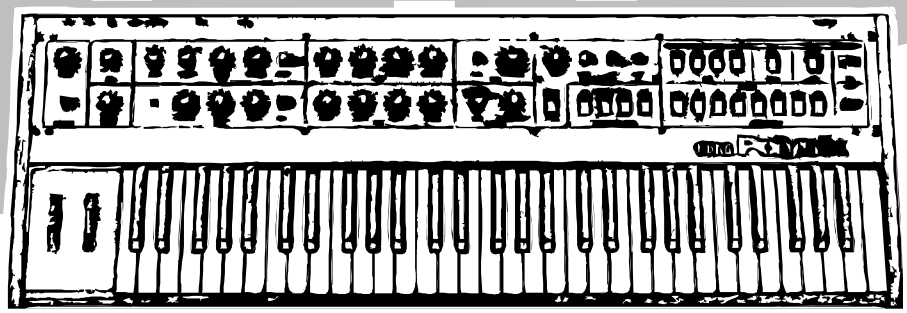
P6-M

MIDI Interface for Korg Polysix Synthesizer

Model 8-427
Version 1.0



Installation Manual

rev. 3

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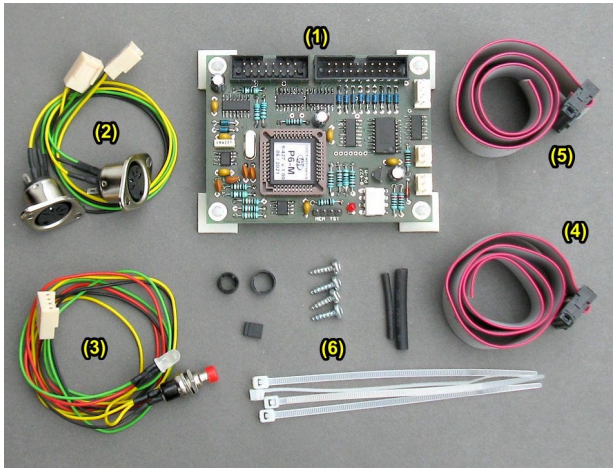
1 INTRODUCTION

1.1 MIDI INTERFACE KIT PARTS

The MIDI interface kit contents all necessary parts for installation incl. all support and coupling elements. The delivery also includes both installation and operation manuals in printed form. Please check if the delivery is complete before the installation (see fig. 1.1.1):

(1) MIDI Interface board
(2) 2x DIN-5 socket with cable
(3) Bunched cables with button and LED
(4) 16-core ribbon cable with connector
(5) 20-core ribbon cable with connector
(6) Coupling elements (LED holder, jumper, self-tapping screws, insulation tubes and tightening strips)
(7) Owner's and Installation manuals in printed form

Fig. 1.1.1 - Parts of P6-M interface kit



1.2 GENERAL INFORMATION

Mounting the interface in the Korg Polysix synthesizer is very easy. If you follow the instructions from this manual, there should be no major problems during the installation. The interface installation procedure is thoroughly described in the following chapters. Please follow these instructions accurately to avoid any damage of the instrument.

Attention! Disconnect the instrument form the mains prior to the installation. There is a risk of the electric shock!

Attention! Observe precautions for handling electrostatic discharge sensitive devices!

The producer is not responsible for any eventual mechanical or electrical damage of the Korg instrument caused by the infringement of the described installation procedure or by careless manipulation during the installation of the MIDI interface!

It is recommended to calibrate the instrument accordingly to the instructions in service manual of the instrument prior the interface installation. This ensures trouble-free operation of the interface.

The cover of the instrument will not be markedly damaged during the installation. The physical appearance of the vintage instrument remains nearly the same as before the installation. If necessary, the interface can be simply removed and the instrument restored back to original appearance.

All original circuits of the Korg Polysix remain without any modification. The instrument can be used the same way as before the retrofitting.

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1.3 INTERFACE CONNECTION

The interface is connected to the KLM-366 and KLM-371 boards of the instrument. The following diagrams (figs. 1.3.1, 1.3.2) explain the electrical connection of the interface in the instrument.

Fig. 1.3.1 – Connection to the instrument

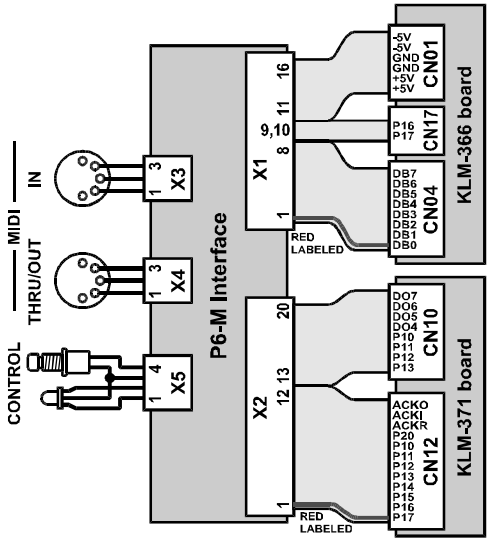
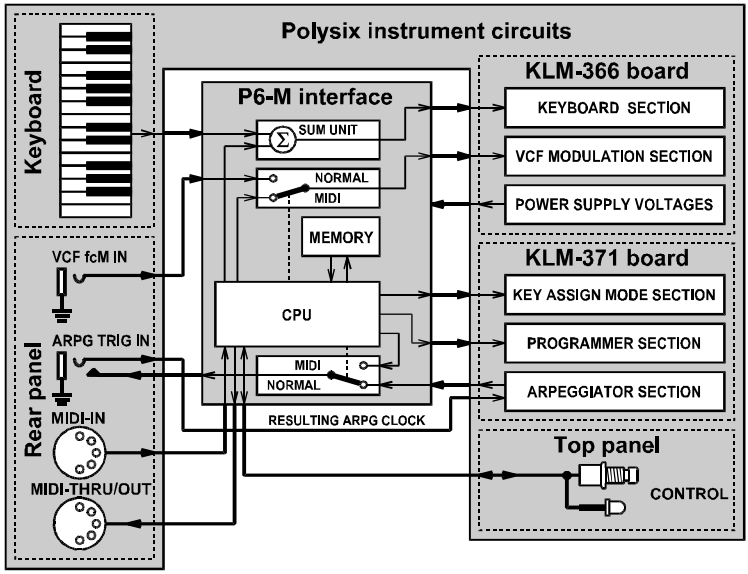


Fig. 1.3.2 – Block diagram of the interface function



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2 INSTALLATION PROCEDURE

2.1 THE INSTRUMENT DISASSEMBLY

a) Unscrew the four screws on the bottom side of the instrument (fig. 2.1.1) and four screws on the top panel (fig. 2.1.2). Keep the screws. They will be used again after the MIDI kit installation is finished.

