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Using Atmega32 With Arduino IDE

By Silvius (/member/Silvius/) in Circuits (/circuits/) > Arduino (/circuits/arduino/projects/)   116,079   72   131

ATMEGA32 / ARDUINO

(/member/Silvius/)
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openhardware.ro
(http://openhardware.ro)

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Over time I have used all kinds of Atmel microcontrollers in various projects.

One of the most suitable was ATmega32. I have a small collection of development boards for Atmega32/16, some bought as-is, some made on stripboard.

Although the original Arduino boards offers a pleasant experience and a rapid development of the projects, when it was necessary to "extract" these projects to give them final shape I hit the well-known problem: arduino board must be "locked" in the project.

It is not only the price. Although a microcontroller in thru-hole package is significantly bigger than SMD version, it is still much smaller than an Arduino board.

And still I want to use the Arduino IDE to benefit from the collection of (very well made) (ready-to-use) libraries.

So I gathered together information useful for this purpose.
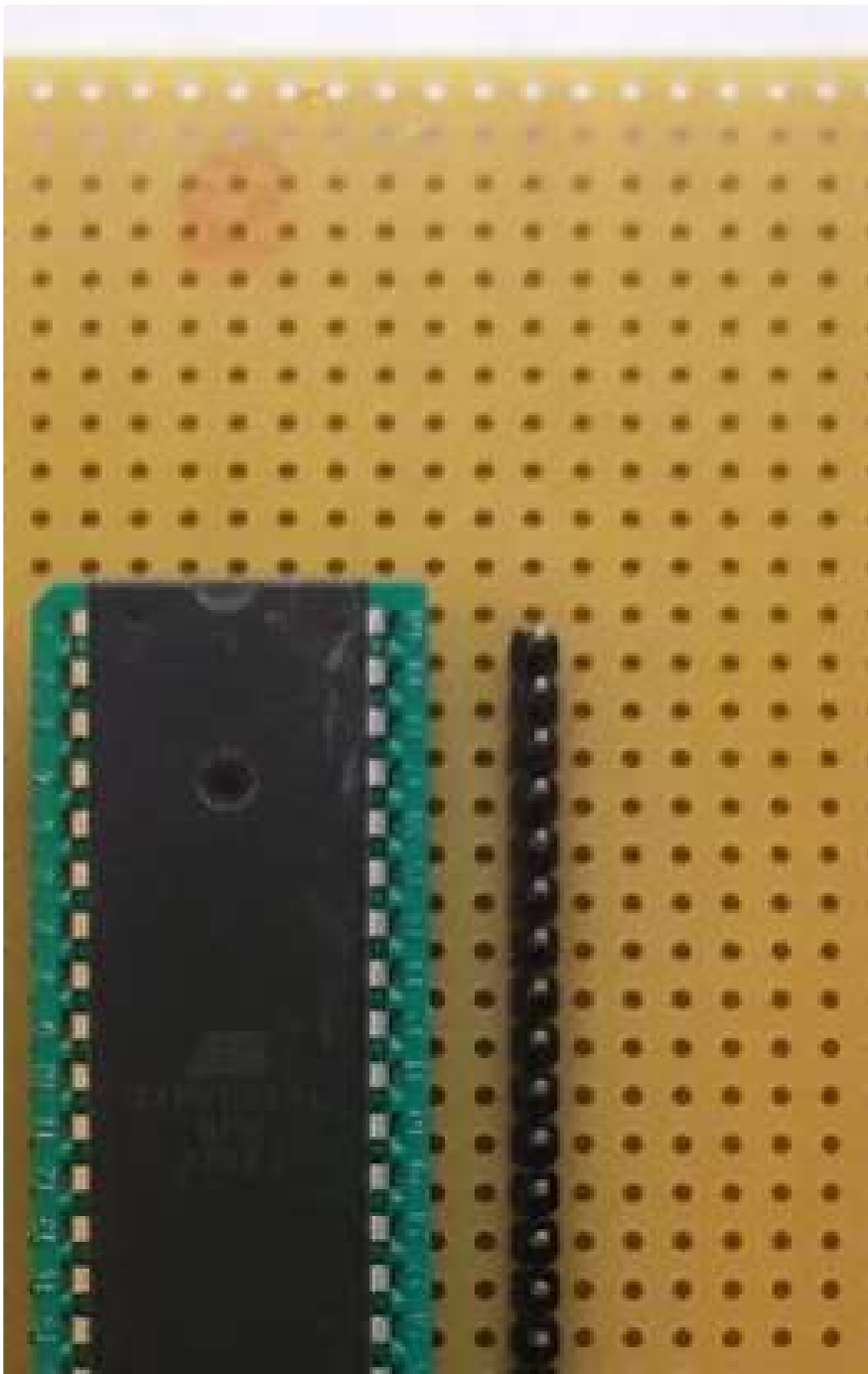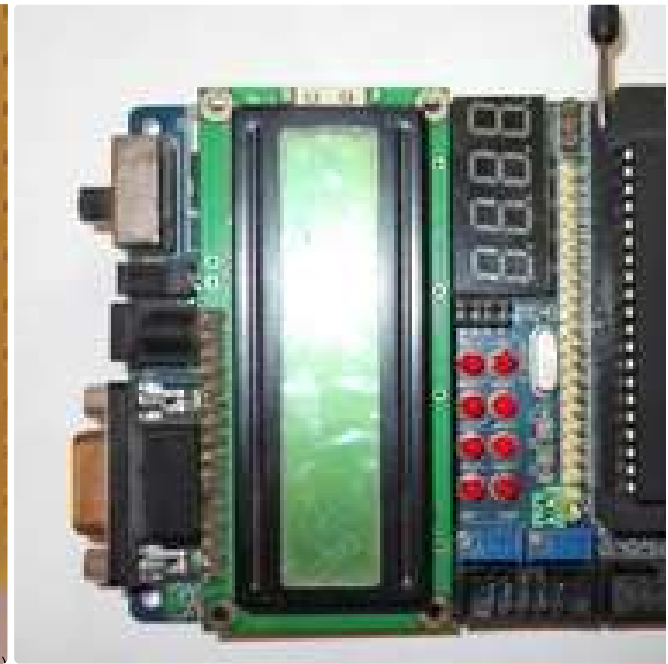
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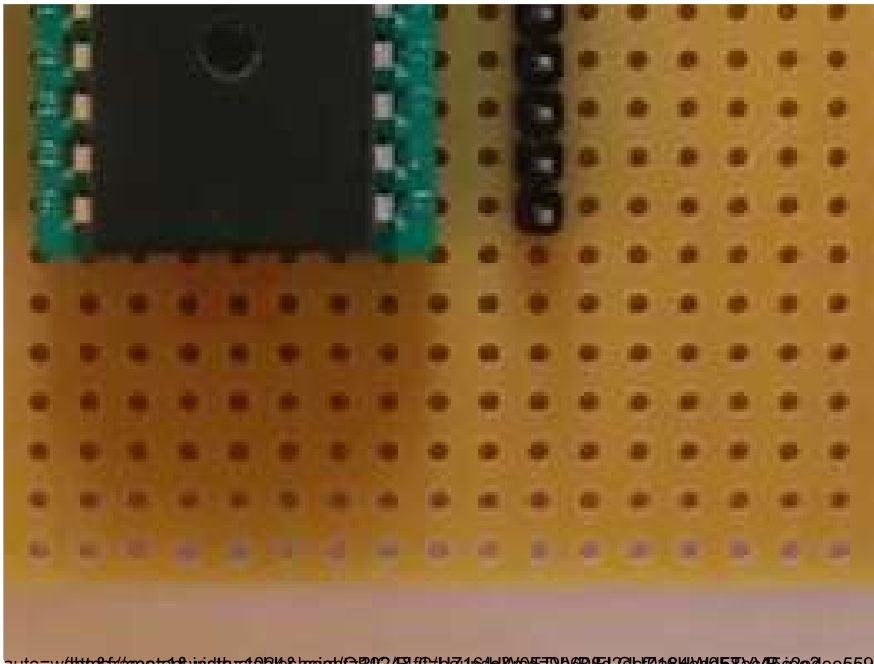## Step 1: Things You Will Need:

1. Atmega32 microcontroller. :)
2. Programmer (any programmer recognized by Arduino IDE). I use the USBasp programmer.
3. Minimal setup for power-up Atmega32 microcontroller (breadboard, stribpoard or a classical development board).

We do not need all, photos above are for exemplification only.
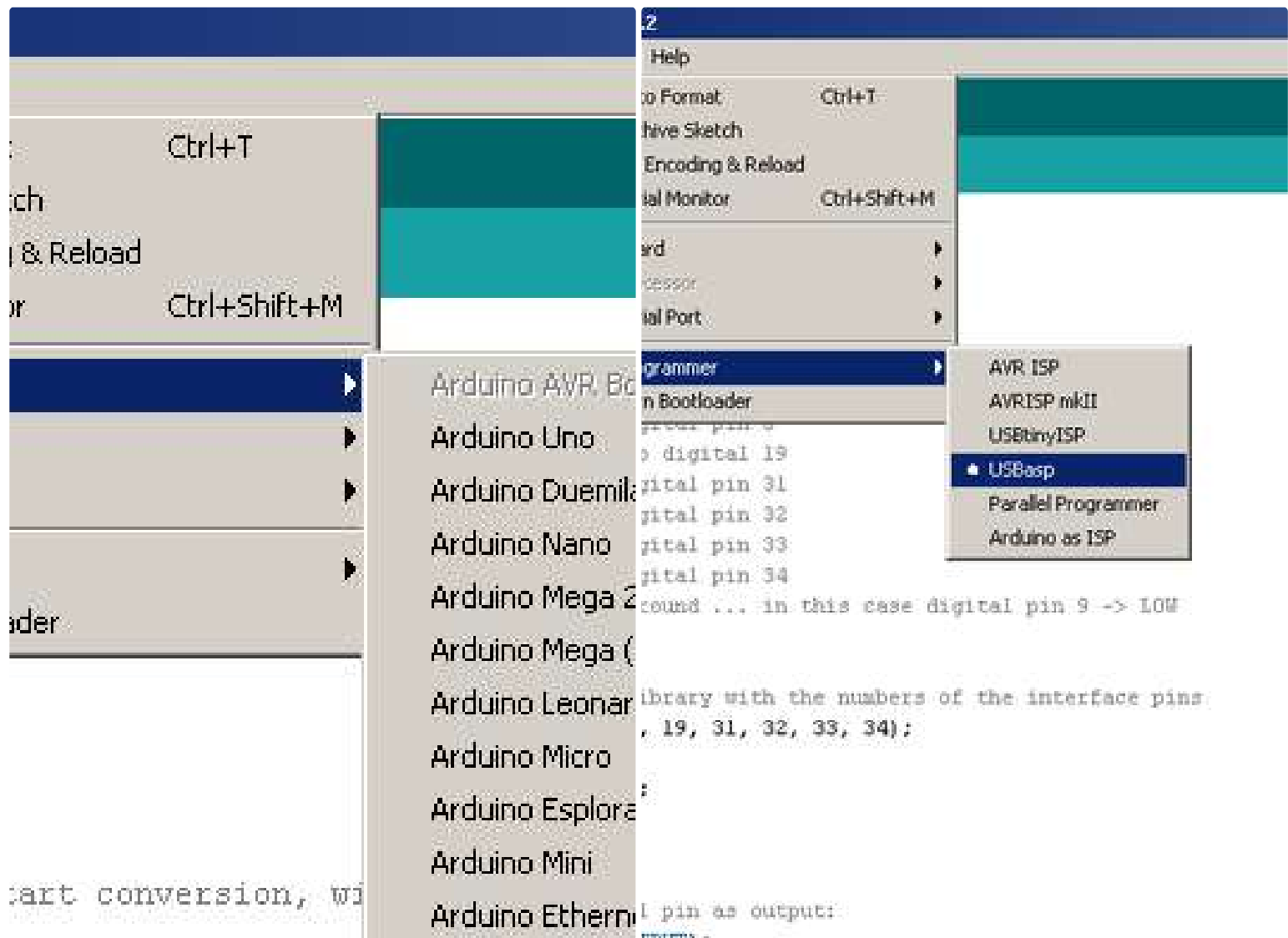
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Step 2: Software Set-up

Ctrl+T

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& Reload

or   Ctrl+Shift+M

Arduino AVR Bo

Arduino Uno

Arduino Duemila

Arduino Nano

Arduino Mega 2

Arduino Mega (

Arduino Leonar

Arduino Micro

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Arduino Mini

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Help

o Format   Ctrl+T

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Encoding & Reload

ial Monitor   Ctrl+Shift+M

rd   ▶

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ial Port   ▶

grammer   ▶

n Bootloader

ital pin 6

o digital 19

ital pin 31

ital pin 32

ital pin 33

ital pin 34

ound ... in this case digital pin 9 -> LOW

ibrary with the numbers of the interface pins

, 19, 31, 32, 33, 34);

AVR ISP

AVRISP mkII

USBtinyISP

● USBasp

Parallel Programmer

Arduino as ISP

l pin as output:

1. Download zip file attached to this instructables.

2. Locate file boards.txt in arduino folder ...arduino-1.5.2\hardware\arduino\avr\boards.txt

3. Append information from zip archive **boards.txt** to original **boards.tx**t

4. Make a folder named **mega32** in ...arduino-1.5.2\hardware\arduino\avr\variants

5. Copy file **pins_arduino.h** from the zip into folder created at step 4.

6. Start Arduino IDE and select board.

7. Select programmer

Later edit:

I removed link to github projet where I originally found. As long as there source changed and not fit this instructable.

