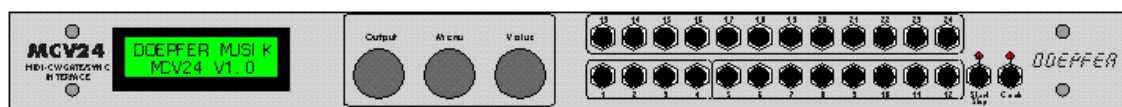# DOEPFER

MCV24

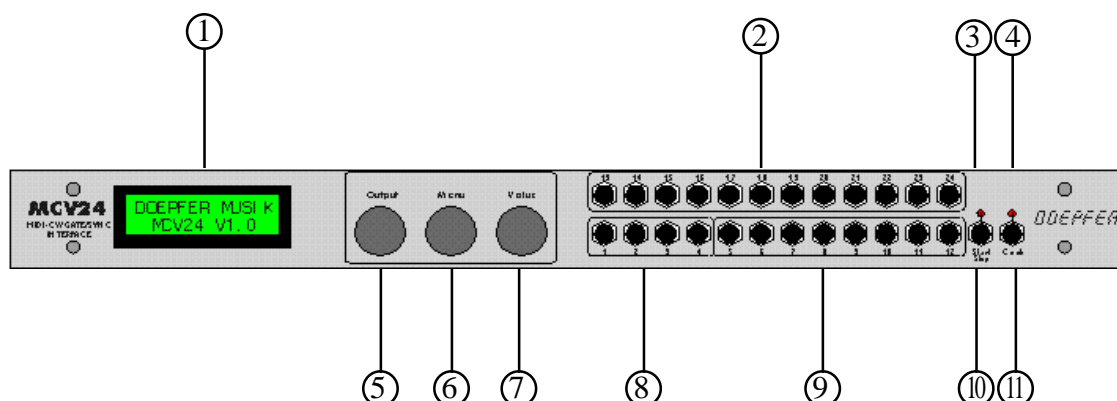## MIDI-CV/GATE/SYNC INTERFACE

Preliminary English owners manual

Controls and connections

Frontpanel

1   32 character backlit LCD screen.
2   12 outputs using an 8-bit DAC optimised for 0~10V output
3   Start/Stop LED indicator controlled by MIDI input. (linked to pin 1 of Sync socket)
4   Clock LED indicator controlled by MIDI clock. (linked to pin 3 of Sync socket)

Dual function controls - Rotary and Push
5   {Rotary}   - Output select - selects one of the 24 outputs for programming
          {Push}   - Enters the value selected with rotary selection
6   {Rotary}   - Menu select - selects which page of parameters to edit
          {Push}   - Enters the selected parameter for use selected with rotary selection
7   {Rotary}   - Value select - selects a value for the current parameter
          {Push}   - Enters the value selected by the rotary control for useage

8   4 outputs using a 12-bit DAC optimised for -2~8V at one volt per octave scaling
9   8 outputs using an 8-bit DAC optimised for 0~10v at one volt per octave scaling
10   Start/Stop output. (linked to pin 1 of Sync socket)
11   Clock output (linked to pin 3 of Sync socket)

Back panel
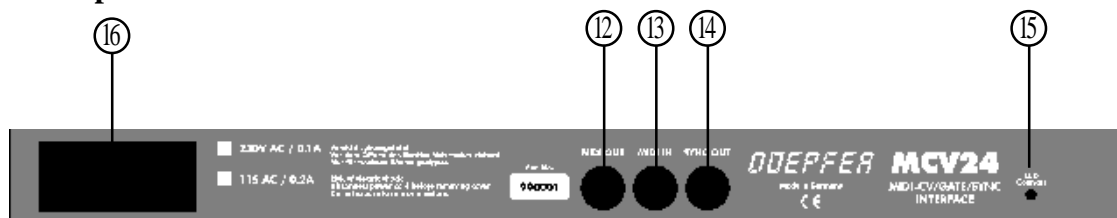
12   MIDI out is also the thru of the MIDI input
13   MIDI input
14   Sync output with programmable divide ratio of MIDI clock
15   LCD Contrast - adjusts the viewing angle for the LCD
16   Power switch

MCV24 Overview

The MCV24 is a flexible MIDI to analogue interface, and any of it's 24 outputs can be configured for any purpose such as control voltages for VCO pitch, control voltages for any modulation destination (such as VCF or VCA), triggers or gates. Outputs 1 to 4 are higher precision 12-bit DAC's, whilst the rest are 8-bit DAC's, outputs 1 to 12 are optimised for one volt per octave scaling, but can also be set to Hertz/volt scaling (like most Korg and Yamaha instruments). All outputs have a programmable slew control to reduce digital quantisation inherent in a 7-bit MIDI system, in fact this slew control on the analogue side can produce a smoother control voltage from an 8-bit converter than some 16-bit converters manage without the slew control.

