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john
 October 31, 2018
 1 Comment



In this guide, learn about Arduino Nano pin outs and diagrams. We've created a well explained, diagram based pin out representation of Arduino Nano.

Arduino Nano Pinout

The Arduino Nano, as the name suggests is a compact, complete and bread-board friendly microcontroller board. The Nano board weighs around 7 grams with dimensions of 4.5 cms to 1.8 cms (L to B). This article discusses about the technical specs most importantly the pinout and functions of each and every pin in the Arduino Nano board.

How different is Arduino Nano?

Arduino Nano has similar functionalities as Arduino Duemilanove but with a different package. The Nano is inbuilt with the ATmega328P microcontroller, same as the Arduino UNO. The main difference between them is that the UNO board is presented in PDIP (Plastic Dual-In-line Package) form with 30 pins and Nano is available in TQFP (plastic quad flat pack) with 32 pins. The extra 2 pins of Arduino Nano serve for the ADC functionalities, while UNO has 6 ADC ports but Nano has 8 ADC ports. The Nano board doesn't have a DC power jack as other Arduino boards, but instead has a mini-USB port. This port is used for both programming and serial monitoring. The fascinating feature in Nano is that it will choose the strongest power source with its potential difference, and the power source selecting jumper is invalid.

Arduino Nano – Specification

Show 10 entries

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Arduino Nano	Specifications
Microcontroller	ATmega328P
Architecture	AVR
Operating Voltage	5 Volts
Flash Memory	32 KB of which 2 KB used by Bootloader
SRAM	2KB
Clock Speed	16 MHz
Analog I/O Pins	8

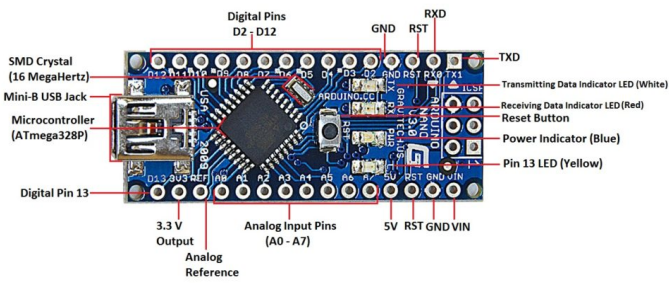
EEPROM	1 KB
DC Current per I/O Pins	40 milliAmps
Input Voltage	(7-12) Volts

Showing 1 to 10 of 15 entries

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Arduino Nano Pinout Description

Taking this pin-out diagram below as reference, we shall discuss all the functionalities of each and every pin.



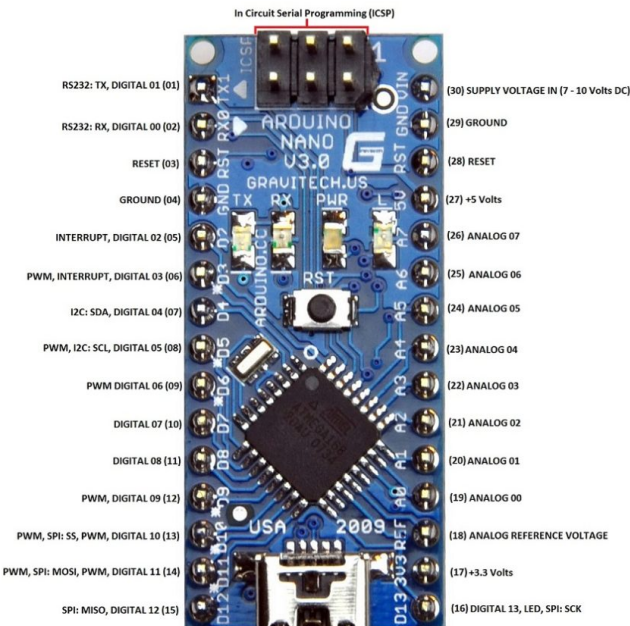
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Arduino Nano Pinout

We can infer from the image that Arduino Nano got 36 pins in total. We will see all the pins section wise as well as a detailed format at last.