After a message from the **author: Eric Conner,** I put back link to github project where I originally found this library:

https://github.com/eaconner/ATmega32-Arduino (https://github.com/eaconner/ATmega32-Arduino)

Note: Zip file attached to this article is an older version of above library. This will work as this instructable was written.

Over time, after some feedback I noticed that source from github has changed.

Also, in comments you will see references to some errors, and how to to correct it.

This article and answers from comments is relate to version attached here, not github (newer) version.

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Step 3: Done.

ATMEGA32 / ARDUINO

D0	1	PB0 (XCK/T0)	(ADC0) PA0	40	D31	A0
D1	2	PB1 (T1)	(ADC1) PA1	39	D30	A1
D2	3	PB2 (INT2/AIN0)	(ADC2) PA2	38	D29	A2
D3	4	PB3 (OC0/AIN1)	(ADC3) PA3	37	D28	A3
D4	5	PB4 (SS)	(ADC4) PA4	36	D27	A4
D5	6	PB5 (MOSI)	(ADC5) PA5	35	D26	A5
D6	7	PB6 (MISO)	(ADC6) PA6	34	D25	A6
D7	8	PB7 (SCK)	(ADC7) PA7	33	D24	A7
	9	RESET	AREF	32		
	10	VCC	GND	31		
	11	GND	AVCC	30		
	12	XTAL2	(TOSC2) PC7	29	D23	
	13	XTAL1	(TOSC1) PC6	28	D22	
D8	14	PD0 (RXD)	(TDI) PC5	27	D21	
D9	15	PD1 (TXD)	(TDO) PC4	26	D20	
D10	16	PD2 (INT0)	(TMS)PC3	25	D19	
D11	17	PD3 (INT1)	(TCK) PC2	24	D18	
D12	18	PD4 (OC1B)	(SDA) PC1	23	D17	
D13	19	PD5 (OC1A)	(SCL) PC0	22	D16	
D14	20	PD6 (ICP1)	(OC2) PD7	21	D15	

It's done.

Now you can try some simple examples that are already in Arduino.

Be very careful about correlation between ARDUINO pin and microcontroller pin.

Here is blink example: Files->Examples->Basics->Blink

Pin13 Arduino == Pin19 (PD5) Atmega32

```
/*Blink
  Turns on an LED on for one second, then off for one second, repeatedly.
  This example code is in the public domain.
 */


// Pin 13 has an LED connected on most Arduino boards.
// give it a name:
int led = 13;


// the setup routine runs once when you press reset:
void setup() {
  // initialize the digital pin as an output.
  pinMode(led, OUTPUT);
}


// the loop routine runs over and over again forever:
void loop() {
  digitalWrite(led, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);               // wait for a second
  digitalWrite(led, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);               // wait for a second
}
```

After some comments I found two errors in the file pins_arduino.h

So I'll post here the errors and correct values.

erroneous definition of SCL and SDA

```
const static uint8_t SDA = 8; //wrong
const static uint8_t SCL = 9; //wrong
```

must be changed in:

```
const static uint8_t SDA = 17; //correct
const static uint8_t SCL = 16; //correct
```

Since I am not the author of the project on github, it is subject to change beyond my control.

So please use code attached to this instructable and make above modifications.

UPDATE:

For **Serial library to work properly** must be made following changes to the file
HardwareSerial.cpp
In ...\arduino-1.5.8\hardware\arduino\avr\cores\arduino**HardwareSerial.cpp**

will replace:

```
#if defined(__AVR_ATmega8__)
        config |= 0x80; // select UCSRC register (shared with UBRRH)
#endif
```

with:

```
#if defined(__AVR_ATmega8__) || defined(__AVR_ATmega32__) || defined(__AVR_ATmega16__)
        config |= 0x80; // select UCSRC register (shared with UBRRH)
#endif
```

See also: https://www.instructables.com/id/ATmega-DIP40-Mini...
(https://www.instructables.com/id/ATmega-DIP40-Minimal-Board/)

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1 Person Made This Project!

indiamtech (/member/indiamtech/) made it!

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Recommendations

(/Infinity-Dodecahedron-Mirror/)

Infinity Mirror Dodecahedron (/Infinity-Dodecahedron-Mirror/) by MarcoGhelfino (/member/MarcoGhelfino/) in LEDs

❤ 278 👁 15K

(/Automated-Chessboard/)

Automated Chessboard (/Automated-Chessboard/) by Greg06 (/member/Greg06/) in Arduino (/circuits/arduino/projects/)

❤ 374 👁 37K

(/contest/breadsoup22/)

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We have a **be nice** policy.
Please be positive and constructive.

