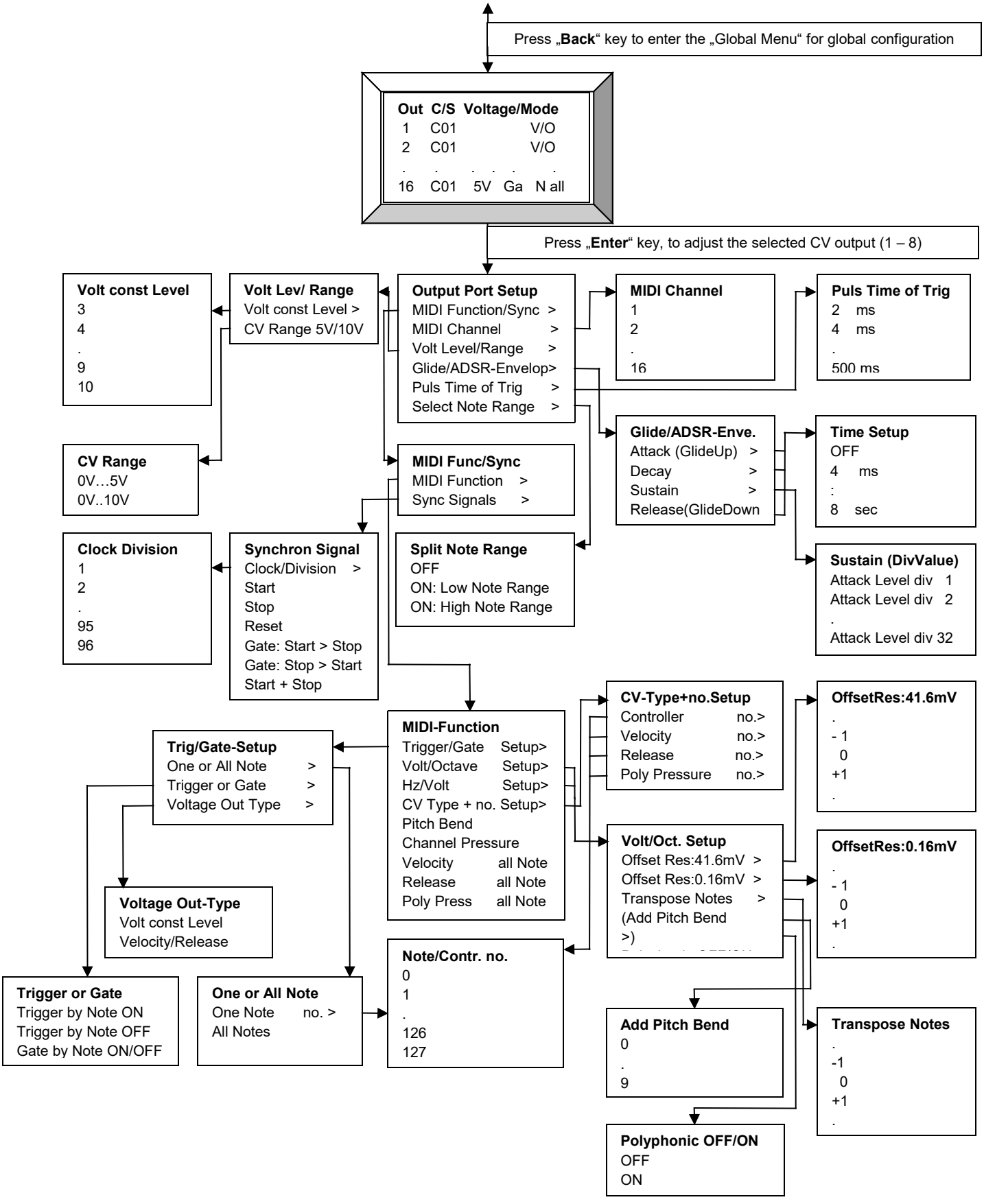
Principle of menu control

You can change the configuration of an output by moving in the initial overview, first the row with the corresponding output number in the center of the display, where the left margin a fixed arrow ">" mark is located. Then press the "Enter" key to enter into a subsequent submenu where you can get a first overview of other configuration options. To return back to the initial overview, you simply press the "Back" button. According to this principle, you can reach all the sub-menus and exit step by step.

