

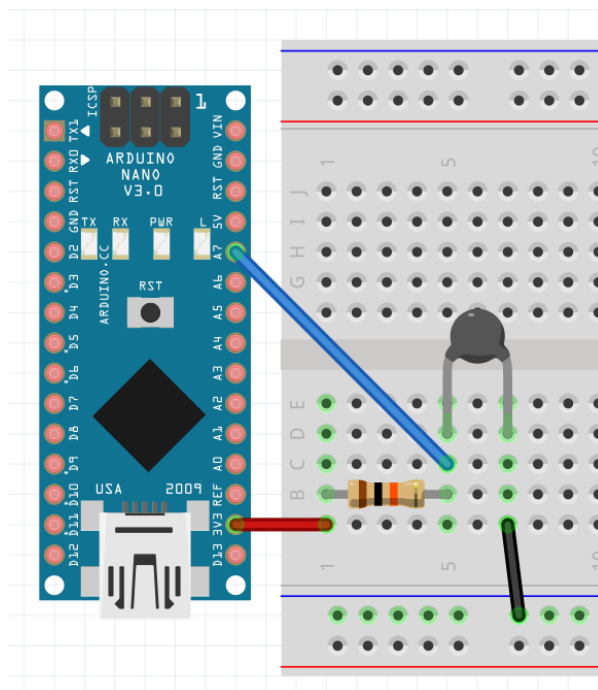
🔒 Analog pin reading over 1024 - SOLVED

andrewk_arduino

avr. 2023 post #1

Hello,

I have a very simple Arduino Nano circuit to measure temperature. A thermistance is powered by a 3v3 pin and connected to an analog pin (see circuit diagram below).



The problem is that I'm having unexpected readings on the analog pin. 1.6V between A7 and ground gives a reading of ~1400, while 3.3V gives a maximum reading of ~2885. This is weird to me, as the reading is supposed to be in 10bits (no higher than 1024).

Here is my code:

```
int ThermistorPin = A7;
float Vo = 0;

void setup() {
  Serial.begin(19200);
}

void loop() {
  Vo = analogRead(ThermistorPin);

  Serial.println(Vo);
}
```

Notice that I set the baud rate to 19200, and am using 4800 baud in the serial monitor. Other baud rates (like 9600) output gibberish. I believe this is related to my Arduino's clock rate, but I'm not sure if it is related to my current issue.

Any help or guidance would be greatly appreciated, as I am fairly new to Arduino projects. Thank you!

Edit: A 5V voltage gives a 4095 reading. This may just be that my readings are in 12 bit.

✅ Résolu par **jim-p** dans le **message #15**

It's the LGT8F328P which indeed has a 12 bit ADC

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Passer au contenu principal

When you change Vo to an interger, what do you get?

[andrewk_arduino](#) avr. 2023 post #3

I get similar results, reading of ~1400 at 1.5V. Thank you for the suggestion

[DVDdoug](#) avr. 2023 post #4

Are you sure it's a Nano?

[anon56112670](#) avr. 2023 post #5

```
andrewk_arduino:  
(no higher than 1024).
```

sp. "no higher than 1023".
Is this a real circuit, with hardware that you can touch?

[anon56112670](#) avr. 2023 post #6

```
andrewk_arduino:  
Notice that I set the baud rate to 19200, and am using 4800 baud in the serial monitor.
```

