

## OSA-Link Cable Clone

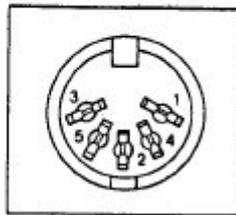
The Scisys Leonardo and Saitek Galileo and Renaissance chess computers could be connected to a PC via an OSA-Link cable. Such a cable is needed to run the OSA-4-Arena software and other tools. Unfortunately that cable is no longer available.

### OSA-cable information

It was connected to a special serial interface with TTL level (0-5V) under the board as 5-pin-connector:

#### A. Leonardo OSA-LINK pin assignment

Connector : 5 pin DIN type



Terminal No.	Signal	Name
1	TxD	Data from Leonardo
2	GND	Ground
3	RxD	Data to Leonardo
4	V+	From adapter 9V/50mA max. unregulated
5	+5V	5V/50mA max. regulated

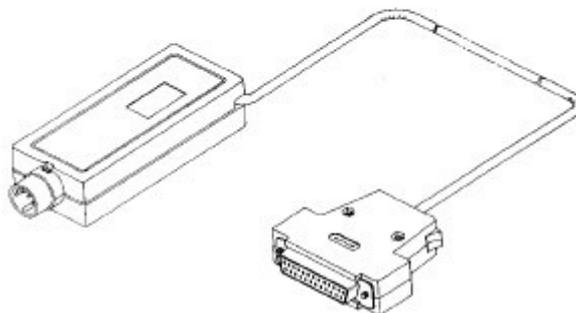
**Note:** Signal levels are 0-5V (TTL levels). Direct connection to RS-232C voltage levels will damage the circuit.

Several versions of communication cables were available for different computers, like the IBM PC:

#### **Adapter III**

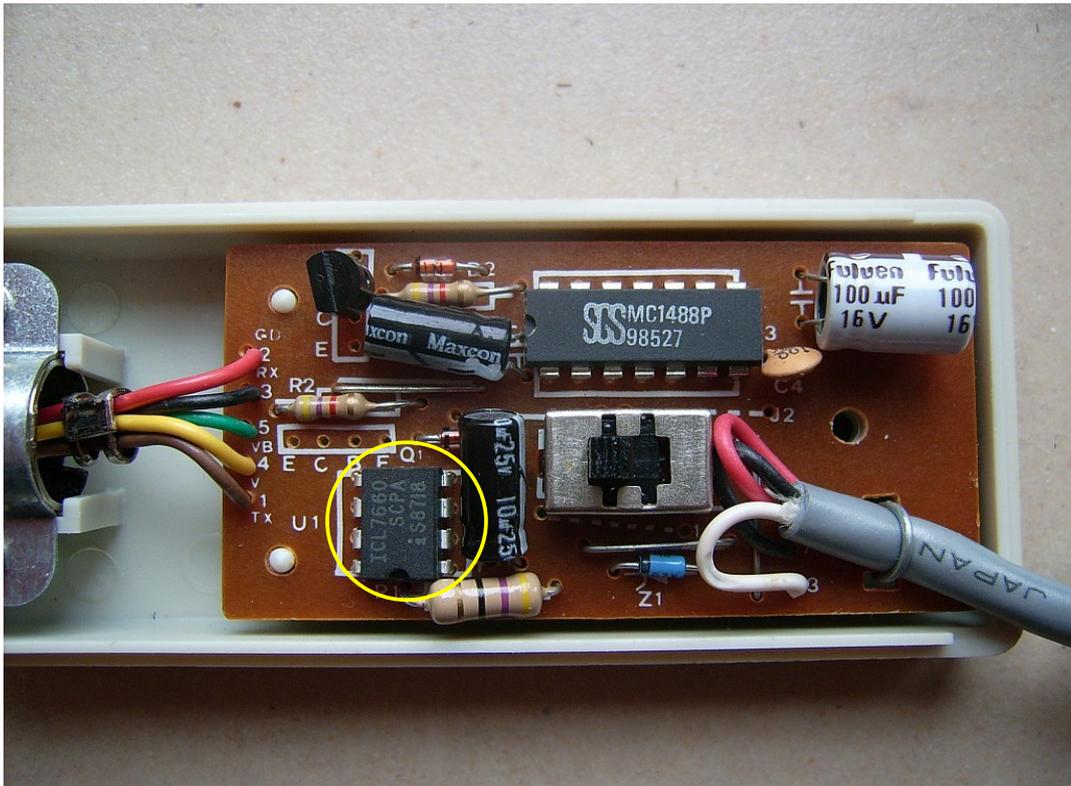
Art. No. 593

Directly usable with **IBM** PC series and compatibles, and **Amstrad/Schneider CPC** series.

