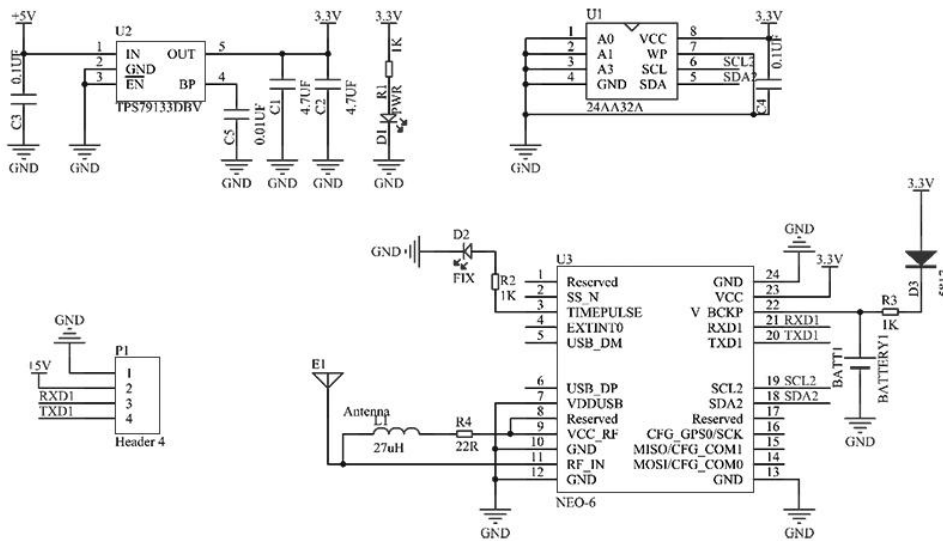


LAMPIRAN

Module u-blox NEO-6M GPS

The u-blox NEO-6M GPS engine on these modules is quite a good one, and it also has high sensitivity for indoor applications. Furthermore, there's one MS621FE-compatible rechargeable battery for backup and EEPROM for storing configuration settings. The module works well with a DC input in the 3.3- to 5-V range (thanks to its built-in voltage regulator). The original circuit diagram of the module, borrowed from the web, is shown below:



As indicated, the GPS modules are based on the u-blox NEO-6M GPS engine. The type number of the NEO-6M is NEO-6M-0-001, and its ROM/FLASH version is ROM 7.0.3 (PCN reference UBX-TN-11047-1). The NEO-6M module includes one configurable UART interface for serial communication, but the default UART (TTL) baud rate here is 9,600. Because the GPS signal is right-hand circular-polarized (RHCP), the style of the GPS antenna will be different from the common whip antennas used for linear polarized signals. The most popular antenna type is the patch antenna. Patch antennas are flat, generally have a ceramic and metal body, and are mounted on a metal base plate. They are often cast in a housing. For more information about u-blox reference designs, see their [website](#). Remember, the position of the antenna mounting is very crucial for optimal performance of the GPS receiver. When using the patch antenna, it should be oriented parallel to the geographic horizon. The antenna must have full view of the sky, ensuring a direct line of sight with as many visible satellites as possible.

Initial test setup

For a quick test using your Windows computer, you just need to establish a serial communication with the GPS module using one USB-UART adapter like the PL2303 USB-to-Serial Converter module. The hardware setup is pretty simple:

NEO-6M GPS Module	USB-to-Serial Converter
TX	RX
RX	TX
GND	GND
VCC	5 V

Module GSM SIM800L

Module **SIM800L** merupakan jenis module **GSM/GPRS Serial** yang populer digunakan oleh para penghobi elektronika, maupun profesional elektronika.

Dimana dapat diaplikasikan dalam berbagai proyek pengendalian jarak jauh via message dari Handphone dengan simcard jenis Micro sim.

Pada saat ini, terdapat beberapa tipe dari Breakout Board, tetapi yang paling banyak dijual di Indonesia yaitu versi mini dengan kartu GSM jenis Micro SIM.



