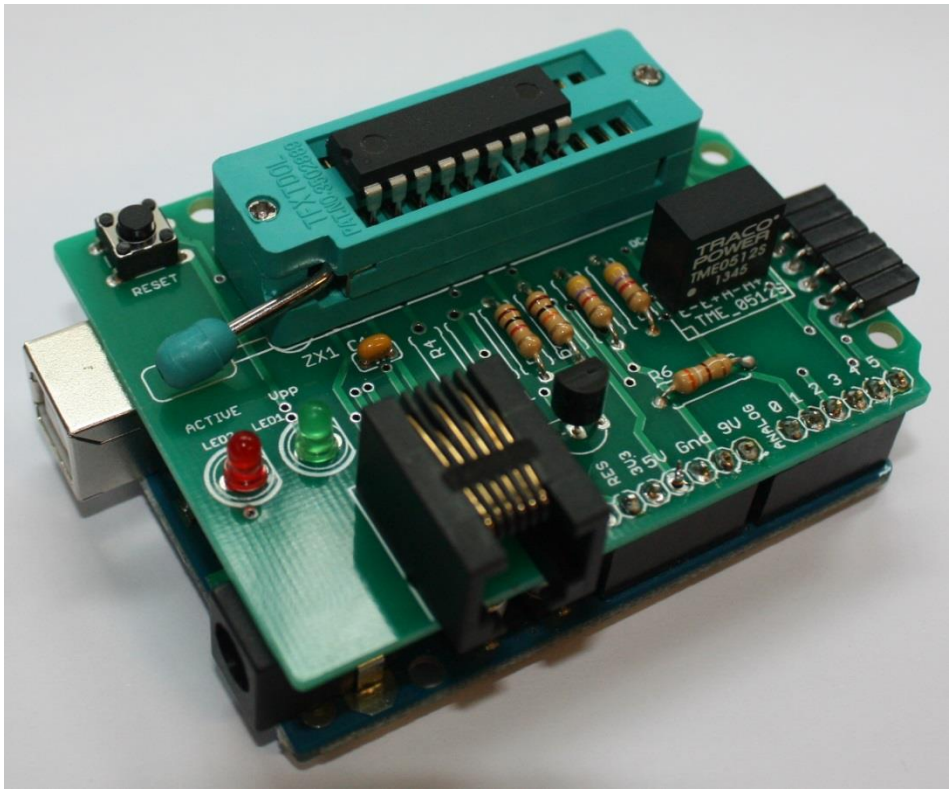

ArdPicProg

Arduino PIC Programmer

Construction Manual

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Helpful Hints

Before you begin with the construction of your ArdPicProg, it is recommended that you first read these instructions completely. Then you will know what matters and will be able to avoid mistakes which will be hard to fix afterwards.

A basic understanding of electronic parts and their handling, soldering and about the Arduino are required for the construction and the commissioning of the ArdPicProg.

Conduct the soldering and the wiring in an orderly and conscientious manner; don't use acidic solder of any kind. Make sure that there are no cold solder joints. Keep these things in mind, because an unclean or bad joint, a defective contact or a bad construction cause a time-consuming search for faults and could possibly cause a destruction of the components.

The possibility that something won't work after the assembly, can be drastically diminished by working conscientiously and orderly. Check every step before continuing. Follow the instructions! Only do the things written in the manual and do not skip any steps! Check every step twice: once for building and once to check.

Please take the time it needs to build this kit. Tinkering is not task work and should be enjoyable!

Room for your notes:

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Contents of the Kit and Tools needed

The kit in front of you contains all the necessary components needed to build an ArdPicProg. Please verify the completeness with the help of the attached checklist.

Checklist: ArdPicProgrammer

Quantity	Resistors*	Description	√
1	10k, 0,25W	R1	☐
1	1k, 0,25W	R2	☐
2	4k7, 0,25W	R5,R7	☐
1	390R, 0,25W	R6	☐
	*R3 and R4 are not included.		
	Capacitors		
1	100n	C1	☐
	Semiconductors		
1	BC548C	Q1	☐
1	LED 3mm green	LED1	☐
1	LED 3mm red	LED2	☐
	Other		
2	Pin Header 6 pol.	J3, ANALOG	☐
2	Pin Header 8 pol.	J1, POWER	☐
1	RJ-12 Socket	J7	☐
1	Female Header 6 pol. gew. (2x3pol)	J8	☐
1	DC-DC-CONVERTER TME_0512S	TME_0512S	☐