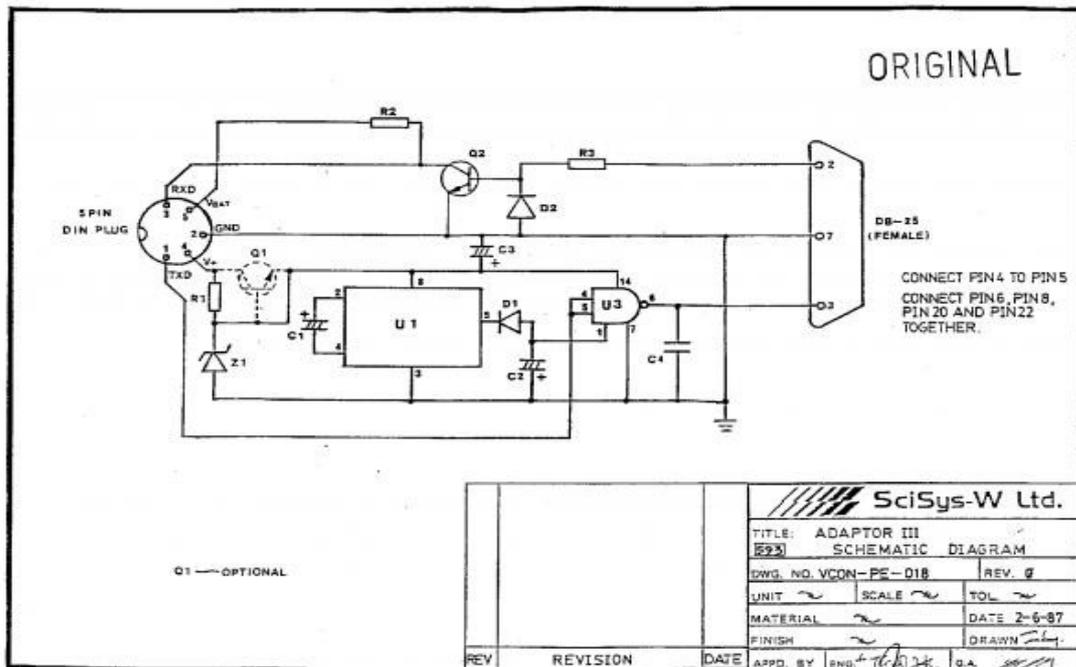


Special information can be found in the manual 'Connection Cable for Leonardo Chess Computer', published from Saitek in 1987. It is available as download at [www.zanchetta.net/echecs](http://www.zanchetta.net/echecs), look under Documentations and Saitek. The pictures above are taken from this specification.

The PC side of the cable has a RS232 ( $\pm 12V$ ) serial interface. A small box between the interfaces contains a TTL-RS232 converter.



On the PC side (right) only GNG, RxD and TxD are connected. The OSA interface (left) has GND, RxD, TxD, 5V (regulated) and 9V (unregulated). Both voltages are needed by the TTL-RS232 converter MC1488P. The IC on the left (yellow circle) is a regulator for the 9V from the OSA interface. The next picture shows the original circuit diagram.



## Possible replacements

It is relative easy to re-assemble an OSA-cable. You will need a modern IC for the TTL-RS232 conversion and two cables, one with a 5-pin-DIN male jack and the other with a 9-pin female RS232 socket.

As IC you can take the well known MAX 232 or an ADM232L. Both ICs need only 5V to operate, so the 9V from the board is not needed and will make the work easier.

The next pictures show the principle circuits for both ICs.

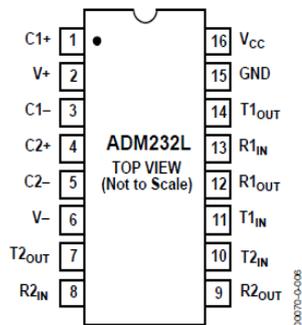
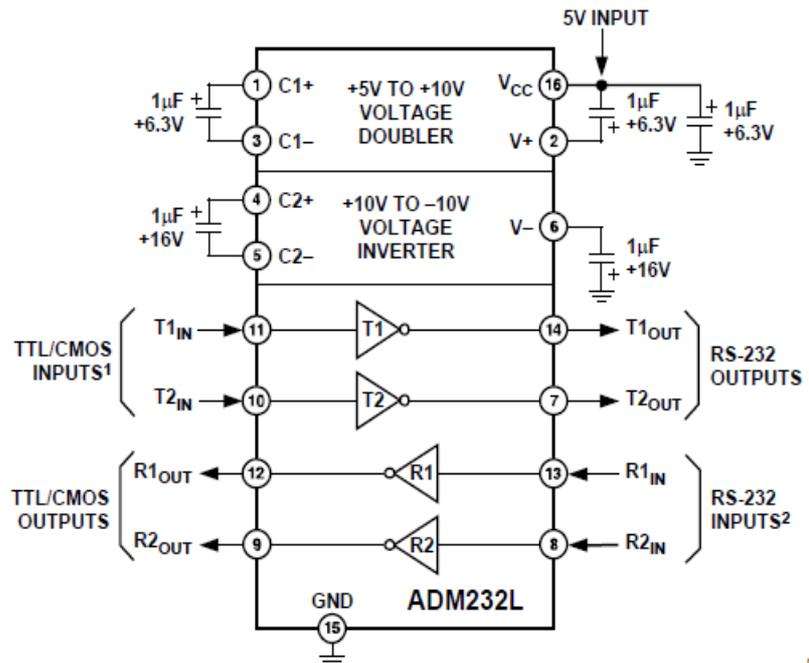


