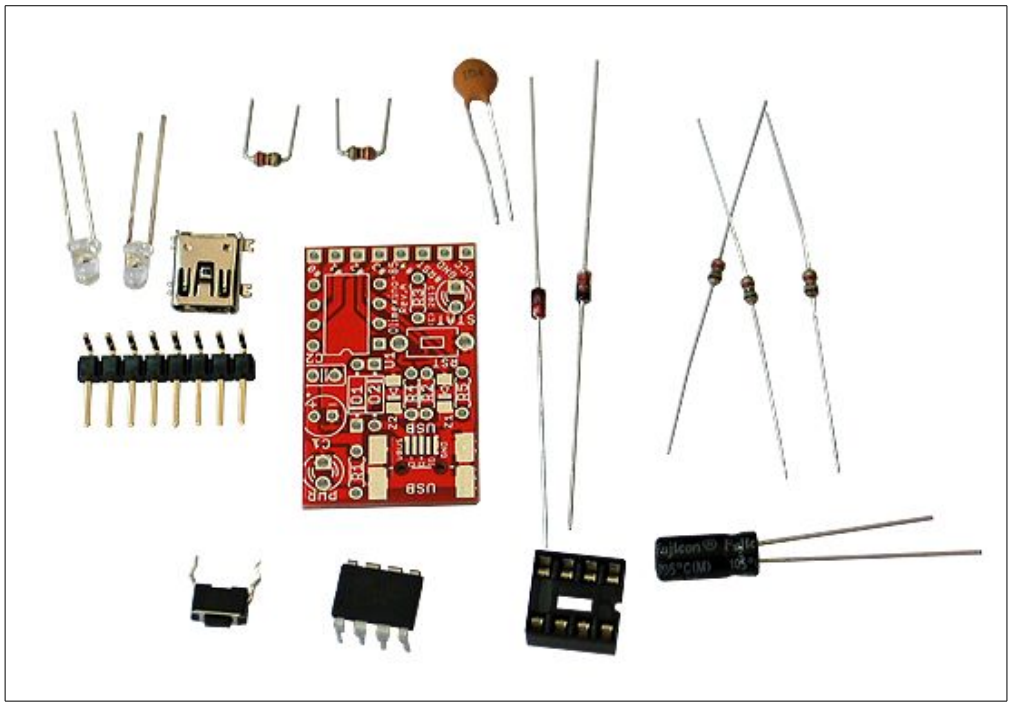

OLIMEXINO-85-KIT

Assembly guide

Revision A, October 2013
Designed by OLIMEX Ltd, 2013

lead-free

All boards produced by Olimex LTD are ROHS compliant

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It is possible that the pictures in this manual differ from the latest revision of the board.

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THERE IS NO WARRANTY FOR THE DESIGN MATERIALS AND THE COMPONENTS USED TO CREATE OLIMEXINO-85. THEY ARE CONSIDERED SUITABLE ONLY FOR OLIMEXINO-85.

THE DESIGN OF OLIMEXINO-85 IS BASED HEAVILY ON THE LITTLE WIRE'S DESIGN BY IHSAN KEHRIBAR AND USES DIGISTUMP'S DIGISPARK SOFTWARE. OLIMEXINO-85 WOULD NOT HAVE BEEN POSSIBLE WITHOUT THE EXISTENCE OF BOTH LITTLE WIRE AND DIGISPARK PROJECTS.