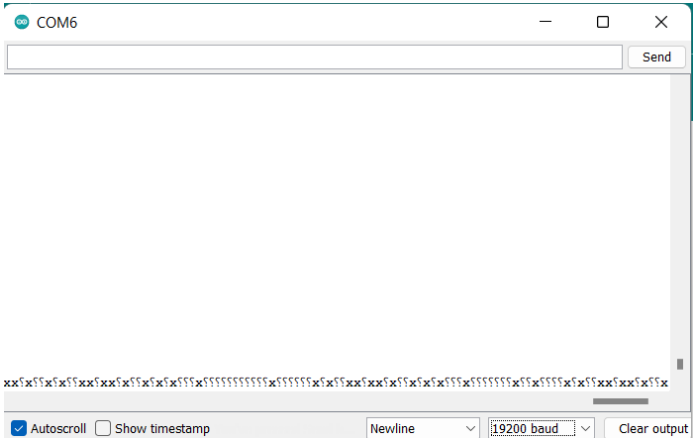
More explanation

[andrewk_arduino](#) avr. 2023 post #7

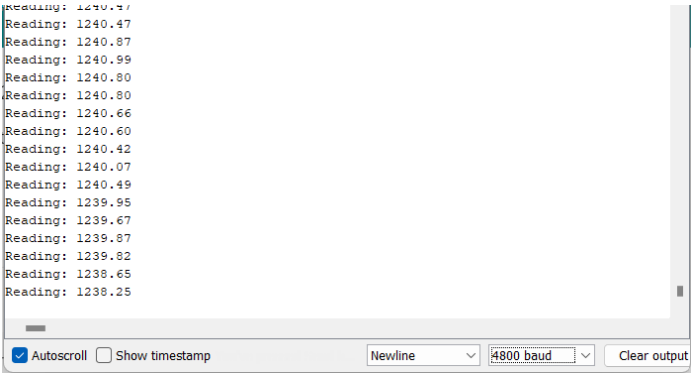
Yes, I have the physical circuit on breadboard in front of me.

[andrewk_arduino](#) avr. 2023 post #8

As you see in the code, I set the Arudino baud rate to 19200 with the line `Serial.begin(19200);`. However, setting the same baud rate in the serial monitor outputs nonsense:



It is only when setting the baud rate in the serial monitor window to 4x smaller than the one set in the code ($19200/4 = 4800$) that I get a proper output:



Wawa Brattain avr. 2023 post #9

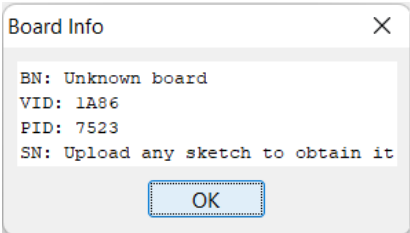
Your readings and diagram don't make sense if you're using the Nano V3.0 in your Fritzing picture. They do if you're using one of the later Nano models, like the Nano BLE. "Nano" is used for an extended family of Arduino boards. Tell us exactly which Nano you have.

andrewk_arduino:
Edit: A 5V voltage gives a 4095 reading.

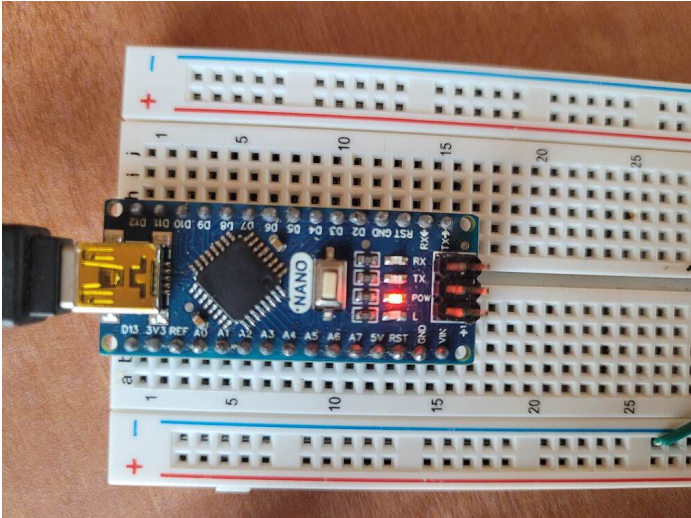
Which will damage the board if it's a newer 3.3volt-logic Nano.
Which with 12-bit readings it clearly is.
Leo..

andrewk_arduino avr. 2023 post #11

Here is the "Board info" I see on my computer. Perhaps it is not an official Arduino, it was given to me.



Here is a physical picture of the board (I have two identical boards, hence why nothing is connected here).



andrewk_arduino avr. 2023 post #12

I included details and photos of the board in my reply just above.

[Passer au contenu principal](#)

[jim-p](#)

avr. 2023 post #13

That's a clone that uses that 32Mhz IC, can't remember the name.

[jim-p](#)

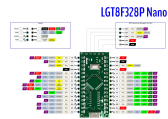
avr. 2023 post #15

It's the LGT8F328P which indeed has a 12 bit ADC

[jim-p](#)

avr. 2023 post #16

You need to install a new core for that IC:



GitHub - dbuezas/lgt8fx: Board Package for Logic Green LGT8F328P LGT8F328D...