Keterangan PinOut :

1. ANT : Antena
2. VCC : tegangan masukan 3.7 – 4.2Vdc
3. RST : Reset
4. RX : Rx Data Serial
5. TX : Tx Data Serial
6. GND : Ground
7. RING : ketika ada telp masuk
8. DTR
9. MIC + : ke microphone kutub +
10. MIC – : ke microphone kutub –
11. Speaker + : ke speaker atau amplifier kutub +
12. Speaker – : ke speaker atau amplifier kutub –
13. Micro Sim (Kartu GSM)

Spesifikasi modul SIM800L :

- Menggunakan ic Chip : SIM800
- Tegangan ke VCC : antara 3.7 – 4.2Vdc (tetapi pada datasheet = 3.4 – 4.4V), dan disarankan menggunakan 3.7 Vdc agar tidak terdapat notifikasi “Over Voltage“
- Bekerja pada frequency jaringan GSM yaitu QuadBand (850/900/1800/1900Mhz)
- Konektifitas class 1 (1W) pada DCS 1800 dan PCS 1900GPRS, sedangkan pada class 4 (2W) pada GSM 850 dan EGSM 900
- GPRS multi-slot class 1~12 (option) tetapi default pada class 12
- Suhu pengoperasian normal : 40°C ~ +85°C
- Menggunakan port TTL serial port, sehingga dapat langsung diakses menggunakan microcontroller tanpa perlu memerlukan MAX232
- Transmitting power

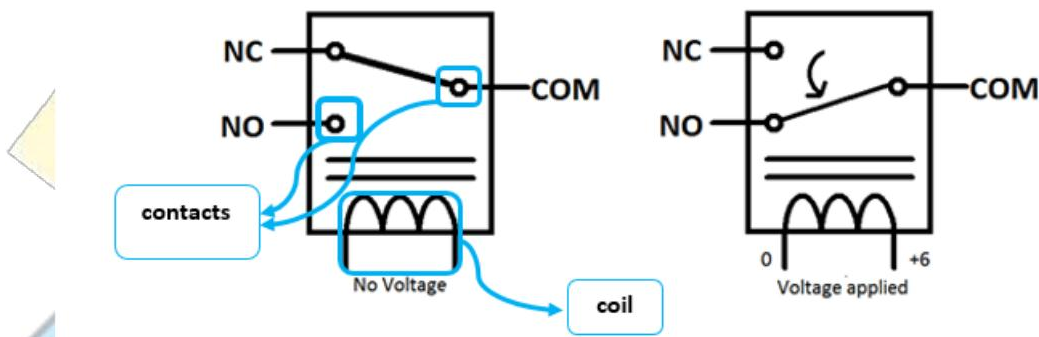
- Power module automatically boot, homing network
- Terdapat Led pada modul yang berfungsi sebagai indikator. Apabilapada module terhubung dengan jaringan GSM maka **LED akan berkedip perlahan**, akan tetapi apabila tidak ada sinyal maka **LED akan berkedip cepat**.
- Ukuran module : 2.5cm x 2.3cm



RELAY MODULES

RELAY WORKING IDEA

Relays consist of three pins normally open pin , normally closed pin, common pin and coil. When coil powered on magnetic field is generated the contacts connected to each other.