Fig. 2.1.1

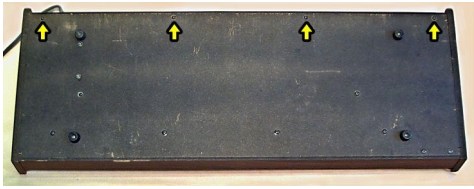
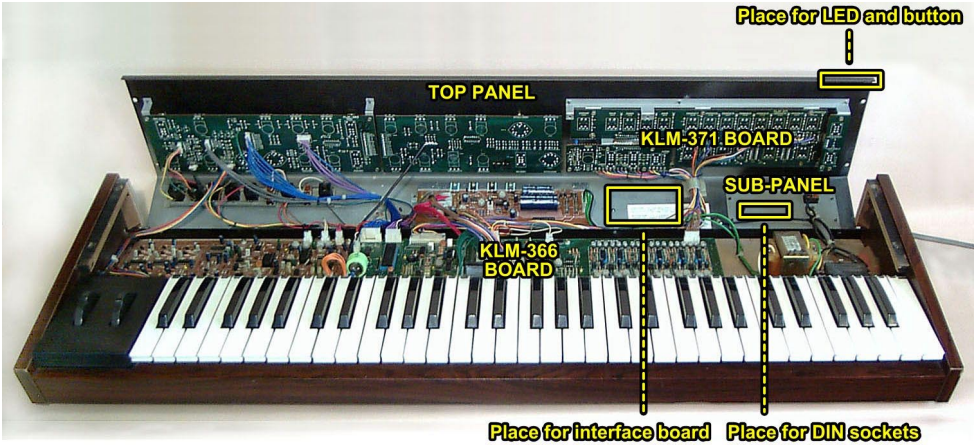


Fig. 2.1.2

b) Carefully lift up the instrument top panel and turn it back (fig. 2.1.3). All instrument's parts and boards needed for the interface installation are now accessible (fig. 2.1.4).

Fig. 2.1.3

Fig. 2.1.4



2.2 MIDI DIN SOCKETS INSTALLATION

The interface has both MIDI input and output. However, only MIDI input is necessary for basic operation of the interface (i.e controlling the instrument by MIDI commands). MIDI THRU/OUT output connector need not to be

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installed if you don't require transfer of MIDI data to another MIDI devices (THRU function) or reverse communication of the interface with host system (OUT function). Nevertheless, having both MIDI input and output is more convenient for an easy integration in a more advanced MIDI system.

There are more possible ways to install the MIDI-IN socket(s) if you do not want to mechanically damage the panels of the instrument by drilling (see chapter 3.1).

Recommended method of the MIDI socket(s) montage is described below.

2.2.1 HOLES FOR MIDI SOCKETS DRILLING

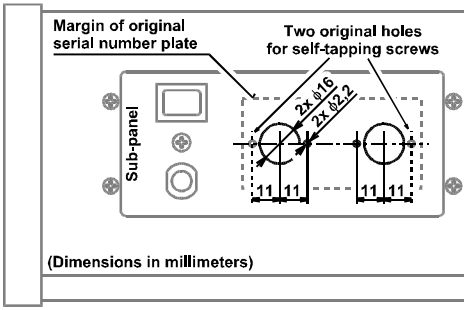
a) The best solution is to mount the MIDI sockets to the power cord sub-panel on the rear panel of the instrument, where the serial number plate is originally fixed (fig. 2.2.1). This solution is recommended, since you can revert the instrument to its original appearance if you decide to remove the interface in the future.

b) Unscrew the serial number plate from the power cord sub-panel (fig. 2.2.1). Safely store the serial number plate and two self-tapping screws for future usage[1].

c) Drill two holes with diameter 16 mm and two holes with diameter 2,2 mm to the sub-panel of the instrument as shown on fig. 2.2.2. Use sharp drills and **work carefully** so that the panel is not scratched and other parts of the instrument are not damaged during the drilling!

Fig. 2.2.1

Fig. 2.2.2



d) Clean the edge of the holes with small rasp or tip of bigger drill from both sides of the panel after the holes are drilled.

e) **Clean all iron sawdust and raspings from the inside of the instruments**, they can cause short circuits or serious electrical damage if they are left inside the instrument. Please clean the instrument carefully!

2.2.2 MIDI SOCKETS MOUNTING

a) Pull flat connectors of MIDI cables through the 16 mm holes in the panel from outer side and insert the DIN sockets of the cables into the holes (fig. 2.2.3). Both MIDI cables are identical and can be swapped.

b) Fix the DIN sockets to the panel using four self-tapping screws from the interface accessory (fig. 2.2.4).

Fig. 2.2.3

[1] The plate can be placed back.to its original position to hide the drilled holes if the interface will be removed and the DIN sockets unmounted.

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c) It is recommended to label the DIN sockets ("MIDI IN", "MIDI THRU/OUT" for example) with self-adhesive foil glued near the sockets (fig. 2.2.5).

Fig. 2.2.4

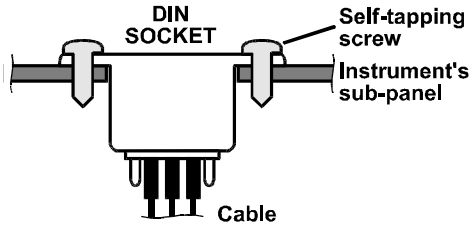


Fig. 2.2.5

2.3 RESET BUTTON AND INDICATION LED INSTALLATION

There are two control elements on the interface – reset button and indication LED. There are more possible ways to install the button and the LED. The button and the LED need not be installed if you prefer to maintain the vintage status of the instrument (i.e. if you don't want to damage the instrument's panel by drilling). Or you can install only the reset button or only the indication LED (see chapter 3.2). Nevertheless having both of them installed is more convenient for easier device control.

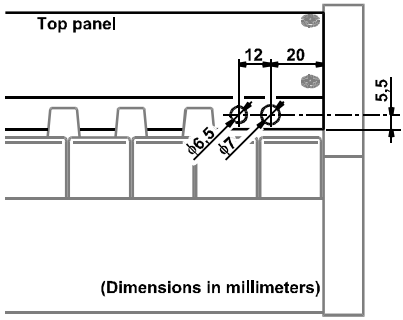
2.3.1 HOLES FOR RESET BUTTON AND INDICATION LED DRILLING

a) If you decide to install the LED and the button, the suitable place for them is the right side of the front panel of the instrument - above the highest keys (fig. 2.3.1).

b) Drill one hole with diameter 7 mm (for reset button) and one hole with diameter 6,5 mm (for indication LED) to the panel – see fig. 2.3.2. Use sharp drills and **work carefully** so that the panel is not scratched and other parts of the instrument are not damaged during the drilling!