Figure 4. ADM232L PDIP/CERDIP/SOIC Pin Configur

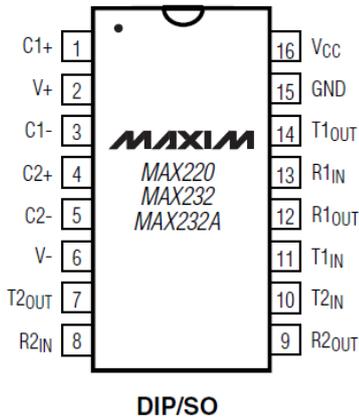


<sup>1</sup>INTERNAL 400kΩ PULL-UP RESISTOR ON EACH TTL/CMOS INPUT.  
<sup>2</sup>INTERNAL 5kΩ PULL-DOWN RESISTOR ON EACH RS-232 INPUT.

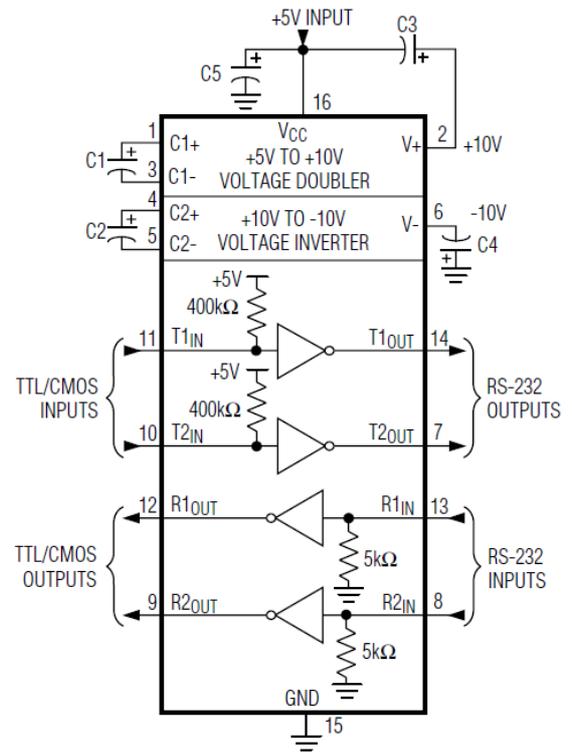
Figure 18. ADM232L Typical Operating Circuit

For the ADM232L you will need 5 condensers with 1  $\mu$ F each, that's all. The IC has two communication lines (T1/R1 and T2/R2), for OSA only one will be used.

TOP VIEW



CAPACITANCE ( $\mu\text{F}$ )					
DEVICE	C1	C2	C3	C4	C5
MAX220	0.047	0.33	0.33	0.33	0.33
MAX232	1.0	1.0	1.0	1.0	1.0
MAX232A	0.1	0.1	0.1	0.1	0.1

