

EN2533 – Robot Design and Competition

Homework 4 – Arduino Mega 2560

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Arduino 2560 is an open-source microcontroller board.

Specifications of Arduino Mega 2560

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|--|--|
| • Microcontroller present | - Atmega2560 |
| • Operating voltage of the microcontroller | - 5 V |
| • Number of digital I/O pins | - 54 including 15 which can supply PWM output |
| • Number of analog input pins | - 16 |
| • DC current rating per I/O pin | - 20 mA |
| • DC current drawn from chip | - 50 mA |
| • Flash memory | - 256 KB |
| • SRAM | - 8KB |
| • EEPROM | - 4KB |
| • Clock speed | - 16 MHz |
| • Communication | - USB (Programming with ATmega2560)
ICSP (Programming)
SPI
I2C
USART |

Power Pins

- | | |
|------------------------------------|--|
| • Recommended supply voltage (VIN) | - 7V to 12 V |
| • GND | - Ground |
| • 5 V Supply | - For External hardware power supply |
| • 3.3 V Supply | - For External low voltage hardware supply |

Controller Pins

- | | |
|----------------|--|
| • RESET | - A low level longer than 4 clock cycles on this pin, will generate a reset. |
| • XTAL1, XTAL2 | - Crystal oscillator is connected to supply clock for the controller with bypass capacitor to the GND. |
| • AREF | - Used when A/D for analog to digital conversion with external reference voltage for conversion and don't want to use internal reference voltages. |

Alternative Pins

- SPI - Pin 22 - SS, Pin 23 - SCK, Pin 24 - MOSI, Pin 25 - MISO

Used for serial communication with Serial Peripheral Interface (SPI) protocol for communication between 2 or more devices.

(Ex: Programming the ATmega, Communication with other peripherals such as LCD, SD)

- I2C - Digital pin 20 for SDA and 21 for SCK (Speed 400kHz) to enable 2 wire communication with other devices. (Ex: LCD and other multiple devices)
- PWM - Digital pin 2 – 13 can be used as PWM output to write PWM value from 0 – 255. (Ex: Speed control of motor, light dimmer)
- USART - Pin 0 – RXD0, Pin 1 – TXD0, Pin 19 – RXD1, Pin 18 – TXD1
Pin 17 – RXD2, Pin 16 – TXD2, Pin 15 – RXD3, Pin 14 – TXD3
For serial USART communication with PC or other system for data sharing and logging. (Ex: Two controller communication)
- Pinchange Interrupt - Digital Pins - 0,22,23,24,25,10,11,12,13,15,14
Analog Pins - 6,7,8,9,10,11,12,13,14,15
Used for pin change interrupt. (Ex: Push button-based interrupt and others)
- Hardware Interrupt - Digital pin 2,3,18 - 21
Used for interrupt services (Ex: Sensors like ultrasonic and other)

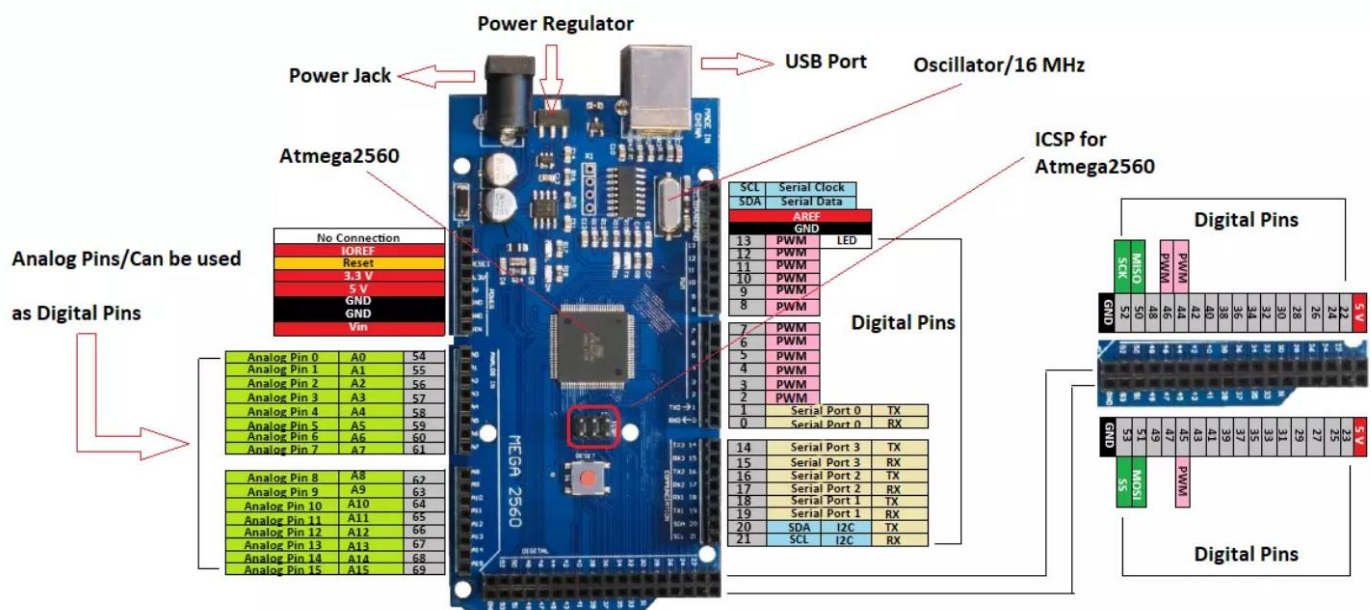


Figure 1 - Pinout Diagram of Arduino Mega 2560

Reference

<https://www.circuitstoday.com/arduino-mega-pinout-schematics>

<https://www.elprocus.com/arduino-mega-2560-board/>

<https://www.theengineeringprojects.com/2018/06/introduction-to-arduino-mega-2560.html>