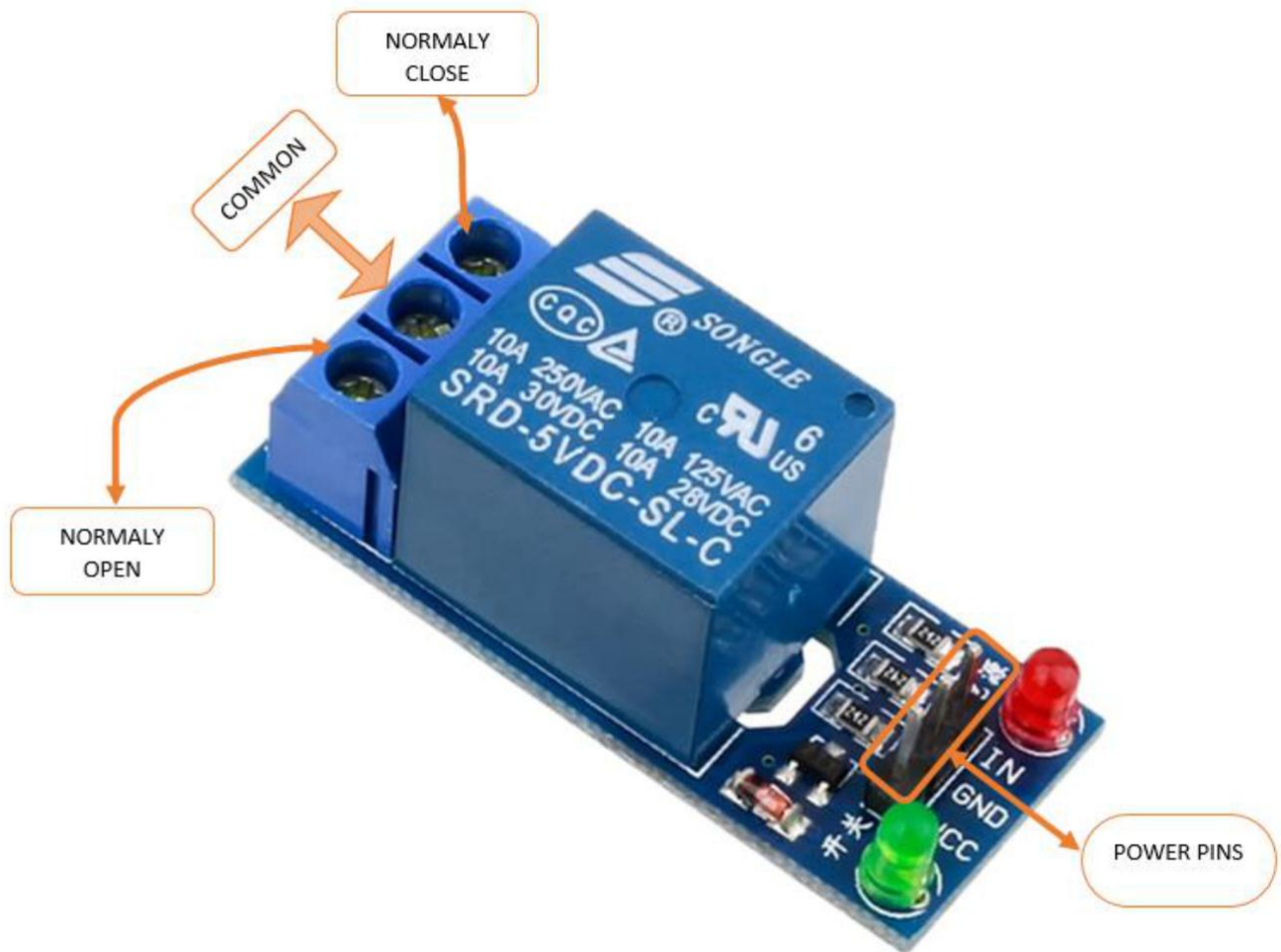


Relay modules 1-channel features

- Contact current 10A and 250V AC or 30V DC.
- Each channel has indication LED.
- Coil voltage 12V per channel.
- Kit operating voltage 5-12 V
- Input signal 3-5 V for each channel.
- Three pins for normally open and closed for each channel.

How to connect relay module with Arduino

As shown in relay working idea it depends on magnetic field generated from the coil so there is power isolation between the coil and the switching pins so coils can be easily powered from Arduino by connecting VCC and GND pins from Arduino kit to the relay module kit after that we choose Arduino output pins depending on the number of relays needed in project designed and set these pins to output and make it out high (5 V) to control the coil that allow controlling of switching process.