Each CV output has programmable offset and range along with a secondary CV that is mixed with the first one, and can be any MIDI event or controller.

24 software driven voltage controlled LFO's each with selectable waveforms, waveshapes (including random), MIDI syncable, output offset and rate control - one for each of the available outputs

24 software driven voltage controlled ADSR envelopes - one for each of the available outputs

24 software driven voltage controlled slew limiters for portamento or filtering quantisation.

Modulation matrix allows up to 6 patches per output, modulation of any source to any destination

Independent keying modes for each output including high note, low note, last note and poly modes

All outputs can be set for volt per octave or hertz per volt scaling

Calibration of all tuning and scaling done from the front panel - no trimmer presets to adjust

Programmable clock division from MIDI clock, plus clock inversion option

16 non-volatile memories (remembers when switched off), to suit varying system requirements.

Programmable memories can be named

Start/Stop output on front panel converts MIDI transport

5-pin DIN sync socket output on rear panel, can be programmed to any standard such as Roland (24), Korg (48), Linn (96) etc..

MCV24 Basics

The MCV24 doesn't really have any controls for operation, once it has been programmed to do a particular function, that is exactly what it does, so once programmed, changing presets is probably the only operation required on the MCV24. However, a full understanding of what the MCV24 will do and how to set it up is a vital element that must be learned first. As the requirement of a MIDI to CV interface is likely to be different for everyone, it is difficult to generate "factory" presets, as the instruments to which it is going to be used with is an unknown factor. Assuming it is most likely to be a Doepfer A-100 system is fine, except it would still be unknown what kind of control is needed. So, unlike most pieces of equipment, we have to start learning the MCV24 by programming, rather than calling up a few factory presets to experiment with.

If you absolutely must try to make the MCV24 work straight away, try connecting the CV1 output to a VCO input, and CV13 output to the Gate input, and transmit your MIDI input on channel 1, but when you need to know why - read on.

Controls

Perhaps the first control to mention is the LCD contrast control on the rear panel, this should only need to be set once, and if needed to be altered a small screwdriver is needed, as the control is recessed behind the back panel. In most cases, it will be unnecessary to adjust this control anyway.

The front panel has 3 controls OUTPUT, MENU and VALUE, although these are actually dual controls as they have a press action as well to select the item selected by them. The MENU controls which parameter to edit, the VALUE knob is used to change the value (pressing the knob actually enters the data), and the OUTPUT knob selects which of the 24 outputs to be edited.

In most examples shown here, Output 01 is used and shown, but the operations relate to all 24 outputs.

MENUS

There are 7 pages of operation within the menu, labelled A to G.

```
A----->:Output01
Doepfer  MCV24
```

```
<B---->:Output01
CV  Parameter
```

```
<-C--->:Output01
LFO  &  ADSR  Param
```

```
<--D-->:Output01
ModulationMatriX
```

```
<---E->:Output01
System  Parameter
```

```
<----F>:Output01
Global  Sync  Par.
```

```
<-----G:Output01
Preset&Utilities
```

Turning the MENU control moves between the pages. Turn the MENU knob anticlockwise until the screen below is shown. (If you are into a deeper menu, you will need to press the MENU knob to return to this page.

MENU-A

```
A----->:Output01
Doepfer  MCV24
```

The first page is actually just an information page, and reminds you that you have a Doepfer MCV24, however, if you press the MENU knob, the installed operating system version and release date is displayed.

```
V1.0      15.06.99
(c)  Doepfer  GmbH
```

MENU-B

```
<B--->:Output01
CV Parameter
```

There are two CV's per output which are mixed together, CV1 and CV2 have different options available with some cross over, though CV1 is the only one that can be assigned notes, and CV2 is the only one that can be assigned pitch bender for example.

CV PARAMETER

The CV Parameter menu holds many pages, as this section is where most of the settings live. Pressing the MENU knob enters the first page (actually, the page you go to is the last page before this menu was exited, so in here, turn the knob anticlockwise until the screen as shown below is on the screen).

MIDI TO

```
EditCV1:Output01
Midito:xxxxxxxx
```

The MIDI To function selects which MIDI event will be assigned to control the selected output (Output 01 in the case of the example shown here). Depending on which event is selected, determines how many edit pages are available, as all unrelated options are suppressed to keep things clearer.