Checklist: ArdPicProgrammer (continued)

Quantity		Description	√
1	RESET-Button	RESET	
1	ZIF socket 18-24 pins	ZX1	
1	Circuit Board		

You also need the following tools:

1. Electronic Soldering Iron
2. Electronic Solder
3. Side cutters to shorten the component connections

Additionally, to commission your programmer you will need:

1. Arduino with a programming sketch (Downloadable online)
2. Computer with application software (Downloadable online)

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Construction

In order to simplify construction this manual is split into two major parts:

1. Populating of the components on or under the circuit board
2. Commissioning and function test

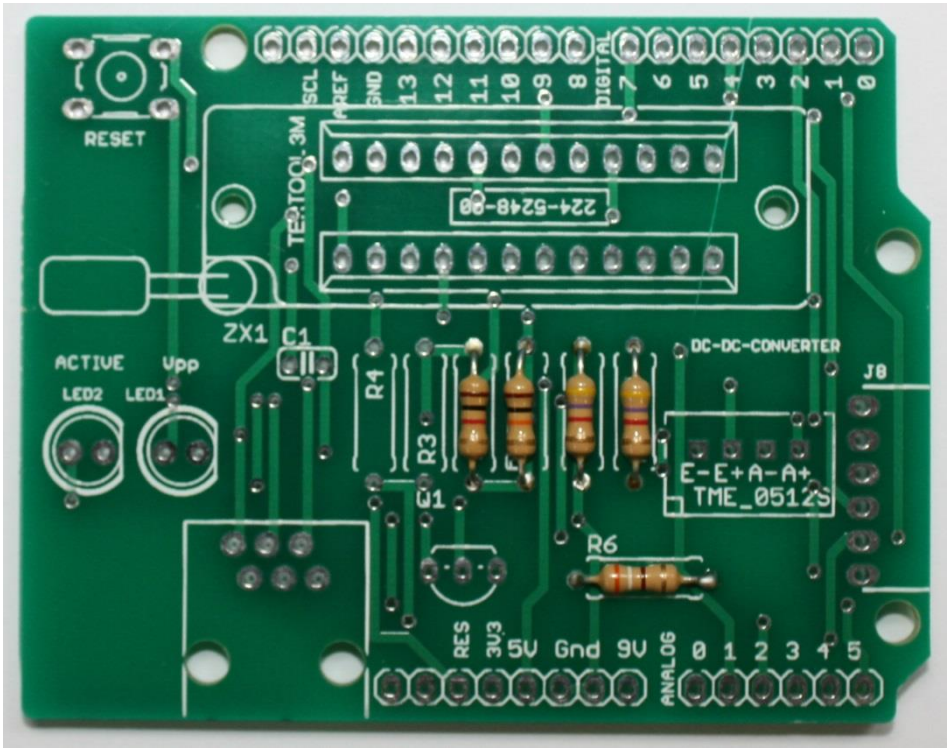
The following paragraphs will describe how to populate the components on the circuit board. First, all the components on the top of the circuit board will be equipped. The silk print on the circuit board will support this process

The order of the placement of the components depends on their height; generally the lower pieces will be placed first. Afterwards, connect headers, which connect your programmer to your Arduino are placed on the underside of the circuit board and then soldered from above.