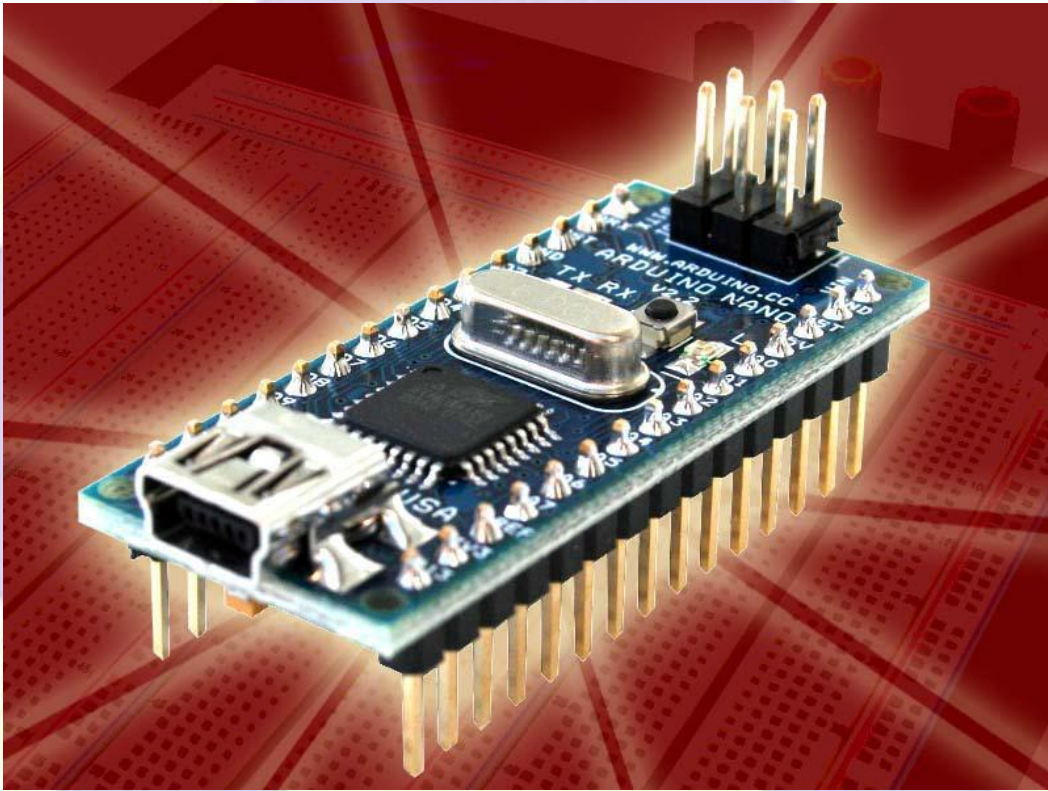


NOTE : whatever was the relay channels number the pinconfiguration is the same for every channel except the power pins (VCC and GND) are for the board itself. The input signal (IN) pin for every relay.



Arduino Nano (V2.3)

User Manual



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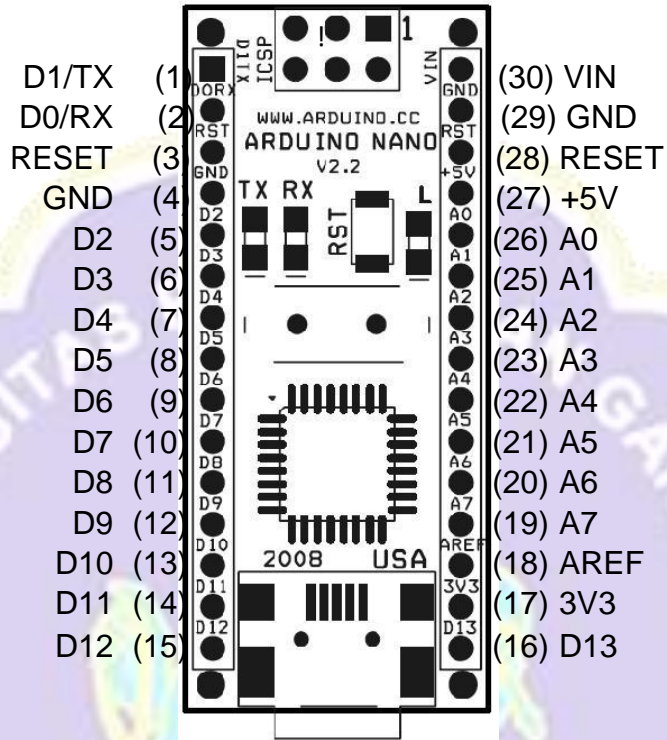
<http://creativecommons.org/licenses/by-sa/2.5/>