The MIDI sources available for CV1 are: Off, Notes, Controllers, Poly Aftertouch and Mono Aftertouch.

MIDI TO - NO EVENT

```
EditCV1:Output01
Midito:NoEvent>>
```

No Event is basically the OFF option, this only turns off CV1, CV2 is still active. There are then no pages to select that relate to CV1.

MIDI TO - NOTE EVENT

```
EditCV1:Output01
Midito:NoteEvent
```

Note Event selects MIDI notes to be used for CV1 output. 5 additional pages of options become available relating to notes.

MIDI CHANNEL

```
EditCV1:Output01
Midichannel:001
```

The MIDI CHANNEL pages allows the MIDI channel to be assigned to control a particular output CV. Any channel between 1 and 16 can be selected here. In the example shown, output CV number 1 is being controlled by MIDI channel 1.

MODE

```
EditCV1:Output01
Mode:xxxxxxx
```

Mode is the keying priority for the selected output, the options are:-

High Note	When played legato or polyphonically, the highest (top) note will be used
High & Follow	Same as High Note mode, except the highest note will retrigger when played legato or polyphonically if a higher note is released with another note held down.
Low Note	If played legato or polyphonically, the lowest (bottom) note will be used
Low & Follow	Same as Low Note mode, except the lowest note will retrigger when played legato or polyphonically if a lower note is released with another note held down.
Last Note	However played, whatever the last note played, will be used
----------	Reserved for future expansion
Poly 1	Allows multiple CV outputs to be set to the same MIDI channel and played polyphonically.
Poly 1 & Priority	As Poly 1 except priority given to note
Poly 2	Same as Poly 1, except with a different key reassignment system.
Poly 2 & Priority	same as Poly 2, except priority given to note.

BASE NOTE

```
EditCV1:Output01
BaseNote  :c1
```

The Base Note is the lowest note that can be played from the keyboard. This is actually setting the note that is assigned to a CV output of 0V. Ideally, this is the lowest C on the controlling keyboard, any other note will transpose the CV output. Note the use of German musical terminology, where B is shown as H, the upper case letters are negative values (C1 for example is C-1), and with no number, indicates the normal bottom note of a 5 octave keyboard (C = C0 which is MIDI note 36 - the note that a General MIDI Drum kit Bass Drum is on). Because it is the base note that is being changed, it may appear that the value knob increments the pitch the wrong way - as you turn the control clockwise and the base note goes up - the pitch falls. This is correct and just about logical if you give it some thought - which we will not go into here.

NOTE FROM

```
EditCV1:Output01
From:C3
```

This setting can be a bit difficult to grasp, yet simple when understood. This setting of FROM and the next setting of TO, allows a keyboard zone to be specified, essential a low note (From) and a high note (To) that the output CV will work within. Most of the time, this will be set across the entire keyboard, with a FROM setting of C3 (value = 000) and a TO setting of g6 (value = 127). So to define a five octave keyboard range FROM is set to C and TO is set to c4, although there is rarely any need to restrict the range, so leaving the default setting of FROM C3 and TO g6 is advisable.

NOTE TO

```
EditCV1:Output01
to   :g6
```

The upper note setting for the above Note FROM setting. If you set the TO lower than the FROM, then this has the same effect as an off position, and no data will be passed.

The next setting is SLEW, but before this, we will take a look at the different settings for different settings of MIDI TO.

MIDI TO - CONTROLLERS

```
EditCV1:Output01
Midito:Controll.
```

Midi To Controller defines the MIDI control to a MIDI controller or a range of controllers, which is set with the following menu items.

MIDI CHANNEL

```
EditCV1:Output01
Midichannel:001
```

The MIDI CHANNEL pages allows the MIDI channel to be assigned to control a particular output CV. Any channel between 1 and 16 can be selected here. In the example shown, output CV number 1 is being controlled by MIDI channel 1.

FROM

```
EditCV1:Output01
From:Modulation
```

The FROM and TO (next item) parameters select which controller to use. It is possible by using the FROM and TO range to specify just one controller number (perhaps this is the normal mode anyway), or a range can be specified - this could allow several controllers to control the same destination, such as Mod wheel (controller 1) and breath controller (Controller 2).

Where a reserved function is assigned to a MIDI controller, the display will show that function by name rather than number, such as controller 1 is the Modulation wheel and controller 7 is Channel Volume.

