

## **DESIGN OF SOLAR RADIATION INTENSITY MONITORING BASED ARDUINO MEGA 2560**

**Name of Student** : AnnisaAmadheaFirman  
**NRP** : 2411031056  
**Departement** : ProdiD3 Metrologi and  
Instrumentation, Engineering  
Physic,FTI-ITS  
**Advisor Lecturer** : Ir. Ya'umar, M.T.  
Dr. RidhoHantoro, S.T, M.T

### **ABSTRACT**

*In this research has been done to build solar radiation monitoring system in order to determine the amount of solar radiation and the amount of energy emitted to the earth and the work principle of this instrument is sensor phototransistor PT501 detect sun light as input and enter to voltage divider as circuit which can converted resistant become voltage and can be read by arduino as signal processing. From arduino will be converted into output solar radiation intensity is watt per meter square. The output can be monitor used communication system Visual Studio 2008. Result calibration from testing phototransistor PT501 sensor is instrument uncertainty ( $U_{a1}$ ) is 32.98, regression uncertainty ( $U_{a2}$ ) is 100.314, digital resolution is 0.01, resolution uncertainty ( $U_{b1}$ ) is 0.003, combination uncertainty ( $U_c$ ) is 105.59,  $V_{eff}$  is 9.71 and instrument uncertainty ( $\%U_{exp}$ ) is 0.0036. Static characteristic of solar radiation intensity instrument is range is  $101.22 \text{ W/m}^2 - 654.87 \text{ W/m}^2$ , sensitivity = 0.747, linearity = 1.27, accuracy = 1.44 and  $\%$  accuracy = 98.56%.*

**Keywords** : solar radiation intensity, arduino, visual studio 2008.