Board Package for Logic Green LGT8F328P LGT8F328D and LGT8F88D - GitHub - dbuezas/lgt8fx: Board Package for Logic Green LGT8F328P LGT8F328D and LGT8F88D

[Wawa](#) Brattain

avr. 2023 post #17

andrewk_arduino:

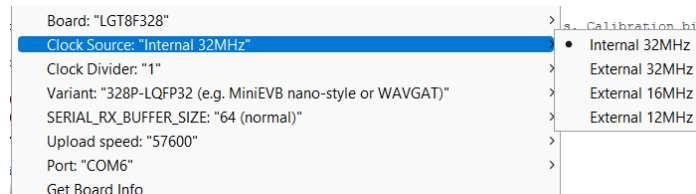
while 3.3V gives a maximum reading of ~2885

Which tells me that it could be 5volt-logic.
Leo..

[andrewk_arduino](#)

avr. 2023 post #18

Thanks a lot for this information. I have installed the new core and selected the LGT8F328B with 32MHz clock speed.



I can now properly set the baud rate as the same one shown on the serial monitor.

A 1.5V voltage on the analog pin now shows a 320 reading. It seems to now read in 10bit and will not show a reading over 1016.

This isn't necessarily problematic for me, I'm just trying to understand its behavior.

[Grumpy_Mike](#) Karma: 2500+

avr. 2023 post #19

In that first Fritzing thing you posted there is no ground connected to your bread board, so how do you expect it to work?

[andrewk_arduino](#)

avr. 2023 post #20

Sorry about that! The breadboard is indeed connected to the Arduino's ground.

[jim-p](#)

avr. 2023 post #21

You can set the resolution by:
`analogReadResolution(bits)`

Thank you so much! I am now indeed measuring up to 5V in 12 bits.

I think this officially solves my issue, thanks for your help!

jim-p

avr. 2023 post #23

If you are sure, mark it as solved

Etienne_74

avr. 2023 post #24

andrewk_arduino:

I am now indeed measuring up to 5V in 12 bits.

Does anyone have an explanation about that 5V "scale" on a 3.3V Arduino ?

Wawa Brattain

avr. 2023 post #25

It's not a 3.3volt-logic processor.
It seems to be a 328 clone running at 32Mhz.
Leo..

Etienne_74

avr. 2023 post #26

Wawa:

It's not a 3.3volt-logic processor.

Ah, OK. The thermistance is powered by a 3v3 pin but the Arduino is power by a 5V PS. That makes sense.

Wawa Brattain

avr. 2023 post #27

The thermistor should be powered by the MCU supply,
so powering it with 3.3volt is wrong in this case.
Leo..

andrewk_arduino

avr. 2023 post #28

Can you please elaborate on this? Plugging it on the 3.3V Arduino pin seemed to work fine for temperature sensing.

Etienne_74

avr. 2023 post #29

Wawa:

The thermistor should be powered by the MCU supply,
so powering it with 3.3volt is wrong in this case.

I guess it's to take advantage of the full 12 bits ADC resolution and lower the signal/noise ratio but maybe you could tell us if there's more...

anon57585045

avr. 2023 post #30

If you do that, the ADC results will be referenced to a 5V that may vary a few tens of millivolts, while the 3.3V remains the same since it's regulated.

That will produce an offset error, it will be sensitive to supply voltage variations.

Wawa Brattain

avr. 2023 post #31

[Passer au contenu principal](#)

A ratiometric sensor, like a thermistor, should be powered from the same supply that Aref of the A/D is connected to. The Aref of a 328 is by default connected to 5volt. (I guess your clone is the same).

If you do, then voltage on the thermistor increases/decreases with the same and opposite amount of the sensitivity (mV per A/D step) of the A/D. Resulting in the A/D value being stable.











If A/D and thermistor are powered from different supplies (a stable regulated 3.3volt and a potentially unstable USB supply), then that ratiometric behaviour is lost. Resulting in a varying temp readout with supply variations.

Leo..

A fermé ce sujet (le 14 oct. 2023)

This topic was automatically closed 180 days after the last reply. New replies are no longer allowed.

Sujets connexes

Sujet	Réponses	Vues	Activité
  analogRead always returning 1023	13	16,5 k	juin 2014
  Problems reading analog pin	8	851	janv. 2015
  One analog pin always showing "wrong" value Arduino Uno	26	4,1 k	nov. 2019
  Temperature readings	16	5,6 k	juin 2011
  Question on analogRead - Newb	5	1,1 k	janv. 2009

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