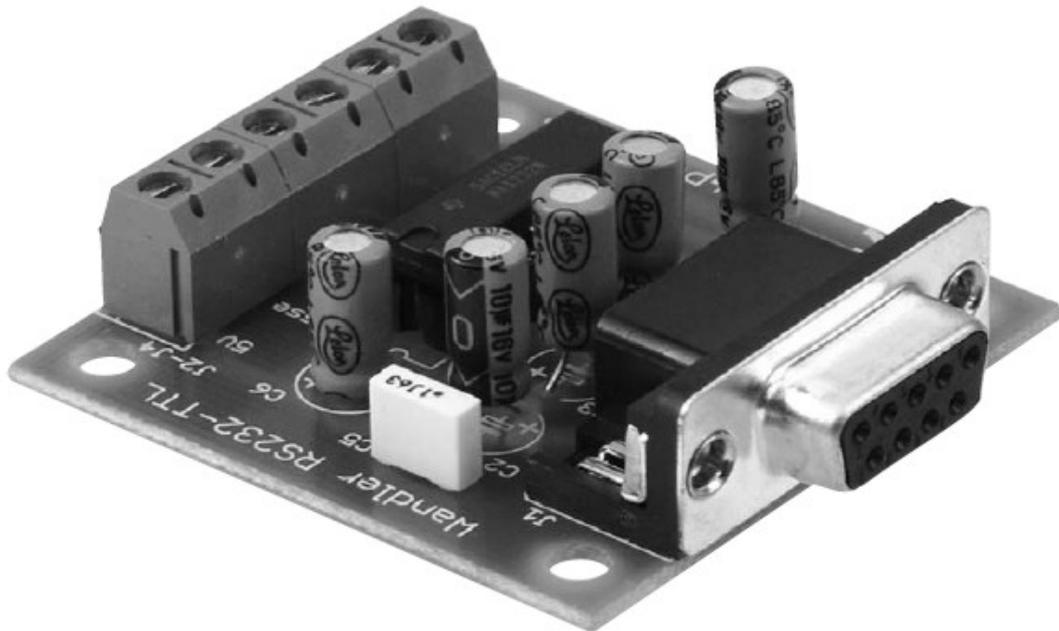


The MAX232 is very similar.

You can choose any of these ICs and assemble your own circuit, but it will be much easier to buy a ready-to-go assembly kit. A fellow at [www.schachcomputer.info](http://www.schachcomputer.info) found a very nice kit at [www.pollin.de](http://www.pollin.de), a german electronic distributor. It is still possible to order the kit from foreign countries.

### TTL-RS232 adapter from Pollin

The german company Pollin offers a complete assembly kit for the TT-RS232 conversion. It is small, easy to build and cheap.



You can order via internet at [www.pollin.de](http://www.pollin.de):

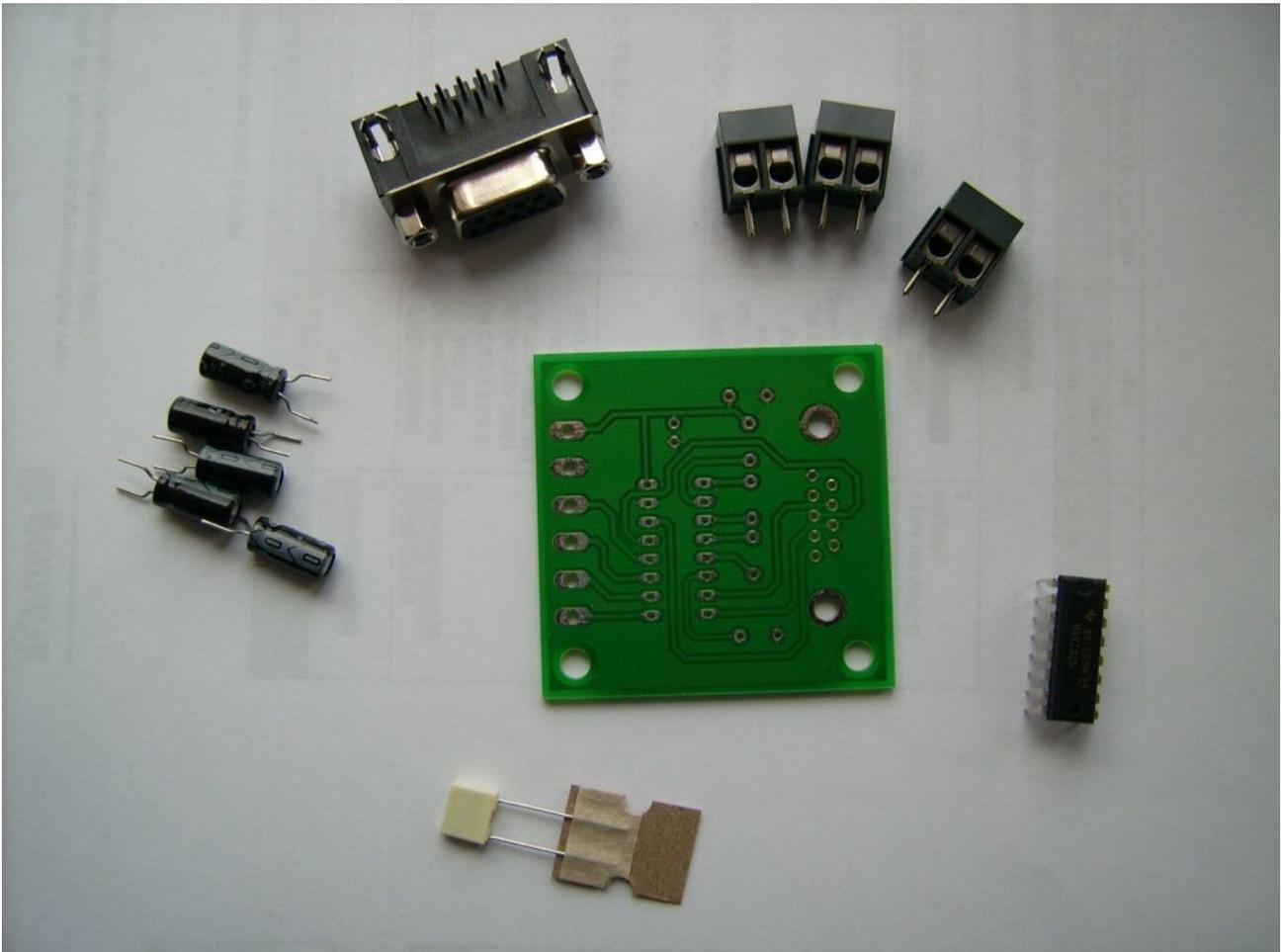
Order-No.	Article	Price EUR
810036	Bausatz RS232-TTL-Wandler	3,95
720738	Sub-D-Verlängerungskabel, 9-pol., 1,8m	1,25
560172	Audiokabel, 2x DIN-Stecker 5-pol., 1,5m	1,95