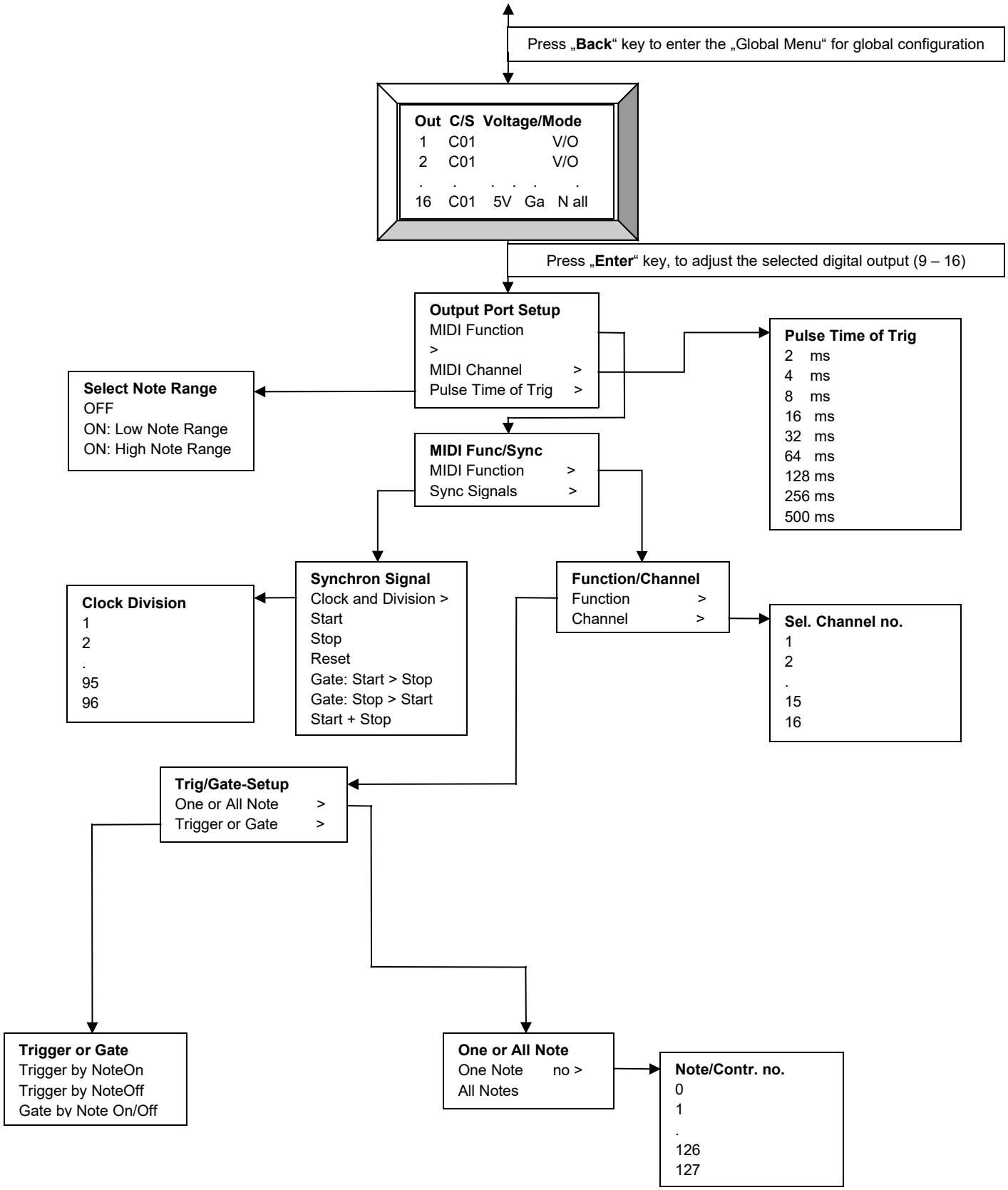
Submenus can either call further submenus, or do you already through a configuration and parameter setting of the output you previously selected. Control which output is currently in the editing, appears whose number in the upper right corner of the display, spearheaded by the pound sign "#".

There is a higher-level menu, the "Global Menu" where you can make either system-specific or general settings. This overriding menu is accessed when you are in the output list (after each closing) and press the " Back" button. By pressing the " Back" button takes you back to the initial overview.
Note:
One of you remapped parameter is then already been taken into account and stored internally in flash memory automatically when this parameter line is equal to the arrow mark ">". So you need NOT only the "ENTER "-key to make the new setting effective. This means you can immediately observe the effect of a newly selected parameter or a newly selected MIDI function to control LED 's, or your tone generator.

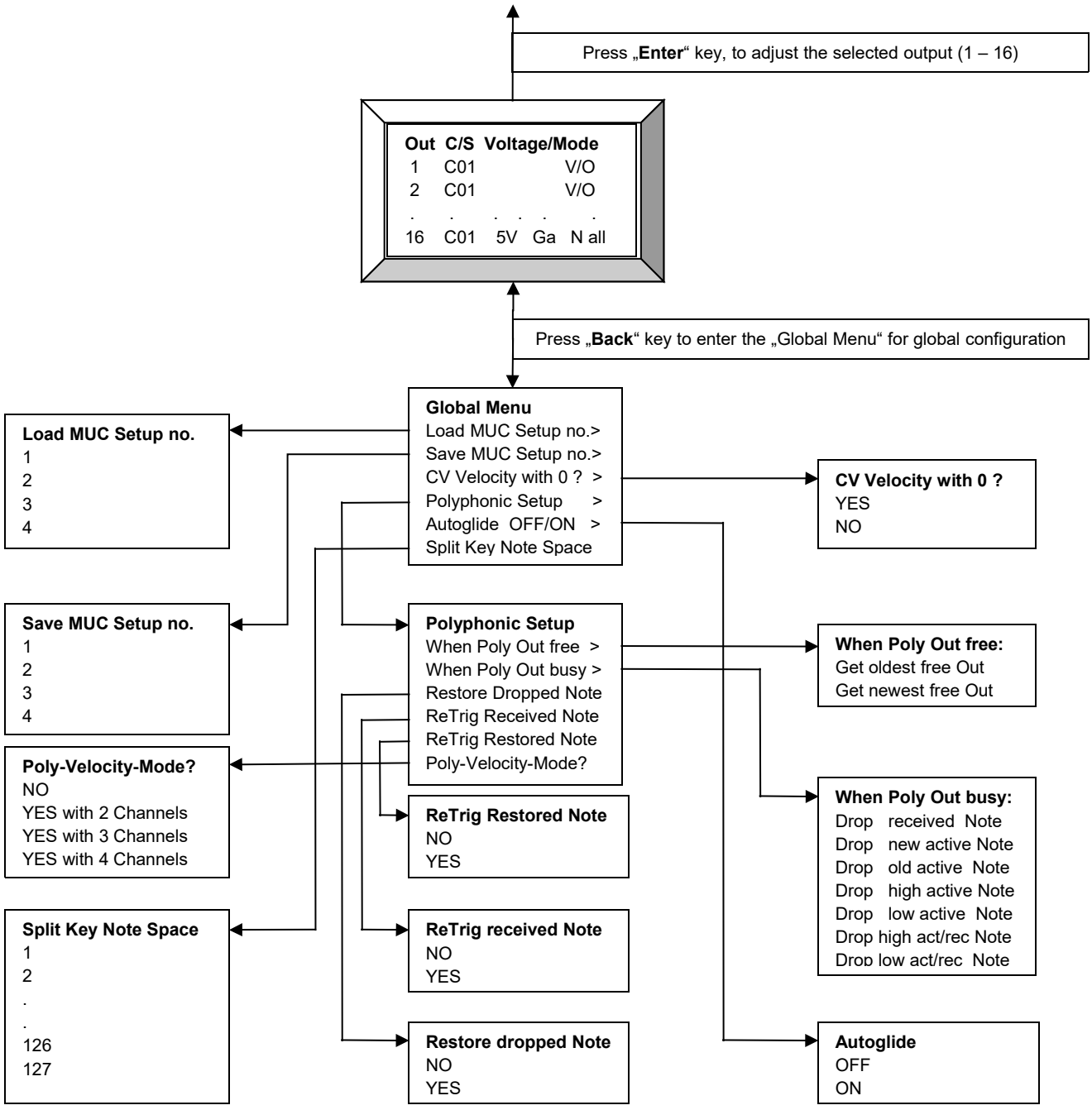
Menu structure graphic of CV outputs(Out 1-8)



