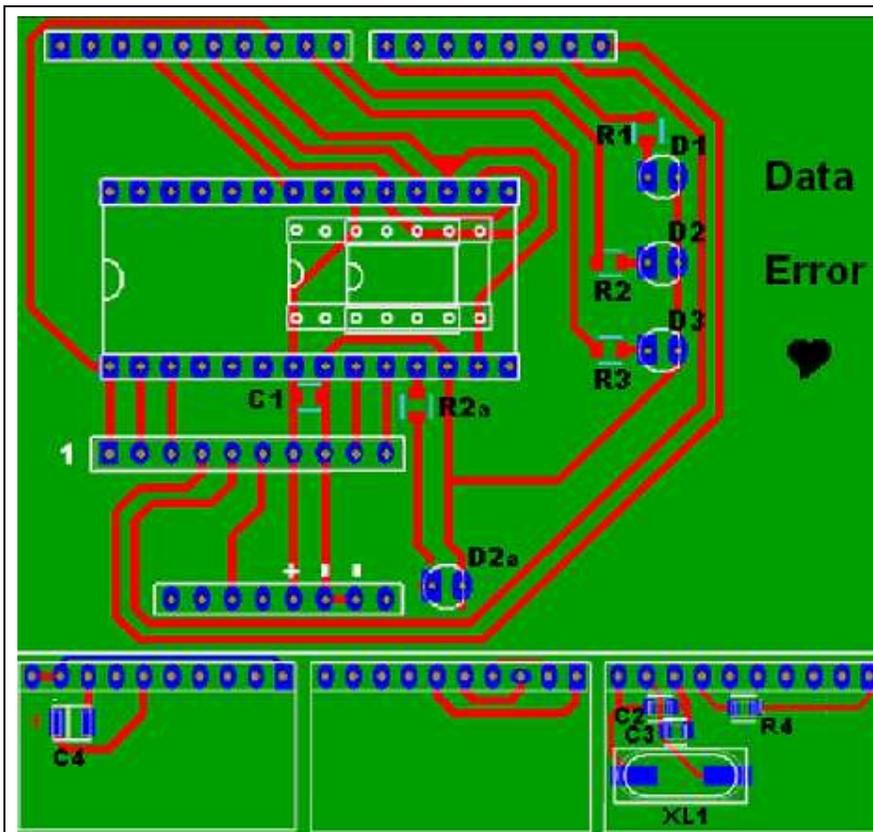


ARDUINO PROGRAMMING SHIELD

MEK14-001-01



COMPONENTS LIST

Resistors: All 5%, SMD 0805, unless otherwise stated:

R1, 3	2	1K Ω	MK= 102
R2, 2a	2	330 Ω	MK= 331
R4	1	10K Ω	MK= 103

Capacitors: SMD 0805, unless otherwise stated:

C1	1	100nF Cer. 50V
C2, 3	2	22pF Cer. 50V
C4	1	10 μ F TANT 16V, SMD Case =A

Semiconductors:

D1	1	LED DI-AM 3mm
D2, 2a	2	LED DI-RD 3mm
D3	1	LED DI-GR 3mm

Miscellaneous:

XL1	1	16.00MHz CRYSTAL HC-49SMD
CN1	2	HEADER SIL STR 40W 2.54 TH=12
CN2	1	SOCK SIL STR HOUSED 2.54 10-W
CN3	1	SOCK DIL 0.3 D-LEAF P28
CN4	1	SOCK ZIF TEXT TOOL 28W

INTRODUCTION

The Arduino Programmer for ATMEGA328P and ATtiny25, 45 and 85 (8 pins) also the ATtiny 44 and 84 (14 pin) devices by moving the selector PCB to program the different micros. The ZIF socket making it easy for quick programming of multiple micros. An onboard quick check LED when blink sketch is used for checking software or device.