The Sub-D cable is for the connection from the adapter to the PCs serial interface and optional, if you don't have one. If your PC or Laptop does not have a serial interface, you can use an USB-to-RS232-adapter (not available at Pollin).

The 5-pol.-DIN cable is for the connection to your chess computer. One of the plugs will be cut off and the single cables will be plugged into the clamp of the Pollin adapter.

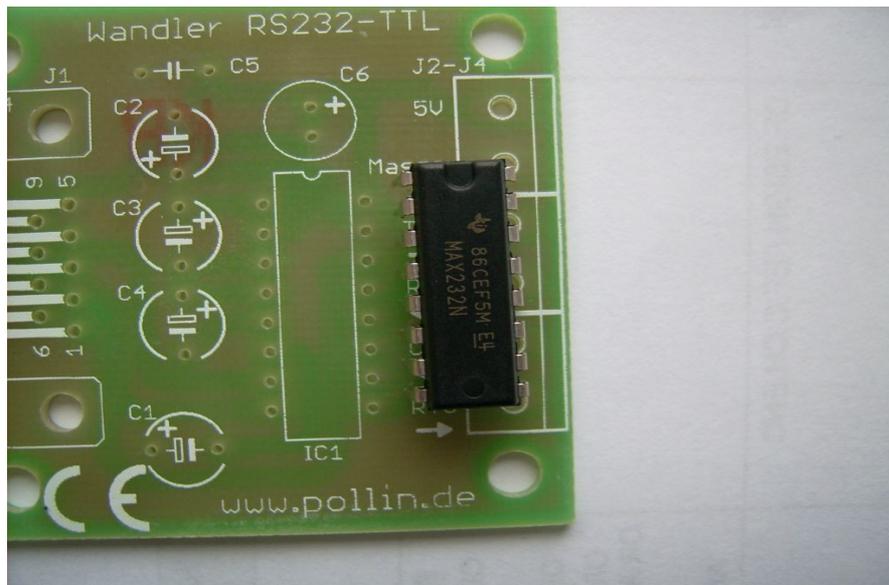
## Buildup

You will get the following parts from pollin for the TTL-RS232 adapter:



The connectors for the TTL-cable and the RS232 jack are self-descriptive. At the bottom of the picture you see a condenser of 100 nF (C5), the fitting direction doesn't matter.

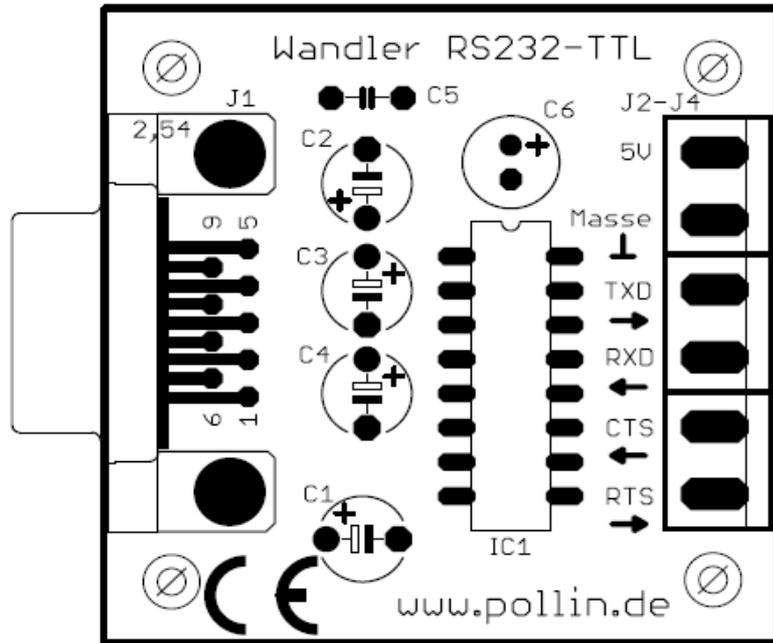
The IC (MAX232) should be fit with the notch at one end into the corresponding place on the circuit board:



The condensers on the left with  $10\ \mu\text{F}$  have a plus/minus orientation. It is important to fit them in the right orientation to the circuit. Plus is marked on the board with a + and minus with a bold-white line (see C1 to C4). The condensers are marked with a coloured line and the number 0 in it for the minus pole.

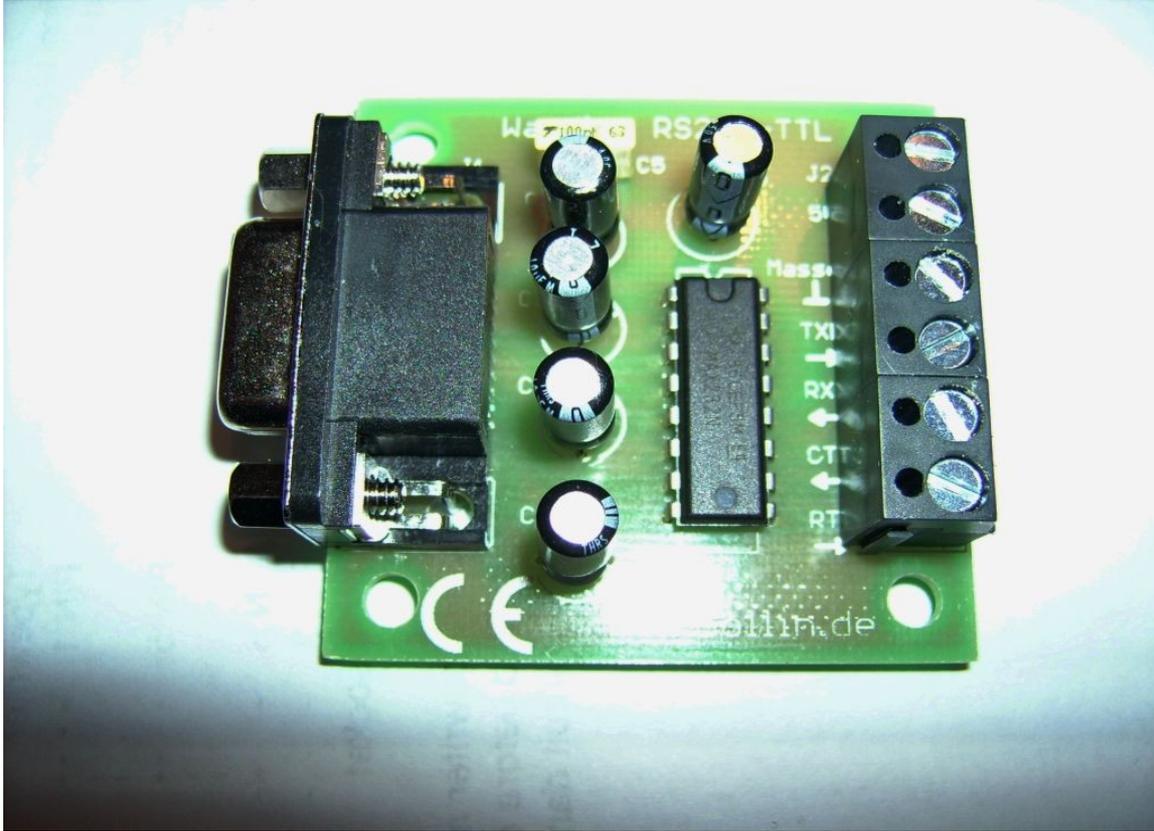


The next picture shows the printout of the circuit board with the position of all parts.