Menu structure graphic of digital outputs(Out 1-8)



Menu structure graph for system and global settings



Summary of selection of menu options and parameters

It will be the main menu options and their possible parameter choices explained. It should again be noted that a possible parameter value already achieved by selection the corresponding display line to the left of the arrow placed ">" mark. You must not press down the "Enter "button to accept the value. But when you press the "Enter" button after you have selected a parameter value , you will go back to the “output overview” immediately. With the "Back" button you can go to the previous menu and make further parameter settings.

„Output Port Setup“

In the "Output Port Setup" menu you get when you are in the “output overview” and press the "Enter" button. Depending on which output you have previously is selected with the arrow “>”, you can define specific configuration in the following sub-menu.

„**MIDI Function/Sync**”
Calls a submenu for selecting a MIDI sync command or a MIDI function.

„**MIDI Channel**“
Calls a submenu for selecting a particular MIDI channel (1-16).

„**Volt Level/Range**“
Calls a submenu, for the determination of voltage range for the CV output, or a maximum voltage level for trigger, gate, and sync signals.

„**Glide/ADSR-Envelope**“
Calls a submenu for defining an attack, decay , release time and a sustain voltage level at the output CV. Only for the Volt / Octave function, the times of attack and release for the use of a glide function is used exclusively. Attack corresponds to the temporal transition from a lower to a higher pitch (GlideUp). According to the release time is the time to transition from a higher to a lower pitch (GlideDown).

„**Pulse Time of Trig**”
Calls a submenu for setting the pulse duration (2ms , 4ms , ..., 500 ms) when outputting a trigger , retrigger or synchronous signal.

„**Note Range OFF/ON**”
Calls a submenu for setting “no note range” or “low note range” or “high note range” for the issuance of a Key CV, gate and trigger signals to be used. The definition of the note range itself takes precedence over the "Global Menu" under "Split note range".

“MIDI Function/Sync”

In this menu you have the following options:

„**MIDI Function**"
Calls a submenu for the specific choice of a MIDI function , such as Trigger , Gate, Volt/Octave , Hz/V, CV Type, Pitch Bend, Channel Pressure , etc.

„**Sync Signals**"
Calls a submenu for selecting a particular MIDI sync command , such as Clock with devision, Start, Stop, Reset or formed from these commands gate function like Start > Stop and Stop > Start.

"Voltage Lev/Range"

In this menu you have the following options:

„**Volt const Level**"
Defining a constant maximum signal output voltage for the selected CV output (Out 1-8) in the range of 3V to 10V, if they have been configured as a trigger , gate or sync signal.

„**CV Range 0..5V/10V**"
Determining a voltage range (0 -5V or 0- 10V) for the selected CV output (Out 1-8) when a variable voltage function, such as Velocity, Release, Pressure or Pitch Bend configured.

"Glide/ADSR-Envelope"

In this menu you have the following options:

„**Attack (GlideUp)**"
Calls a submenu for setting the length of time a moving , linear transition from a low to a higher voltage value at the selected CV output. In addition to a complete deactivation of this function , you can use the temporal transition in steps of 4ms , 8ms , 16ms adapt to 8sec individually. Note: On the Pitch Bend function, this setting does not influence. Has been configured for the selected CV output a trigger or gate signal corresponds Attack a 4 components of a full ADSR envelope.
If you need a glide function for any CV output, so the Attack time corresponds a Glide-up time , which specifies the transition time from a lower to a higher pitch.
Notes:
1) Normally it will select identical values for Release, which corresponds to a glide-down time.
2) For the Hz/Volt Function implemented this type of support Glide is only conditionally suitable , since the voltage change always is linear and not logarithmic.

„**Decay**"
Calls a submenu for setting a temporal transition (decay time) between 2ms and 8sec. This setting is used exclusively when a trigger or gate signal has been configured for the selected CV output. Decay corresponds to a of 4 components of a full ADSR envelope.

„**Sustain**"
Calls a submenu for setting a voltage level which is reached after a period of decay. This voltage level is dependent on the previously achieved maximum voltage amplitude attack (attack voltage max level). Sustain can be set to *Attack-Level div 1*, *Attack-Level div 2*,….., *Attack-Level div 32*. This setting

is used exclusively when a trigger or gate signal has been configured for the selected CV output. Sustain corresponds to a of 4 components of a full ADSR envelope.

„**Release (GlideDown)**“
Calls a submenu for setting the length of time a moving , linear transition from a higher to a lower voltage value at the selected CV output. In addition to a complete deactivation of this function , you can use the temporal transition in steps of 4ms , 8ms , 16ms adapt to 8sec individually. Note: On the Pitch Bend function, this setting does not influence. Has been configured for the selected CV output a trigger or gate signal corresponds Release a 4 components of a full ADSR envelope.
If you need a glide function for any CV output, so the Release time corresponds a Glide-down time , which specifies the transition time from a higher to a lower pitch.
Notes:
1) Normally it will select identical values for Attack, which corresponds to a glide-up time.
2) For the Hz/Volt Function implemented this type of support Glide is only conditionally suitable , since the voltage change always is linear and not logarithmic.