CONSTRUCTION	<p>Several components are SMD 0805 (L+2.0 x W=1.25mm) and would require a steady hand and some patience when placing and soldering. Soldering iron tip should be clean and a sharp point type +- 1mm or less a nonmagnetic tweezer is also recommended to pick and place. A solder joint should not be heated for longer than 3 seconds, if you can do it in 2 seconds, GOOD. A pause of 3-5 seconds between each leg when soldering surface mount components is recommended so that you do not overheat the component and damage it.</p> <p>Always start with the low profile components in this case the SMD components and clean the solder pads before soldering.</p> <p>NOTE: Due to an internal track alignment a link between pin 1 and pin 10 on the selector PCB on the ATtiny section needs to be made, see image below. Resistors and Capacitor 0805 package first. Note SMD capacitors are not marked so do not mix them up. Tack care to place the two capacitors next to the crystal that they are in there centres and the electrolytic tantalum capacitors are in the correct polarity orientation. Then move on to the LEDS, polarity orientation is important the square solder pad is for the positive leg or longer LED lead, Next the Pin terminals and last the 28 pin IC socket or the ZIF socket not both. After all soldering has been complete clean the PCB from excess flux. Inspect the solder joints that they are clean and there are no solder bridges on the solder pads especially at the pads of the two capacitors near the crystal on the selector board.</p>
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TESTING	<p>Before connecting to power give once over on the solder joints and the PCB is clean. Once you have confirmed all soldering joints are satisfactory connect to the Arduino and connect the USB cable. You should hear the computer acknowledge the USB connection, good. If not remove the USB cable and the programming shield. Plug only the USB plug to the Arduino, do you hear the acknowledgment sound? If yes there is a short on the power supply section of the shield check it again. Once everything is connected you can move to the programming section.</p>
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PROGRAMMING	<p>Load the ISP sketch from the Menu Bar, File/Example/ArduinoISP/ArduinoISP. Upload to your Arduino. Remove USB cable and connect the programming shield and connect the USB cable. The LEDs should flash twice very fast, first amber, red and then green. The green will start to breath, this shows the health of the programmer and that it is ready to programming.</p> <p>ATMEGA328P: place the selector board in the 1st pin set position the one with the crystal. Place the ATMEGA328P in the ZIF socket and from the Menu Bar, select: Tools/ Burn Bootloader. This will tack a minute or less. To use the on board blink open Blink sketch and rename LED = 13 to LED = 5 or <code>pinMode(13... to 5 and digitalWrite(13... to 5 HIGH and LOW).</code></p> <p>ATMEGA328P with 8 MHz internal clock: The selector board in the same position as above. From the Menu Bar, select: Tools/Board/ATmega328 on breadboard (8 MHz internal clock). Again Arduino as ISP. Then again select: Tools/ Burn Bootloader. Programming this chip you will need to remove the ATmega328 on the Arduino board and reconnect the shield with the selector PCB in the 2nd pin set position to programme directly from the Arduino's USB2Serial interface. Upload sketch as normal. To Blink test open Blink sketch and rename LED = 13... to 5, as above.</p> <p>ATtiny25/45&85: From the Menu Bar, select: Tools/Board/ATtiny25/45/85. From the Menu Bar select processor: "25,45or 85". Again From the Menu Bar select Clock "internal 1 MHz.... Again Arduino as ISP. Place the selector board in the 3rd pin set position, last on the right. Place you 8 pin ATtiny with the two rows of pins free from the bottom see PCB silk screen layout. Now Burn the Bootloader to the selected device. This Burn Bootloader only needs to be done once and only needed again if you are changing the the internal clock frequency. Programming after the bootloader has been complete would only need the sketch with the correct board selected and the correct ports used. Blink Test, change LED = 13... to 4, as explained above.</p>
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ATtiny24/44&84: From the Menu Bar, select: Tools/Board/ATtiny24/44/84. From the Menu Bar select as per ATtiny24/44/84 above. Place you 14 pin ATtiny with the one rows of pins free from the bottom see PCB silk screen layout. Programming as above. Blink Test, change LED = 13... to 8, as explained above.

REFERENCE see for more explanations

The Arduino Programmer for ATMEGA328P with the internal clock see: <https://www.arduino.cc/en/Tutorial/ArduinoToBreadboard> and download this hardware configuration archive ZIP. Unzip and place this breadboard folder with its files in your folder location: "arduino-1.6.7/hardware". For the ATtinyx5 and x4 see: Programming the ATtiny see: <https://create.arduino.cc/projecthub/arjun/programming-attiny85-with-arduino-uno-afb829>. Follow the instructions. Copy and paste the ATtiny support URL to the Preferences box located in your File Menu tab."Additional Boards Manager URLs"

Troubleshooting

We found no trouble in getting this kit to work first time. If yours does not work, Switch Power off.

- 1) Check all pins are inserted in to the Arduino and there are no bent pins that are not inserted into the Arduino's housing.
- 2) Check if there is power on the shield both positive and ground. While plugged into the Arduino and the USB connected. Use a multi meter set to measure +5VDC, place the negative probe at D1's negative lead. The positive probe on the ZIF socket pin 7 and Pin 20, should both read 5V. Keep positive probe on pin 20 and move the negative probe to pin 8, then pin 22 both should give 5V reading.
- 3) With a multimeter in continuity beep test and using the schematic test the all power terminal are making connection. Also test internal signal lines.

NOTE: Image show the link (gray) between pin 1 and pin 10 on the selector PCB on the ATtiny section.