Fig. 2.3.1

Fig. 2.3.2



c) Clean the edge of the holes with small rasp or tip of bigger drill from both sides of the panel after the holes are drilled.

d) **Clean all iron sawdust and raspings from the inside of the instruments**, they can cause short circuits or serious electrical damage if they are left inside the instrument. Please clean the instrument carefully!

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2.3.2 RESET BUTTON AND INDICATION LED MOUNTING

a) Insert LED holder (from the interface accessory) into 6,5 mm hole in the instrument's panel from the outer side. Pull the lock ring of the LED holder over the supplied LED. Then insert the LED into the holder (from inner side of the instrument's panel) and fix it by the overthrust of the ring on the holder (fig. 2.3.3, 2.3.4).

b) Insert the reset button into 7 mm hole in the instrument's panel from inner side. Fix the button to the panel with the nut and spring washer (fig. 2.3.3, 2.3.4).

Fig. 2.3.3

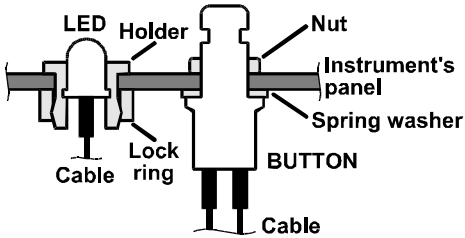


Fig. 2.3.4

2.4 20-CORE RIBBON CABLE MOUNTING

The delivered 20-core ribbon cable is fitted with 20-pin connector (fig. 2.4.1). It must be connected to several pads at the KLM-371 board of the instrument (fig. 2.4.2). Note that the KLM-371 board is divided to three parts.

Fig. 2.4.1

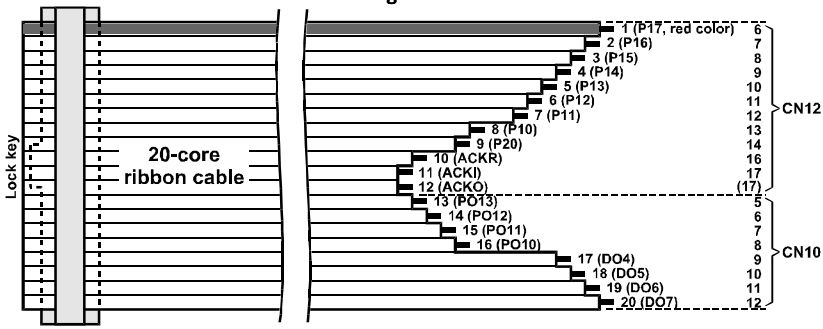
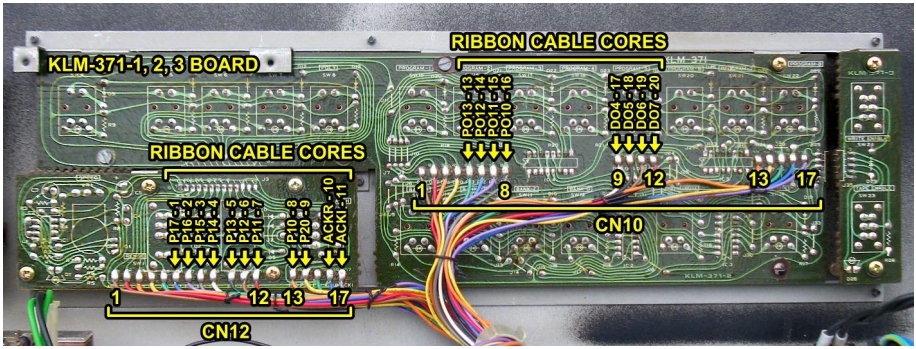


Fig. 2.4.2



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Split up free end of the cable (by ripping or cutting) to individual wires and adapt their lengths as necessary during the cable installation. Stripe ends of all wires in length about 2 mm and tin them before they are connected to the instrument. Individual control signal wires must be connected accordingly to the table 1 (also see figs. 2.4.1 and 2.4.2). Wire Nr. 1 (terminal) is signed with red color.

Table 1 – Connection of 20-core ribbon cable to KLM-371 board

Wire Nr.	Signal	Connector / Pad Nr.	Remark	Wire Nr.	Signal	Connector / Pad Nr.	Remark
1	P17	CN12 / 6	Red signed wire	11	ACKI	CN12 / 17	Unsolder the orig. wire
2	P16	CN12 / 7		12	ACKO	(CN12 / 17)	To the orig. freed wire
3	P15	CN12 / 8		13	PO13	CN10 / 5	
4	P14	CN12 / 9		14	PO12	CN10 / 6	
5	P13	CN12 / 10		15	PO11	CN10 / 7	
6	P12	CN12 / 11		16	PO10	CN10 / 8	
7	P11	CN12 / 12		17	DO4	CN10 / 9	
8	P10	CN12 / 13		18	DO5	CN10 / 10	
9	P20	CN12 / 14		19	DO6	CN10 / 11	
10	ACKR	CN12 / 16		20	DO7	CN10 / 12	

a) Wires from Nr. 1[2] to Nr. 10 of the 20-core ribbon cable are solderd directly to pads 6 to 14 and 16 of CN12 connector[3] as shown on fig. 2.4.3. Solder the wires to these pads directly in parallel manner to original wires leaded to the pads.

b) Unsolder the original wire from pad Nr. 17 of CN12. Solder wire Nr. 11 of the ribbon cable to the freed pad (fig. 2.4.4).

