

# AC CURRENT TRANSFORMER

## Overview



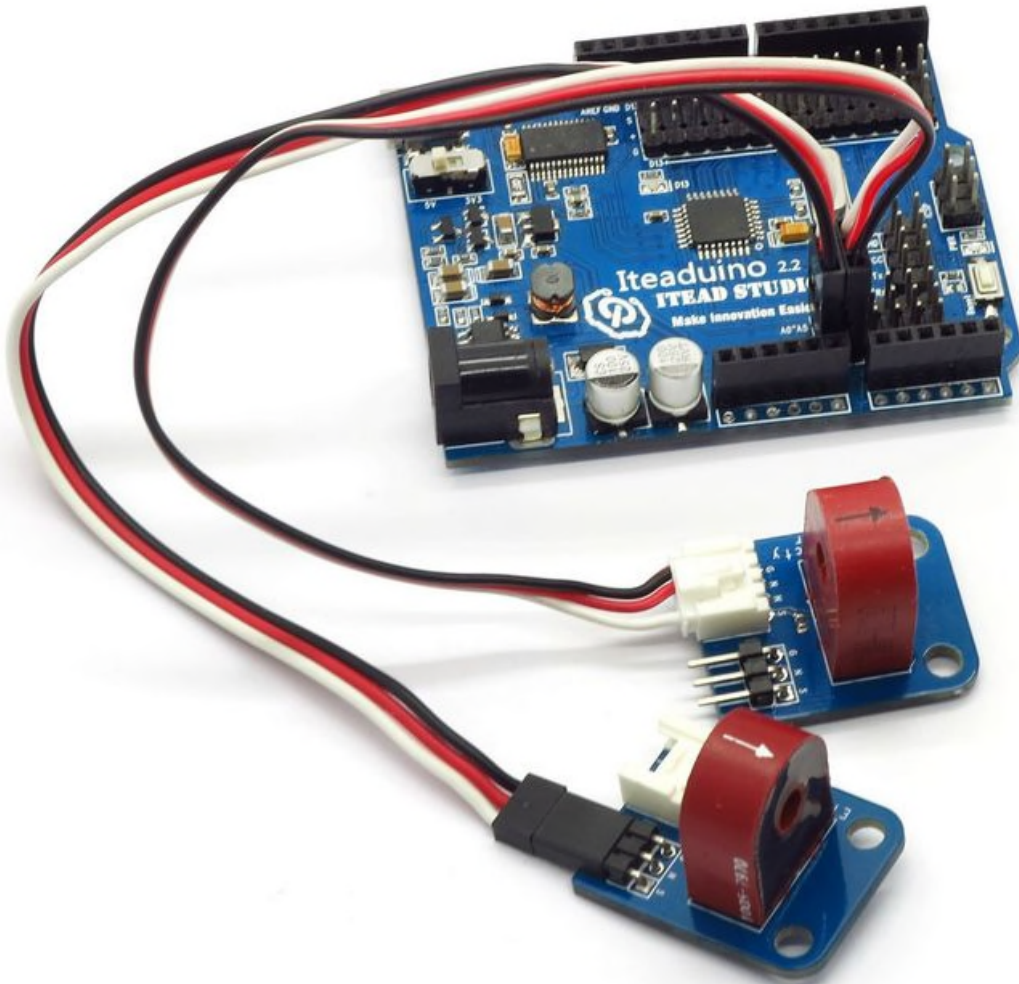
What is an electronic brick? An electronic brick is an electronic module which can be assembled like Lego bricks simply by plugging in and pulling out. Compared to traditional universal boards and circuit modules assembled with various electronic components, electronic brick has standardized interfaces, plug and play, simplifying construction of prototype circuit on one's own. There are many types of electronic bricks, and we provide more than twenty types with different functions including buttons, sensors, Bluetooth modules, etc, whose functions cover from sensor to motor drive, from Ethernet to wireless communication via Bluetooth, and so on. We will continue to add more types to meet the various needs of different projects.

