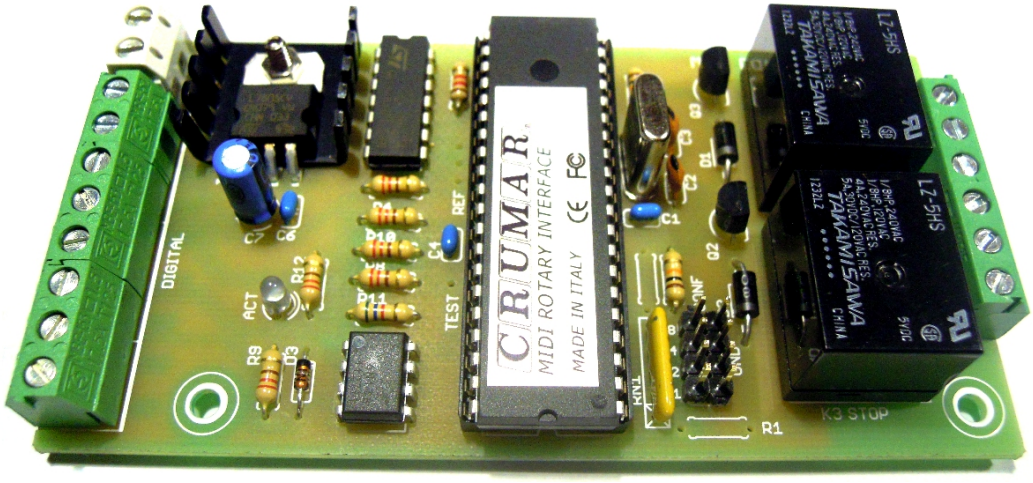
MIDI ROTARY INTERFACE

(fw 1.3)



USER'S GUIDE

DISCLAIMER

This is an OEM device (OEM = Original Equipment Manufacturer), as such it is intended to be part of a more complex product that the end user is going to assemble according to his own needs. Handling this device requires knowledge and skills in electronics and a sense of responsability in dealing with electronic devices. If you're not sure, please contact an expert.

The manufacturer (Crumar) cannot be held responsibile of any misuse of this device that goes beyond the original specifications.

WARRANTY AND BASIC RECOMMENDATIONS

Always work on a clean and tidy area.
Always pull off the mains plug before working. Turning off a switch is not enough.
Discharge your body from electrostatic energy before touching sensitive electronic devices.
Do not unsolder any component from this board.
Do not solder wires directly on the board, use the connectors instead.
Do not exceed the maximum required power supply voltage.
Altering, modifiying or damaging the board voids the warranty.

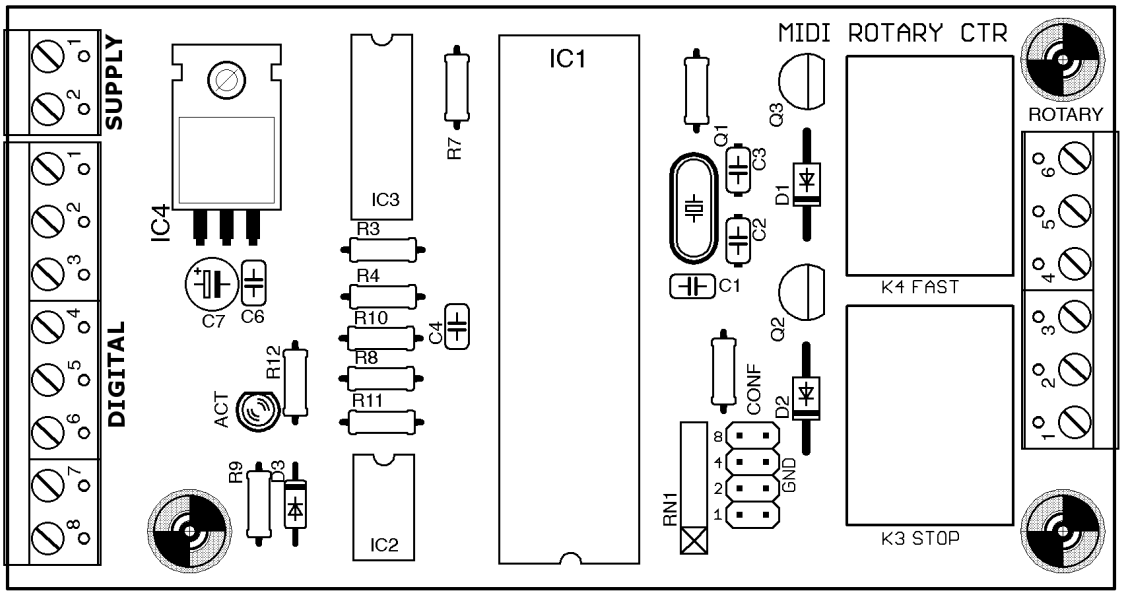
This product is made and distributed in Italy by V.M.Connection
Please visit www.crumar.it for more informations.