„MIDI-Function“

In this menu you have the following options:

„**Trig/Gate Setup**“
Specified a trigger or gate and calls another sub-menu to make further settings for this function type.

„**Volt/Octave Setup**“
Selects the Volt/Octave function and branches in a setup submenu to configure Transpose Notes, Offset Voltage , Combined Pitch Bend and Polyphony OFF/ON.

„**Hz/Volt Setup**“
Selects the Hz/Volt function and branches in a setup submenu to configure Transpose Notes, Offset Voltage and Polyphony OFF/ON.

„**CV Type + no Setup**“
It calls a submenu that specifies the exact CV function (Velocity, Release, Controller, Poly Pressure) and the related notes and controller number.

„**Pitch Bend**“
Selects the MIDI command “Pitch Bend”.

„**Channel Pressure**“
Selects the MIDI command “Channel Pressure”.

„**Velocity all Note**“
Selects the Velocity value for CV output. This value corresponds to the third byte of the MIDI command “Note ON”.

„**Release all Note**“
Selects the Release value for CV output. This value corresponds to the third byte of the MIDI command “Note OFF”.

„**Poly Press all Note**“
Selects the MIDI command “Poly Pressure” for all notes.

„Trig/Gate-Function“

In this menu you have the following options:

„**One or All Note**“
Calls a submenu, where you can choose between one specific note number "One Note", or not "All Notes".

„**Trigger or Gate**“
Calls a submenu where you can choose among various trigger functions or a gate function.

„**Voltage Out-Type**”

Calls a submenu where you can choose between a constant voltage value or a variable control voltage , which is determined by Velocity or Release.

„One or All Note“

In this menu you have the following options:

„**One Note**“
The activation of a trigger or gate signal is carried by a specific note value , which is set by the following submenu.

„**All Notes**“
Trigger or Gate signal for each received note value.

„Trigger or Gate“

In this menu you have the following options:

„**Trigger by NoteOn**“
Configure output as a trigger , which is triggered by the MIDI command " Note On ".

„**Trigger by NoteOff**“
Configure output as a trigger , which is triggered by the MIDI command " Note OFF ".

„**Gate by Note On/Off**”
Configure output as a gate whose active signal of the two successive received MIDI commands " Note On " and " Note Off " is determined.

„Voltage Out-Type“

In this menu you have the following options:

„**Volt const Level**“
The output trigger or gate signal voltage corresponds to the menu "Const volt Level" setting.

„**Velocity/Release**“
The output trigger or gate signal voltage corresponds to the received velocity or release value. The corresponding voltage range of 0V..5V or 0V..10V is set in the parameter menu "CV Range 0..5V/10V".

„Volt/Octave Setup“

In this menu you have the following options:

„**Offset Res:41.6mV**“
Calls a parameter menu for setting an offset voltage that is added to the Volt / Octave function. The step size is + / - 4.16mV , which allows a tune to the pitch with a large step size.

„**Offset Res:0.16mV**“
Calls a parameter menu for setting an offset voltage that is added to the Volt / Octave function. The step size is + / - 0.16mV , which allows a tune to the pitch with a smal step size.

„**Transpose Notes**”
Calls a parameter menu , for a shift in the pitch in semitones. This allows you to move or adjust note numbers and pitch accordingly.

„**Add Pitch Bend**“
Calls a parameter menu, to additional pitch bend on the Volt/Octave signal, with a freely selectable strength. There are 10 settings (0..9) available, where 0 turns off the influence of the pitch.

„**Polyphonic OFF/ON**“
Calls a parameter menu , for activate/deactivate the polyphony function.

„Hz/Volt Setup“

In this menu you have the following options:

„**Offset Res:41.6mV**“
Calls a parameter menu for setting an offset voltage that is added to the Volt / Octave function. The step size is + / - 4.16mV , which allows a tune to the pitch with a large step size.

„**Offset Res:0.16mV**“
Calls a parameter menu for setting an offset voltage that is added to the Volt / Octave function. The step size is + / - 0.16mV , which allows a tune to the pitch with a smal step size.

„**Transpose Notes**”
Calls a parameter menu , for a shift in the pitch in semitones. This allows you to move or adjust note numbers and pitch accordingly.

„**Polyphonic OFF/ON**“
Calls a parameter menu , for activate/deactivate the polyphony function.

„CV Type + no. Setup“

In this menu you have the following options:

„**Controller no.**“
Selects the " controller " command , the control voltage is determined by the last MIDI byte. In the following parameter selection menu you define the corresponding controller number (0 - 127) firmly.

„**Velocity no.**“
Selects the "Note On" command, the control voltage is determined by the last MIDI byte (velocity). In the following parameter selection menu you define the corresponding note number (0 - 127) firmly.

„**Release no.**“

Selects the " Note Off " command , the control voltage is determined by the last MIDI byte (Release). In the following parameter selection menu you define the corresponding note number (0 - 127) firmly.

„**Poly Pressure no.**“
Select the " Polyphonic Pressure" or " Polyphonic Aftertouch " from command whose control voltage is determined by the last midi byte. In the following parameter selection menu you define the corresponding note number (0 - 127) firmly.

„Sync Signals”

In this menu you have the following options:

“**Clock and Division**”
Selects the MIDI-Clock. In the following parameter selection menu you define a divider between 1 and 96.

„**Start**“
Selects the MIDI-Start command.

„**Stop**“
Selects the MIDI-Stop command.

„**Reset**“
Reset the MUC in his start condition and send a trigger signal to the output.

„**Start>Stop (Gate)**“
Selects a gate function. The pulse duration is specified with the two MIDI commands “MIDI Start” and “MIDI Stop”.

„**Stop>Start (Gate)**”
Selects a gate function. The pulse duration is specified with the two MIDI commands “MIDI Stop” and “MIDI Start”.

„**Start+Stop (Trig)**”
Selects MIDI Start and MIDI Stop as synchronizing signal. A trigger pulse is generated for both MIDI commands.

