

© GPL3+ Step by step on how to program a ATtiny85 microcontroller with Arduino Uno development board.

attiny85

13,352 VIEWS 19 COMMENTS 54 RESPECTS 5 REPLICATIONS

ABOUT THIS PROJECT

arduino

be expensive and unnecessary. So I decided to use ATtiny85 microcontroller in place of Arduino Uno development boards. ATtiny85 is a cheap and powerful alternate when u don't need too many PWM pins. Since ATtiny85 is just a microcontroller we need a Arduino Uno to program it. In this project I will explain how to do it. Below is the pin configuration of ATtiny85 and the datasheet can be found here http://www.atmel.com/images/atmel-2586-avr-8-bit-

microcontroller-attiny25-attiny45-attiny85_datasheet.pdf. ATtiny45 / ATtiny85 Reset 1 8 \ \ VCC (+) (Analog Input 3) Pin 3 2 7 Pin 2 (Analog Input 1, SCK) (Analog Input 2) Pin 4 3 6 Pin 1 (PWM, MISO)

5 Pin 0 (PWM, AREF, MOSI) (-) GND 4 ATtiny85 Pin Configuration

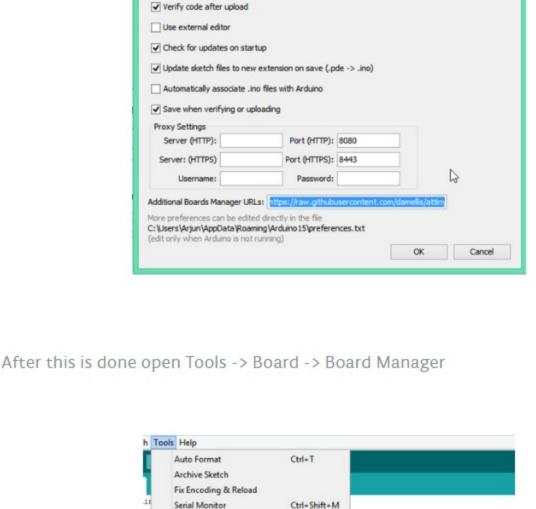
To program the ATtiny85 we need to first set Arduino Uno in ISP mode. Connect your Arduino Uno to the PC. Open Arduino IDE and open the ArduinoISP example file (File -> Examples -> ArduinoISP) and upload it.

Adding ATtiny85 Support to Arduino IDE By default Arduino IDE doesn't support ATtiny85 so we should add ATtiny boards

Show verbose output during: ☐ compilation ✓ upload

Compiler warnings: None 🗸 ✓ Display line numbers

Preferences Sketchbook location: C:\Users\Arjun\Documents\Arduino Editor language: System Default (requires restart of Arduino) (requires restart of Arduino) Editor font size: 12



mega(1280 and)

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Boards Manager... Arduino AVR Boards

Arduino Nano

Arduino Esplora Arduino Mini

Arduino Ethernet

LilyPad Arduino USB

Arduino Pro or Pro Mini

Arduino Robot Control

Arduino Robot Motor

Arduino NG or older

LilyPad Arduino

Arduino Fio

Arduino Duemilanove or Diecimila

Arduino Yún

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Tools Help

Auto Format

Archive Sketch Fix Encoding & Reload Serial Monitor

Board: "Arduino Yún" Port: "COM30"

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reset: 10: 11:

Programmer: "Arduino as ISP"

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Board: "Arduino Yún"

Programmer: "Arduino as ISP"

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lash LED_PMODE on each flash commit

'lash LED_FMODE while writing EEPROM (both ght LED_ERR whenever we hit a STK_NOSYNC.

