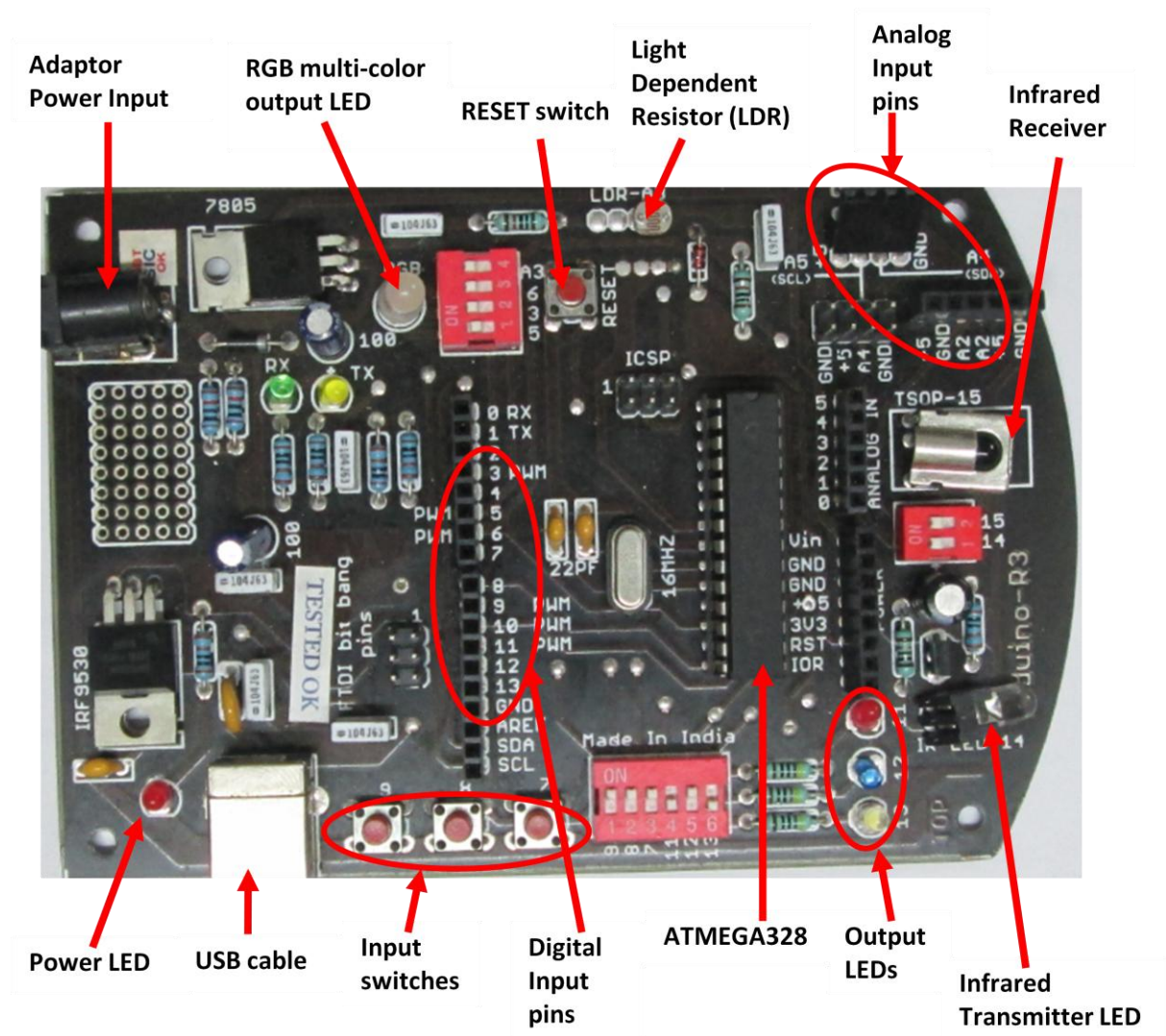


Induino R3 - An Overview:



Induino R3

The Induino R3 is a low-cost Indian made clone / derivative of the popular Arduino Board. The InduinoX was an Indian made clone of the Arduino Duemilanove with a host of added features. The Induino R3 is the latest revision (2013) in this series of InduinoX boards.