Electronic brick of electricity sensor is based on TA12-100 current transformer, which can transform AC signals of large current into small amplitude signals. The maximum current that can be detected can reach 5A, and the present current signal can be read via analog I / O port.

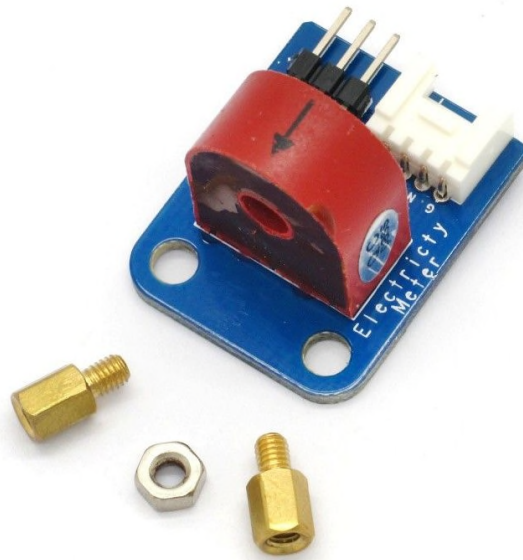
# Features

---

1. Plug and play, easy to use. Compatible with the mainstream 2.54 interfaces and 4-Pin Grove interfaces in the market.



2. With use of M4 standard fixed holes, compatible with M4-standard kits such as Lego and Makeblock.



## Specifications

PCB size	30.0mm X 24.0mm X 1.6mm
Compatible interfaces	2.54 3-pin interface and 4-pin Grove interface(1)

Note 1: S for analog output port, G for ground, and N for not used pin.

## Electrical Characteristics

Parameter	Min.	Typical	Max.	Unit
Transformation coefficient	-	1000:01:00	-	-
Input current	0	-	5	A
Output current	0	-	5	mA
Sampling resistor	-	200	-	$\Omega$
Sampling voltage	0	-	1	V
Working frequency	20	-	20000	Hz

Working temperature	-55	-	85	°C
Dielectric strength	-	6	-	KAC/1min

## Demo

Connect S port of electronic brick of electricity sensor to A0 port of Arduino board, and we will use the following program to read the analog value, and the send it to computer for display via serial port.

```
#define ELECTRICITY_SENSOR A0 // Analog input pin that sensor is attached to

float amplitude_current;           //amplitude current
float effective_value;             //effective current

void setup()
{
  Serial.begin(9600);
  pins_init();
}
void loop()
{
  int sensor_max;
  sensor_max = getMaxValue();
  Serial.print("sensor_max = ");
  Serial.println(sensor_max);
  //the VCC on the Grove interface of the sensor is 5v
  amplitude_current=(float)sensor_max/1024*5/200*1000000;
  effective_value=amplitude_current/1.414;
  //minimum_current=1/1024*5/200*1000000/1.414=24.4(mA)
  //Only for sinusoidal alternating current
  Serial.println("The amplitude of the current is(in mA)");
  Serial.println(amplitude_current,1);//Only one number after the decimal point
  Serial.println("The effective value of the current is(in mA)");
  Serial.println(effective_value,1);
}
void pins_init()
{
  pinMode(ELECTRICITY_SENSOR, INPUT);
}
/*Function: Sample for 1000ms and get the maximum value from the SIG pin*/
int getMaxValue()
{
  int sensorValue;                //value read from the sensor
  int sensorMax = 0;
  uint32_t start_time = millis();
  while((millis()-start_time) < 1000)//sample for 1000ms
  {
```

```
    sensorValue = analogRead(ELECTRICITY_SENSOR);  
    if (sensorValue > sensorMax)  
    {  
        /*record the maximum sensor value*/  
        sensorMax = sensorValue;  
    }  
}  
return sensorMax;  
}
```