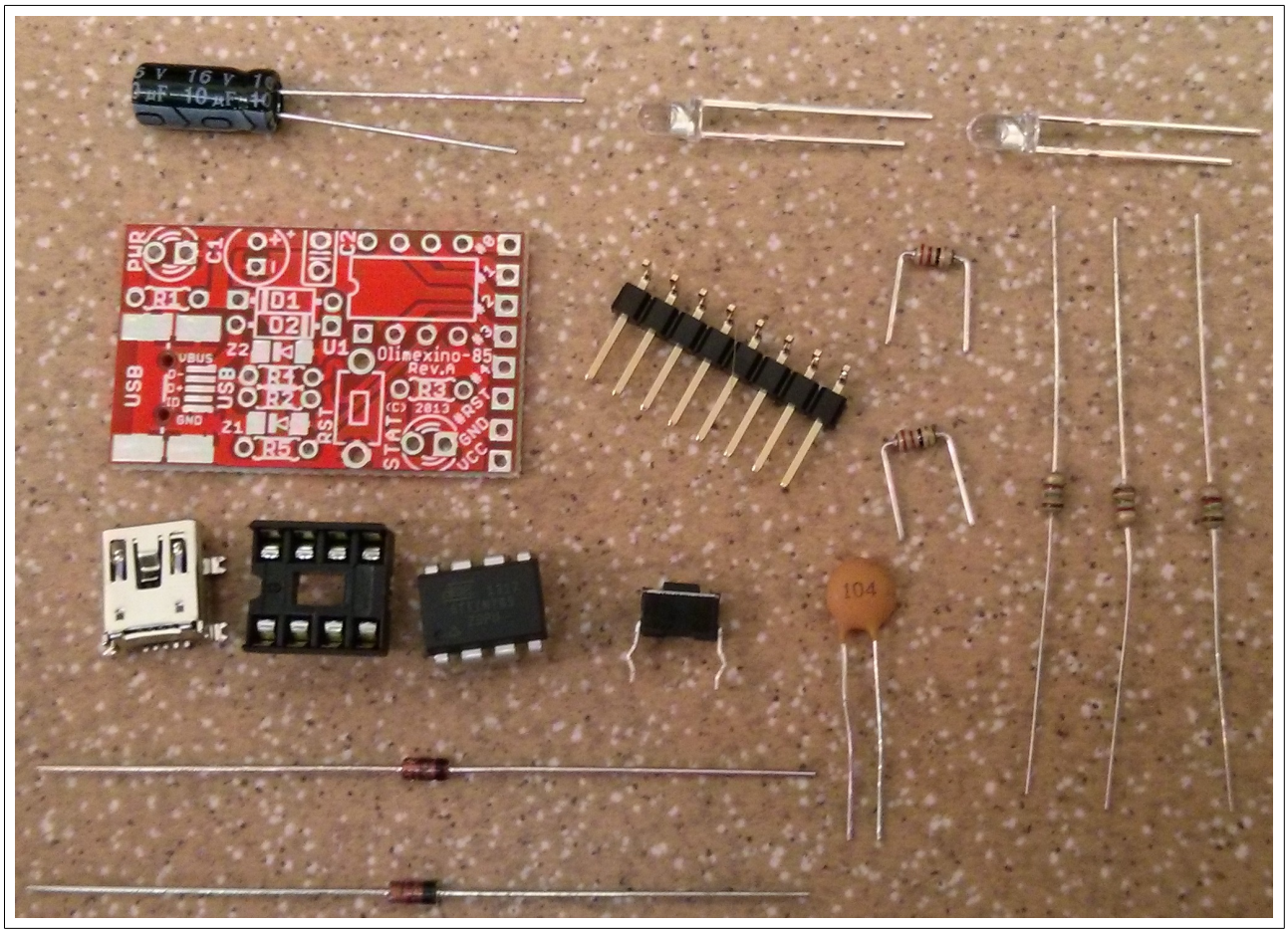
Chapter 1. Introduction

Congratulations on buying OLIMEXINO-85-KIT! We hope you will enjoy soldering the OLIMEXINO-85!

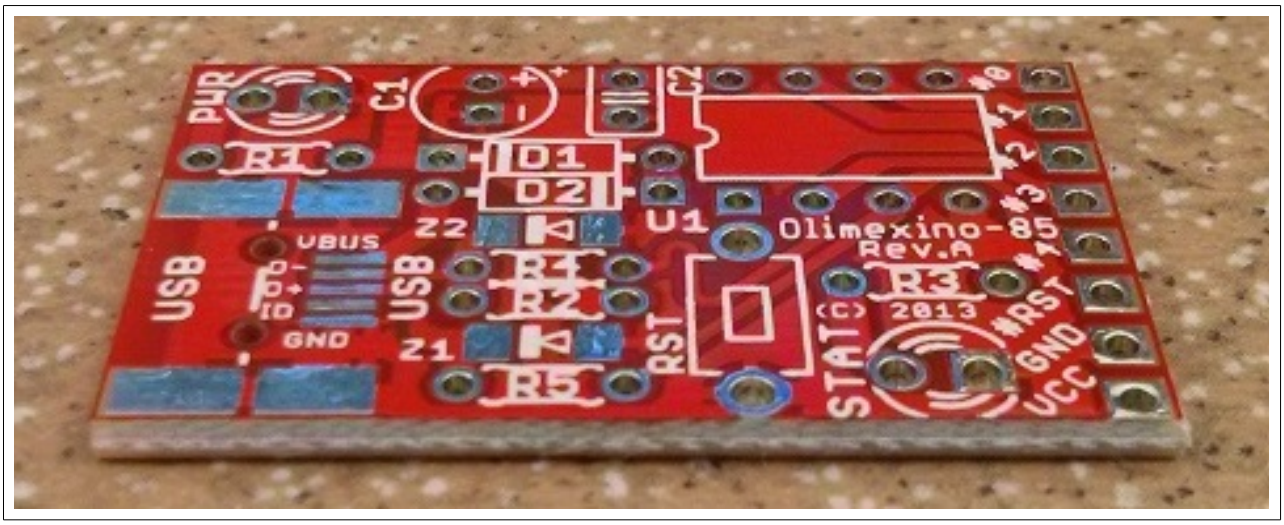
If you are completely inexperienced in soldering you might want to check a guide or two on soldering for beginners. There are also a great number of how-to videos available online that might give you some insights on the whole process.

We also sell the already assembled board – the name of the product is OLIMEXINO-85-ASM! Visit our web-site - https://www.olimex.com for more information.