TO

```
EditCV1:Output01
To   :Breath Ctrl
```

This is the TO part of the controller range setting. If you set the TO lower than the FROM, then this has the same effect as an off position, and no data will be passed.

The next setting is SLEW, but before this, we will take a look at more different settings for different settings of MIDI TO.

MIDI TO

```
EditCV1:Output01
Midito:PolyAfter
```

Midi To poly aftertouch defines the MIDI control to polyphonic aftertouch.

MIDI CHANNEL, MODE, BASE NOTE, FROM, TO

These settings are the same as that for MIDI EVENT=Notes, please refer to this section at the beginning of this section.

MIDI TO

```
EditCV1:Output01
Midito:MonoAfter
```

This selects MIDI to monophonic aftertouch, which is the aftertouch data generated by most keyboards. There are no additional parameters with mono aftertouch, so we move on to where all the other menus pages turn to next:- Slew

SLEW

```
EditCV1:Output01
Slew      :On    >>
```

This is where the Slew function is enabled or disabled. When on, the CV output voltage is slewed, which means it's rate of change is slightly lagged, this improves the limitation of the 7-bit MIDI system, although for note information a longer setting would be used for portamento. (The slew time setting is under the CV2 parameters later on). With controllers, aftertouch and pitch bender, a greater smoothness can be achieved using slew.

The next parameters are only available if MIDI EVENTS = notes.

VELOCITY

```
Veloci.:Output01
Mode:Direct
```

The Velocity mode determines what the velocity of the incoming MIDI note will be routed to. The options are:-

ADSR Attack	-	Velocity control over the speed of the Attack time in the ADSR
ADSR Decay	-	Velocity control over the speed of the Decay time in the ADSR
ADSR Sustain	-	Velocity control over the level of the Sustain level in the ADSR
ADSR release	-	Velocity control over the time of the Release time in the ADSR
ADSR M.Depth	-	Velocity control over the output level of the ADSR
LFO M.Depth	-	Velocity control over the output level of the LFO
unused....	-	for future expansion
Slew-Rate	-	Velocity control over the Slew rate time
Direct	-	Allows the velocity generated CV to be sent to any output CV

All routings can then be sent to up to 4 separate output CV's using the following menu

VELOCITY TO

```
Veloci:Output01
>1--->:Output05
```

The Velocity To options allows up to 4 defined outputs for the Velocity data to be sent to. In the example shown above here, the velocity CV is being sent to output CV 5.

VELOCITY SLEW TIME

```
Veloci:Output01
VelSlewTime:Off
```

If the velocity has been switched on, then this parameter allows the time for the slew.

TRIGGER MODE

```
Trigger:Output01
Mode:Direct
```

The Trigger Mode sets the destination of the key trigger, the options are:-

No   -   Trigger Mode off
Direct   -   The trigger (gate) can then be routed to any output CV
ADSR   -   Triggers the internal software envelope generator
LFO   -   Resets the internal software LFO generator

TRIGGER ASSIGN

```
Trigger:Output01
>1--->:Output13
```

The Trigger assign, routes the key generated trigger to any output. There are 4 simultaneous destinations, the above example shows that the key trigger output generated from the CV routed to output 1 is going to output 13. This is a typical setting, as it puts the keyboard CV to output 1 and the associated Gate to output 13. The options available are Off (shown as - - - - - -) or outputs 1 ~ 24.

If you route the trigger to the same output as the CV is on, such as Trigger: Output 01 to Output 01, then the gate will be added to the key CV, making every note very high in pitch, which is unlikely to be of any use - but you never know!

RETRIGGER TIME

```
Trigger:Output01
ReTrigTime:001
```

The Retrigger time sets the delay between a new note being played and the trigger being generated (Gate output). With a setting of 000, there is no retrigger, so when playing legato style (playing new notes before releasing others), the new note does not retrigger. At a setting of 001, which is perhaps the normal setting, the note is re-triggered immediately, and as the value is increased (up to 127), the delay is increased, meaning that the new note is played immediately, but the actual gate output is delayed. This of course gives a delay between pressing a note, and the gate output signal being generated.

MIDI TO (CV2)

```
EditCV2:Output01
Midito:xxxxxx
```

This is the second CV routing, and is similar to CV1 functions, except that the destination options are a little different. The MIDI To function selects which MIDI event will be assigned to control the selected output (Output 01 in the case of the example shown here). Depending on which event is selected, determines how many edit pages are available, as all unrelated options are suppressed to keep things clearer.

The MIDI sources available for CV2 are: Off, Controllers, Poly Aftertouch, Pitch Bend and Mono Aftertouch. Note that CV2 cannot be controlled by notes, and adds Pitch Bender that CV1 did not have.

