LDR Sensor

This sensor consists of 2 pins. It works on the principle of photo conductivity. When the light falls on its surface, then the material conductivity reduces and also the electrons in the valence band of the device are excited to the conduction band. These photons in the incident light must have energy greater than the band gap of the semiconductor material. It makes the electrons to jump from the valence band to conduction. These devices depend on the light, when light falls on the LDR then the resistance decreases, and increases in the dark. It is a LDR is kept in the dark place, its resistance is high and, when the LDR is kept in the light its resistance will decrease. If a constant “V’ is applied to the LDR, the intensity of the light increased and current increases.

In this project, the sensor sends data in analog form to the Arduino. The Arduino reads this data and displays it in the serial monitor.

DHT11 Sensor

It consists of 3 pins, Data Out, Ground, Vcc. It sends digital signals to the Arduino which is then read and displayed on the serial monitor. Humidity sensing component is used, of course to measure humidity, which has two electrodes with moisture holding substrate (usually a salt or conductive plastic polymer) sandwiched between them. The ions are released by the substrate as water vapor is absorbed by it, which in turn increases the conductivity between the electrodes. The change in resistance between the two electrodes is proportional to the relative humidity. Higher relative humidity decreases the resistance between the electrodes, while lower relative humidity increases the resistance between the electrodes. Besides, they consist of a NTC temperature sensor/Thermistor to measure temperature. A thermistor is a thermal resistor – a resistor that changes its resistance with temperature. Technically, all resistors are thermistors – their resistance changes slightly with temperature – but the change is usually very very small and difficult to measure. Thermistors are made so that the resistance changes drastically with temperature so that it can be 100 ohms or more of change per degree! The term “NTC” means “Negative Temperature Coefficient”, which means that the resistance decreases with increase of the temperature. On the other side, there is a small PCB with an 8-bit SOIC-14 packaged IC. This IC measures and processes the analog signal with stored calibration coefficients, does analog to digital conversion and spits out a digital signal with the temperature and humidity.