Step 1: Equipping of Resistors R1, R2 and R5 – R7

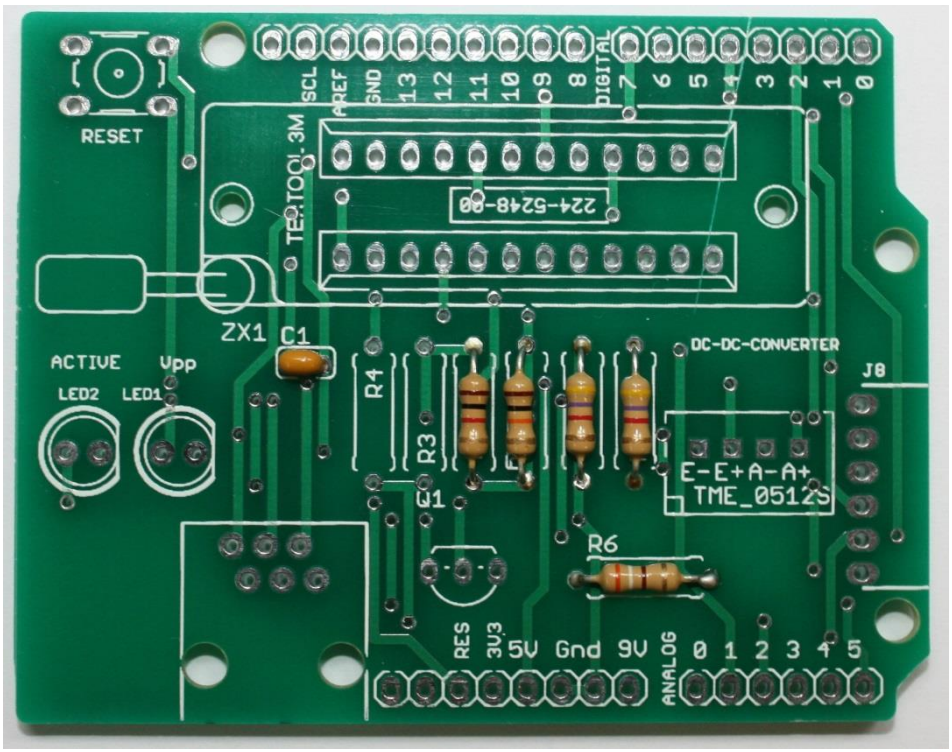
The resistors R1, R2 and R5 – R7 will be equipped first. In order to do this, bend the connecting wires at a 90 ° angle based on the grid dimensions and then place them in the designated holes (refer to the enclosed graphics) Please pay close attention to the color coding of the resistors.

To ensure that none of the parts of the circuit board fall off, bend the connecting wires at a roughly 45 ° angle apart and the solder them carefully with the conducting paths on the back of the circuit board. Afterwards cut off the excess wire.



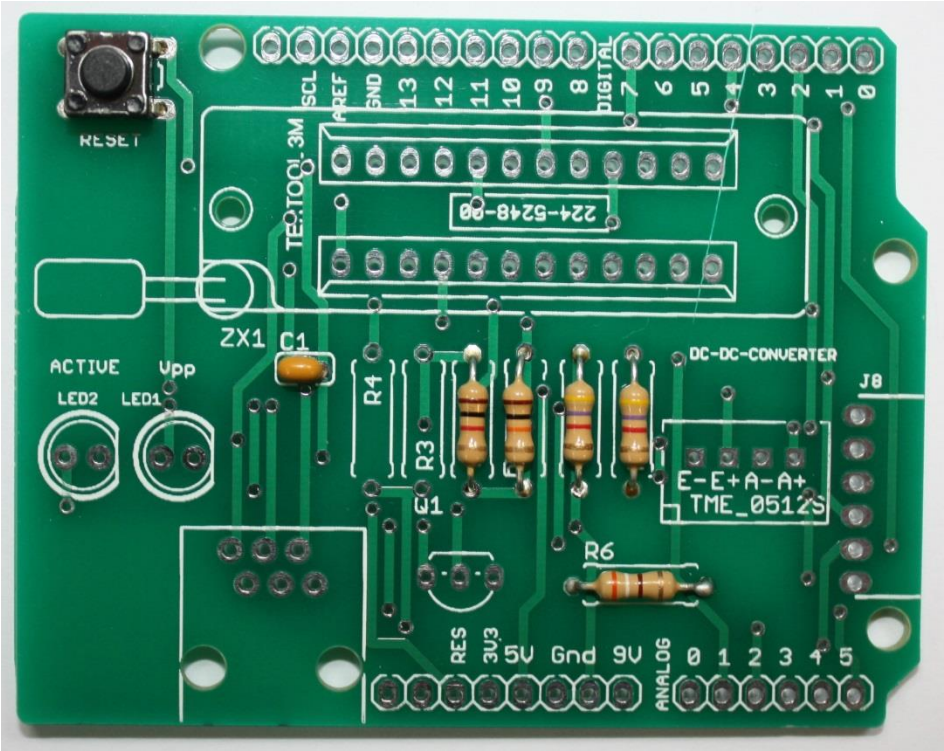
Step 2: Equipping of the Capacitor C1

Now, the Capacitor C1 will be inserted followed by a mild angling of the connection wires in order to prevent the pieces falling out. In this case, we are working with a non-polarized ceramic capacitor, therefore the alignment is irrelevant



