

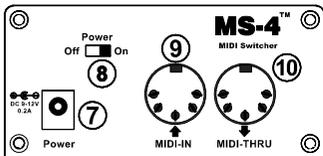
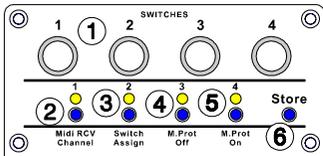
- Introduction

There are still a lot of units (*Amplifiers, footpedals...*) which are not able to be switched by Midi. For those cases we developed the MS-4. If transmitting Midi program changes to the MS-4 four independent units can be switched, of course they are able to be switched by remote!

Please read this manual carefully!

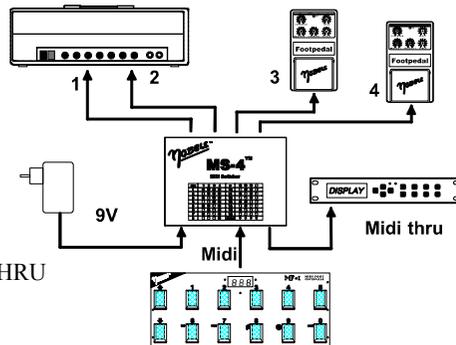
1 Controls

- (1) Switches 1..4 (*by relays!*)
- (2) Led + KEY 1 for Switch 1 or Midi RCV Channel
- (3) Led + KEY 2 for Switch 2 or Switch Assign
- (4) Led + KEY 3 for Switch 3 or M.Prot OFF
- (5) Led + KEY 4 for Switch 4 or M.Prot ON
- (6) Store key (*to save*)
- (7) 9V Power Supply jack (*check polarity!*)
- (8) POWER ON/OFF
- (9) MIDI IN jack (*receives PHANTOM Power*)
- (10) MIDI THRU jack (*transmits PHANTOM Power*)



2 Connection

1. Connect a 9V DC power supply to the jack (7). (*Please check the polarity first!*)
2. Connect a midi cable from the MIDI IN jack (9) to the midi unit which is able to transmit midi program changes. (*E.g. midi footcontroller Nobels MF-1 or MF-2*)
3. The output of the SWITCHES 1..4 (1) can be connected with standard cables to the remote or footswitch jacks of the units to be switched.
4. Other midi units can be chained via the MIDI THRU jack (10).



3 First Setup (Midi Receive Channel)

Note: One midi unit transmit data, the other receives data. To "understand" each other it is necessary to set these units to the same midi transmit / receive channel:

1. While pressing KEY (2) switch the POWER SWITCH (8) to the ON position.
2. Then press the key (2) as often as the requested receive channel is selected. The 4 LEDs (*see table*) shows the corresponding channel 1..16 or omni (*all leds are flashing!*).
3. Press the KEY STORE (6) to save. Switch the unit off.

Ch:	1	2	3	4	9	10	11	12	13	14	15	16	Omni
1	○	○	○	○	○	○	○	○	○	○	○	○	○
2	●	○	○	○	○	○	○	○	○	○	○	○	○
3	○	●	○	○	○	○	○	○	○	○	○	○	○
4	○	○	○	●	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○	○	○	○

○ Led is off
 ● Led lights up
 * Led is flashing

4 Latched Type or Momentary Switches???

Description: There are two kinds of switches: Latched type and momentary switches. Latched type switches have two positions: One is ON the other is OFF. Momentary switches (*or unlatched*) making "contact" while pressed. Mostly it is necessary for multieffects! The MS-4 are able to simulate these kinds of switches for the four SWITCHES 1..4. Additional it is possible to choose between 2 different contacttimes which means the time a momentary switch is pressed! If possible always try to use the shortest time. The logic of the SWITCHES can be changed between "positiv" or "negativ". It means that the LEDs 1..4 are on when the contacts are closed and off when the contacts are open.

Configure the switches

1. While pressing KEY (3) switch the POWER SWITCH (8) to the ON position.
2. Use KEY 1 for SWITCHES 1, use KEY 2 for SWITCHES 2 and so on. Each of the SWITCHES 1..4 can be assigned to one of the 6 different switchfunctions by pressing the corresponding KEY 1..4.

Switch Function	Action	Count	Display (Leds)	On Time	Off Time
Sw. latched positiv	press key	NO	LED = ON		
Sw. Latched negativ	press key	1 times	LED = OFF		
Sw. Unlatched pos.12ms	press key	2 times	LED = flashes fastly	short ON	long OFF
Sw. Unlatched neg.12ms	press key	3 times	LED = flashes fastly	long ON	short OFF
Sw. Unlatched pos.100ms	press key	4 times	LED = flashes slowly	short ON	lang OFF
Sw. Unlatched neg.100ms	press key	5 times	LED = flashes slowly	long ON	short OFF

See table!

3. Press the KEY STORE (6) to save. Switch the unit off.

Look at this example:

I want to switch the reverb of my amplifier. If the footswitch is closed the reverb is off! But I want to see if the reverb is on. In this case the corresponding LED 4 must be light up. For that I have to choose a negativ logic. I hold KEY (3) "Switch Assign" and switch the MS-4 on. Now the LED 4 is on which means the switch is set to positiv. I press KEY 4 once, the LED 4 is getting off. Now the logic is set to negativ. Finally I have to press the KEY STORE (6) and switch the unit OFF. That's all!