„Global Menu“

In the "Global Menu" you can go if you are in the output overview are (after switch on) and press the "Back" key. In this menu area you can make either system-specific or general settings.

„**Load MUC Setup no**“
Calls a submenu that allows you to load up to 4 setups.

„**Save MUC Setup no**“
Calls a submenu that allows you to save up to 4 setups.

„**CV Velocity with 0 ?**“
Calls a submenu where you can select whether to control the CV Velocity output the value velocity = 0 into account, or should be ignored.

„**Polyphonic Setup**“
Calls a submenu to specify the procedure for the selection of freed or already occupied polyphony outputs.

„**Autoglide OFF/ON**“
Calls a submenu to select AutoGlide OFF/ON for Volt / Octave function.

„**Split Note Range**“
Calls a submenu for setting a lower note area "low note range" or upper note range "high note range", for the opportunity to play two different sound modules via a MIDI keyboard. In this submenu, you can select only a note number, what the note border of the two note areas of "low note range" and "high note range" sets. In the "Output Port Setup" menu you can activate and selecting this note range for each output separately.

„Polyphonic Setup”

In this menu you have the following options:

“**When Poly Out free**”
If a new note is received and there are several vacant polyphony outputs are available, then put in the following sub-menu to which is to be of these free polyphonic outputs assigned to the new note.

„**When Poly Out busy**“
If a new note is received, all polyphony outputs are already occupied , then the grades are defined in the following sub-menu will be ignored or replaced.

„**RestoreDroppedNote**“
In a submenu you can specify whether a discarded system of polyphony , but still active note (= corresponding key is still pressed) is to be stored , so it can be reactivated when a previously occupied polyphony output has become available.

„**ReTrigReceivedNote**“
In a submenu you can specify whether a retrigger to be generated at the polyphony gate output, the previous note was replaced by the newly received note.

„**ReTrigRestoredNote**“
In a submenu you can specify whether a retrigger to be generated at the polyphony gate output, the previous note was replaced by the cached from polyphony system touch.

„**Poly–Velocity-Mode?**“
In a subsequent submenu you can specify whether a particular polyphony mode with engaged Velocity for 2, 3 or 4 votes, to be activated. Note: If only 2 or 3 voices is selected, the remaining free

CV outputs can not be otherwise used by the user at the time. Only the digital outputs Out 13-14 are still configurable.

„When PolyOut free:“

In this submenu, you can select the type of selection has become free polyphonic outputs set. Must therefore be assigned to a freely available from several polyphony outputs a newly played note, this sets the selection process.

„**Get oldest free Out**“
It is used of the oldest freed polyphony output.

„**Get newest free Out**“
It is used of the last vacant polyphony output.

„When PolyOut busy:“

In this submenu, you can select the type of selection that is already programmed polyphony outputs set. Thus, if another note played , with no further free polyphonic output longer available because these are already occupied by more active notes , this sets the selection process.

„**Drop received Note**“
The newly received note will not be considered and will be lost.

„**Drop new activ Note**“
It polyphony output is used and its still fitting score for the newly received note discarded that was last played.

„**Drop old activ Note**“
It polyphony output is used and its still fitting score for the newly received note discarded , which is applied for the longest time.

„**Drop high activ Note**“
It polyphony output is used and its still fitting score for the newly received note discarded, which is the highest of the pitch.

„**Drop low activ Note**“
It polyphony output is used and its still fitting score for the newly received note discarded, which is the lowest of the pitch.

„**Dr. high act/rec Note**“
The note with the highest pitch is discarded. If this is a note that is already active abuts a polyphony output, so it will be replaced by the newly received note. However, if the newly received note of the pitch at the highest, so there is no change to the polyphony outputs, so that the newly received note is discarded.

„**Dr. low act/rec Note**“
The note with the lowest pitch is discarded. If this is a note that is already active abuts a polyphony output, so it will be replaced by the newly received note. However, if the newly received note of the pitch at the lowest , so there is no change to the polyphony outputs , so that the newly received note is discarded.

„Poly-Velocity-Mode?“

In this menu you can determine whether a particular polyphony mode with engaged Velocity for 2, 3 or 4 votes, to be activated.

„**NO**“
The special polyphonic velocity mode is turned off. All outputs can be configured freely by the user.

„**YES with 2 Channels**“
The polyphony mode is turned on, and provides 2 voices including velocity. The outputs for V/Oct and Hz/Volt with associated velocity and gate signal are set for every vote as follows:
1. Stimme: Out1 (V/O bzw. H/V), Out5 (Velocity), Out9 (Gate)
2. Stimme: Out2 (V/O bzw. H/V), Out6 (Velocity), Out10 (Gate)

„**YES with 3 Channels**“
The polyphony mode is turned on, and provides 3 voices including velocity. The outputs for V/Oct and Hz/Volt with associated velocity and gate signal are set for every vote as follows:
1. Stimme: Out1 (V/O bzw. H/V), Out5 (Velocity), Out9 (Gate)
2. Stimme: Out2 (V/O bzw. H/V), Out6 (Velocity), Out10 (Gate)
3. Stimme: Out3 (V/O bzw. H/V), Out7 (Velocity), Out11 (Gate)

„**YES with 4 Channels**“
The polyphony mode is turned on, and provides 4 voices including velocity. The outputs for V/Oct and Hz/Volt with associated velocity and gate signal are set for every vote as follows:
1. Stimme: Out1 (V/O bzw. H/V), Out5 (Velocity), Out9 (Gate)
2. Stimme: Out2 (V/O bzw. H/V), Out6 (Velocity), Out10 (Gate)
3. Stimme: Out3 (V/O bzw. H/V), Out7 (Velocity), Out11 (Gate)
4. Stimme: Out4 (V/O bzw. H/V), Out8 (Velocity), Out12 (Gate)

Split Key Note Range

By splitting the existing note space (0-127) into two areas (Low Note Range and High Note Range) it is to play two synthesizers separately with the left and right hand with only one keyboard. In the " Global Menu" under the menu item " Split note range " can be set individually by selecting a note number the separation of the two touch areas.
Notes:
1) The selected note number to be associated with the upper note range.
2) The actual activation and selection of the desired note range for a particular output in the menu " Output Port Setup" under the menu item " note range OFF / ON".

