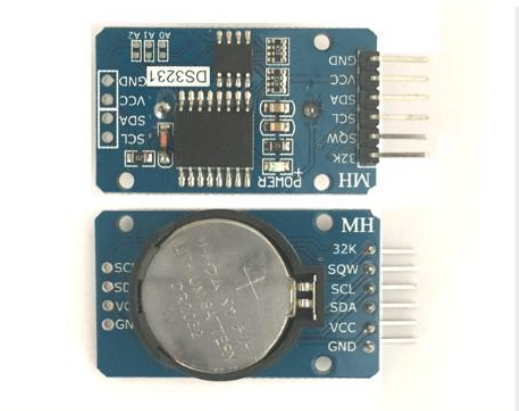
DS3231 RTC Module :



DS3231 RTC Module | DS3231 RTC Module Pinout

RTC means **Real Time Clock**. RTC modules are simply TIME and DATE remembering systems which have battery setup which in the absence of external power keeps the module running. This keeps the TIME and DATE up to date. So we can have accurate TIME and DATE from RTC module whenever we want.

DS3231 RTC Pin Configuration :

DS3231 RTC Pin Configuration

DS3231 is a six terminal device, out of them two pins are not compulsory to use. So we have mainly four pins. These four pins are given out on other side of module sharing the same name.

Pin Name	Description
VCC	Connected to positive of power source.
GND	Connected to ground.
SDA	Serial Data pin (I2C interface)
SCL	Serial Clock pin (I2C interface)
SQW	Square Wave output pin
32K	32K oscillator output

Interfacing of RTC module with arduino :

Connect the pins accordingly.

Arduino UNO	RTC Module
5V	VCC
GND	GND
ICSP2 Header	SDA
ICSP2 Header	SCL

HDMI

High-Definition Multimedia Interface (HDMI) : HDMI or High Definition Multimedia Interface is meant for transfer of digital audio and digital video from DVD players, set top boxes etc. to TVs, projectors etc. HDMI supports the transfer of any uncompressed video and audio formats over a single cable. HDMI supplies high definition quality audio and video without distortion and works well with displays such as, LCD, LED, Plasma and DLP projectors etc. HDMI output match pixel-by-pixel with the displays.

HDMI Cable :

Pin 1	TMDS Data2+
Pin 2	TMDS Data2 Shield
Pin 3	TMDS Data2−
Pin 4	TMDS Data1+
Pin 5	TMDS Data1 Shield
Pin 6	TMDS Data1−
Pin 7	TMDS Data0+
Pin 8	TMDS Data0 Shield
Pin 9	TMDS Data0−
Pin 10	TMDS Clock+
Pin 11	TMDS Clock Shield
Pin 12	TMDS Clock−
Pin 13	CEC
Pin 14	Reserved
Pin 15	SCL
Pin 16	SDA
Pin 17	DDC/CEC/HEAC Ground
Pin 18	+5 V
Pin 19	Hot Plug detect

HDMI Working :

HDMI working is explained with the help of communication protocols such as Display Data Channel (DDC), Transition Minimized Differential Signaling (TMDS) and Consumer Electronics Control (CEC), which are physically separate.

Transition Minimized Differential Signaling (TMDS) :

Transition Minimized Differential Signaling (TMDS), is an encoding method used by HDMI for the transfer of data from one point to another without degrading the information over the distance of the cable.

Display Data Channel (DDC)

DDC is a set of communication protocols that defines certain rules and regulations on the connection between a graphics adapter and computer display. This protocol allows communication between the display and adapter on the display formats the monitor can support and enables the adjustment of display parameters such as contrast, sharpness etc.
The support of Enhanced Display Data Channel (E-DDC) is required for HDMI, which provides the information to the sender about the video formats supported by the receiver

Consumer Electronics Control (CEC)

User gets the privilege of controlling CEC-enabled two or more devices with the help of a single remote controller of any of these devices. CEC also allows the commanding and controlling of CEC supporting devices by mutual intervention. CEC-enabled devices can send instructions between each other. One Touch Play, Deck Control, One Touch Record, Tuner Control etc. are the functions provided by CEC.