Step 3: Equipment of the Reset Button

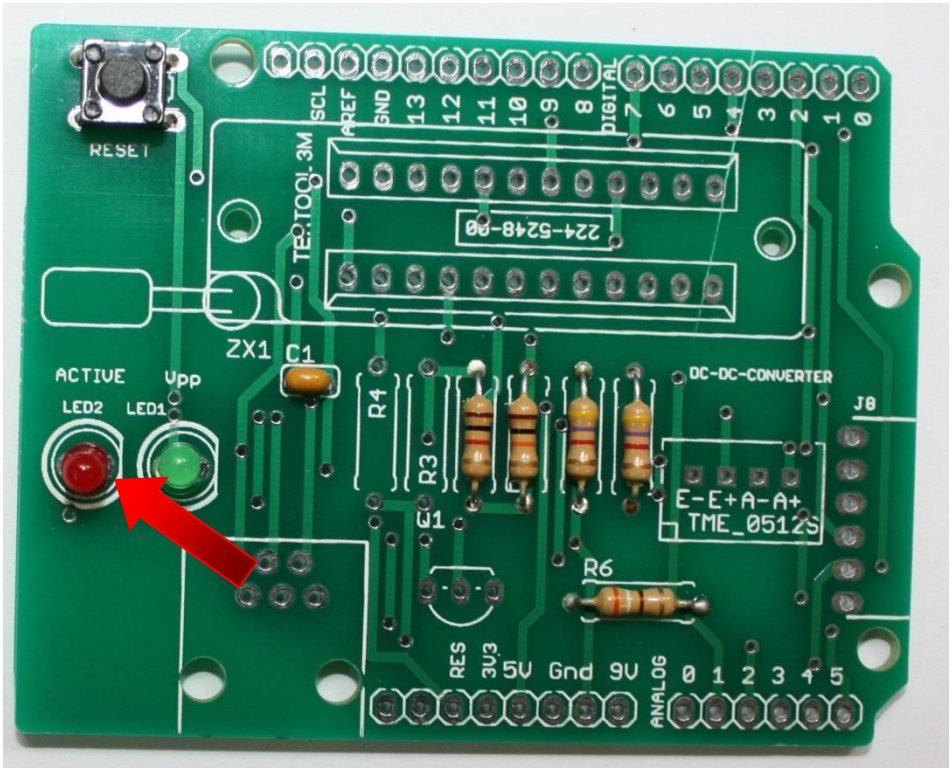
The following steps include the insertion and soldering of the Reset Button. The position of the hole only permits one mounting direction, which guarantees a correct alignment.



Step 4: Equipment of the LEDs

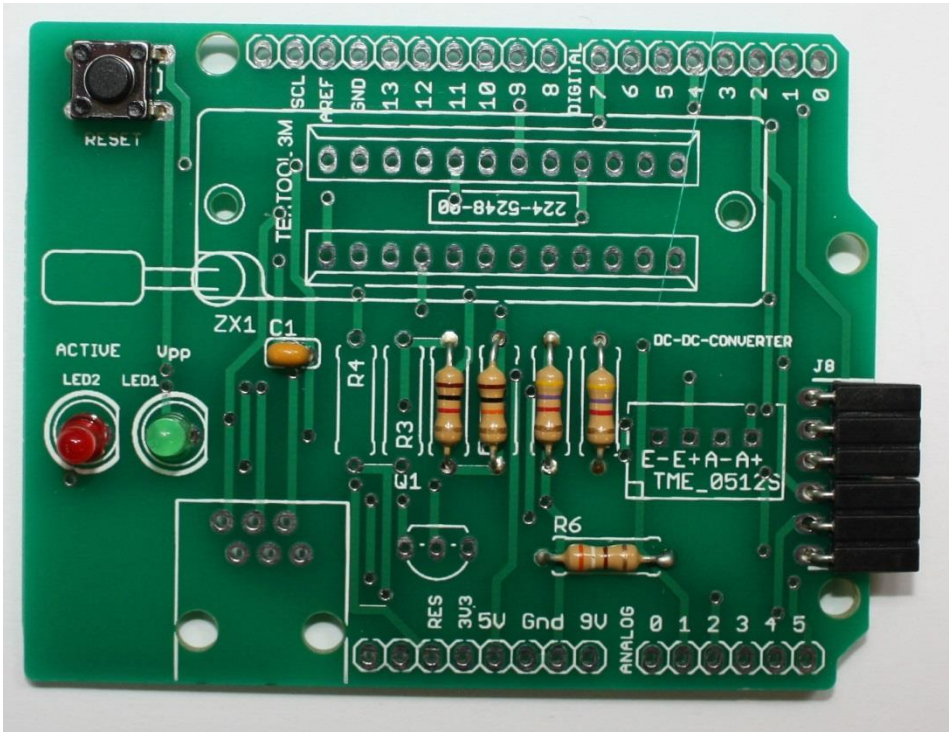
LEDs are polarized components. Therefore please pay close attention to the alignment when doing this step. The casing of the LED is flattened on one side (as indicated on the following image by the red arrow). Also, to support a correct placement, the LED pins feature a different length; the pin on the flattened side is shorter.

