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Korg Poly61

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☐ 03-03-2013, 04:53 PM   #**1**

gus ⚪   Join Date: Mar 2013
Junior Member   Posts: 4

📄 **Korg Poly61**

Does the Korg poly 61 works with UMR2 ?
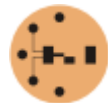
here is the service manual

Thanks in Advance!

Quote

☐ 03-03-2013, 08:16 PM   #**2**

John ⚪   Join Date: Jan 2009
Moderator   Posts: 3,007

Hi Gus, welcome to the forum.

I took a look at the link, but the document scan was too blurry for me to see what the keyboard matrix looks like.

Given that the Poly 61 has a keyboard matrix like those described in this article:

http://forum.highlyliquid.com/showthread.php?t=1133

...then there is a good chance that the UMR2 will work. If you can measure the matrix signal voltages (is it 5V?) and if you can post a sketch of the keyboard matrix, I can provide more detailed information about how to connect the UMR2. It should be possible to determine arrangement of the keyboard matrix by visual inspection. (Using a continuity tester to follow circuit traces might make things easier.)

Quote

03-04-2013, 03:00 AM   #3

gus ⊙   Join Date: Mar 2013
Junior Member   Posts: 4

Hi john !
here is what information i've found on the internet also take a look at the attachments

i have a cheap multimeter and i hope the mesurements to be correct

 Name: Korg Poly61.jpg Views: 1734 Size: 217.2 KB

here is the keyboard matrix connectors

Name: IMAG0110.jpg Views: 906 Size: 198.2 KB

Taken from MIK Music

Voice assignment/Keyboard scanning

The voice board consists of 6 identically built voices and some control circuitry. The assignment of the voices to the notes being played is done by one of the two microcontrollers on the CPU-board. It is the D8049C-217. This MCU is also used in the MonoPoly and the PolySix. Roughly said, it handles keyboard scanning, CV multiplexing and the arpeggiator. In the "Poly"-mode, the 6 voices are used in a round-robin fashion, meaning that the 6 voices are used in a sequential way, starting at voice 1 (the leftmost voice on the board) and cycling up to voice 6 (the rightmost voice), then restarting at voice 1.

The keyboard scanning is an interesting thing to know when debugging synthesizers. Nearly every synthesizer, which is controlled by a microprocessor, does the same here. On the Poly-61, this job is also accomplished by the assigner MCU and works the following way.

You have 61 keys. But looking at the keyboard, there are just 16 cables. So how does this work? The keyboard is connected to form a matrix of 8 rows and 8 columns. Usually, such a matrix works low-active, which results in the following scanning procedure.

The MCU puts a high signal (5V) on all keyboard rows except for one, which is put to a low signal (0V). Then it reads the 8 columns. The keys, that are pressed, connect the 0V signal to the corresponding column signal. The other columns are pulled to high (5V) via resistors. So the MCU knows, which of the possible 8 keys are pressed. Then it proceeds with the next row, switching the previous row to high and the current one to low. It gets another value of 8 columns corresponding to the key states. So it does with all 8 rows and gets - 64 key states. This are 3 more than needed, but those 3 extra keys are either used for other things like front panel switches or just ignored.

But what happens, if you push 3 keys, say columns 3 and 5 in row 3 and column 3 in row 5. This would create connections between row 3 and 5 via the column line of column 3 and the MCU would see a phantom keypress at column 5 in row 5, besides the fact, that this connection would short-circuit the 0V on row 3 with the 5V on row 5 (or vice versa), which might not be too good for the outputs of the MCU. This is what those 61 diodes on the keyboard PCB are for. They avoid such short circuits by blocking the signal flow between the rows.

With this knowledge, you are now able to debug your keyboard. If you have a problem that exactly every 8th key doesn't work, this could be the result of a broken row or column cable. But in worst case, it could also be a problem around the assigner MCU. The other potential reason for single non-working keys can be the diodes on the keyboard PCB. So you can follow the traces on the PCB for a non-working key and check it's diode.

Thanks in Advance!

Quote

03-05-2013, 10:42 PM

#**4**

gus ○
Junior Member

Join Date: Mar 2013
Posts: 4

📃 **any answer**

any answer?