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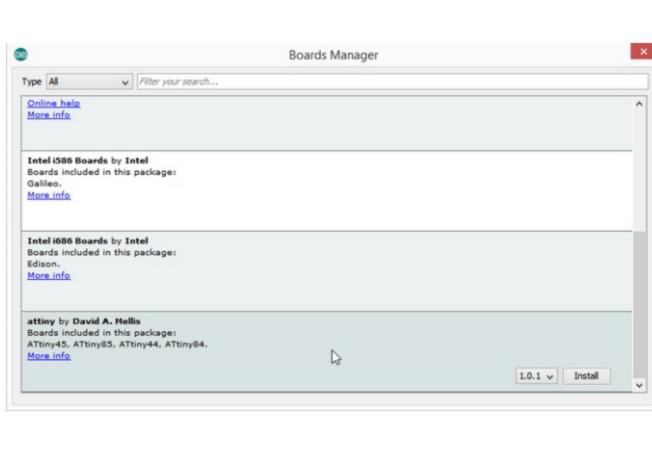
Port: "COM30"

Burn Bootloader

not-mega:

name:

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Ctrl+T

Ctrl+Shift+M

mega(1280 and 2

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Boards Manager...

Arduino Yún

Arduino Uno

Arduino Leonardo Arduino Micro

Arduino Esplora

LilyPad Arduino USB

Arduino NG or older

Arduino Robot Control

Arduino Robot Motor

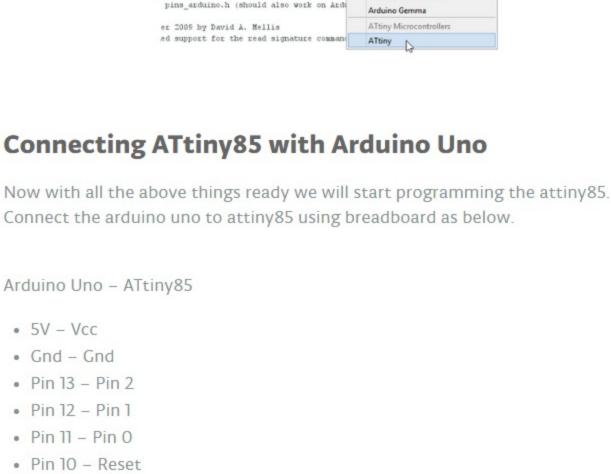
Arduino Pro or Pro Mini

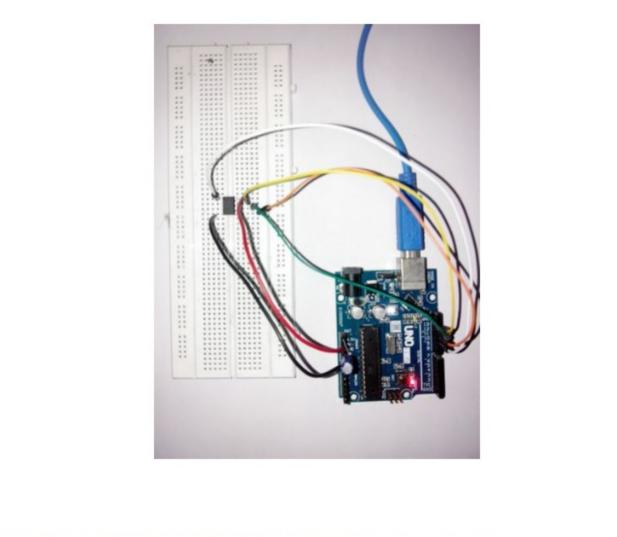
LilyPad Arduino

Arduino AVR Boards

Arduino Duemilanove or Diecimila

Arduino Mega or Mega 2560





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pne second, repeated Board: "ATtiny" Processor: "ATtiny85" Clock: "8 MHz (internal)" 1 MHz (internal) 8 MHz (internal) Port: "COM30" 8 MHz (external) (3