Place the LEDs in the respective positions. The LEDs are placed directly on the pcb. After you put the LEDs into the board, flip it over and bend the leads outwards so they will stay in place while you solder them. After you solder the leads, clip them close to the board.



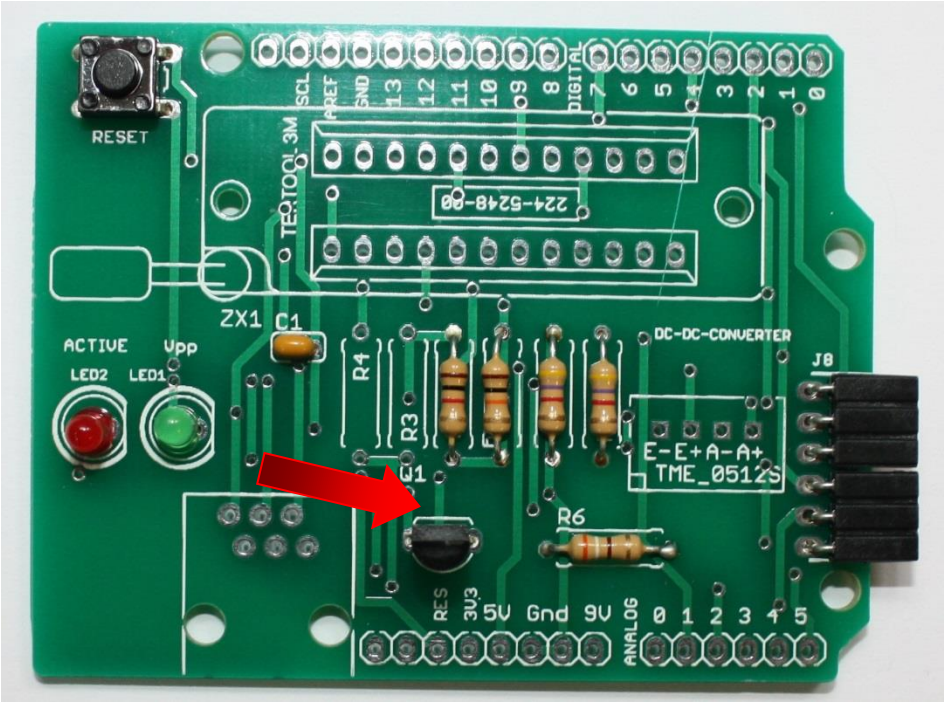
Step 5: Equipment of JP8 (angled female connector)

The six pin female connector JP8 is comprised of two three pin connectors. Please make sure that both connectors are aligned properly in order to warrant a stable and reliable connection while operating the programmer.