MIDI TO (CV2) - CONTROLLERS

```
EditCV2:Output01
Midito:Controll.
```

Midi To Controller defines the MIDI control to a MIDI controller or a range of controllers, which is set with the following menu items.

MIDI CHANNEL (CV2)

```
EditCV2:Output01
Midichannel:001
```

The MIDI CHANNEL pages allows the MIDI channel to be assigned to control a particular output CV. Any channel between 1 and 16 can be selected here. In the example shown, output CV number 1 is being controlled by MIDI channel 1. It is apparent from this that CV1 and CV2 can be on different MIDI channels, though most of the time to avoid confusion, it is perhaps best to have CV1 and CV2 on the same channel.

SCALE (CV2)

```
EditCV2:Output01
Scale:150
```

The Scale setting has a range of 0 to 255, and sets the depth of the controller, where 0 is off and 255 is maximum. A setting of 255 can add around 10V to the output, which is likely to be excessive. Each value setting is 41.57mV (the relevance of this figure is that it is a division of a semi-tone interval), which equates to a value of 24 per volt, so for modulation settings, the table below is a sufficient guide.

Maximum CV output from CV2 with Scale settings

Scale	CV2 output	Scale	CV2 output
24	1v	36	1.5v
48	2v	60	2.5v
72	3v	84	3.5v
96	4v	108	4.5v
120	5v	132	5.5v
144	6v	156	6.5v
168	7v	180	7.5v
192	8v	204	8.5v
216	9v	228	9.5v
240	10v	252	10.5
255	10.6v		

For use with pitch bender, each value of 4 will add one semi-tone to the range, so a typical Pitch Bender depth setting of 2 semi-tones, would be a scale setting of 8 (actually the range is 2 per semi-tone, but as the pitch wheel is centred and it is a +/- range, the range is considered to be a semi-tone in one direction)

SLEW (CV2)

```
EditCV2:Output01
Slew      :On      >>
```

This is where the Slew function is enabled or disabled for CV2. When on, the CV output voltage is slewed, which means it's rate of change is slightly lagged, this improves the limitation of the 7-bit MIDI system. With controllers, aftertouch and pitch bender, a greater smoothness can be achieved using slew.

SLEW TIME

```
EditCV2:Output01
SlewTime :006
```

This is where the Slew time is set, which controls both CV1 and CV2. A setting of 0 (OFF), prevents the CV from changing at all, a value of 1 is the quickest time, with 127 being the longest time.

MENU C (LFO & ADSR PARAMETERS)

```
<-C---->:Output01
LFO & ADSR Param
```

This menu controls the internal LFO and envelope generators per output.

LFO FUNCTION

```
LFO      :Output01
function:On    >>
```

This switches the LFO on or off for the selected output. When switched on the following parameters are available. When switched off, the LFO parameter menu is suppressed.

LFO WAVE

```
LFO      :Output01
Wave:Lin:Tri/Saw
```

The LFO has 5 main basic waveforms, Linear Triangle/Sawtooth, Rectangle (pulse), Sine, Random (analogue) and Random (digital). These basic waveforms are controlled by the Ratio parameter, which vary the waveforms beyond these basic shapes. (see Ratio parameter).

The Random (Analogue) waveform produces a waveshape similar to an analogue noise generator having random amplitude and random pulse lengths. The Random (Digital) produces random pulse lengths, but always at full amplitude.

LFO SYNC

```
LFO      :Output01
Sync:Intern
```

The LFO Sync function determines if the internal clock speed is used (Intern), or a division of the MIDI clock (MidiClock) is to be used for the LFO.

LFO FREQUENCY COURSE (LFO Sync = Intern)

```
LFO      :Output01
Freq(coarse):006
```

When the LFO Sync is set to Internal, this parameter controls the speed of the LFO. Each value relates to 1Hz, so in the example shown above, the speed is 6Hz. The range is form 000 to 019. The following parameter (Frequency Fine) adds to this value.

LFO FREQUENCY FINE (LFO Sync = Intern)

```
LFO       :Output01
Freq(fine   ):008
```

When the LFO Sync is set to Internal, this parameter controls the fine speed of the LFO. Each value relates to 0.01Hz (1/10 Hz), so in the example shown above, the speed is 0.08Hz, which is added to the previous parameter Frequency Coarse. The range is form 000 to 099.