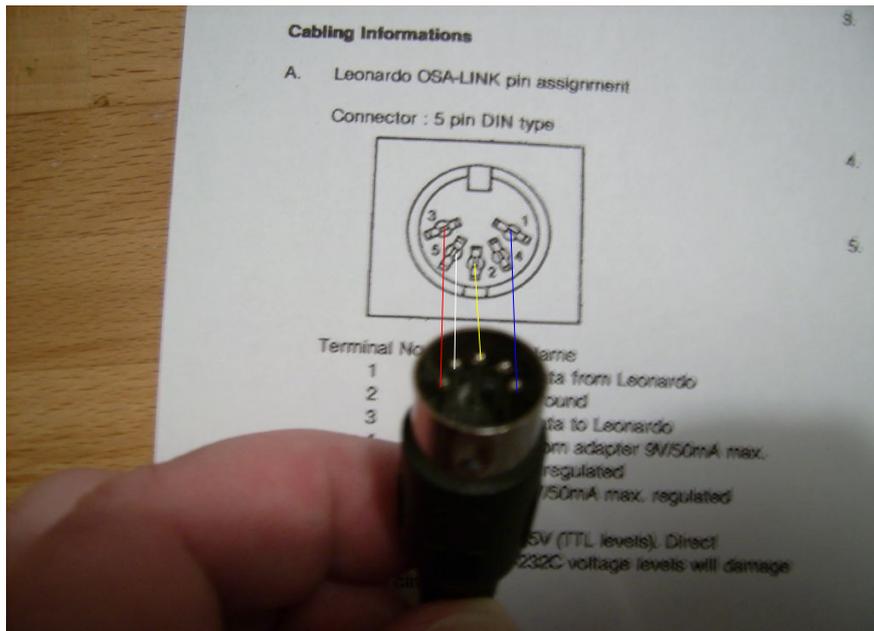
RS232-TTL-Wandler-Bausatz

After assembling the circuit and careful soldering of all contacts the item should look as follows:

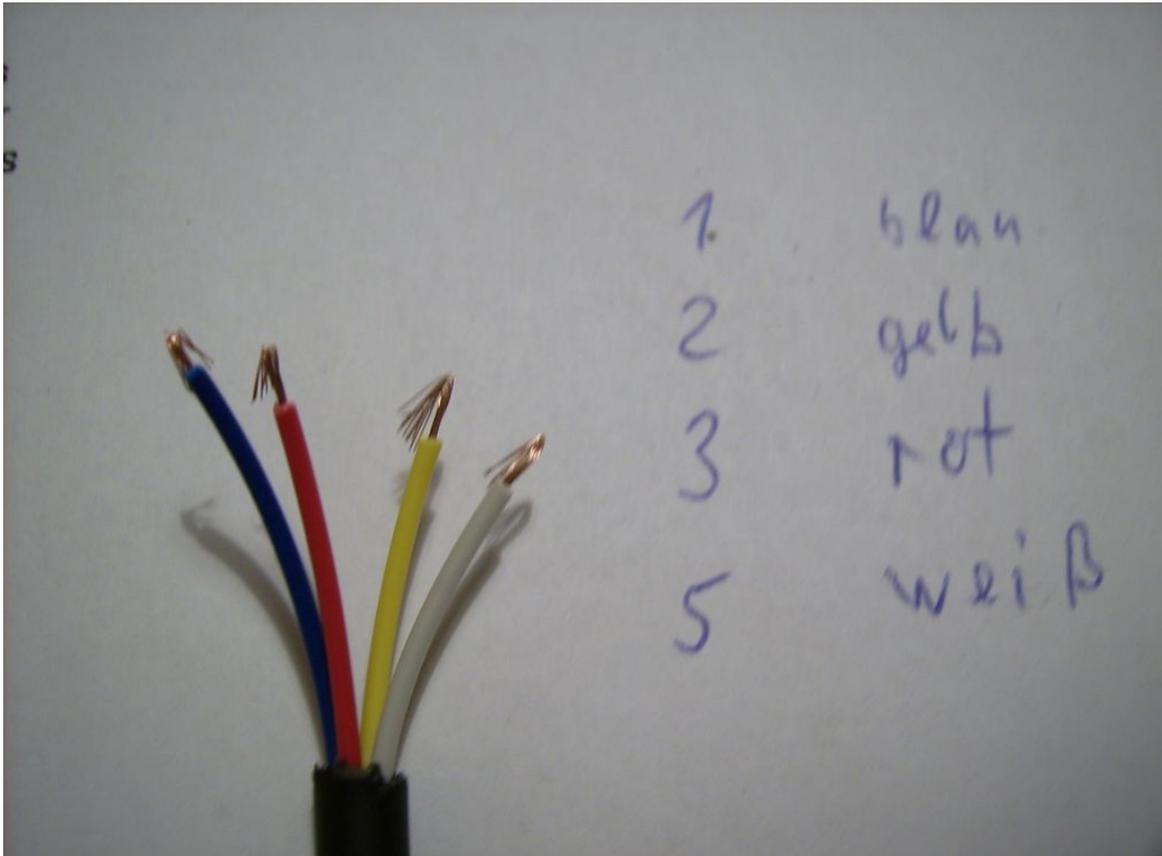


The PC side is now still ready and you can connect a 9-pol-Sub-D cable to the left. For the chess board side only the above four connections are needed (5V, GNG/Masse, TxD, RxD).