The Induino R3 is a Arduino Rev3 Clone with a **ATmega328 microcontroller** loaded with Arduino UNO boot loader. Rev3 compatibility ensures that the board works with the newer versions of the Arduino shields.

It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs (can also be used for digital I/O - so a total of 20 digital I/O's), a 16 MHz crystal oscillator, a USB connection, an ICSP header, and a reset button. Like the Duemilanove, It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. It is completely compatible with all Arduino shields mechanically.

On top of the regular features of an Arduino Board, The Induino R3 comes with a number of on-board peripherals and interfaces.

The Following is the list of On-Board Peripherals:

1. 3 LEDs on digital pins 11,12 & 13 [for experimentation with digital outputs]



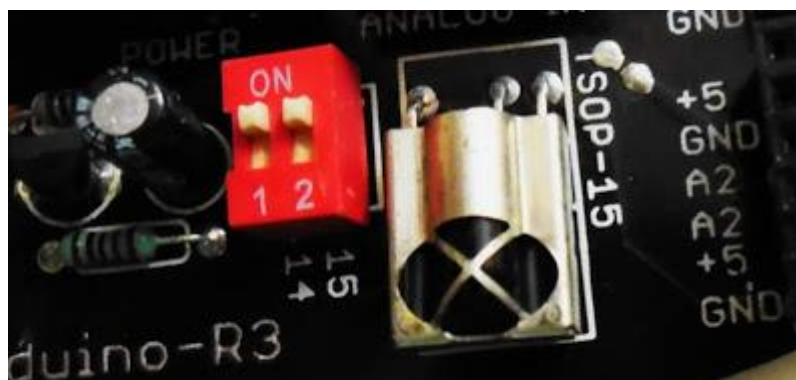
2. 3 Push Buttons on digital pins 7, 8 & 9 [for experimentation with digital inputs]



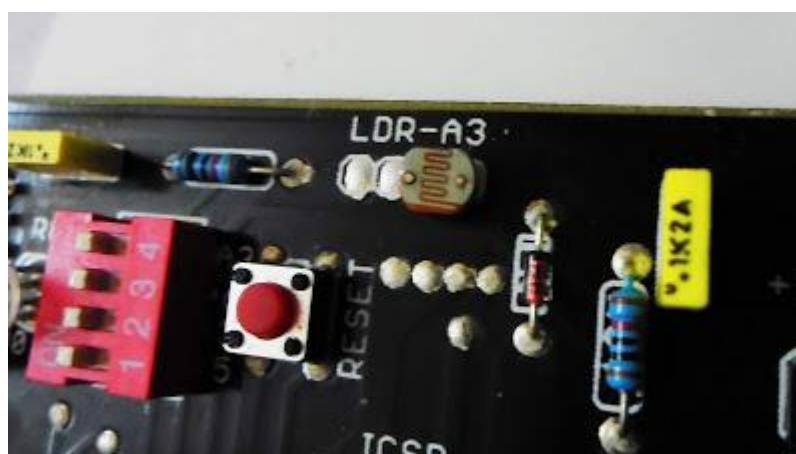
3. 1 IR LED on digital pin 14 a.k.a analog input pin 0 [experimentation with pulse generation & wireless communication]



4. 1 TSOP IR Receiver on digital pin 15 a.k.a analog input pin 1 [experimentation with pulse decoding & wireless communication]



5. 1 LDR (with potential divider) on analog input pin 3 [experimentation with analog sensors]



6. 1 RGB Led [experimentation with analog outputs / PWM]