Digital I/O , PWM - 14 Pins
For Analog Functions - 9 Pins
Power - 7 Pins
SPI (Apart from Digital I/O Section) - 3 Pins
Reset - 3 Pins
TOTAL - 36 Pins



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Arduino Nano Pin Description

Arduino Nano – Pin Description

Pins 1 to 30

Arduino Nano Pin	Pin Name	Type	Function
1	D1/TX	I/O	Digital I/O Pin Serial TX Pin
2	D0/RX	I/O	Digital I/O Pin Serial RX Pin
3	RESET	Input	Reset (Active Low)
4	GND	Power	Supply Ground
5	D2	I/O	Digital I/O Pin
6	D3	I/O	Digital I/O Pin
7	D4	I/O	Digital I/O Pin
8	D5	I/O	Digital I/O Pin
9	D6	I/O	Digital I/O Pin
10	D7	I/O	Digital I/O Pin
11	D8	I/O	Digital I/O Pin
12	D9	I/O	Digital I/O Pin
13	D10	I/O	Digital I/O Pin
14	D11	I/O	Digital I/O Pin
15	D12	I/O	Digital I/O Pin

16	D13	I/O	Digital I/O Pin
17	3V3	Output	+3.3V Output (from FTDI)
18	AREF	Input	ADC reference
19	A0	Input	Analog Input Channel 0
20	A1	Input	Analog Input Channel 1
21	A2	Input	Analog Input Channel 2
22	A3	Input	Analog Input Channel 3
23	A4	Input	Analog Input Channel 4
24	A5	Input	Analog Input Channel 5
25	A6	Input	Analog Input Channel 6
26	A7	Input	Analog Input Channel 7
27	+5V	Output or Input	+5V Output (From On-board Regulator) or +5V (Input from External Power Supply)
28	RESET	Input	Reset (Active Low)
29	GND	Power	Supply Ground
30	VIN	Power	Supply voltage

ICSP Pins

Arduino Nano ICSP Pin Name	Type	Function
MISO	Input or Output	Master In Slave Out
Vcc	Output	Supply Voltage
SCK	Output	Clock from Master to Slave
MOSI	Output or Input	Master Out Slave In
RST	Input	Reset (Active Low)
GND	Power	Supply Ground

Arduino Nano Digital Pins

Pins - 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16

As mentioned earlier, Arduino Nano has 14 digital I/O pins that can be used either as digital input or output. The pins work with 5V voltage as maximum, i.e., digital high is 5V and digital low is 0V. Each pin can provide or receive a current of 40mA, and has a pull-up resistance of about 20-50k ohms. Each of the 14 digital pins on the Nano pinout can be used as an input or output, using `pinMode()`, `digitalWrite()`, and `digitalRead()` functions.

Other than the digital input and output functions, the digital pins have some additional functionality as well.

Serial Communication Pins

Pins - 1, 2

1 - RX and 2 - TX

These two pins RX- receive and TX- transmit are used for TTL serial data communication. The pins RX and TX are connected to the corresponding pins of the USB-to-TTL Serial chip.

PWM Pins

Pins - 6, 8, 9, 12, 13, and 14

Each of these digital pins provide a Pulse Width Modulation signal of 8-bit resolution. The PWM signal can be generated using `analogWrite ()` function.

External Interrupts

Pins - 5, 6

When we need to provide an external interrupt to other processor or controller we can make use of these pins. These pins can be used to enable interrupts INTO and INT1 respectively by using the `attachInterrupt ()` function. These pins can be used to trigger three types of interrupts such as interrupt on a low value, a rising or falling edge interrupt and a change in value interrupt.

SPI Pins

Pins - 13, 14, 15, and 16

When you don't want the data to be transmitted asynchronously you can use these Serial Peripheral Interface pins. These pins support synchronous communication with SCK as the synchronizing clock. Even though the hardware has this feature, the Arduino software doesn't have this by default. So you have to include a library called SPI Library for using this feature.

LED

Pin - 16

If you remember your first Arduino code, blinking LED, then you'll definitely came across this Pin16. The pin 16 is being connected to the blinking LED on the board.