Take the 5-pol-DIN cable, cut off one plug and strip the wires. Then check which wire (different colour) is connected with what pin at the DIN-plug. Check that the plug is in the correct orientation with the OSA-plug layout.



Use a measurement device to find out the cable connection and write it down.



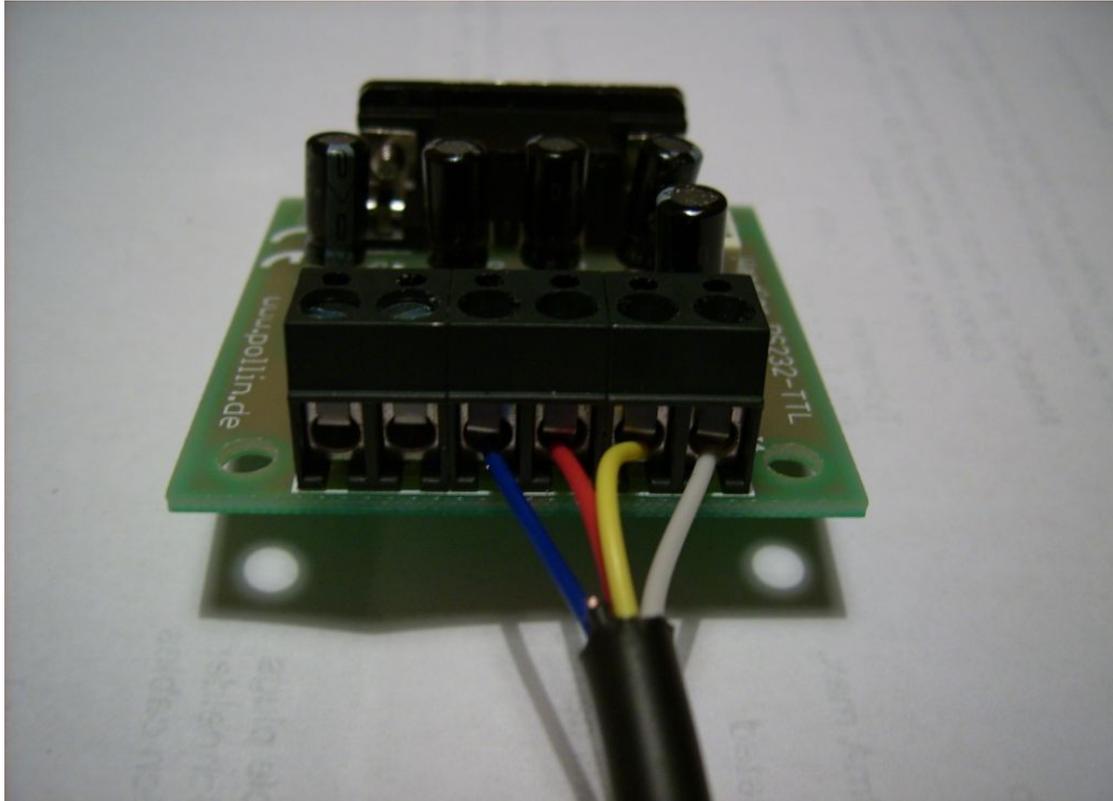
The 5-pol-DIN cable from Pollin has the following connections:

PIN-No.	Description	Colour
1	TxD	blue
2	GND	yellow
3	RxD	red
5	5V	white

The wire to pin 4 is not used and can be cut off. The colours may vary from manufacturer to manufacturer, even if you buy it from the same vendor. So please check the cable connections carefully!

To fit the wired into the plugs of the circuit board it is a good idea to fold the ends. This will give a more stable connection in the screwed plugs. Do not tin-plate the wires with solder, just use the copper wires as they are.

Now you can fit the wires into the plugs of the circuit board.



Fit 5V (white) into the right plug and GND (yellow) in the second plug. RxD (red) shall be fit into the TxD-plug and TxD (blue) shall be fit into the 4<sup>th</sup> plug (RxD) of the circuit board.

That's all, now you have your own OSA-Link cable and can use all of the available software for your chess computer. Have fun!

**Note:**

All informations are provides 'as is' and there are no guarantees for the hardware. I'm not responsible for any damage that may occur, using such a cable is at your own risk.