CRUMAR MIDI ROTARY INTERFACE

INTRODUCTION

This product helps you to connect a number of known “Clonewheel” organs or other MIDI equipment to a vintage or modern rotary speaker or digital simulator. Rotary speakers have motors that establish the speed of the rotating speakers, usually for a slow or fast rotation, or even no rotation. This board receives the command under the form of a MIDI message and controls two mechanical relays that, if connected the right way to the motor circuitry, control the rotation speeds. Later in this manual it is explained how to connect the relays to a number of existing rotary speakers.

BOARD LAYOUT AND CONNECTIONS



The connections are offered under the form of screw terminal blocks, that are sockets into which you can insert a wire and lock it with a screwdriver. This way you don't have to solder anything. Sockets are on the two sides of the board. As you can see from the picture above, on the left side you have, from top to bottom:

1. Positive power supply. Connect the positive pole from your DC PSU (7 to 12 Volts, 500 mA)
2. Negative power supply. Connect the negative pole from your DC PSU.

Digital connections, from top to bottom:

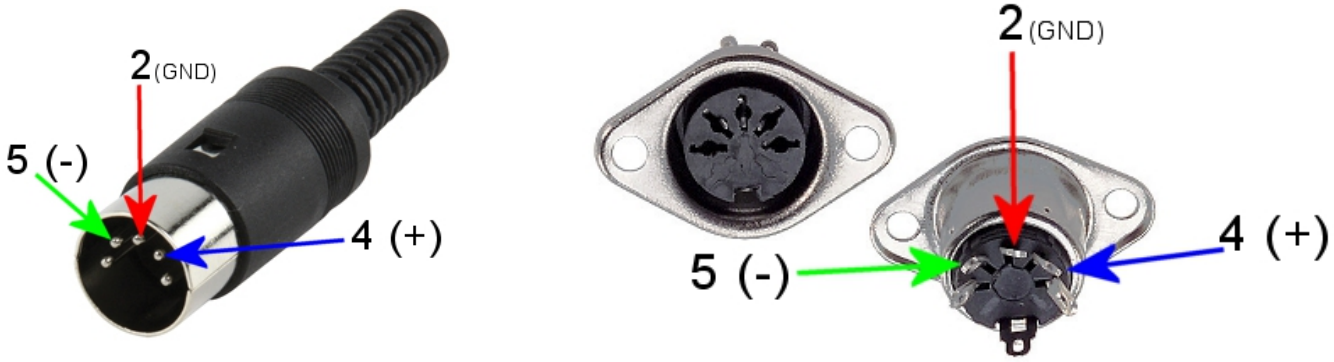
1. Positive pole to the “Slow” LED
2. Positive pole to the “Fast” LED
3. Ground pole for the LEDs
4. To MIDI THRU positive pole (DIN5 pin n. 4)
5. To MIDI THRU ground pole (DIN5 pin n. 2)
6. To MIDI THRU negative pole (DIN5 pin n. 5)
7. From MIDI IN positive pole (DIN5 pin n. 4)
8. From MIDI IN negative pole (DIN5 pin n. 5)

About the LEDs: you can use any standard 5 volts 5mm or 3mm LED of any colour, the current limiting resistors are not needed as they already are mounted on the PCB. The “Slow” and “Fast” LEDs light up when the CPU receives the related commands. When the STOP command is received, both LEDs light up. The board always starts in SLOW position when it's powered up.

On the right side of the board you have the sockets that are directly connected to the terminals of the two relays. These terminals can be connected to the rotary speaker you are willing to MIDI-fy. There are four possible statuses, two per each relay. The relay labeled as “K4 FAST” switches between the SLOW and FAST speed; the relay labeled as “K3 STOP” switches between the RUN and STOP (or sometimes referred to as BRAKE) position. The contacts use the following scheme:

- STOP position: pin 3 shorts with pin 1
- RUN position: pin 3 shorts with pin 2
- SLOW position: pin 6 shorts with pin 5
- FAST position: pin 6 shorts with pin 4

MIDI CONNECTIONS



The above image shows the pinout of both the male DIN5 cable connector and the female DIN5 panel connector. The center pin is connected to ground and is only used for the MIDI output ports (which include the THRU port), while the MIDI input only use the pins 4 and 5. Pay attention not to swap these pins or your MIDI connection won't work.