Polyphonie without Velocity

The MUC-4xx/5xx supports up to 8 voices (8 x CV + 8 x GATE), which you can assign one or divided several, freely selectable MIDI channels. The configuration sample D shows that you can split the keyboard into two sections (low note range and high note range). So you can play independently two synthesizers with only one keyboard with the left and right hand.

Configuration samples:

A) 8 x Polyphonic outputs on MIDI-Channel 2

B) 4 x Polyphonic outputs on MIDI-Channel 2
4 x Polyphonic outputs on MIDI-Channel 5

C) 3 x Polyphonic outputs on MIDI-Channel 2
2 x Polyphonic outputs on MIDI-Channel 5
3 x Polyphonic outputs on MIDI-Channel 10

D) 4 x Polyphonic outputs on MIDI-Channel 2 with “Low Note Range” for playing with left hand.
4 x Polyphonic outputs on MIDI-Channel 2 with “High Note Range” for playing with left hand.

Assignment of polyphony channels / fixing the number of voices

The assignment is the fact that you first of all the MIDI channel number for one of the CV outputs (1-8) set , and then select one of the two functions Volt / Octave or Hz / V, where in the following setup screen polyphony switch function and specify a note range if necessary. The votes now arises from the number of activated polyphony outputs which have the same midi channel with the same note range.

Notes:

- If at a later time the MIDI channel number to be changed, the previously set polyphony function is automatically disabled and MUST , if desired, be re- activated by the user.
- How to automatically assign a polyphonic output should take place after a " Note On " is received, you can specify in the "Global Menu" under the menu item " Polyphonic Setup".

- Outputs that were not configured for polyphony , can still be used for all available from MUC functions.

Assignment of polyphony gate outputs

The necessary, its GATE outputs are configured automatically by the system and directly above the CV outputs. Have you configured as the CV output 7 with a polyphony function, the corresponding GATE output has the number 15. The previously documented feature for this output is suppressed here so long until the polyphony of its polyphony CV output is deactivated again.

Polyphony with velocity

Need a polyphony issue , including the velocity , you can use this special mode in the " poly - velocity mode ? " Enable and specify the number of votes If the maximum possible number selected from 4 votes, so you can use the remaining 4 digital outputs (out 13-16) for other configurations available yet. With a choice of 2 or 3 voices , it is unfortunately not yet possible at the moment to use the remaining CV outputs otherwise.
The corresponding user-selectable MIDI channel is, which was set in out 1. This setting is then automatically applied to all remaining polyphony outputs. If mode is enabled the "polyphony with velocity", you can recognize this on the label "...PV V/O..." or "...PV H/V..." in the output overview. This special mode determines exactly which of the outputs must be used for the control signals (volts/octave or Hz/Volt, velocity, gate). Look also in the description of the menu point "Poly-velocity mode?".

Glide function / ADSR envelope

In the " Output Port Setup" under the menu item " Glide / ADSR Envelope" you have the possibility temporal transitions (Attack, Decay, Release) Output voltage and a one -to-reach voltage level (sustain) determine. Are trigger or gate signals have been configured on a CV output , it is clear from the previously specified in this menu transition periods and the sustain voltage value an ADSR envelope.
Possible adjustable transition times are 2ms, 4ms, 8ms, 16ms, 32ms, 64ms, 128ms, 250ms, 500ms, 1s, 2s 4s and 8s.
The determination of the sustain voltage, which is achieved at the end of the decay time , depends on the previously achieved maximum attack voltage level (attack level voltage Hi) and a variable divider ratio. In this admittedly simple form of ADSR envelopes support , the resulting voltage can sustain only in steps as “Attack Level div 1” (equivalent to the Attack Sustain Voltage-Max Level) , “Attack level div 2” (Sustain corresponds to the half are determined by the Attack Voltage Max level) to “Attack level div 32”
Note:
Depending on which of voltage you choose for your trigger or gate signal is the maximum amplitude of the envelope of either a constant preset voltage (3V, 4V, ..., 10V) or variable received from the velocity value depends. Since the attack and release times for the Glide function will use (= special case of an ADSR envelope, see below) will appear in the output list between the Out-No. and the MIDI channel number of the letter "g", such as "10gC12 ...".

Special case: Glide function
A special case is the Glide function. This can almost all CV output voltages, such as are used for Volt / Octave Controller values, etc., for continuous, smooth transitions. For this purpose, only the decay time must be disabled (= "OFF") are. Attack corresponds to the time of a voltage increase (= "Glide Up") and by analogy which is the release time of a decreasing voltage (= "glide down"). In general, one will select identical time values for Attack and Release for use of the Glide function.
Note:
For the Hz / Volt Function implemented this type of support Glide is only conditionally suitable, since Glide the voltage change always is linear and not logarithmic, but as / Volt function would be required in Hz.

Autoglide

Autoglide automatically the glide function which set volts/octave is played for function, if at least a note is active and another note at the moment. The transition to the new pitch is then fluently, which change the time in the menu point "Attack (GlideUp)" and "Release (GlideDown)" corresponds to.

If a Autogide for a Volt / Octave function has been activated, you can recognize this in the output overview by a label as "... AG ...".

AutoGlide they can superior in the "Global Menu" under the menu item " Autoglide OFF / ON" to enable. Please be sure to remember also according to the times in the menus " Attack (GlideUp)" and " Attack (GlideDown) " to activate your individual glide time. In general, one will select this identical times.

The bootloader menu

If you hold down during the switch the "Enter " key for 5 seconds , you will enter the so-called "Bootloader " menu. From there, you can , for example, load the latest firmware currently in the MUC , so make an "Update ". Furthermore, you can reset the complete setup memory in the MUC, as in the delivery. Overall , the following three menu items are available whose functions can be executed by pressing the appropriate selection keys "Up ", " Down" and " Back" :

- „Up“-Taste: Start the upload of the new MUC firmware.
- „Down“-Taste: Reset the MUC memory of setups.
- „Back“-Taste: Starts the MUC program.