Fig. 2.4.3

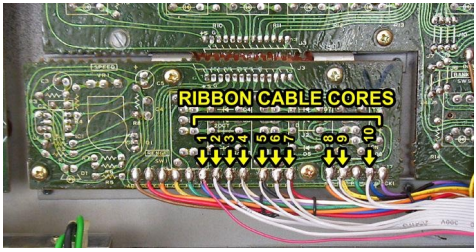


Fig. 2.4.4

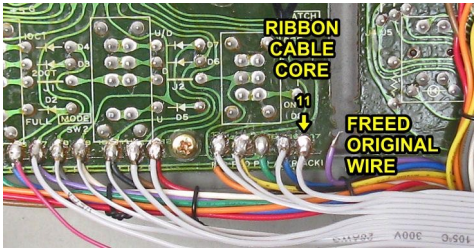


Fig. 2.4.5

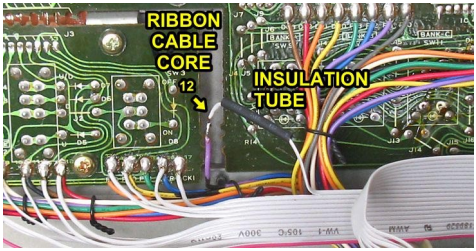
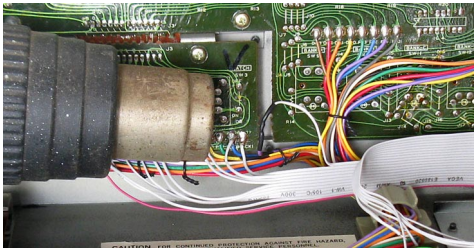


Fig. 2.4.6



[2] Wire Nr. 1 is signed with red color.

[3] There is no physical connector on the KLM-371 board. Only row of soldering pads is here. But these pads are labeled as CN12 connector in technical documentation of the instrument.

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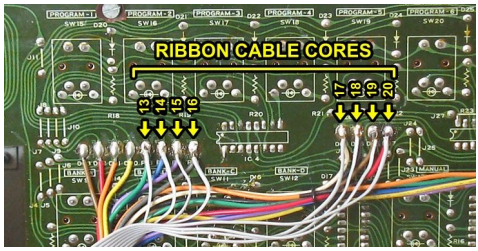
c) Place heat-shrink insulation tube ϕ 2 mm (from the interface accessory) on wire Nr. 12 of the ribbon cable and solder the wire Nr. 12 of the ribbon cable to previously freed wire Nr. 17 of CN12 (fig. 2.4.5).

d) Isolate the connection with the insulation tube and heat it (with a hot-flue pistol for example) until it shrinks tightly to the wires (fig. 2.4.6).

Fig. 2.4.7



e) Wires from Nr. 13 to Nr. 20 of the 20-core ribbon cable are solderd directly to pads 5 to 12 of CN10 connector[4] as shown on fig. 2.4.7. Solder the wires to these pads directly in parallel manner to original wires leaded to the pads.

2.5 16-CORE RIBBON CABLE MOUNTING

The delivered 16-core ribbon cable is fitted with 16-pin connector (fig. 2.5.1). It must be connected to several pads at the KLM-366 / KLM-366B[5] board of the instrument (fig 2.5.2a, 2.5.2b).

Fig. 2.5.1

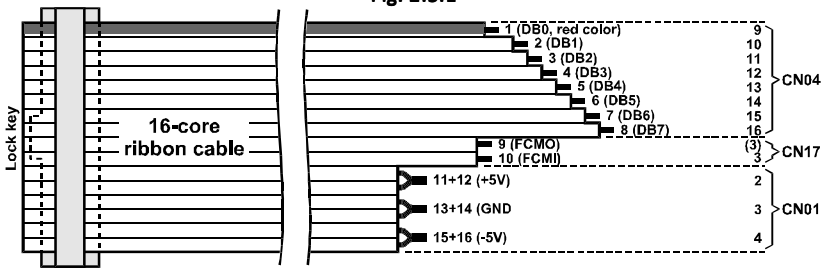
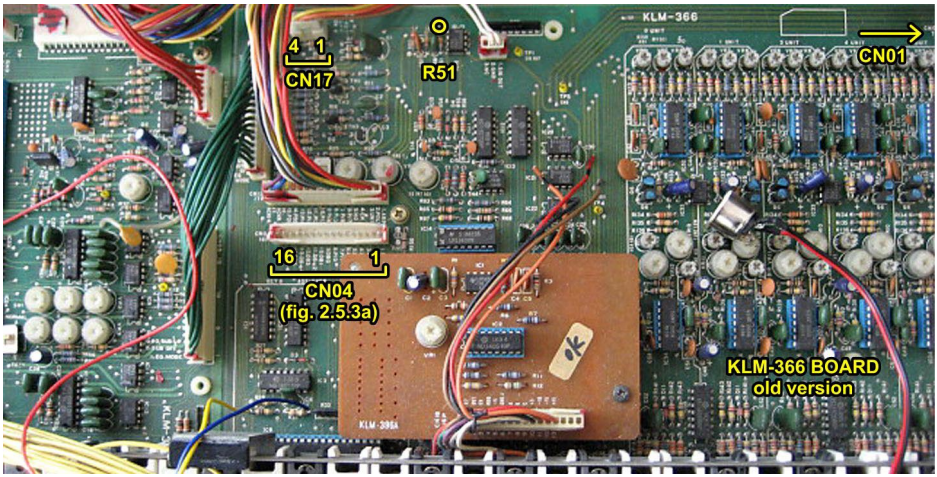


Fig. 2.5.2a (KLM-366)



[4] There is no physical connector on the KLM-371 board. There is only a row of soldering pads. But these pads are labeled as CN10 connector in technical documentation of the instrument.

[5] There are two different versions of the board - KLM-366 (old version – figures indexed “a”) and KLM-366B (new version – figures indexed “b”).

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Fig. 2.5.2b (KLM-366B)

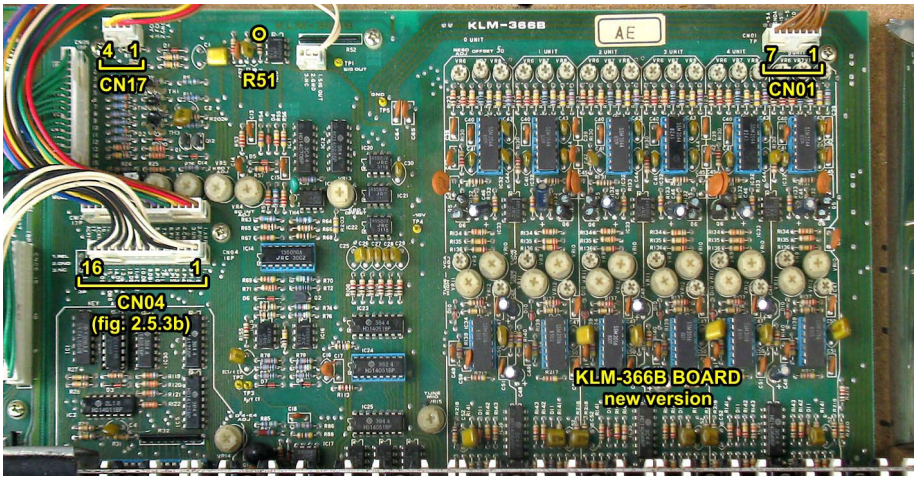
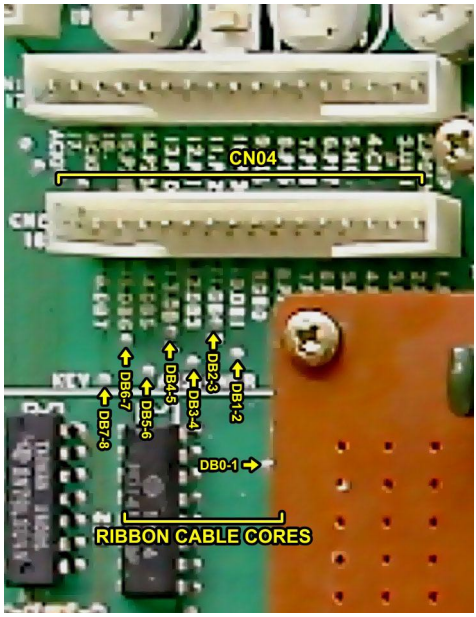