More information:

www.arduino.cc

Rev. 2.3

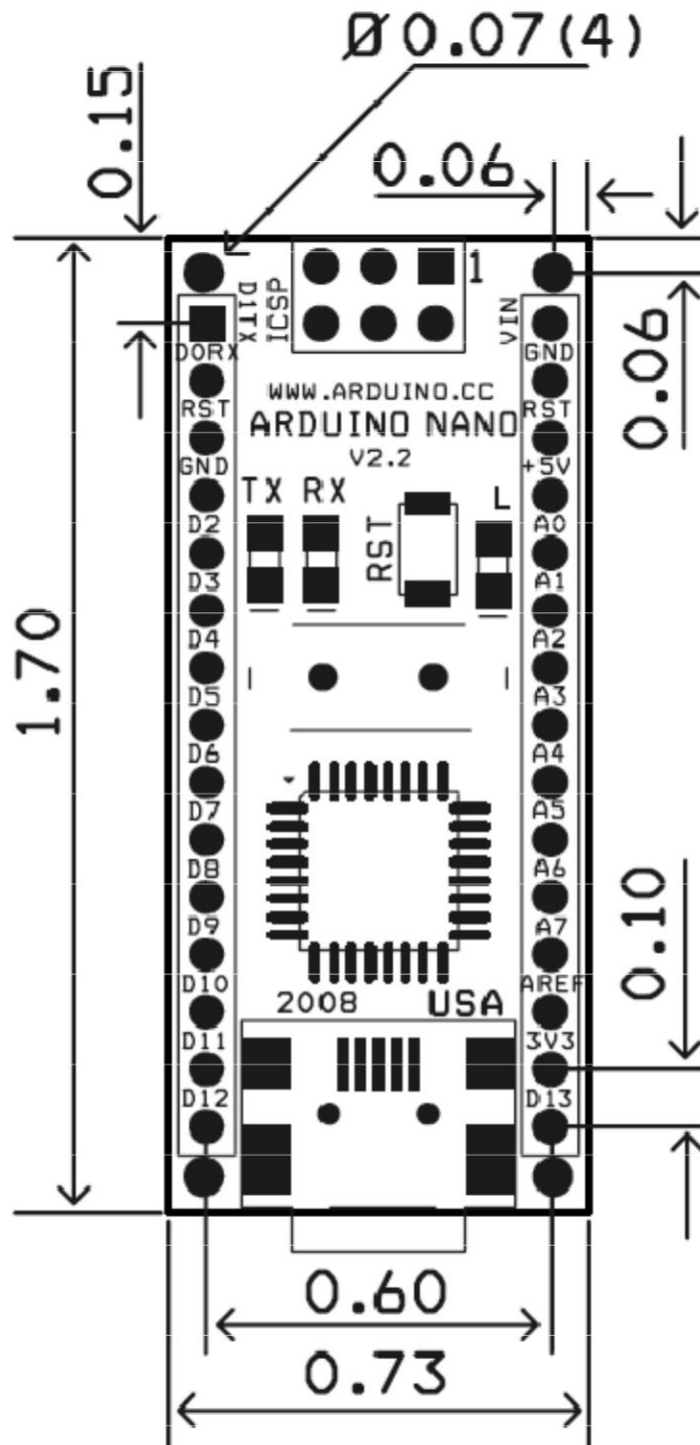
Arduino Nano Pin Layout



Pin No.	Name	Type	Description
1-2, 5-16	D0-D13	I/O	Digital input/output port 0 to 13
3, 28	RESET	Input	Reset (active low)
4, 29	GND	PWR	Supply ground
17	3V3	Output	+3.3V output (from FTDI)
18	AREF	Input	ADC reference
19-26	A7-A0	Input	Analog input channel 0 to 7
27	+5V	Output or Input	+5V output (from on-board regulator) or +5V (input from external power supply)
30	VIN	PWR	Supply voltage

! ! ! ! !