Quote

03-07-2013, 03:35 PM

#**5**

John ○
Moderator

Join Date: Jan 2009
Posts: 3,007

📃

Hi Gus, based on this description:

Quote:

> Originally Posted by **gus** ⊡
> *The MCU puts a high signal (5V) on all keyboard rows except for one, which is put to a low signal (0V). Then it reads the 8 columns. The keys, that are pressed, connect the 0V signal to the corresponding column signal. The other columns are pulled to high (5V) via resistors. So the MCU knows, which of the possible 8 keys are pressed. Then it proceeds with the next row, switching the previous row to high and the current one to low. It gets another value of 8 columns corresponding to the key states. So it does with all 8 rows and gets - 64 key states. This are 3 more than needed, but those 3 extra keys are either used for other things like front panel switches or just ignored.*

The keyboard is a 8 select x 8 data matrix. The select pulses are at ground potential, so polarity is "active low".

I think the UMR2 would work with this keyboard.

Before you begin the install, be sure to read the UMR2 user manual!

Be sure to connect the matrix polarity jumper as shown here:

Then:

- connect the host's select lines to the UMR2 select terminals (in any order)

- connect the host's data lines to the UMR2 data i/o terminal (in any order)

- connect UMR2 DC IN to the host's 5V supply rail and ground

- wire the MIDI connectors

- complete the setup procedure described in the UMR2 user manual.

Hope this helps. If you try it, please post your results! 🙂

Quote

03-08-2013, 02:39 AM

#**6**

gus ⚪
Junior Member

Join Date: Mar 2013
Posts: 4

Hi John and thank you for the response
before i buy it i have one more question for you
the host select lines is the connector CN 30D ?
the host's data lines is the connector CN 29P ?

Please take a look at the attachment schematics

Thanks in Advance!

Quote

03-09-2013, 06:23 PM

#**7**

John ◯
Moderator

Join Date: Jan 2009
Posts: 3,007

Quote:

> Originally Posted by **gus** ⧉
> *Hi John and thank you for the response*
> *before i buy it i have one more question for you*
> *the host select lines is the connector CN 30D ?*
> *the host's data lines is the connector CN 29P ?*
>
> *Please take a look at the attachment schematics*
>
> *Thanks in Advance!*

EDIT: Based on Ralf's report below, I got it wrong in this post. Please read the entire thread.

It appears to me that CN 29P (P10-P17) are select lines.

and that CN 30D (D0-D7) are the data lines.

You can see the pull-up resistors on the data lines near the large IC marked 8049.

If you have any doubts, it would be wise to check everything first using a scope.

Last edited by John; 07-02-2014 at 06:34 PM. Reason: Flagging my error.

Quote

04-15-2014, 06:48 AM

#**8**

campbell ○
Member

Join Date: Oct 2009
Posts: 33

I just bought a Poly 61 and I'm curious if anyone has successfully installed the UMR2

Quote

06-12-2014, 01:35 AM

#**9**

Ralf ○
Junior Member

Join Date: Jun 2014
Posts: 1

I got it working in my Poly 61 without problems. Just install everything according to the description here, except for the data and select lines. They are the other way round than in Johns suggestion. CN29P are data and CN30D are select lines. This is how it worked for me.

Quote

06-13-2014, 05:30 PM

#**10**

John ○
Moderator

Join Date: Jan 2009
Posts: 3,007

Quote:

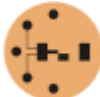Originally Posted by **Ralf** ⇒
I got it working in my Poly 61 without problems. Just install everything according to the description here, except for the data

and select lines. They are the other way round than in Johns suggestion. CN29P are data and CN30D are select lines. This is how it worked for me.

Ralf, welcome to the forum and thank you for reporting your results!

Quote

07-02-2014, 05:18 PM   #11

emerse ○   Join Date: Jul 2014
Junior Member   Posts: 5

Hey guys,

Thanks for all the information thus far 🙂

I have just spent the day installing the UMR2 into my Poly61 carefully following the instructions above.

I have selected Active Low-Select Polarity and connected the data & select lines as described earlier in the tread.

However after successfully completing the setup procedure I am unable to trigger my Poly 61 using a midi controller. The weird thing is that the LED on the UMR2 is flashing red as if it is receiving some information when pressing keys on the midi controller.

During the setup procedure, all went okay however after sending the single midi note from another midi keyboard and then continuing on to individually pressing every key on the host keyboard from left to right. There is no red LED lighting up after every key press?

