

## **ABSTRACT**

*Photovoltaic for homes or in smart homes is already widely used. In its use, it needs to be combined with PLN's sources, as the main electricity source. However, to implement it, tools and systems are needed as controllers and monitoring. So in this study, a tool has been made to read the direct current voltage and current of the battery and control the use of electrical resources from the battery that can be switched to the PLN source..*

*The working principle of this tool is to monitor electrical energy, control the storage and use of electrical energy produced by alternative plants with storage media in the form of batteries, with the use and charging of batteries carried out alternately, then regulating photovoltaic electrical energy use with PLN electricity. The main components in this study include the Arduino Mega 2560 microcontroller, ACS712 current sensor, voltage sensor, Liquid Crystal Display 16x2 and 1 channel relay module.*

*The results of this study are that the system has the ability to activate and deactivate the discharging or charging process, power source switches and voltage and current readings. The results of monitoring are accuracy of sensing voltage 98.39% for battery 1 and 99.29% for battery 2. Then the accuracy of current sensing is compared to specifications of 52.53204% for 5 watt incandescent alternating current lamps and 66.20763% for 5 watts of Light Emitting Diode alternating current.*

**Keywords:** *smart meter, voltage sensor, relay module, ACS712, arduino mega 2560, photovoltaic*