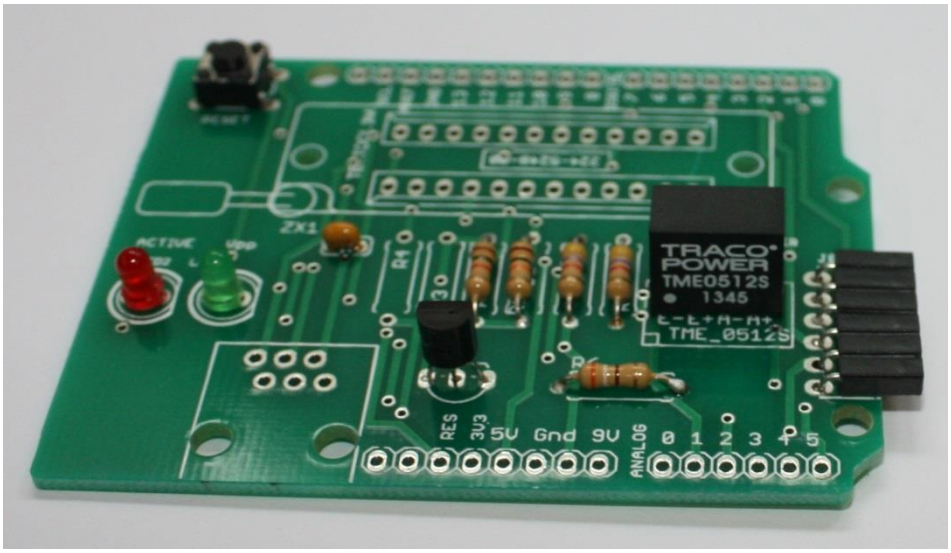
Step 6: Equipment of the transistor Q1

A transistor is again a polarized component and you would have to make sure again that the placement of the transistor exactly matches the print on the circuit board.



Step 7: Equipment of the DC-DC-converter

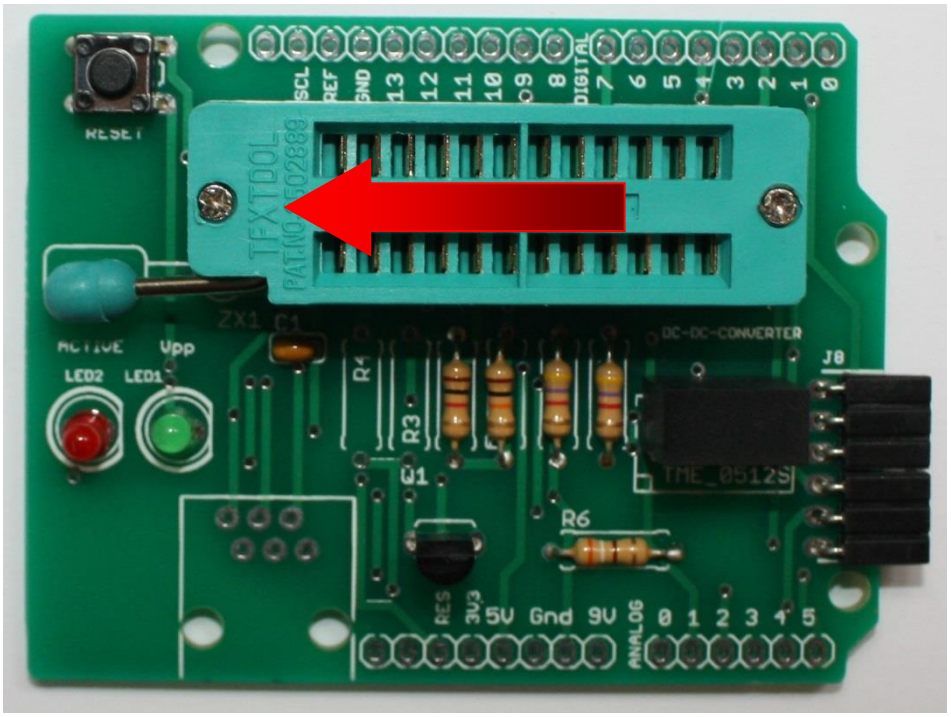
In this step you would place and solder the DC-DC converter. Since this component is polarized again you have to make sure to position the converter correctly.