Update MUC firmware

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

1. Save the MUC-firmware (SVxxxx.syx), which is present as a syx file in a desired folder you have on your computer.
2. Ensure that a fully functional MIDI interface is installed in your computer.
3. Start the upload program "C6", which is located on the enclosed CD.
4. Assign in the upload program C6 the already installed MIDI interface.
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 for 5 seconds permanently the "Enter" key while turning on the MUC and you will arrive the bootloader menu.
8. Now press the "Up" button and the MUC is activated for receiving data.
9. Immediately after you press the "Send" button from C6 upload program , the actual upload process is initiated. Now a confirmation appears on the MUC display.
10. After about a minute the upload process should be completed , and you will receive a message on the MUC display.

Then you must turn off the MUC and disconnect the MIDI connection. Once you turn on the MUC again immediately started with the new firmware. After this upload process the possibly previously stored data from you in the setup memory are no longer.

Attention:
Please avoid at all costs to interrupt the MIDI connection , or even the power supply during the upload process. In the worst case, the data in the flash memory can be "corrupted" and the unit can

not perform a new upload. In this case the MUC must be returned for service.

Reset MUC setup memory to default

Once you are in the bootloader menu , you can prepare the MUC by pressing the "Down" button to reset a setup memory. Only when you then turn on the MUC and again, after starting the first of the setup memory of MUC reset to its default values.

Appendix

Information about the „Output Overview“

After each power on the "Output Overview" will appear, with the corresponding parameter values are shown in columns for each of the 16 outputs. The top row (header row) of the four line display contains the label in short form.

Representation example of the “Output Overview”

Out		C/S	Voltage	Mode
1		C01	10V	Tr N 048
2	g	C10	5V	Ga N Lo
3	g	C16		AG V/O Hi

To get an overview of the current configuration of all control outputs (out 1-16), scroll with the Up / Down buttons to move up or down.

Importance of information in columns shown

Column „Out“

The outputs are numbered consecutively in the first column under the heading "Out" from 1 to 16, which corresponds to the same inscription on the MUC below the connectors. The second column (without heading) informs the user with a letter "g" that a glide or an ADSR envelope on a CV output is activated.
Note: For lack of space, this column has no heading.

Column „C/S“

Depending on whether a MIDI sync signal is to be or received and processed a MIDI function to a specific MIDI channel , is in this column either "Syn" for synchronous , or a "C" for Channel followed by channel number (1 - 16).

Column „Volt“

The maximum voltage level that can be reached with an active output signal at the corresponding output.
Note:
The output signal is defined as a constant voltage , so there are only two possible voltage states, such

as 0V and specified in "V " maximum voltage value. If the level of the output voltage of a data byte contained in the MIDI command , such as the velocity value dependent, so are "Volt " the maximum possible voltage level at with maximum control.

Column „Mode“

Is a more detailed description of the set control mode again. We can basically distinguish four control functions:

1. Output for Trigger/Gate signals
2. CV control voltage.
3. “Hz/Volt” or “Volt/Octave“ with or without polyphonic, pitch or autoglide.
4. Output for Sync signals.

1) **Output for Trigger/Gate signals**
   Trigger signals can be generated by the two MIDI "Note_On" and "Note_Off". Here, as usual, be assigned to a specific note number which appears on the display. Optionally, a trigger or gate signal may be generated by any note. In such a case , the term "all" appears instead of the note number. Because of space constraints in the representation on the display , the command "note_oN" with the letter "N" and the command "note_ofF" was marked with the letter "F".

2) **CV control voltage**
   CV control voltages are identified by the prefix "CV". Typical of this is that the voltage value is obtained at the output until the same MIDI message is received again, and then the voltage level is updated.

3) **„Volt/Octave“ or „Hz/Volt“ function**
   These functions return a function of the received note value from an appropriately calibrated voltage value.

4) **Output for Sync signals**
   The received via the MIDI data stream synchronous signals such as clock, start, stop and reset can be routed directly as a trigger signal on one of the 16 outputs. Especially for the clock signal, a divider (1 - 96) is adjustable, thereby reaching all possible timings. In addition, two "gate" functions were realized its active signal from the commands successively received as start / stop or in reverse order stop / start is determined.

Spread of note value to control voltage

The spreading of note value for the output voltage control of the Volt/Octave- or Hz / V function has been calibrated at the factory. However, in order to renew the calibration, or by a synthesizer, slightly to compensate for the spread to different standard, a corresponding adjustment of potentiometers on the back of the MUC can be made.

Contrast setting for LCD display

About the hole with the label "LCD" you reach the potentiometer for the contrast setting of the 4 line display.

Soft-Reset / Read out Error-Code

To the outputs 1-16 to put in an initial state , and to read out the error code , you can perform a soft reset. Simultaneously press the two "Back" and "Down" buttons down when you are in the initial overview. This action has the same effect as if you were turning on the MUC off and on again. Your previously saved setups remain preserved. The error code is reset to 0 after.