I can still play the Poly 61 as normal so the keys are working. One thing I should also mention is I'm currently powering the UMR2 using 3 AAA batteries because I'm not sure where I can find the 5V & ground on this circuit. Any suggestions would be greatly appreciated.

Hopefully someone can shed some light on this situation, I feel as though I very close, one minor tweak and it should start working 🙂

Cheers,
Jay

Last edited by emerse; 07-05-2014 at 03:08 PM. Reason: Spelling errors

Quote

07-02-2014, 06:44 PM   #**12**

John ⚪
Moderator

Join Date: Jan 2009
Posts: 3,007

Hi Jay, welcome to the forum.

Did you see Ralf's note a few posts up from here? If the select/data lines are reversed, it would explain the trouble with the setup procedure and with triggering notes via MIDI.

Also, the best way to find the 5V rail is to use a multimeter. The 5V and ground traces on the host's PCB will tend to be wider than other traces.

> Quote:
>
> Originally Posted by **emerse** ▶
> *Hey guys,*
>
> *Thanks for all the information thus far* 🙂

I have just spent the day installing the UMR2 into my Poly61 carefully following the instructions above.

I have selected Active Low-Select Polarity and connected the lines as described earlier in the tread.

However I after completing the setup procedure I am unable to trigger my Poly 61 using a midi controller. The weird thing is that the LED on the UMR2 is flashing lightly red as if it is receiving some information when pressing keys on the midi controller.

I followed the setup procedure, all went okay however after sending the single midi note from another midi keyboard and then continuing to individually press every key on the host keyboard from left to right. There is no red LED lighting up after every key press?

I can still play the Poly 61 as normal so the keys are working. One thing I should also mention is I'm currently powering the UMR2 using 3 AAA batteries because I'm not sure where I can find the 5V & ground on this circuit. Any suggestions would be greatly appreciated.

Hopefully someone can shed some light on this situation, I feel as though I very close, one minor tweak and it should start working 🙂

Cheers,
Jay

Quote

☐ 07-03-2014, 01:22 AM   #**13**

emerse ⚪   Join Date: Jul 2014
Junior Member   Posts: 5

📄

Hi John,

Thanks for your reply but I just double checked my connection using a continuity test on my multimeter.

CN29P is connected to Data IN/OUT

CN30D is connected to Select IN

Any further troubleshooting advise would be greatly appreciated.

Cheers,
Jay

Quote

07-03-2014, 04:28 PM

#14

John
Moderator

Join Date: Jan 2009
Posts: 3,007

Quote:

Originally Posted by **emerse**
Hi John,

Thanks for your reply but I just double checked my connection using a continuity test on my multimeter.

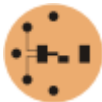*CN29P is connected to Data IN/OUT*

CN30D is connected to Select IN

Any further troubleshooting advise would be greatly appreciated.

Cheers,
Jay

Hi Jay,

It just occurred to me that since you are using a battery for power, the UMR2 ground is not tied to the ground of the host keyboard. That would definitely cause trouble.

Did you identify ground on the host PCB and connect it to UMR2 ground?

Quote

07-05-2014, 08:09 AM   #**15**

emerse ○   Join Date: Jul 2014
Junior Member   Posts: 5

Hi John,

All good, its working perfectly after connecting the UMR2 to the Ground & 5 V rails (I just had to have a closer look for them).

However 2 keys on my Poly 61 are dead so all the notes are out of order after teaching the UMR2 the matrix. I've just recently cleaned to contacts so I'm going to have to attempt to short them.

I read that you suggested this in another thread, would you be able to give me me some more details with how this is done.

Thanks in advance,

Jay

Quote

07-05-2014, 12:20 PM

#**16**

emerse ○
Junior Member

Join Date: Jul 2014
Posts: 5

Hi again John,

I managed to fix the keyboard contacts on the Poly 61 however now I have encountered another issue related to the UMR2.

When teaching the UMR2 the matrix, the red ACT LED lights up successfully before going back to green flashing LED after pressing each key on the Poly 61.

And the rest of the setup process goes as expected, however when playing back the notes on the midi controller the last octave doesn't work as expected; a couple consecutive keys do not trigger notes on the poly 61, ie there is gap of midi notes that dont trigger notes on the poly 61, then there is a couple more notes that work & another gap..

Hope that makes sense. Any suggestions would be greatly appreciated!