In the previous example here was shown a Frequency Coarse of 006, and a Frequency Fine of 008, this therefore gives an LFO speed of 6.8Hz. The range of the LFO is from 0.01Hz to 19.99Hz in 0.01Hz steps.

LFO MIDI CLOCK DIVISION (LFO Sync = Midiclock)

```
LFO       :Output01
MCL(1/16)     :001
```

When the LFO Sync is set to Midiclock, this parameter controls the division ratio of the LFO speed in relation to the MIDI clock. The range is from 000 to 255 where a value of 000 switches the LFO out. The following tables shows the LFO MCL values for musical timing based on 4/4 time.

LFO MCL Value	Effective LFO timing	
1	1/16	Semi-quavers
2	1/8	Quavers
3	3/16	Quaver Triplets
4	1/4	Crotchets
6	3/8	Crotchet Triplets
8	1/2	Minims
12	6/8	Minum Triplets
16		1 Bar
32		2 Bars
48		3 Bars
64		4 Bars
80		5 Bars
96		6 Bars
112		7 Bars
128		8 Bars
144		9 Bars
160		10 Bars
176		11 Bars
192		12 Bars
208		13 Bars
224		14 Bars
240		15 Bars

LFO RATIO

```
LFO      :Output01
Ratio(%):50
```

The LFO Ratio controls the shape of the basic LFO waveform. A central value of 50% keeps the waveform symmetrical, so the Tri/Saw waveform is a pure Triangle, and the Rectangle wave is a pure square wave. With the Rectangle wave, the Ratio value is the pulse width, ranging for 1% to 99%. With the Tri/Saw waveform, a Ratio of 1% provides a Saw Down waveform, and a value of 99% is a Saw Up waveform as shown below.

Ratio = 1%   Ratio = 50%   Ratio = 99%
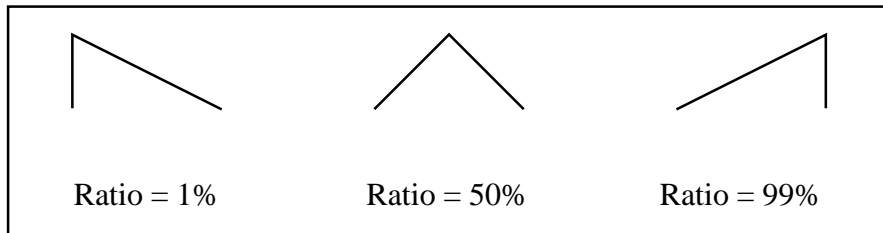
LFO DEPTH

```
LFO      :Output01
Modula.Depth:015
```

The LFO Depth controls the amount of LFO modulation applied to the output. The range is from 000 (off) to 127 (maximum).

LFO OFFSET COARSE

```
LFO      :Output01
Offset(cor):+000
```

The LFO offset allows the LFO to be centralised around zero (value of 000) for even positive and negative swings, or biased in either polarity. For example, vibrato would need to be centralised, but Tremolo would be only positive polarity. The range is -127 through to 000 to +127.

Offset = -127   Offset = 000   Offset = +127
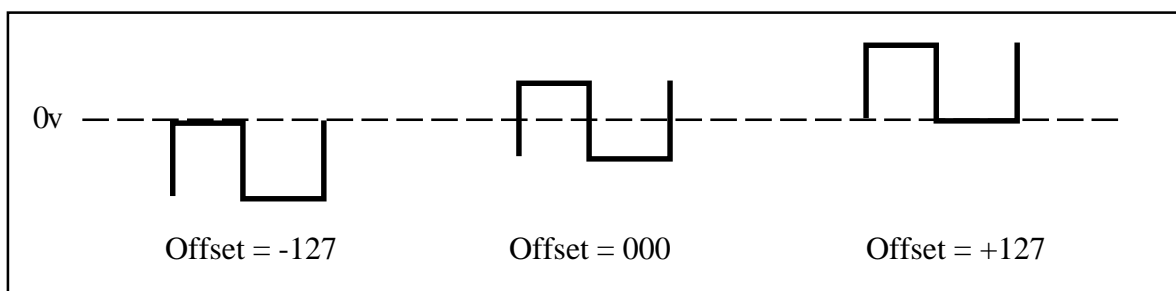
LFO OFFSET FINE

```
LFO      :Output01
Offset(fine):050
```

   The LFO offset fine allows the LFO offset to be finely adjusted to a precision of 1/10 per value set. So, each setting here relates to 1/10 of the Offset Coarse. The range is 000 to 099.