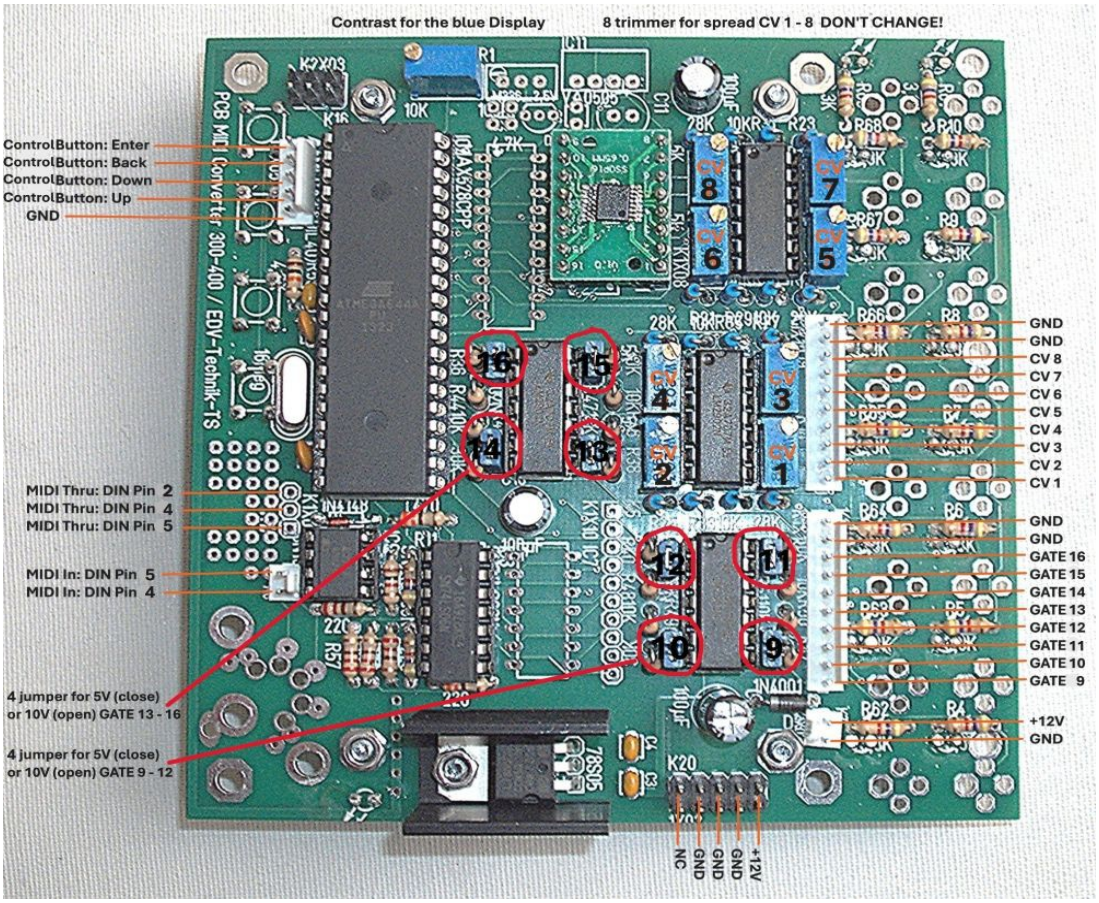
The error code that appears in this soft reset for about 1 second, gives information about possible misinterpretation of MIDI commands, or whether the system-reserved memory for the processing polyphony was insufficient and has overflowed.

Error-Code = 0
All right, all data have been received and evaluated correctly.

Error-Code = 1
There is a synchronization error. Data of individual MIDI commands can not be processed completely. It was received in a new MIDI command , even though the previous command was not yet completely received and processed. Such an error occurs mainly when, for example MIDI messages were not sent correctly in succession from the transmitter.
Consequence: An incorrect output of the MUC could result from it.

Error-Code = 2 or 4
The intermediate storage of still active notes within polyphonic function could not be executed correctly because of a memory overflow.
Consequence: Still actively played notes will be lost.

MUC-400-V2-KIT (overview and pin connections)



Specifications:

	MUC-5xx	MUC-4xx
CV Output (MUC Out 1 – 8)	Resolution: 16 bit Maximum voltage: 16V Voltage range: 0-5V, 0-10V Tune resolution: 0,325mV Functions: V/Oct (0-10V, Add Pitch Bend + Autoglide) Hz/Volt (0,5V – 16V) Velo,Release, Pitch, Contr,Pressure (0-5V or 0-10V, Glide support) Trig, Gate, Sync (3V-15V, Step 1V, ADSR-Envelope support)	Resolution: 16 bit Maximum voltage: 10V Voltage range: 0-5V, 0-10V Tune resolution: 0,162mV Functions: V/Oct (0-10V, Add Pitch Bend + Autoglide) Hz/Volt (0,5V – 10V) Velo,Release, Pitch, Contr,Pressure (0-5V or 0-10V, Glide support) Trig, Gate, Sync (3V–10V, Step 1V, ADSR-Envelope support)
Digital Output (MUC Out 9 – 16)	Functions: Trig, Gate, Sync MUC-500: V-Trig (5V), S-Trig MUC-510: V-Trig (10V), S-Trig MUC-550: V-Trig (5V or 10V), S-Trig	Functions: Trig, Gate, Sync MUC-400: V-Trig (5V) MUC-410: V-Trig (10V) MUC-420: S-Trig MUC-430: V-Trig (4x5V, 4x10V), S-Trig MUC-400-(V2)-Eurorack: V-Trig (5V)
Split Key Note Space	Individual splitting in two note ranges (Low Note Range, High Note Range) for playing two synthesizer simultaneously (polyphonic, mono)	Individual splitting in two note ranges (Low Note Range, High Note Range) for playing two synthesizer simultaneously (polyphonic, mono)
Polyphonic	Up to 8 channels (no Velocity) Up to 4 channels with Velocity	Up to 8 channels (no Velocity) Up to 4 channels with Velocity
Glide	Glide function for each CV output Autoglide support for V/Oct	Glide function for each CV output, Autoglide support for V/Oct
ADSR Envelope	Add on each CV output	Add on each CV output
Spread Volt/Note adjustment	With 8 potentiometer on the backside	With 8 potentiometer on the backside
Number of setups	4 setups	4 setups
Firmware update	With bootloader support	With bootloader support
Material of the case	Aluminium	MUC-4xx: Synthetic MUC-400-Eurorack: Aluminium
Jack type	MUC-5xx: 3,5mm	MUC-400: 3,5mm MUC-410: 3,5mm MUC-430: 3,5mm MUC-400-(V2)-Eurorack: 3,5mm
Power connection	12V, 110mA	12V, 95mA

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