Fig. 2.5.3a (KLM-366)

Fig. 2.5.3b (KLM-366B)



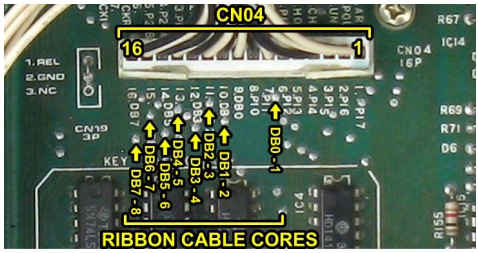
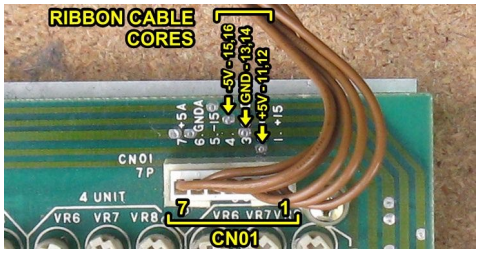


Fig. 2.5.4



Split up free end of the cable (by ripping or cutting) to individual wires and adapt their lengths as necessary during the cable installation. Stripe ends of all wires in length about 2 mm and tin them before they are connected to the instrument. Individual control signals wires must be connected accordingly to the table 2 (also see figs. 2.5.1, 2.5.2, 2.5.3 and 2.5.4). Wire Nr. 1 (terminal) is signed with red color.

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Table 2 – Connection of 16-core ribbon cable to KLM-366 board							
Wire Nr.	**Signal**	**Connector / Pad Nr.**	**Remark**	**Wire Nr.**	**Signal**	**Connector / Pad Nr.**	**Remark**
1	DB0	CN04 / 9	Red signed wire	9	FCMO	(CN17 /3)	To lead of R51 resistor
2	DB1	CN04 / 10		10	FCMI	CN17 / 3	To freed pad
3	DB2	CN04 / 11		11	+5V	CN01 / 2	Both 11 and 12 wires to the same pad
4	DB3	CN04 / 12		12	+5V		
5	DB4	CN04 / 13		13	GND	CN01 / 3	Both 13 and 14 wires to the same pad
6	DB5	CN04 / 14		14	GND		
7	DB6	CN04 / 15		15	-5V	CN01 / 4	Both 15 and 16 wires to the same pad
8	DB7	CN04 / 16		16	-5V		

a) Wires from Nr. 1[6] to Nr. 8 of the 16-core ribbon cable are connected to pins 9 to 16 of CN04 connector as shown in table 1. Since solder pads of the CN04 connector are not accessible directly (they are on bottom side of the KLM-366 board), the wires are soldered to some via-pads on the board what conforms to the pins of the CN04 connector (fig. 2.5.5).

b) Unsolder upper lead of R51 resistor from the KLM-366 board (fig. 2.5.6).

Fig. 2.5.5a (KLM-366)

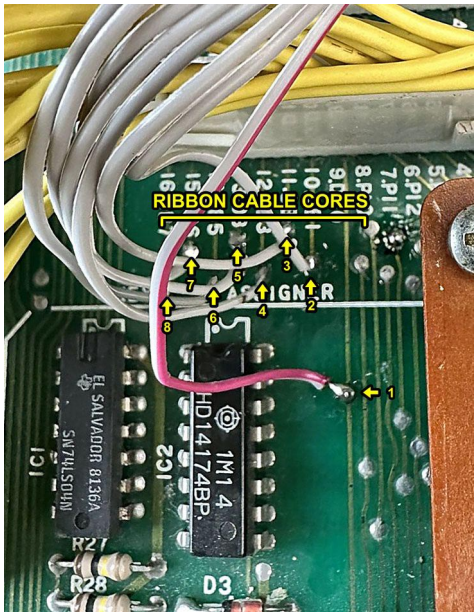


Fig. 2.5.5 b (KLM-366B)

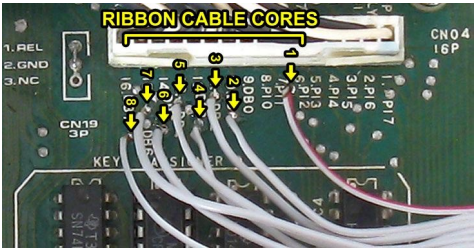
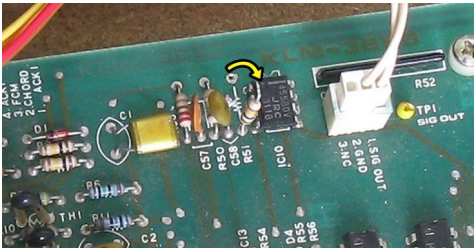


Fig. 2.5.6



c) Solder wire Nr. 10 of the ribbon cable to the freed soldering pad (fig. 2.5.7)

d) Place heat-shrink insulation tube ϕ 4 mm (from the interface accessory) on the wire Nr. 9 of the ribbon cable and solder the wire Nr. 9 to freed lead of the R51 resistor (fig. 2.5.8).

[6] Wire Nr. 1 is signed with red color.