6 Programming of the MS-4

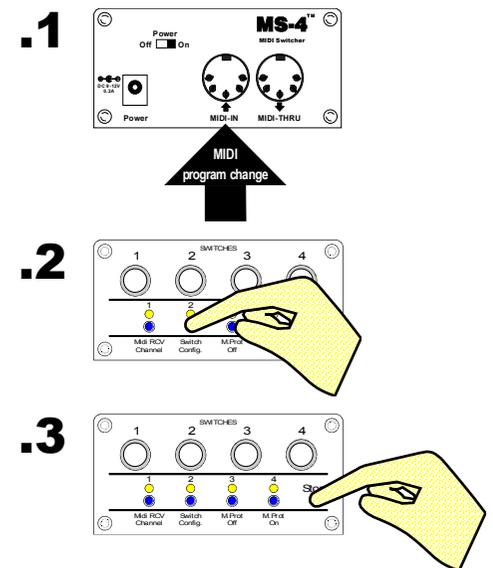
The programming of the MS-4 is very easy and can be done in 3 steps only as follows:

1. Transmit your requested midi program change from eg. a midi footcontroller to the MS-4: This sets the MS-4 to the same program.
2. Select the desired constellation of switching with the four KEYS 1..4.
3. Press the KEY STORE (6) to save. That's all!

Always a midi program change is received by the MS-4 it recalls the constellation of the SWITCHES you saved.

The MS-4 supports bank selects: It has a total of 3 banks each with 128 programs. After power on the MS-4 uses the first Bank by default!

See chapter 12 "Midi Information"!



7 Special Information

On this page you will get a description about special functions and the technical information about the MS-4. The midi implementation chart is for advanced user. This is also to notice the controller value for the midi bank selects. As default the MS-4 uses Bank 0 after power on.

8 Memory Protect

To prevent accidentally lost of data it is possible to protect the memory of the MS-4:

1 Select Memory Protect:

While pressing KEY 4 (5 - M.Prot On) switch the POWER SWITCH (8) to the ON position.

2 Deselect Memory Protect:

While pressing KEY 3 (4 - M.Prot Off) switch the POWER SWITCH (8) to the ON position.

9 Restore the factory settings

The MS-4 can be initialised. After that, all internal data of the MS-4 are set as same as it comes out of the factory. Of course all previously data are getting lost!

1 Doing the Factory Setup:

While pressing KEY 2 (3) and KEY 4 (5) switch the POWER SWITCH (8) to the ON position.

2 Press the KEY STORE (6).

3 Switch the MS-4 off.

10 Test the MS-4

There is a built-in test for doing an easy test of the MS-4. The Leds, Keys and Relays will be tested.

1 Invoke the Test:

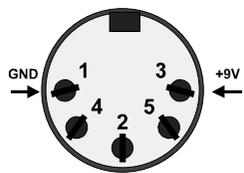
While pressing KEY 1 (2) and KEY STORE (6) switch the POWER SWITCH (8) to the ON position.

2 Now you can check the items by eye or with your measurement gear.

3 Switch the MS-4 off.

11 Using Phantom Power

How it comes:



Some other manufacturer are also using 2 pins of the MIDI jacks to distribute power from one unit to another (Phantom power). This is easy to handle and you can probably save nerves, time and money which means you need one power adaptor less. The required power may now be supplied from your MIDI effect or keyboard.

The idea of the polarity and the connection is described in the ELECTRONIC MUSICIAN issued #12/89. Some other manufacturer are also using this idea!



This is not a standard. Please check your equipment before using it!

Please note:

Nowadays some midi cables are on the market which using only 3 leads instead of 5. With those cables it is impossible to use phantom power! Please check before buy!

12 MIDI Information (Implementation Chart)

FUNCTION	TRANSMITTED	RECOGNIZED	COMMENTS
BASIC CHANNEL Default Changed	X	1-16	Memorized
MODE	X	Mode 2, Mode 4	*1
PROGRAM CHANGE True #	X	0-127	
CONTROL CHANGE 0, 32	X	0,1,2	Bank Select (LSB, MSB) Bank 0: 0=0, 32=0 Bank 1: 0=1, 32=0 Bank 2: 0=2, 32=0
*1 NOTES	Mode 1: Omni ON, Poly Mode 3: Omni OFF, Poly	Mode 2: Omni ON, Mono Mode 4: Omni OFF, Mono	O: Yes X: No

13 Maintenance and precautions

Avoid using the unit in the following places, as damages could occur:

- extrem hot environment (eg. direct sunlight)
- high humidity
- dusty environment

For cleaning wipe the unit with a soft and dry cloth. Never apply benzene, thinners or any other like agents to avoid discoloration.

The unit uses an internal built in EEPROM, which needs NO battery to hold the content of the memory after power off.

Protect the unit from strong impact. In a case of malfunction or otherwise suspect there is a damage, immediately refrain from using the MS-4. Please contact your service station.

The four internal relays are not able to switch high voltage and/or high current. In that case the contacts of the reed relays may burn up! Please refer to the technical information. The SWITCHES are NEVER used to switch voltage more than 40 Volts. This is very dangerous to your health!

14 Technical Information

Dimension	: 104 x 70 x 44mm	Weight	: approx. 270g
Power Suply	: 9~12V DC / 200mA	Consumption	: max. 135mA
Inputs	: MIDI IN, POWER	Outputs	: MIDI THRU, OUTPUT 1..4
Display	: 4x LEDs	Memory	: 384 (3x 128 Programs)
Relays	: 4x Reed Relays, max. 0.5A / 10W. *1		

*1 Also do not override the limits for a short periode of time.

Radio and Television Interferences (USA)

This unit has been verified to comply with the limits of a Class B computing device, pursuant to subpart 15 of FCC rules. Operation with non certified or non verified equipment is likely to result in interferences to radio and TV reception.



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