ADSR FUNCTION

```
ADSR     :Output01
function:On     >>
```

   This switches the ADSR Envelope on or off for the selected output. When switched on the following parameters are available. When switched off, the ADSR parameter menu is suppressed.

ADSR ATTACK TIME

```
ADSR     :Output01
Attack   :000
```

   This sets the Attack time for the ADSR envelope generator. The range is from 000 (quickest) to 127 (longest).

ADSR DECAY TIME

```
ADSR     :Output01
Decay    :000
```

   This sets the Decay time for the ADSR envelope generator. The range is from 000 (quickest) to 127 (longest).

ADSR SUSTAIN LEVEL

```
ADSR    :Output01
Sustain:050
```

This sets the Sustain level for the ADSR envelope generator. The range is from 000 (lowest) to 127 (highest).

ADSR RELEASE TIME

```
ADSR    :Output01
Release:003
```

This sets the Release time for the ADSR envelope generator. The range is from 000 (quickest) to 127 (longest).

ADSR MODULATION DEPTH

```
ADSR    :Output01
Modula.Depth:127
```

The ADSR Modulation Depth controls the amount of ADSR modulation applied to the output. The range is from 000 (off) to 127 (maximum).

MODULATION MATRIX

```
<--D-->:Output01
ModulationMatrix
```

The modulation matrix has 6 simultaneous routings, which patch a selection of modulation sources (such as notes, controllers, poly aftertouch, pitch bender and mono aftertouch) to a selection of destinations (such as ADSR times and level, LFO level and slew rate time). Each of the 6 routings are identical.

MIDI SOURCE

```
MidiEv1:Output01
is:Controller
```

Selects the source for the modulation. The options are Controllers, Mono aftertouch, Pitch Bend and Poly Aftertouch. Midi Events 2 ~ 6 are the same as Midi Event 1 parameters.

MIDI EVENT MIDI CHANNEL

```
MidiEv1:Output01
Midichannel:001
```

Selects the Midi channel of the modulation source. Note that each of the 6 modulation routings each have their own Midi channel.

M**IDI EVENT NUMBER**

```
MidiEv1:Output01
Nr.  :Modulation
```

Selects the Controller Number or the Poly Aftertouch note that is used as the modulation source. The controller options are the same as in previous menu's.

MODULATION DESTINATION

```
MidiEv1:Output01
--->:ADSRAttack
```

Selects the destination that the modulation input is routed to, this can be: ADSR Attack time, ADSR Decay Time, ADSR Sustain Level, ADSR Release Time, ADSR Depth, LFO Depth, Slew Rate Time and unused - which is reserved for future expansion.

SYSTEM PARAMETERS

```
<---E->:Output01
System  Parameter
```

       The System Parameters are where various system setups are done, this includes calibration of the CV scaling along with renaming the outputs for easier reference.

EDIT NAME

```
Edit    :Output01
Name    :A100rack
```

       Each of the 24 outputs can be renamed to something that resembles your system for easier use. If you find the outputs are used for different things all the time, then it may pay to leave them with their default names, the above example has re-labelled output 1 as A100 Rack, whilst another output may be MS-404, this method saves having to remember which output jack the device is connected to.

       Use the menu knob to scroll along the characters in the name, and use the Value knob to edit the characters.

TUNE MODE

```
Tune    :Output01
Mode:Volt/Oktave
```

       This selects between 1 volt per octave or Hertz per volt scaling. 1 volt per octave is used for most modular systems including the Doepfer A-100, Roland System 100m & System 700, Moog modulars, Digisound modular, Emu and Arp systems etc, this also includes mono synths such instruments as Roland , Moog , ARP, Octave (like the Cat and Kitten), Korg Mono/Poly, Sequential Pro-One, Oberheim (SEMs and OB1) and many others.

       The Hertz per volt system was used by Korg (except the Mono/Poly) and Yamaha.

TUNE NOTE #1

```
Tune    :Output01
Note#1:000
```

       This sets the reference Midi note number for calibration of the CV. The range is from 0 to 127.

TUNE CV#1 COARSE

```
Tune      :Output01
CV#1/Coarse:+000
```

Sets the coarse voltage to CV1.

TUNE CV#1 FINE

```
Tune      :Output01
CV#1/fine   :000
```

Sets the fine voltage to CV1

TUNE NOTE #2

```
Tune      :Output01
Note#2:096
```

This sets the reference Midi note number for calibration of the CV. The range is from 0 to 127.

TUNE CV#2 COARSE

```
Tune      :Output01
CV#2/Coarse:+102
```

Sets the coarse voltage to CV2.

