Design and Build Smart Charging System in PLTS Based on Microcontrollers

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ABSTRACT

*PLTS off grid that applies DC coppling system commercially still applies manual charging system. The development of smart charging devices to support battery life time needs to be done. The use of smart charging devices is applied to 2 Pb type batteries with 1 battery (12V / 5A) as the main energy and 2 batteries (12V / 10A) as the backup energy. Maximum charge scale of 30A / 12V. The voltage set on the converter is around 15V - 17V. The use of supporting sensors such as a 25V voltage sensor, 4 units according to the Pb battery scale, 3 units of ACS12-30A Current sensors according to the current capacity performance of the converter. RTC DS3231 and Micro SD Card to support the data logger system. I2C and LCD 20 * 4 as a monitoring system. As well as Arduino Mega 2560 REV3 as a microcontroller supporting the smart charging system. The average value of the voltage sensor error is around 0.35% and the ACS12-30A current sensor is around 0.58%. The trial lasts 4 - 6 hours. Drivers use 5V and 12V relays to support the smart chaging driver system. The smart charging device is capable of transferring the charging / discharging process from battery 1 (Use 1) to battery 2 (Use 2) when battery 1 is full or empty.*

***Keywords** : PLTS off grid, DC coppling, smart charging, microcontroller.*