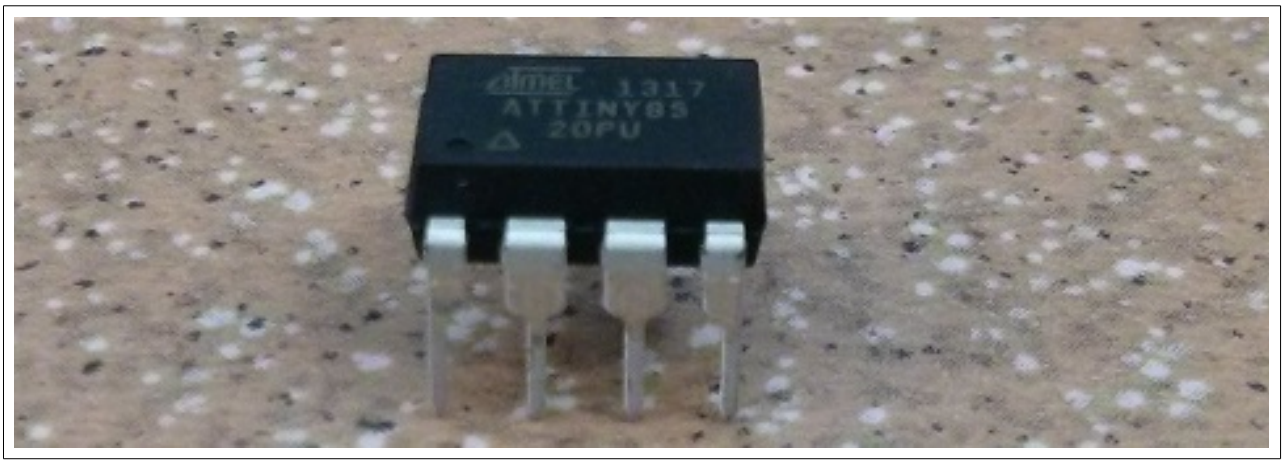
Before you begin, check that your kit has all these items:



1x OLIMEXINO-85 board:

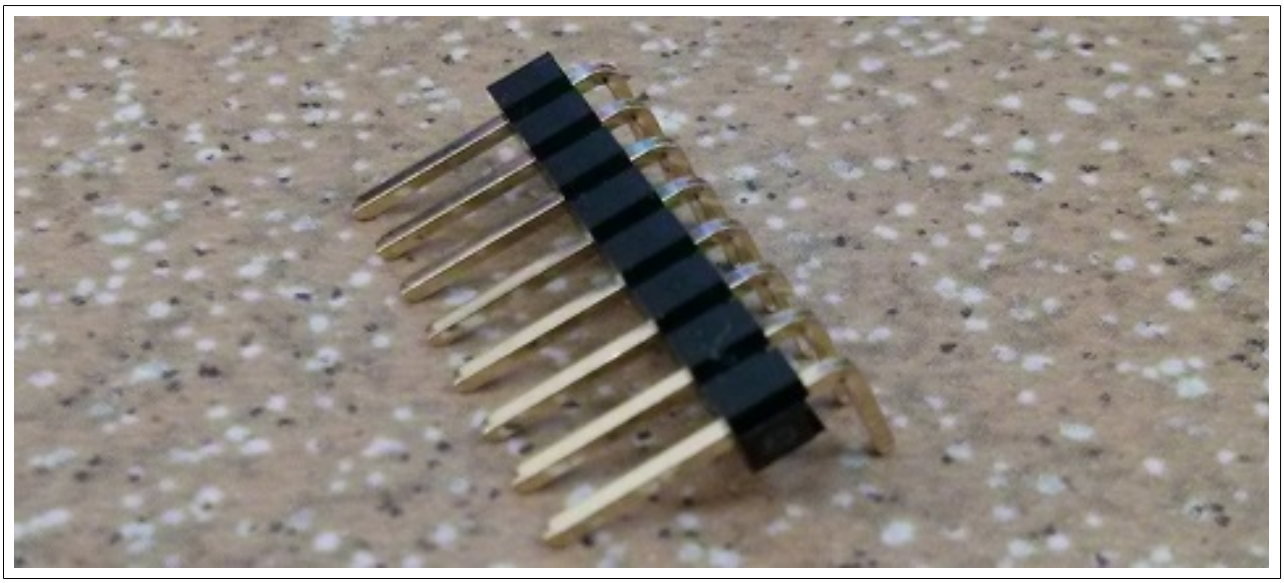


1x ATtiny85 microcontroller

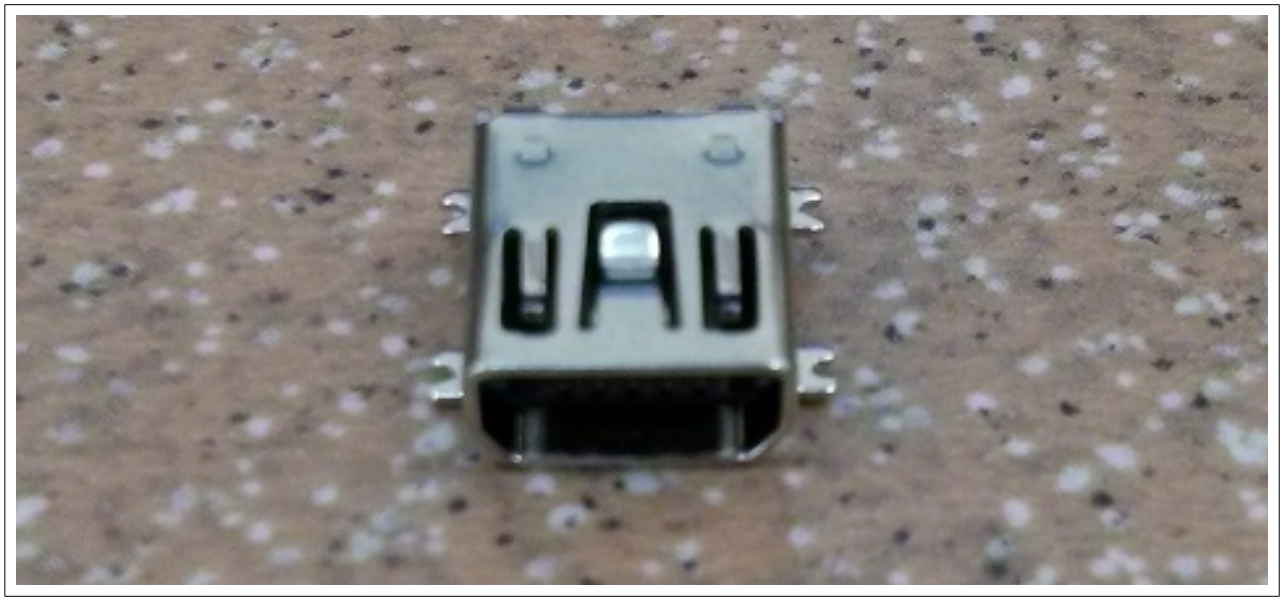


1x microcontroller DIP socket

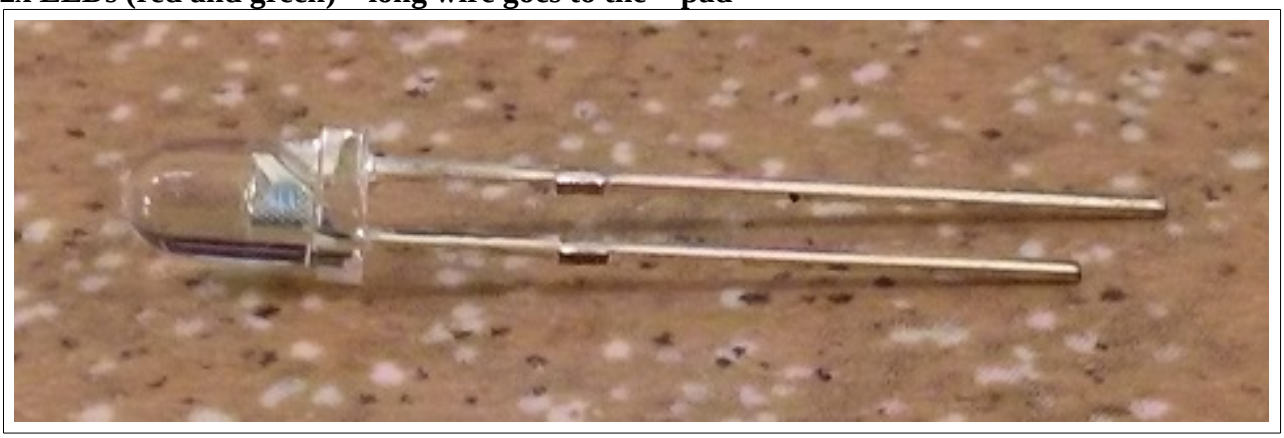
1x set of male headers



1x mini USB connector

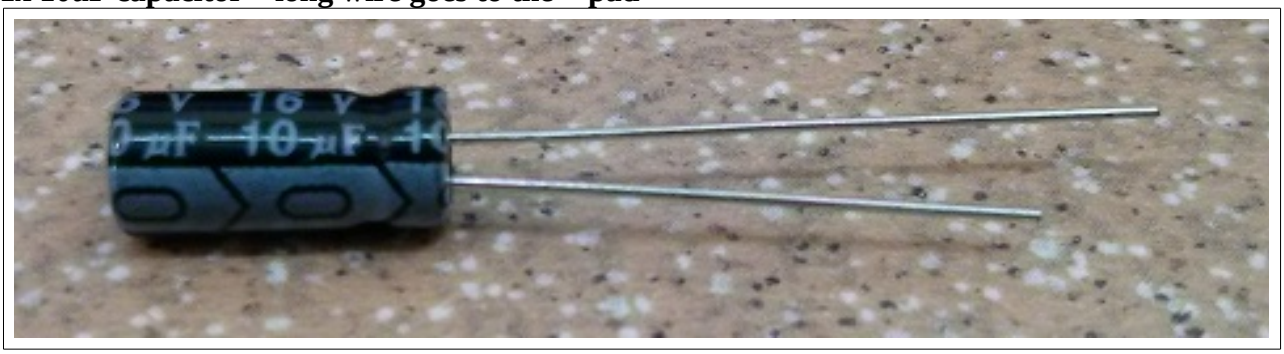


2x LEDs (red and green) – long wire goes to the + pad



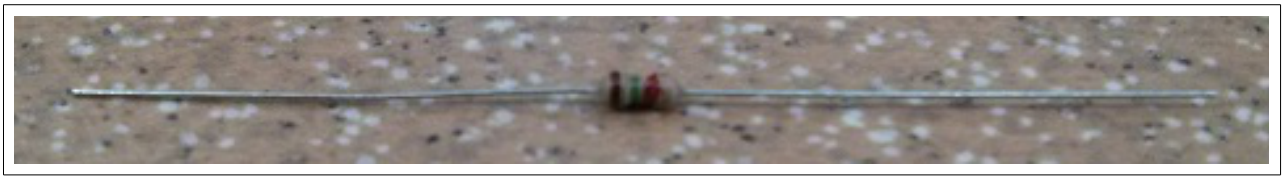
1x button

1x 10uF capacitor – long wire goes to the + pad



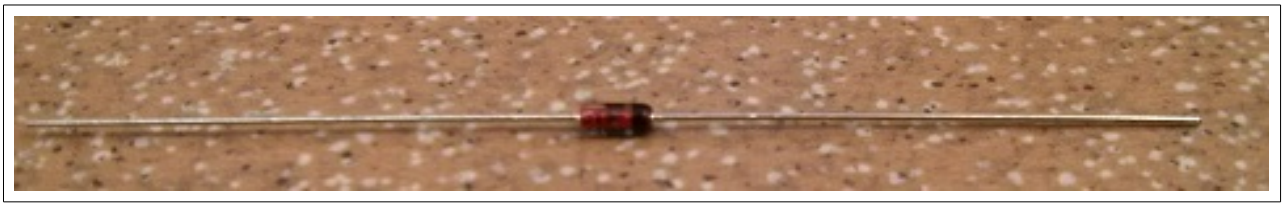
1x 100nF capacitor

3x 1.5K resistors – color code BROWN-GREEN-RED-GOLD*



2x 22R resistors – color code RED-RED-BLACK-GOLD*

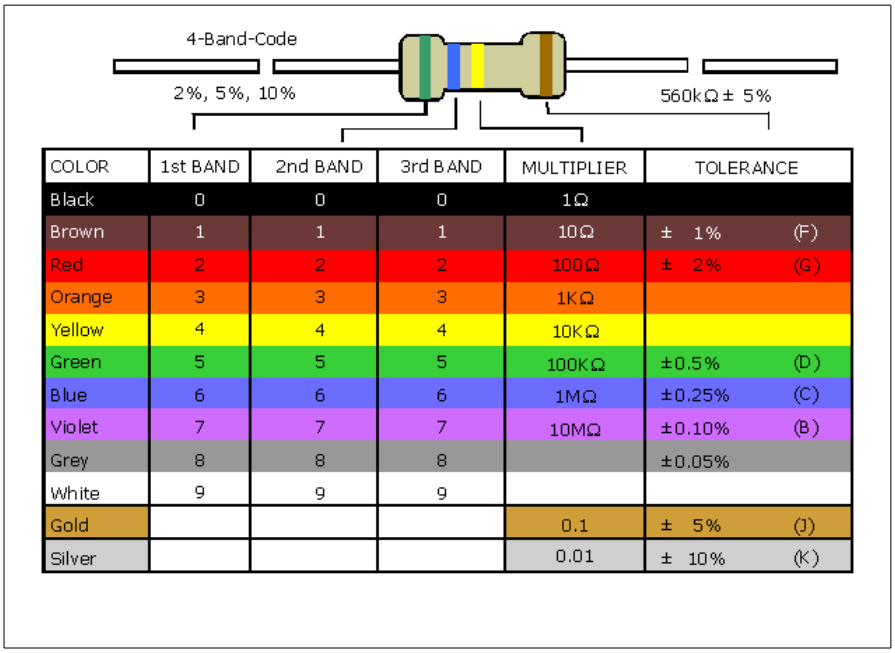
2x diodes



More information about the values and the packages of each of the elements that the board uses might be seen in the appendix at the end of the document.