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Ctrl+Shift+M

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AVR ISP

AVRISP mkll USBtinyISP

ArduinoISP

Ctrl+Shift+M

Ctrl+T

Ctrl+Shift+M

ATtiny45

ATtiny85

ATtiny44 ATtiny84

16 MHz (external)

20 MHz (external)

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               an LED (with resistor) on the following p:
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               artheat - shows the programmer is runn:
                                                                Arduino as ISP
               ror - Lights up if something goes t
               :ogramming - In communication with the sla
                                                                Arduino Gemma
By default the ATtiny85 runs at 1MHz. To make it to run at 8MHz select Tools ->
Burn Bootloader.
                          1 Tools Help
                                 Auto Format
                                                          Ctrl+T
                                 Archive Sketch
                                 Fix Encoding & Reload
                                 Serial Monitor
                                                          Ctrl+Shift+M
                                 Board: "ATtiny"
                                 Processor: "ATtiny85"
                                 Clock: "1 MHz (internal)"
                                 Port: "COM30"
                          L.
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Programmer: "Arduino as ISP"

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Burn Bootloader

################################ | 100% 0.05s

This example code is in the public domain. 11 modified 8 May 2014 12 13 by Scott Fitzgerald 14 16 17 // the setup function runs once when you press reset or power the board

digitalWrite(0, HIGH); // turn the LED on (HIGH is the voltage level)

// wait for a second

// wait for a second

// turn the LED off by making the voltage LOW

Turns on an LED on for one second, then off for one second, repeatedly.

Most Arduinos have an on-board LED you can control. On the Uno and Leonardo, it is attached to digital pin 13. If you're unsure what pin the on-board LED is connected to on your Arduino model, check

the documentation at http://arduino.cc

// initialize digital pin 13 as an output.

23 // the loop function runs over and over again forever

You can see the above message if everything was successful. Now we have upload the blink program to ATtiny85 and now lets test it out. **Testing ATtiny85 Blink** Now its time to test. Remove all connections from Arduino and take a power

source. Here I will use a button cell to power ATtiny85.

I am working on a project which requires reading multiple sensor data on different locations. These require only few PWM pins so using multiple Arduino Uno would

Configuring Arduino Uno as a ISP (In-System **Programming)**

to Arduino IDE. Open File -> Preferences and in the Additional Boards Manager URLs give this url https://raw.githubusercontent.com/damellis/attiny/ide-1.6.xboards-manager/package_damellis_attiny_index.json.

After opening Board Manager scroll down the list where it says "attiny by Davis A. Mellis". Click on that and install it.

After installing now you would be able to see a new entry in the Board menu

Add a 10uF capacitor between RESET and GND in arduino. This is to avoid arduino from being auto reset when we upload the program to attiny85. If you are using a electrolytic capacitor make sure the anode goes in GND of uno. **Uploading program to ATtiny85** Now back to Arduino IDE. Select ATtiny under Tools -> Board. Then select ATtiny85 under Tools -> Processor. And select 8 MHz (internal) under Tools -> Clock.

Tools Help

Auto Format

Archive Sketch

Serial Monitor

Board: "ATtiny"

Port: "COM30"

Burn Bootloader

Tools Help

Auto Format Archive Sketch

Serial Monitor

Burn Bootloader

Tools Help

Auto Format

Archive Sketch

Serial Monitor

Board: "ATtiny"

Port: "COM30"

Burn Bootloader

12:

13:

Fix Encoding & Reload

Processor: "ATtiny85" Clock: "1 MHz (internal)"

Programmer: "Arduino as ISP"

Fix Encoding & Reload

Programmer: "Arduino as ISP"

Then make sure Arduino as ISP is selected under Tools -> Programmer

Fix Encoding & Reload

Processor: "ATtiny85"

Clock: "1 MHz (internal)"

Programmer: "Arduino as ISP"

Done burning bootloader.

avrdude done. Thank you.

Blink§

18 void setup() {

pinMode(0, OUTPUT);

digitalWrite(0, LOW);

delay(1000);

delay(1000);

19

20

21 }

29)

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You will get the above message if burning bootloader was successful. Now open the Blink example from arduino examples and change the pin number from 13 to 0 and upload.

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