Arduino Nano Mechanical Drawing



ALL DIMENSIONS ARE IN INCHES

Arduino Nano Bill of Material

Item Number!	Qty.!	Ref. Dest.!	Description!	Mfg. P/N!	MFG!	Vendor P/N!	Vendor!
1!	5!	C1,C3,C4,C7,C9!	Capacitor,!0.1uF!50V!10%! Ceramic!X7R!0805!	C0805C104K5RACTU!	Kemet!	80"C0805C104K5R!	Mouser!
2!	3!	C2,C8,C10!	Capacitor,!4.7uF!10V!10%! Tantalum!Case!A!	T491A475K010AT!	Kemet!	80"T491A475K010!	Mouser!
3!	2!	C5,C6!	Capacitor,!18pF!50V!5%! Ceramic!NOP/COG!0805!	C0805C180J5GACTU!	Kemet!	80"C0805C180J5G!	Mouser!
4!	1!	D1!	Diode,!Schottky!0.5A!20V!	MBR0520LT1G!	ONsemi!	863"MBR0520LT1G!	Mouser!
5!	1!	J1,J2!	Headers,!36PS!1!Row!	68000"136HLF!	FCI!	649"68000"136HLF!	Mouser!
6!	1!	J4!	Connector,!Mini"B!Recept! Rt.!Angle!	67503"1020!	Molex!	538"67503"1020!	Mouser!
7!	1!	J5!	Headers,!72PS!2!Rows!	67996"272HLF!	FCI!	649"67996"272HLF!	Mouser!
8!	1!	LD1!	LED,!Super!Bright!RED! 100mcd!640nm!120degree! 0805!	APT2012SRCPRV!	Kingbright!	604"APT2012SRCPRV!	Mouser!
9!	1!	LD2!	LED,!Super!Bright!GREEN! 50mcd!570nm!110degree! 0805!	APHCM2012CGCK"F01!	Kingbright!	604"APHCM2012CGCK!	Mouser!
10!	1!	LD3!	LED,!Super!Bright!ORANGE! 160mcd!601nm!110degree! 0805!	APHCM2012SECK"F01!	Kingbright!	04"APHCM2012SECK!	Mouser!
11!	1!	LD4!	LED,!Super!Bright!BLUE! 80mcd!470nm!110degree! 0805!	LTST"C170TBKT!	Lite"On!Inc!	160"1579"1"ND!	Digikey!
12!	1!	R1!	Resistor!Pack,!1K!+/"5%! 62.5mW!4RES!SMD!	YC164"JR"071KL!	Yageo!	YC164J"1.0KCT"ND!	Digikey!
13!	1!	R2!	Resistor!Pack,!680!+/"5%! 62.5mW!4RES!SMD!	YC164"JR"07680RL!	Yageo!	YC164J"680CT"ND!	Digikey!
14!	1!	SW1!	Switch,!Momentary!Tact! SPST!150gf!3.0x2.5mm!	B3U"1000P!	Omron!	SW1020CT"ND!	Digikey!
15!	1!	U1!	IC,!Microcontroller!RISC! 16kB!Flash,!0.5kB!EEPROM,! 23!/O!Pins!	ATmega168"20AU!	Atmel!	556"ATMEGA168"20AU!	Mouser!
16!	1!	U2!	IC,!USB!to!SERIAL!UART!28! Pins!SSOP!	FT232RL!	FTDI!	895"FT232RL!	Mouser!
17!	1!	U3!	IC,!Voltage!regulator!5V,! 500mA!SOT"223!	UA78M05CDCYRG3!	TI!	595"UA78M05CDCYRG3!	Mouser!
18!	1!	Y1!	Cystal,!16MHz!+/"20ppm! HC"49/US!Low!Profile!	ABL"16.000MHZ"B2!	Abracon!	815"ABL"16"B2!	Mouser!