***The resistors can be distinguished by their 4-band color code.** The value for the resistors is calculated as : RED-RED-BLACK-GOLD – 22 x1 +/-5% = 22 Ohms +/-5% ; BROWN-GREEN-RED-GOLD – 15 x100 +/-5%=1500 Ohms +/-5%

Please refer to the table:



COLOR	1st BAND	2nd BAND	3rd BAND	MULTIPLIER	TOLERANCE	
Black	0	0	0	1Ω		
Brown	1	1	1	10Ω	± 1%	(F)
Red	2	2	2	100Ω	± 2%	(G)
Orange	3	3	3	1KΩ		
Yellow	4	4	4	10KΩ		
Green	5	5	5	100KΩ	±0.5%	(D)
Blue	6	6	6	1MΩ	±0.25%	(C)
Violet	7	7	7	10MΩ	±0.10%	(B)
Grey	8	8	8		±0.05%	
White	9	9	9			
Gold				0.1	± 5%	(J)
Silver				0.01	± 10%	(K)

Chapter 2. Tools needed

1. Solder – “glues” together the board and the electronic components. Consider getting lead-free solder. Lead is toxic.

2. Soldering iron – to melt and apply the solder.

3. Pair of cutters – to shorten longer cathode and anode wires. The cutters are also used to clear the bottom of the board after soldering.