Cheers,
Jay

Quote

07-05-2014, 01:53 PM

#**17**

John ○
Moderator

Join Date: Jan 2009
Posts: 3,007

Quote:

> Originally Posted by **emerse** ⊡
> *Hi again John,*
>
> *I managed to fix the keyboard contacts on the Poly 61 however now I have encountered another issue related to the UMR2.*
>
> *When teaching the UMR2 the matrix, the red ACT LED lights up successfully before going back to green flashing LED after pressing each key on the Poly 61.*
>
> *And the rest of the setup process goes as expected, however when playing back the notes on the midi controller the last octave doesn't work as expected; a couple consecutive keys do not trigger notes on the poly 61, ie there is gap of midi notes that dont trigger notes on the poly 61, then there is a couple more notes that work & another gap..*
>
> *Hope that makes sense. Any suggestions would be greatly appreciated!*
>
> *Cheers,*
> *Jay*

Hi Jay,

It sound like maybe there might be a bad connection on one or more of the select lines. How many consecutive keys don't work? Is is the same number as the number of data lines in the matrix? You might try double-checking each of the connections.

Quote

07-05-2014, 02:58 PM

#**18**

emerse ◯
Junior Member

Hi John,

I did a thorough continuity test on both the select and data lines from the Korg Poly 61 CPU board to the UMR2. All connection it appear fine and buzzing out.

As for the notes that don't work. All notes work in the first 4 octaves, however in the last octave the following results were recorded.

1. C (Octave 5) - WORKING
2. C# (Octave 5) - WORKING
3. D (Octave 5) - WORKING
4. D# (Octave 5) - WORKING
5. E (Octave 5) - NOT WORKING
6. F (Octave 5) - NOT WORKING
7. F# (Octave 5) - NOT WORKING
8. G (Octave 5) - NOT WORKING
9. G# (Octave 5) - NOT WORKING
10. A (Octave 5) - NOT WORKING
11. A# (Octave 5) - NOT WORKING
12. B (Octave 5) - NOT WORKING
13. C (Octave 5) - NOT WORKING

Then bizarrely notes A# (Octave 5) & B (Octave 5) are triggered in the following octave on the midi controller on notes F & F#.

Hope this makes sense to you, I'm fairly puzzled. I've also retried the setup procedure which goes as expected.

Thanks again for your help.

Cheers,
Jay

Quote

07-08-2014, 07:42 PM

#19

John ○
Moderator

Join Date: Jan 2009
Posts: 3,007

Quote:

> Originally Posted by **emerse** >
> *Hi John,*
>
> *I did a thorough continuity test on both the select and data lines from the Korg Poly 61 CPU board to the UMR2. All connection it appear fine and buzzing out.*
>
> *As for the notes that don't work. All notes work in the first 4 octaves, however in the last octave the following results were recorded.*
>
> *1. C (Octave 5) - WORKING*
> *2. C# (Octave 5) - WORKING*
> *3. D (Octave 5) - WORKING*
> *4. D# (Octave 5) - WORKING*
> *5. E (Octave 5) - NOT WORKING*
> *6. F (Octave 5) - NOT WORKING*
> *7. F# (Octave 5) - NOT WORKING*
> *8. G (Octave 5) - NOT WORKING*

9. G# (Octave 5) - NOT WORKING
10. A (Octave 5) - NOT WORKING
11. A# (Octave 5) - NOT WORKING
12. B (Octave 5) - NOT WORKING
13. C (Octave 5) - NOT WORKING

Then bizarrely notes A# (Octave 5) & B (Octave 5) are triggered in the following octave on the midi controller on notes F & F#.

Hope this makes sense to you, I'm fairly puzzled. I've also retried the setup procedure which goes as expected.

Thanks again for your help.

Cheers,
Jay

You can try reordering the connections between the UMR2 and the keyboard, to see if that makes any difference. (Always repeat the setup procedure after any changes.)

The data lines must always be connected to the UMR2 data terminals, and the select lines to the UMR2 select terminals, but within those restrictions, any ordering should work.

Quote

10-18-2014, 06:47 AM   #**20**

campbell ○   Join Date: Oct 2009
Member   Posts: 33

I installed the UMR2 in my Poly 61 and it works perfectly.

I was curious if there might be a way to trigger the Arp using the UMR2 that's already installed in my unit. It just needs a switch trigger. My hope would be to use a midi note (that is beyond the Poly 61's range) to trigger the Arp. Any thoughts?

Quote

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