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Fig. 2.5.7

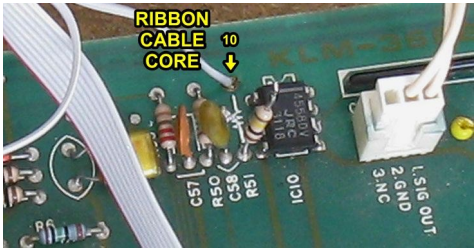
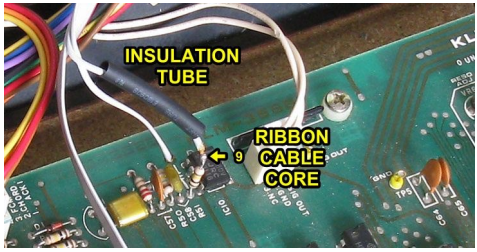


Fig. 2.5.8



e) Overlap the connection and R51 resistor with the insulation tube and heat it (with a hot-flue pistol for example) until it shrinks tightly to the resistor and the wire (fig. 2.5.9).

f) Wires from Nr. 11 to Nr. 16 of the 16-core ribbon cable are connected to pins 2 to 4 of CN01 connector as shown in table 1. Since solder pads of the CN01 connector are not accessible directly (they are on bottom side of the KLM-366 board), the wires are soldered to some via-pads on the board what conforms to the pins of the CN01 connector (fig. 2.5.10).

Fig. 2.5.9

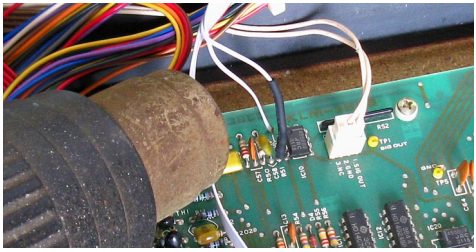
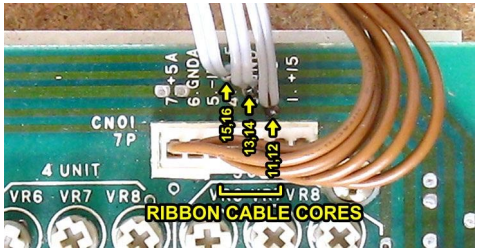


Fig. 2.5.10



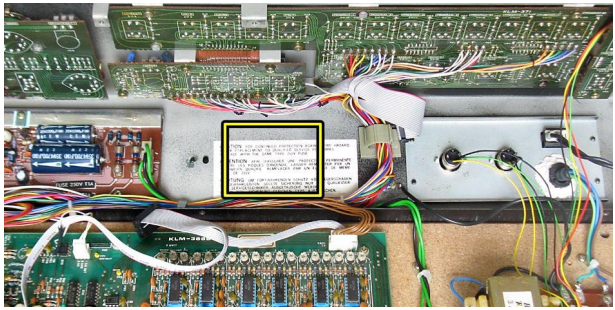
g) Solder both Nr. 11 and Nr. 12 wires of the 16-core ribbon cable to the “+5V” via-pad. It conforms to pin 2 of the CN01 connector (fig. 2.5.10).

h) Solder both Nr. 13 and Nr. 14 wires of the 16-core ribbon cable to the “GND” via-pad. It conforms to pin 3 of the CN01 connector (fig. 2.5.10).

i) Solder both Nr. 15 and Nr. 16 wires of the 16-core ribbon cable to the “-5V” via-pad. It conforms to pin 4 of the CN01 connector (fig. 2.5.10).

2.6 INTERFACE BOARD INSTALLATION

Fig.. 2.6.1



a) The interface board will be placed on the rear panel of the instrument – between the power supply board and power cord sub-panel (fig. 2.6.1).

b) Cleanse the part of rear panel inside of the instrument for the interface board placement (fig. 2.6.1). It is necessary to remove a paper label usually glued in this area. Use a chemical cleaner to remove all dirt and grease.

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c) Remove the protective foil form the self-adhesive supports of the interface board (fig. 2.6.2).

d) Attach the interface board to the instrument's cover so that the board side with two ribbon cable connectors X1 and X2 points to up as shown on the figure 2.6.3. Than fix the self-adhesive supports by pressing down to the panel.

Fig. 2.6.2

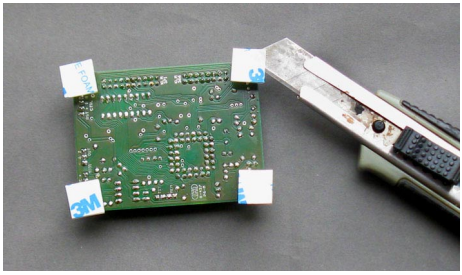

Fig. 2.6.3

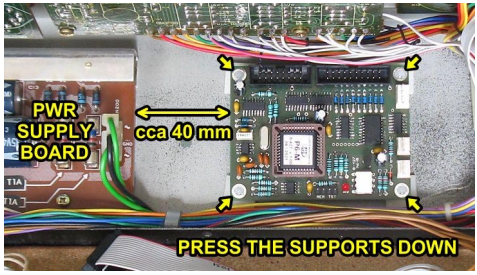

Fig. 2.6.4

e) Plug two 3-pin connectors of the MIDI cables to X3 ("IN") and X4 ("OUT") plug heads on the interface board. Orientation of the connectors is given by the connector lock so they cannot be plugged reversely but be sure that the connectors are not exchanged: MIDI input must be plugged to X3 head and MIDI output to X4 head (fig. 2.6.4).

f) Plug the 4-pin connector of the bunched cables with button and LED to X5 ("CTRL") plug head on the interface board. Orientation of the connector is given by the connector lock again (fig. 2.6.4).

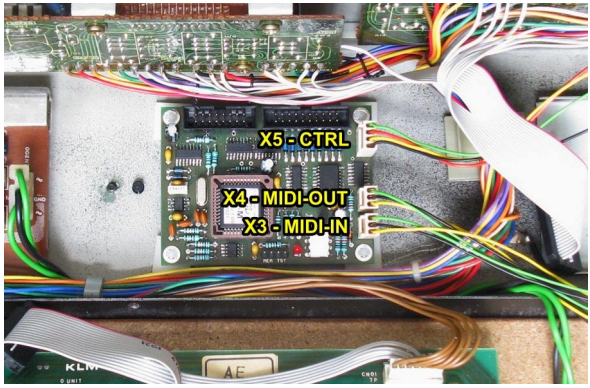

Fig. 2.6.5

g) Plug the 16-pin connector of the ribbon cable leaded from the KLM-366 board to X1 plug head on the interface board. Orientation of the connector is given by the lock slot again (fig. 2.6.5).

h) Plug the 20-pin connector of the ribbon cable leaded from the KLM-371 board to X2 plug head on the interface board. Orientation of the connector is given by the lock slot again (fig. 2.6.5).

i) Align newly installed cables and fix them together to the original keyboard bunched cables with four plastic stripes from the interface accessory (fig. 2.6.6).