It is a good idea to use a stand for holding the board while you solder. At the end you will need a computer with a proper miniUSB cable to connect and program.

Some people might use soldering flux. Remember that after using flux you need to clean the board from all leftover flux!

Chapter 3. Soldering

The top side of the OLIMEXINO-85 board is the one that features the name of the board and the revision! Not only that – the top side has the names and the positions of each of the components of the kit! Make sure that you take a look at the white print and you have identified the position and the orientation of each of the components before you grab the soldering iron!

There are four things to remember before starting to solder:

1. Remember that all components, except for the mini USB connector, are placed on top and their wires go to the bottom of the board. All soldering (except for the mini USB) should be done at the bottom!

2. Remember that you shouldn't connect pads or component pins with solder! This might lead to short circuits – damaging the board or components irrecoverably if you power the board that way. Before powering the board ensure no short-circuits are present.

3. Remember that your soldering iron takes at least couple of minutes to reach operating temperature – if it doesn't get hot enough you might have trouble melting the solder. You shouldn't hold the soldering iron pressend on the components for long periods of time! This might burn the components or the board paths!

4. The components come with long wires – it is good practice to shorten them a bit before soldering and further shorten them after soldering – this makes the finished product more reliable – longer wires lead to easier wire corruption due to component twisting or bending, or even worse – it might lead to short-circuits if they are longer on the bottom. The wires should be cut with a proper pair of cutters.

You should pay attention to three important things regarding the diodes, the LEDs and the capacitor:

1. When placing the LEDs keep in mind that they have a long and a short wire that shows which of

them should go to the “+” of the element pad, and which should go to the “-” – the long wire of the LED is the anode and in our case should go to the “+” of the LED pad.

2. The capacitor C1 also has a long and short wires – the long one should go to the + pad. You might see the cathode markings on the side of the capacitor (over the short side).

3. There are two diodes (not the LEDs!) that has to be orientated in different ways depending on the black stripe they have! Carefully observe pads D1 and D2 and place respectively.

In what order to solder the elements? Generally, it is good idea to start with the parts which are the shortest – e.g. leaving the big capacitor C1 and the microcontroller socket for last. Recommended soldering order:

1. The mini USB – should be placed on the USB pad – this is the hardest to solder component due to the four small wires at its back , and the fact that the soldering should be done on the top of the board

2. Diodes – placed on D1 and D2 pads – they should be orientated as the black mark is specified on the pad – they are in opposite directions – refer to the respective pad drawing

3. 22 R resistors – these two resistors are placed on R4 and R5 pads – they don't require special orientation

4. 1.5 K resistors – these three resistors are placed on pads R1, R2 and R3 – they don't require special orientation

5. C2 – capacitor C2 is placed on pad C2 and doesn't require special orientation

6. C1 – capacitor C1 is the tallest component on the board – you should place the side that shows “zeros” to the “-” pad.

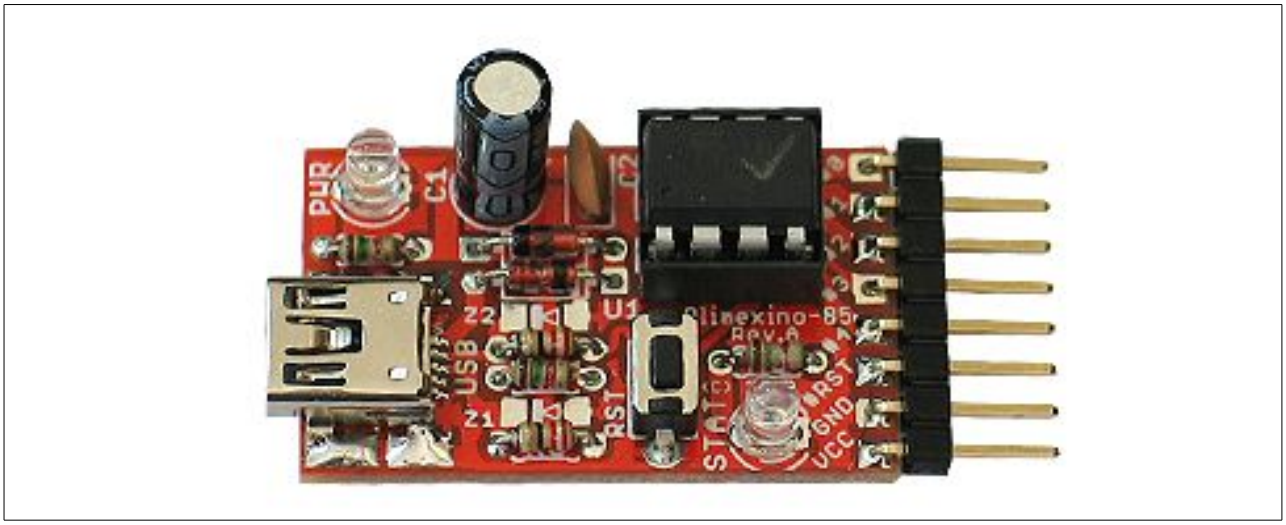
7. Reset button – placed on RST pad and doesn't require special orientation

8. Power and status LEDs – placed on pads PWR and STAT – be careful with the color and the orientation. The long wire should go the the + of the pad.