Hot Plug Detect

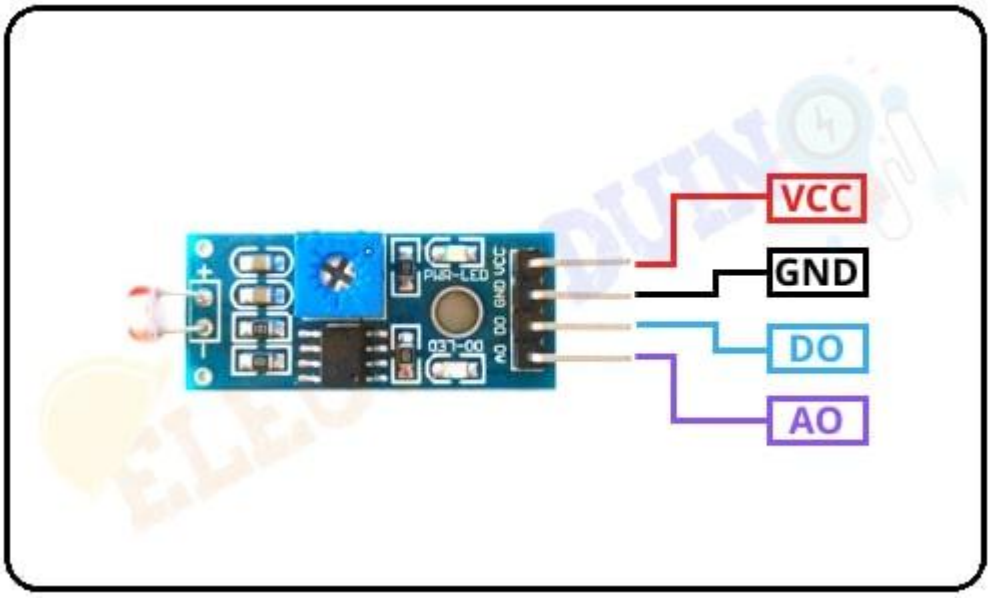
Hot Plug Detect or "HPD" is a feature of the HDMI, DisplayPort, and DVI specifications. Typically it relies on a single pin in the connector making contact, which initiates the process.

LDR Sensor Module

LDR Sensor Module or Photo resistor sensor :

LDR sensor module is a low-cost digital sensor as well as analog sensor module, which is capable to measure and detect light intensity. This sensor also is known as the Photo resistor sensor. This sensor has an on-board LDR(Light Dependent Resistor), that helps it to detect light. This sensor module comes with 4 terminals. Where the “DO” pin is a digital output pin and the “AO” pin is an analog output pin. The output of the module goes high in the absence of light and it becomes low in the presence of light. The sensitivity of the sensor can be adjusted using the on-board potentiometer.

LDR Sensor Module or Photo resistor sensor Pin Diagram :



Pin No	Pin Name	Description
1	VCC	+5 v power supply Input Pin
2	GND	Ground (-) power supply Input Pin
3	DO	Digital Output Pin
4	AO	Analog Output Pin

Interfacing LDR Sensor with Arduino:

Components Pin	Arduino Pin
IR sensor Vcc Pin	+ 5v Pin
IR sensor GND Pin	GND (ground) pin
IR sensor OUT Pin	Digital pin “D2”

LDR or Light Dependent Resistor :

LDR or Light Dependent Resistor is one type of variable resistor. It is also known as a photo-resistor. The Light Dependent Resistor (LDR) works on the principle of **“Photo Conductivity”**. The LDR resistance is change according to the light intensity falls on the LDR. When light intensity increase on the LDR surface, then the LDR resistance will decrease and the element conductivity will increases. When light intensity decrease on the LDR surface, then the LDR resistance will increase and the element conductivity will decrease.