Step 8: Equipment of the ZIF socket

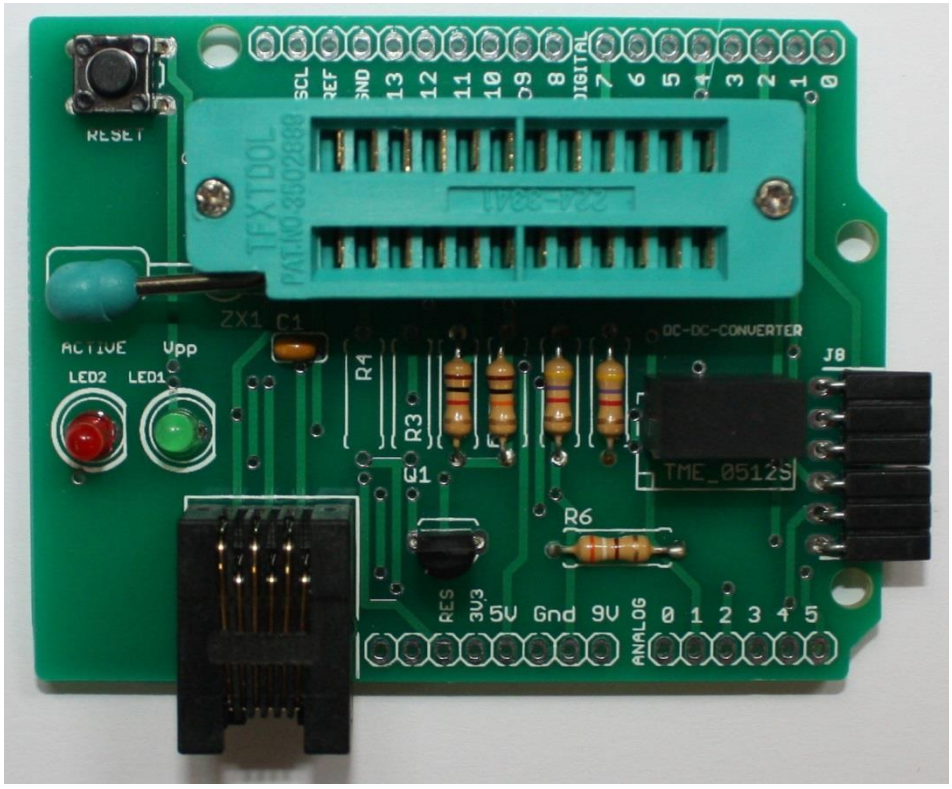
Place the ZIF socket in the position indicated on the top of the circuit board. Once again, verify the positioning. If your kit's ZIF socket would feature less than 24 pins (which does not affect the programmer's feature set), then move the socket all the way to the left as shown in the following image meaning that the rightmost holes remain unused.

To avoid the socket from falling out of ist position when turning the board slightly bend the two outer diagonal pins and then go ahead and solder all the other pins.



Step 9: Equipment of the RJ12 connector

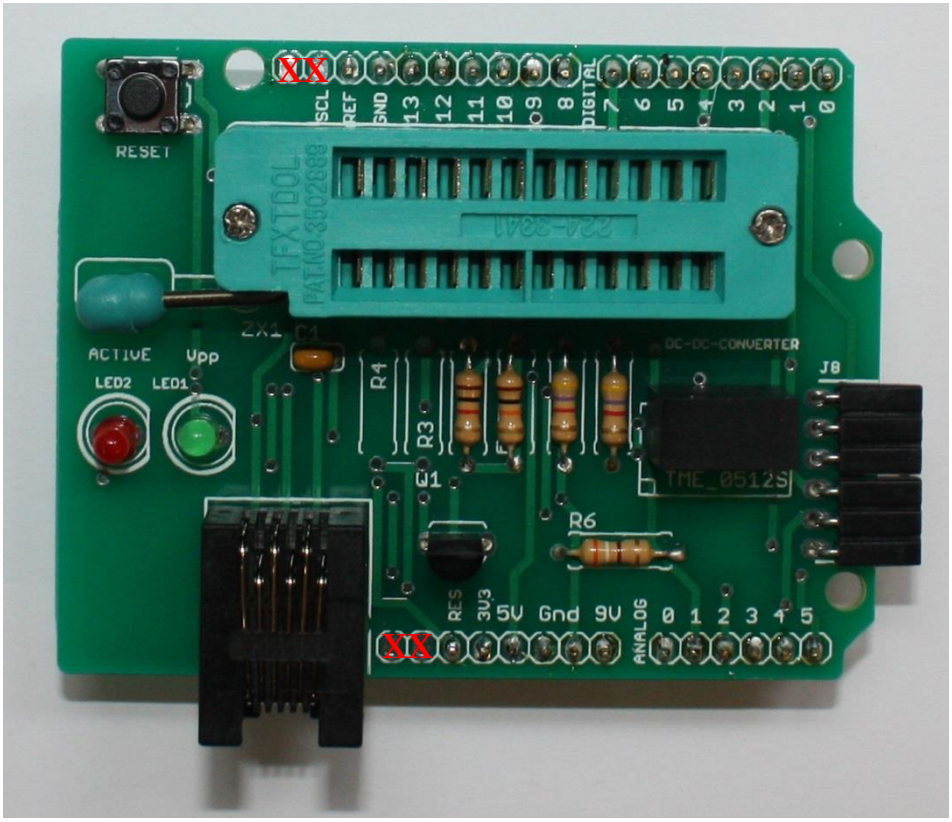
The only remaining component equipped from the top side is the RJ12 connector.