9. DIP socket – the component that would hold our 8 pin AVR microcontroller. There is a small dent on the socket which is also marked on the white print – the dent should be used a marker for the positiong.. It is a good idea to place the ATtiny85 after soldering everything else and just before you power the board. Note that the microcontroller ATtiny85 has a small dot on it – the dot should be on the side of the DIP socket's dent! This dot marks the first pin of the microcontroller.

10. The set of male headers – has to be placed at the edge of the board – the shorter part of the pins should be put in the board (and soldered from the bottom) while the plastic part should be on the top side of the board.

This is how soldered device should look like:



Chapter 4. Connecting to the Digispark IDE

The ATtiny85 of the OLIMEXINO-85 is pre-programmed with a bootloader that allows it to act as a USB device so that it can be programmed by a modified version of the Arduino IDE. The OLIMEXINO-85 runs the “micronucleus tiny85” bootloader, an open source project written by Bluebie: https://github.com/Bluebie. The bootloader is used by the Digispark board – the board that inspired OLIMEXINO-85. Note that currently OLIMEXINO-85 uses the VID/PID pair that Digistump donated to the community.

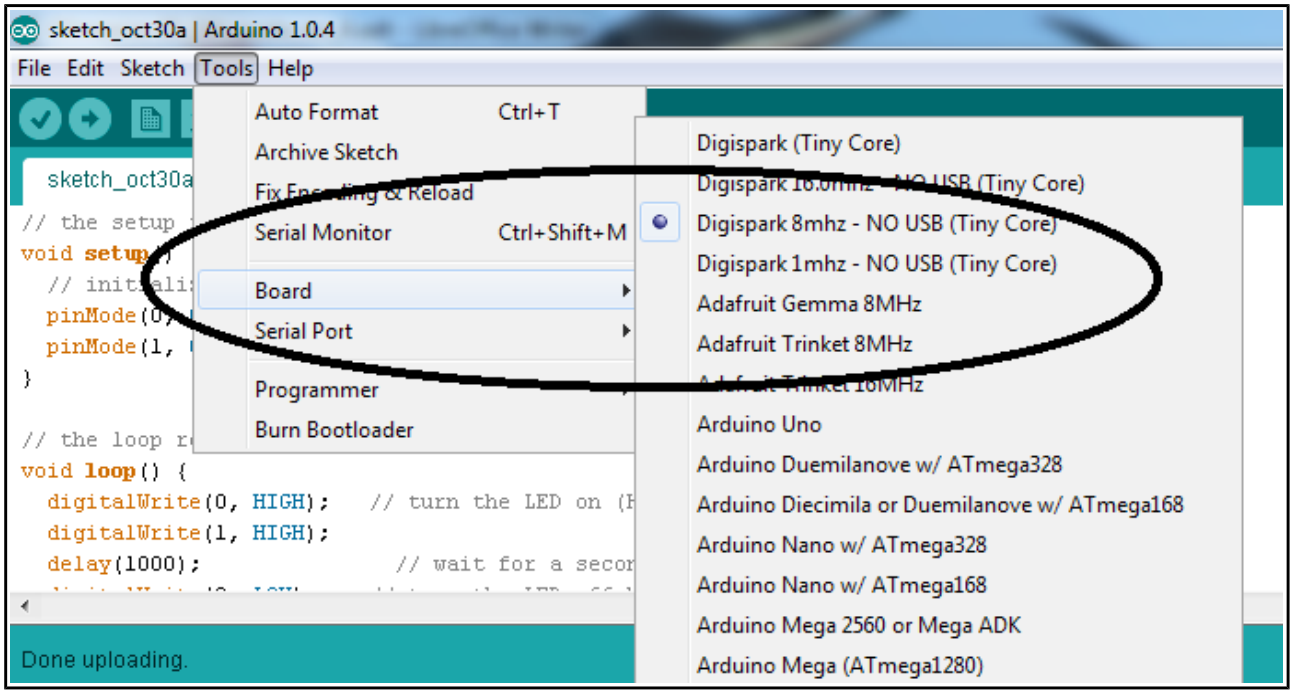
For complete instructions on how to use please visit
http://digistump.com/wiki/digispark/tutorials/connecting.

Digispark have bundled the open source Arduino IDE (v1.04) with their Digispark Addons to make it easy to get started.