There is an ACTIVITY LED on the PCB that helps you to troubleshoot your MIDI connection. This LED blinks when MIDI messages are correctly received by the unit and sent to the THRU port.

CONNECTION TO A ROTARY SPEAKER

There are several types of rotary speakers made by different manufacturers over the past 60 years. Unfortunately there isn't a standard connection for this type of amplifier. Originally, a 5 or 6 pin connector was used that carried both the AC power and the audio signal from the organ to the amplifier, then this was replaced by a 9 pin and then by an 11 pin connector, the latter doesn't carry high voltage signals. Some speakers also have separate sockets for signal and motor control, some use TRS jack connectors, others use XLR connectors.

The most common connectors used in modern rotary speakers are the 11-pin relay type connector and the TRS connectors. The following table shows how to connect the MIDI board to the 11 pin connector, which is the only known standard still used today for rotary speakers.

MIDI ROTARY BOARD PIN	CONNECTED TO	Remarks
1	Not connected	
2	BOARD pin 6	Opens for STOP
3	11-pin conn. pin 6	ground
4	11-pin conn. pin 7	Fast speed
5	11-pin conn. pin 8	Slow speed
6	BOARD pin 2	

Please note: some vintage 11-pin based rotary speakers require that pins 5 and 6 of the 11-pin socket are shorted in order for the amplifier to be turned on.

This board can also be connected to old 9-pin amplifiers:

MIDI ROTARY BOARD PIN	CONNECTED TO	Remarks
1	Not connected	
2	BOARD pin 6	Opens for STOP
3	9-pin conn. pin 1	ground
4	9-pin conn. pin 6	Fast speed
5	9-pin conn. pin 7	Slow speed
6	BOARD pin 2	

If your rotary speaker has a speed control based on a TRS (stereo) jack, you should check with the manufacturer for the pinout. Just to make an example, let's assume that the sleeve is connected to ground and has to make contact with the ring for SLOW and with the tip for FAST, this would be the connection scheme:

MIDI ROTARY BOARD PIN	CONNECTED TO	Remarks
1	Not connected	
2	BOARD pin 6	Opens for STOP
3	TRS sleeve	ground
4	TRS tip	Fast speed
5	TRS ring	Slow speed
6	BOARD pin 2	

As you can see, it's all very simple. The point of shorting the board pin 2 to pin 6 is because the speed signal is interrupted when the STOP position is requested. This connection is not hardwired on the PCB because you might want to use the STOP relay in other ways.

CONFIGURING THE CLONEWHEEL

You can choose which known Clonewheel organ to set for the MIDI control via the “CONF” jumper. This jumper is configured as a BCD (Binary Coded Decimal) enumerator, so you can have 16 different combinations with 4 bits. To make it simple, here is the list of available clones, their number and the jumper configuration.

Number	1	2	4	8	Clonewheel name
0					Generic CC# 1
1	*				Crumar Mojo / Hamichord
2		*			Nord Electro 3 / 4D
3	*	*			Nord C1 / C2 / C2D
4			*		Nord Stage 2
5	*		*		Korg CX-3 / BX-3
6		*	*		Studiologic Numa Organ
7	*	*	*		Viscount / Oberheim DB-3 / DB-5
8				*	Hammond Suzuki SK-1 / SK-2
9	*			*	Hammond Suzuki XK-3 / XK-3c
10		*		*	Korg Kronos side buttons (CC#80 and 81)
11	*	*		*	Pitch/Mod Joystick
12			*	*	- not used / for future update
13	*		*	*	- not used / for future update
14		*	*	*	- not used / for future update
15	*	*	*	*	- not used / for future update

The setting number 0 can be used with any MIDI controller capable of sending the Continuous Controller number 1 with values ranging from 0 to 127 (the Modulation Wheel in the GM standard). Values are interpreted as:

- from 0 to 32 = SLOW speed
- from 33 to 95 = STOP position
- from 96 to 127 = FAST speed

Settings marked as “not used” are free for future updates. The software running in this device can be updated via MIDI System Exclusive. Visit the manufacturer's website for any further update.

OTHER GENERAL ASSEMBLY RECOMMENDATIONS

- The MIDI THRU port carries a perfect copy of the data that is present at the MIDI INPUT. If you don't need it, don't use it.
- If you wish to be able to switch between the available clones without using the jumpers, you can add a 16 position BCD switch, but please use a female SIL-type connector, don't solder wires on the board directly.
- Three holes are provided to secure the board to a steady surface. Use the appropriate spacers and make sure that the bottom of the board doesn't touch any conductive surface.