Step 10: Equipment of the headers (for connecting to the Arduino)

Finally the headers for connecting to the Arduino are equipped. Please refer to the following image: on the bottom side of the circuit board the two six pin connectors are placed and soldered, on the top side the two eight pin connectors are assembled. Please note the positioning by looking at the solder joints in the image – additionally, free holes are marked with an „**X**“.

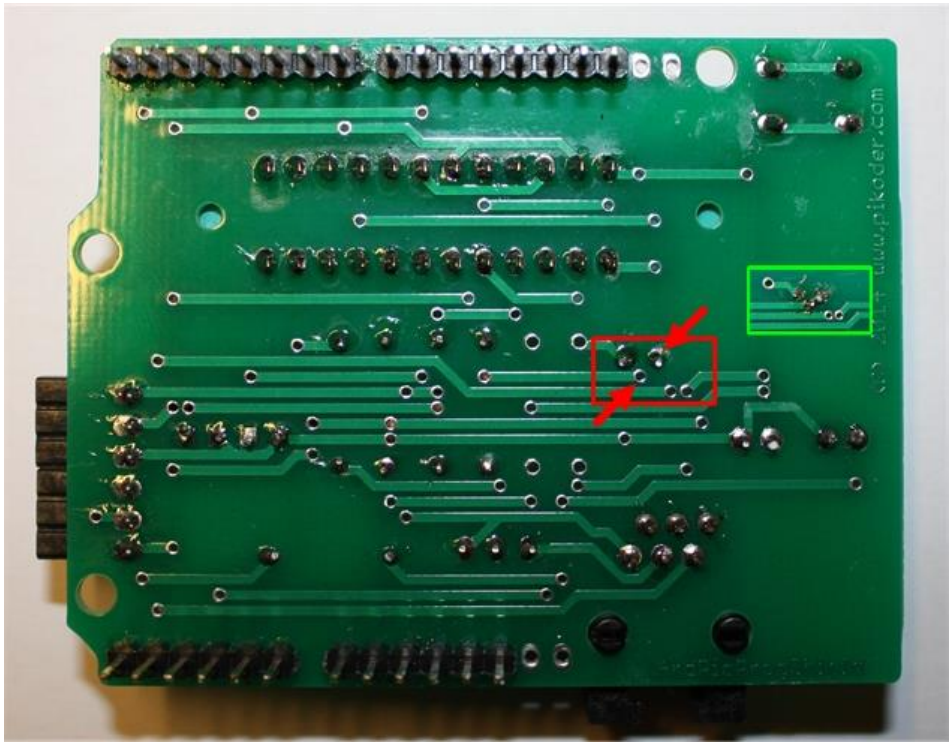
To improve and simplify mechanical alignment you may plug the connectors into an Arduino (with no power attached). Then stack the programmer pcb on top and solder the pins. In this setup the Arduino acts as a mechanical template for the required alignment. However, some level of professional soldering is required to avoid exercising to much heat stress on you Arduino.



Step 11: Solder joint

Unfortunately, on required connection is missing on the circuit board. Since the programmer requires this connection to fully function, you would have to place a solder joint on the circuit board.

The following image indicates which points have to be connected (marked with red arrows). The connection itself can be created by adding some excess solder as shown in the image with the green frame. As an alternative you could use a short piece of wire.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Commissioning

The commissioning of the programmer is described in the ArdPicProg User Guide. This document can be downloaded under http://www.pikoder.de/download/ArdPicProg User Guide.pdf.

Room for your notes:

A

ArdPicProg pinning

Room for your notes:

B

ArdPicProg schematics