Arduino Nano Analog Pins

Pins - 18, 19, 20, 21, 22, 23, 24, 25, and 26

As mentioned earlier UNO got 6 analog input pins but Arduino Nano has 8 analog inputs (19 to 26), marked A0 through A7. This means you can connect *8 channel analog sensor inputs for processing. Each of these analog pins has a inbuilt ADC of resolution of 1024 bits (so it will give 1024 values). By default, the pins are measured from ground to 5V. If you want the reference voltage to be 0V to 3.3V, we can give 3.3V to AREF pin (18th Pin) by using the `analogReference ()` function.

Similar to digital pins in Nano, analog pins also got some other functions as well.

I2C

Pins 23, 24 as A4 and A5

Since SPI communication also has its disadvantages such as 4 essential pins and limited within a device. For long distance communication we use the I2C protocol. I2C supports multi master and multi slave with only two wires. One for clock (SCL) and another for data (SDA). For using this I2C feature we need to import a library called Wire library.

AREF

Pin 18

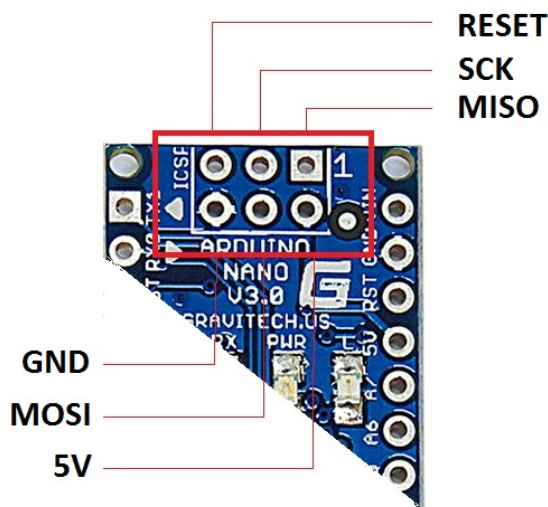
As mentioned already the AREF- Analog Reference pin is used as a reference voltage for analog input for the ADC conversion.

Reset

Pin 28

Reset pins in Arduino are active LOW pins which means if we make this pin value as LOW i.e., 0v, it will reset the controller. Usually used to be connected with switches to use as reset button.

ICSP



Arduino Nano ICSP

www.CircuitsToday.com

<http://www.circuitstoday.com/wp-content/uploads/2018/02/Arduino-Nano-ICSP.jpg>

Arduino Nano ICSP

ICSP stands for In Circuit Serial Programming, which represents one of the several methods available for programming Arduino boards. Ordinarily, an Arduino bootloader program is used to program an Arduino board, but if the bootloader is missing or damaged, ICSP can be used instead. ICSP can be used to restore a missing or damaged bootloader.

Each ICSP pin usually is cross-connected to another Arduino pin with the same name or function. For example, MISO on Nano's ICSP header is connected to MISO / digital pin 12 (Pin 15); MOSI on the ICSP header is connected to MOSI / digital pin 11 (Pin 16); and so forth. Note, MISO, MOSI, and SCK pins taken together make up most of an SPI interface.

We can use one Arduino to program another Arduino using this ICSP.

Arduino as ISP	ATMega328
Vcc/5V	Vcc
GND	GND
MOSI/D11	D11
MISO/D12	D12
SCK/D13	D13
D10	Reset

RESET

Pins 3, 28 and 5 in ICSP

Power

Pins 4, 17, 27, 28, 30 and 2 & 6 in ICSP

Applications

We have compiled a huge list of Arduino Nano based projects with complete source code and detailed explanation of the circuits. Check out the list below.

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
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COMMENTS

Teraz
May 15, 2018

Arduino Uno and Nano have 20 digital I/O pins. Analog pins A0-A5 are digital I/O pins with ADC.



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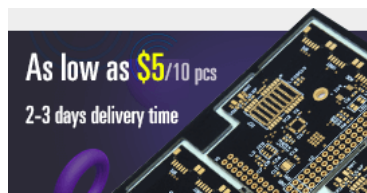
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