TUNE CV#2 FINE

```
Tune      :Output01
CV#2/fine   :017
```

Sets the fine voltage to CV2.

TRIGGER LEVEL ON

```
Trigger:Output01
LevelOn  V %:100
```

Sets the output level of the trigger on signal, referenced as a percentage of maximum (10.6v for outputs 13 ~ 24). So 50% would generate a 5.3V trigger. For V-Trig applications (positive gate like Doepfer A-100 and most others) use high percentage for Trigger Level on, and for S-Trig applications (like Moog) use a Trigger On Level of 0%.

TRIGGER LEVEL OFF

```
Trigger:Output01
LevelOff V %:000
```

Sets the output level of the trigger off signal, referenced as a percentage of maximum (10.6v for outputs 13 ~ 24). So 50% would generate a 5.3V trigger. For V-Trig applications (positive gate like Doepfer A-100 and most others) use a Trigger Level off of 0%, and for S-Trig applications (like Moog) use a Trigger Off Level of 100% (or suitable high level).

GLOBAL SYNC PARAMETER

```
<----F>:Output01
Global Sync Par.
```

The Global Sync Parameter is where control over the system clock and sync parameters are set.

CLOCK TIME

```
Sync-Clock
Clock Time:001
```

This sets the MIDI clock division ratio, a normal setting of 1 passes the MIDI clock unprocessed, whilst a setting of 3, divides the clock by 3 (1/96 becomes 1/32). Range is 1 ~ 255.

SYNC POLARITY

```
Sync-Clock
Polarity:Positiv
```

Inverts the polarity of the clock output on the front panel, and the signal at the Sync DIN output on the rear panel. Normal setting is Positive. Range of settings is Positive or Negative.

PRESET & UTILITIES

```
<------G:Output01
Preset&Utilities
```

This section is where the remaining system control setting are.

PRESET NAME

```
Preset
Name    :Preset
```

Each of the 16 available memories can be named, use the Menu knob to scroll through the name, and the Value knob to edit the characters.

GET EDIT BUFFER

```
Editbuf.<-Preset
Get   <-:Preset02
```

Copies the selected memory into the edit buffer for editing.

STORE EDIT BUFFER

```
Editbuf.<-Preset
Store->:Preset02
```

Saves the current edit buffer into one of the 16 memories.

SEND EDIT BUFFER

```
Send Editb./ Pres
SysEx->:Editbuf.
```

Transmits the current edit buffer or selected preset via MIDI system exclusive. Use the Value knob to select the Edit Buffer or any Preset memory, and then press the Value knob to transmit the data. The display will show a series of moving dots to show transmission is taking place, followed by READY ! when completed.

COPY OUTPUT DATA

```
Copy     :Output01
to       :Output02
```

Enables any output assignment to be copied to any other output. Use the Output knob to select the sources output and the Value knob to select the destination output. Press the Value knob to do the copy. The display will show READY ! when completed to confirm copy has taken place.

EXCHANGE OUTPUT DATA

```
Exchang:Output01
with     :Output02
```

Allows any two output assignments to swapped over, the above example would put the contents of output 1 into output 2 and the contents that were in output 2 into output 1. Pressing the Value knob initiates the exchange, the display will show READY ! when completed.

INITIALIZE OUTPUT SETTINGS

```
Init     :Output01
OK?  ->  :Press
```

Initializes the selected output settings to a default setting, as shown in the table below:-

PARAMETER	VALUE
Name	Output xx
	(the number of the output being edited)
MiditoCV1	NoEvent
MiditoCV2	NoEvent
Midi Channel	1
Mode	High Note
From	0
To	127
Base	0
Slew 1/2	Off
Slewtime	Off
Velocity Mode	No
Trigger Mode	No
Retrigger Time	0
Scale CV2	255
LFO	Off
ADSR	Off
LFO-Wave	Rectangle
LFO Sync	Internal
LFO Frequency	1.0 (Coarse/Fine)
LFO Ratio	50%
LFO Modulation Depth	0
LFO Offset	0.0 (Coarse/Fine)
ADSR Attack	0
ADSR Decay	0
ADSR Sustain	127
ADSR Release	3
ADSR Modulation Depth	127
Tune Mode 1/2	Volt/Octave
Note 1	0
Tune Note 1	0.0 (Coarse/Fine)
Note 2	96
Tune Note 2	104.23 (Coarse/Fine)
Trigger Level On	100%
Trigger Level Off	0%
Modulation Matrix 1~6	NoEvent
Preset Name	Preset

The MCV24 always powers up in the same mode it was in when last powered off.