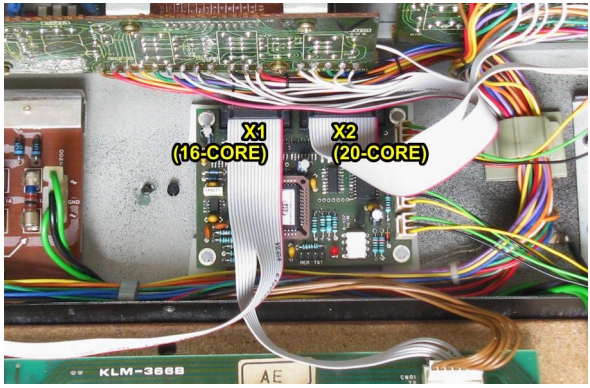

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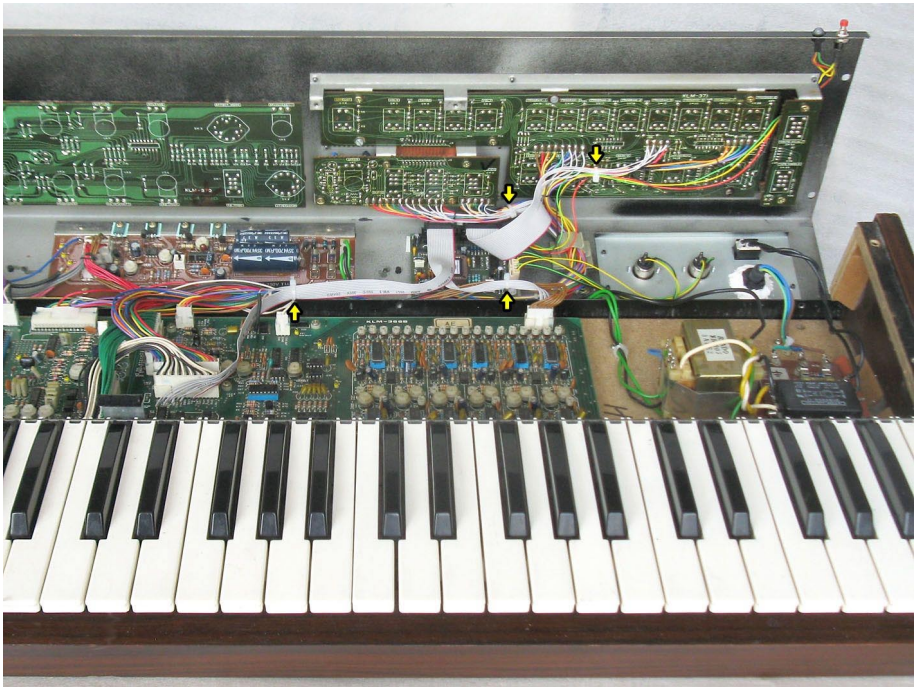
Fig. 2.6.6



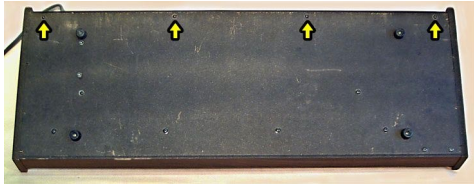
2.7 INSTRUMENT RE-ASSEMBLY

a) Turn the top panel back to its original position on the instrument.

b) Fix the top panel to the side-boards of the instrument with four original screws (fig. 2.7.1) and to the bottom plate of the instrument's cover with four original screws (fig. 2.7.2). This is the reverse procedure of that described in the chapter 2.1.

Fig. 2.7.1

Fig. 2.7.2



The installation of the P6-M MIDI kit is now finished, the instrument is ready for use with MIDI control.

Please read the user's manual carefully before the MIDI interface usage so you understand all interface functions.

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3 INSTALLATION TIPS

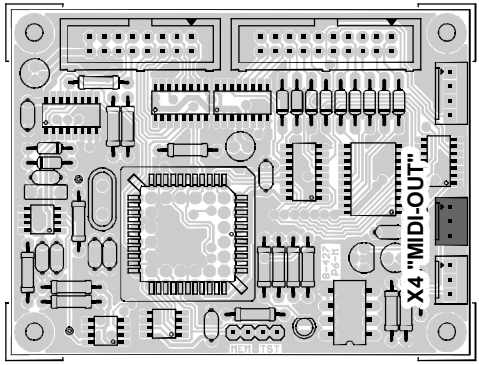
3.1 MIDI INPUT AND OUTPUT

If you do not want to mechanically damage the panels of the instrument by drilling, you can use alternative metod of the MIDI – IN / OUT sockets montage. You can lead out the MIDI cables through a slot on the instrument cover (see fig. 3.1.1 for example). In that case, you will have to replace the delivered MIDI cables with another ones equipped with cable type of the DIN sockets or plugs.

If you decide to install only MIDI-IN socket, the X4 connector (labeled "**MIDI-OUT**") on the interface board will remain unused (see fig. 3.1.2).

Fig. 3.1.1

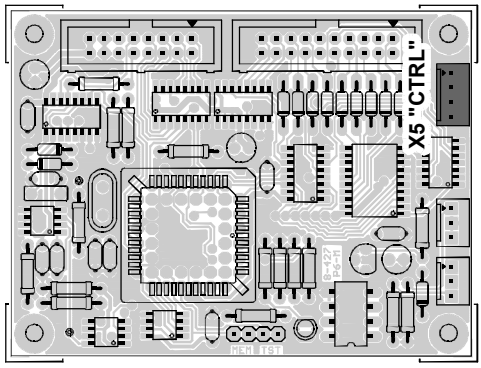
Fig. 3.1.2



3.2 RESET BUTTON AND INDICATION LED

Installation of the reset button and indication LED isn't necessary as well. You don´t need to install this bunched cables if you don't want to damage the instrument's panel by drilling. In such case, the X5 connector (labeled "**CTRL**") remains unused (see fig. 3.2.1). The interface operation is unaffected but you have no optical info about the interface status and reset of the interface must be executed by turning the instrument off and on again or by MIDI commands sent to the interface (see the Owner's Manual of the interface).

Fig. 3.2.1



It is also possible to install only the indication LED or only the reset button on instrument's panel:

For the indication LED only installation, cut-off black and both yellow wires of the bunched cables as shown on fig. 3.2.2 and remove the reset button. Then connect the two free yellow wires together. If the reset button is not installed, the interface operation is unaffected. The only limitation is that the reset of the interface can be done only by turning the instrument off and on again or by MIDI commands sent to the interface (see the Owner's Manual of the interface).