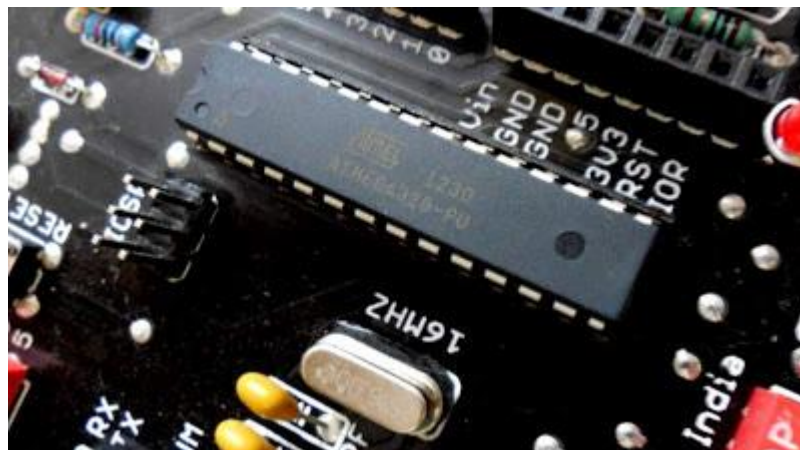


The Following is the list of On-Board Interfaces:

- R3 Shield Compatible Pinouts – Makes the board compatible with all the latest R3 Arduino Shields
- Analog Sensor Interface – Plug & Program Interface compatible with a number of sensors – HC-SR04 Ultrasonic Distance Sensor, RHT03 – Humidity & Temperature Sensor, Force Sensitive Resistors & Other Variable Resistor type sensors
- Servo Interface – Plug & Program up to 2 / 3 Servo Motors (3rd one using the Analog Sensor Interface)
- RTC Interface – Plug & Program interface for Simple Labs RTC Breakout Board / Other Boards with similar pin mapping
- Prototyping Area – A 8x5 dots prototyping area to add custom devices
- FTDI Bit Bang Programming Interface

The Microcontroller:

The Induino R3 comes with an ATmega 328 Microcontroller with an Arduino Uno Bootloader. The Bootloader facilitates the Programming of the IC from within the Arduino IDE. (Note: A New ATmega328 will not have the bootloader and hence cannot be used directly to replace the ATmega328 on the InduinoR3 Board. You will first have to program the Bootloader into the ATmega328 before using it on the InduinoR3)



The ATmega328 has 20 programmable IOs. It has a **32KB Flash** memory (Where the compiled program is stored) of which 0.5 KB is used by the Arduino bootloader. It has **2KB SRAM** (Used for run-time needs - like variables, etc) and **1KB EEPROM** (can be used to store data that needs to be stored even when the microcontroller is powered off).

The Power Setup:

The Induino R3 operates at 5 Volts. It can either be powered through USB or through the DC jack provided on the Board.

The DC Jack

The Induino R3 comes with a 7805 Voltage Regulator for Providing a 5V regulated output voltage. So, You can power the Induino R3 using the DC Jack with an input voltage in the range

of 7 - 25 Volts DC. Note the 7805 can decently handle 500mA of current, so ensure you are not overloading it.

USB Power

The Induino R3 can also be powered from the USB. When powered from the USB, the 7805 Voltage regulator is not used. There is a 500mA Re-settable fuse on the USB power line. This prevents the board from drawing excess current from your USB Port.



Resettable Fuse

“When both the DC-Jack and the USB are used to Power, the board will be powered from the DC-Jack”.

The 3.3 Volts Pin

There is a 3.3 Volt Supply Pin on the InduinoR3. Use this pin with a lot of care. ***“This pin can provide only 50mA of current.”*** This pin uses the FTDI's 3.3V output. Use this Only to Power Sensors / Wireless Modules. **‘DO NOT USE FOR POWERING MOTORS / SERVOS / RELAYS / ETC.’** doing so might end up frying the FTDI chip and making the board useless.

The USB Connectivity:

The Induino R3 Board uses a FTDI FT232 IC for USB communication. This is a Serial to USB converter IC that helps us communicate with the microcontroller serially using USB. The ATmega328 doesn't support USB communication directly and hence the need for a dedicated IC for the same. The FT232 IC needs drivers to work. This is also the key differentiating factor

between the Arduino UNO R3 and the Induino R3. The Arduino Uno R3 uses another Atmega IC (ATmega16U2) for USB Support.

The DIP Switches:

The Induino R3 board uses DIP switches to connect the on-board devices to the respective IO's.

You can put the switch pertaining to a particular device in the Off mode and connect an external device to the IO pin directly. There are 3 DIP switches in total - 1 x 6-Pin DIP Switch, 1 x 4-Pin DIP Switch & 1 x 2-Pin DIP Switch.