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131 Comments

(/member/mpiran79/) mpiran79 (/member/mpiran79/)   Question   7 months ago

Answer   ▲ Upvote

for recicle the old wrong buy atmega 32-16pu i use arduino ide 1.0.6 (on recent, that i use wht arduino board have a lot of error)
on some libraies get an error:
\libraries\Servo\src\Servo.h:77:2: error: #error "This library only supports boards with an AVR, SAM, SAMD, NRF52 or STM32F4 processor."

(/member/zamany/) zamany (/member/zamany/)   Question   1 year ago on Step 3

Answer   ▲ Upvote

No matter how hard I try, I can not understand how to program microcontrol with Ardino. Please learn the steps with a picture.

(/member/mbkh1382/) mbkh1382 (/member/mbkh1382/) 1 year ago

Reply   ▲ Upvote

Hello i got this error
avrdude: invalid baud rate specified '{upload.speed}'
An error occurred while uploading the sketch
please help this is very important for me

(/member/TelekikeG/) TelekikeG (/member/TelekikeG/) 1 year ago on Step 3

Reply   ▲ Upvote

Hello, Nice and good work.
It was very useful for me, I was able to recover previous projects to the arduino and reprogram easily (without Bascom lol).
I write because, from the last version of the Arduino IDE, it has changed and no longer works, now they have grouped it by boards and even though I copy the files the boards do not appear in the list.Has anyone found a solution? I will continue investigating, if I find the solution I post it ..

1 reply ⌄

(/member/gadjet+rathnayake+/) gadjet rathnayake (/member/gadjet+rathnayake+/) 1 year ago

Reply   ▲ Upvote

I completed the "step - 2 software setup" as instructed.

but I cannot see atmega32 boards in boards dropdown menu of arduino IDE

version of IDE is 1.8.5

1 reply ⌄

(/member/TomO26/) TomO26 (/member/TomO26/) 6 years ago

Reply   ▲ Upvote

Hello,
I'm having a problem with pin interrupts using this set-up
I can get INT0 and INT0 to work correctly, enabling the internal pull-up resistors and then using:
attachInterrupt(digitalPinToInterrupt(10), footOne, CHANGE); // Foot One - Pin 10
attachInterrupt(digitalPinToInterrupt(11), footTwo, CHANGE); // Foot Two - Pin 11
but if i try the same for INT2:
attachInterrupt(digitalPinToInterrupt(2), footThree, CHANGE); // Foot Three - Pin 02,
I the interrupt never gets triggered, despite each pin being set up in the same way with the same debouncing circuit.
Any ideas how to get INT2 to work correctly?
thanks

7 replies ⌄

(/member/majidmp97/) majidmp97 (/member/majidmp97/) Question 4 years ago

Answer   ▲ Upvote

HOW WE CAN USER PWM TIMER ?

(/member/rochaksharma7/) rochaksharma7 (/member/rochaksharma7/) 4 years ago

Reply   ▲ Upvote

PLEASE HELP ME GUYS!!!!
ADC is not working on hardware but its works on proteus (software simulation).
i use USB-asp for uploading hex

(/member/thomas000bauer/) thomas000bauer (/member/thomas000bauer/) 4 years ago

Reply   ▲ Upvote

Hello together,
i've encountered a problem. I've tried to read the ADC via "analogRead(A0)" for example. And the compiler responded with the error "'A4' was not declared in this scope".
also the function #define doesn't accept the argument A0 up to A7; does anybody else have expierenced this problem?
I also tried to read the value by using its digital Pin Number, but there is for example ADC5 = D26, but i need to insert "analogRead(27)" to get the corresponding value for ADC5;
thanks if you could help me with my problem here

1 reply ⌄

(/member/ambivert+guy/) ambivert guy (/member/ambivert+guy/) 4 years ago

Reply   ▲ Upvote

I AM HAVING ERROR IN THIS CODE AS : "A0" WAS NOT DECLARED IN THE SCOPE. I CANNOT
ANALOG READ A DATA ON ATMEGA32 USING ARDUINO IDE. PLEASE HELP

```
#include<LiquidCrystal.h>
LiquidCrystal lcd (5, 4, 3, 2, 1, 0);
const int ldrPin = A0;
void setup() {
lcd.begin(16, 2);
pinMode(ldrPin, INPUT);
}
void loop() {
int ldrStatus = analogRead(ldrPin);
if (ldrStatus <=300) {
lcd.setCursor (0, 0);
lcd.print ("XX");
}
else {
lcd.setCursor (0, 1);
lcd.print ("YY");
}
}
```

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