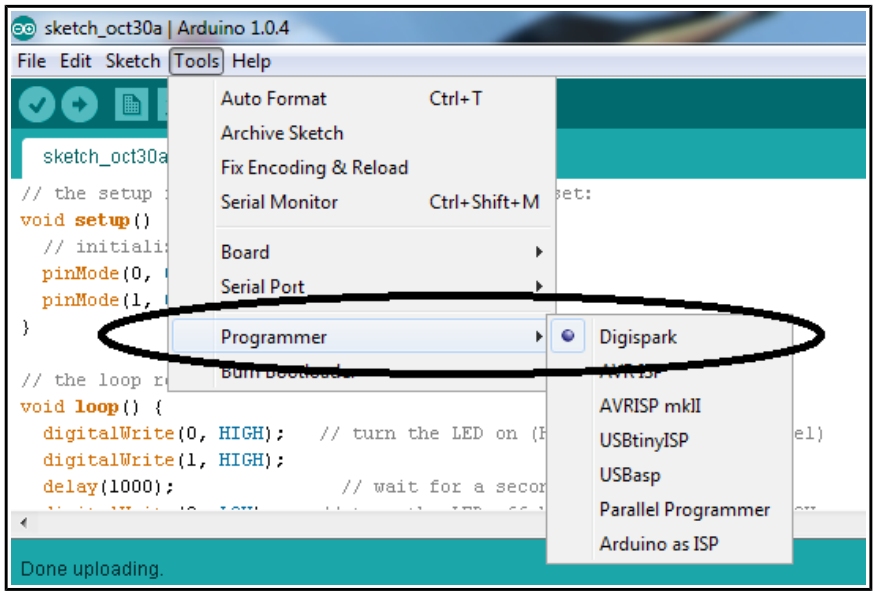
Download Digispark's Arduino IDE from the links provided at the web page and remember to install the drivers as explained in the same tutorial article.

There are also good instructions on how to select the proper board so you can upload programs. It is important that due to the small size of OLIMEXINO-85 it has a specific set of settings and a special algorithm of uploading.

OLIMEXINO-85 is recognized as “Digispark 8mhz - NO USB (Tiny Core)” under “Tools → board”



You should also set the “Tools → Programmer” to “Digispark”.



When you have a program ready to upload you need to disconnect the board! Then press the upload button and you will be asked to connect the board in the next 60 seconds. After you connect the OLIMEXINO-85 don't press anything and just wait until the code is uploaded!

Appendix I. Bill of materials

QTy	VALUE	DEVICE	POSITION(S)
3	1.5k/0.125W	R-EU_0204/5	R1, R2, R3
2	1N4148/DO35	D1N4148-7.62MM	D1, D2
1	10uF/16V/105C(5x11mm,RM2)	CPOL-EUE2-5	C1
2	22R/0.125W	R-EU_0204/5	R4, R5
1	100nF/2010	C-EU025-025X050	C2
1	ATtiny85-20PU+(DIL-8)+ (HR1x8)	ATTINY85	U1
1	LED/3mm/Green	LED3.0MM	PWR
1	LED/3mm/Red	LED3.0MM	STAT
2	NA(BZV55C3V6/SOD80C)	ZDIOD-SMD	Z1, Z2
8	TESTPAD3	TESTPAD3	#0, #1, #2, #3, #4, #RST, GND, VCC
1	TSR-1(T1101GP/6x3x4.3)	SW-TAKT3	RST
1	USB-MINI	MINI_USB9	USB

Appendix II. Product support

For product support, hardware information and error reports mail to: support@olimex.com. All document or hardware feedback is welcome. Note that we are primarily a hardware company and our software support is limited. Please consider reading the paragraph below about the warranty of Olimex products.

All goods are checked before they are sent out. In the unlikely event that goods are faulty, they must be returned, to OLIMEX at the address listed on your order invoice.
OLIMEX will not accept goods that have clearly been used more than the amount needed to evaluate their functionality.

If the goods are found to be in working condition, and the lack of functionality is a result of lack of knowledge on the customers part, no refund will be made, but the goods will be returned to the user at their expense.

All returns must be authorized by an RMA Number. Email support@olimex.com for authorization number before shipping back any merchandise. Please include your name, phone number and order number in your email request.

Returns for any unaffected development board, programmer, tools, and cables permitted within 7 days from the date of receipt of merchandise. After such time, all sales are considered final.

Returns of incorrect ordered items are allowed subject to a 10% restocking fee. What is unaffected? If you hooked it to power, you affected it. To be clear, this includes items that have been soldered to, or have had their firmware changed. Because of the nature of the products we deal with (prototyping electronic tools) we cannot allow returns of items that have been programmed, powered up, or otherwise changed post shipment from our warehouse.

All returned merchandise must be in its original mint and clean condition. Returns on damaged, scratched, programmed, burnt, or otherwise 'played with' merchandise will not be accepted.

All returns must include all the factory accessories which come with the item. This includes any In-Circuit-Serial-Programming cables, anti-static packing, boxes, etc.

With your return, enclose your PO#. Also include a brief letter of explanation of why the merchandise is being returned and state your request for either a refund or an exchange. Include the authorization number on this letter, and on the outside of the shipping box.

Please note: It is your responsibility to ensure that returned goods reach us. Please use a reliable form of shipping. If we do not receive your package we will not be held liable.

Shipping and handling charges are not refundable. We are not responsible for any shipping charges of merchandise being returned to us or returning working items to you.

The full text might be found at https://www.olimex.com/wiki/GTC#Warranty for future reference.