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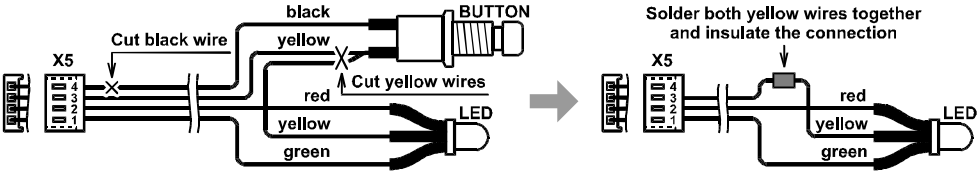
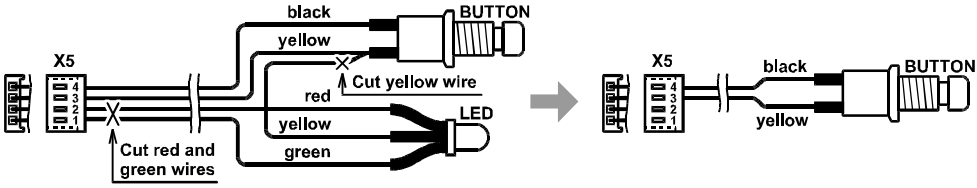
Fig. 3.2.2



For the reset button only installation, cut-off red, green and yellow wires of the bunched cables as shown on fig. 3.2.3 and remove the indication LED. If the indication LED is not installed, the interface operation is unaffected. The only limitation is that you cannot see actual status of the interface (the "Indicator Mode" patch parameter remains unsignificant - see user manual of the interface).

Fig. 3.2.3

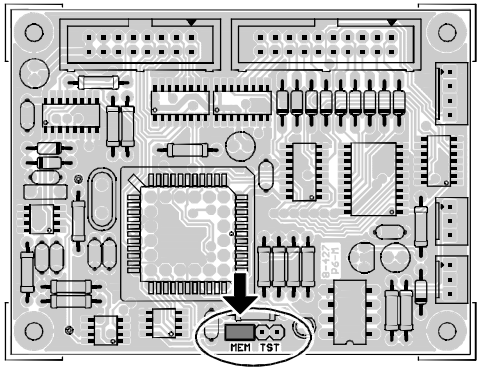


3.3 MEMORY PROTECTION

All user data stored in interface memory can be protected against unwanted rewriting after the memory is filled with your own data.

The jumper from interface accessory have to be plugged on pin header (labeled "**MEM**") on the interface board (see fig. 3.3.1) if you want to activate the memory protection (see the Owner's Manual of the interface for details).

Fig. 3.3.1



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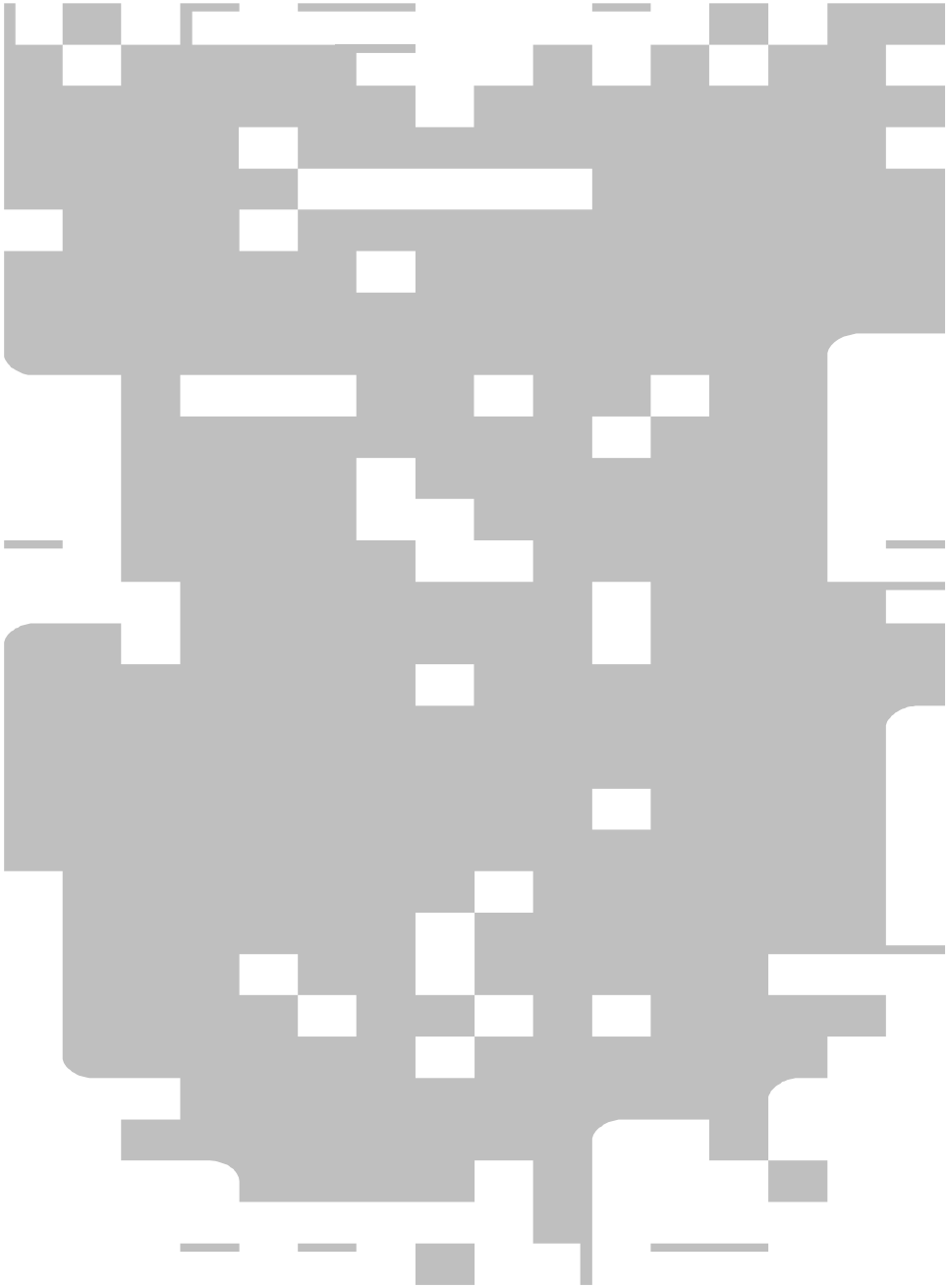
All documents and support software are available at manufacturer's web pages.

Korg Polysix MIDI Interface
Model P6-M, Nr. 8-427, ver. 1.00
Document: 842710_instal, rev. 3

Manufacturer: CHD Elektroservis, Czech Republic

www.chd-el.cz info@chd-el.cz

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