ABSTRACT

RAPID (Riset Andalan Perguruan Tinggi dan Industri) is a research that established in IT Telkom as medium to develop knowledge and technology in control. Product created from this research is PLC (Programmable Logic Controller) which called PLC RAPID. This PLC is designed by RAPID's members themselves. Currently, RAPID is developing extended modules for PLC RAPID, i.e : analog I/O module, digital I/O module, ethernet module, and RFID module. So, this final project which entitled "Design of Extended RFID Module Based on STM32" is part of RAPID project.

This final project use STM32 microcontroller based on ARM Cortex-M3 processor. Advantage from using STM32 is real time performance, compatible with more than 350 devices, maksimum integration, and extensive ecosystem. This final project also use RFID reader SL032 (which is compatible with RFID Tag Mifare 1K) and Memory Flash M25P32 as extended memory and data storage.

When ID from Tag Card detected by RFID reader, that ID is compared with database on microcontroller. Then data from each detected ID will be written on datalogger and stored in memory flash. Detected ID will be shown on ESI Track. ESI Track is software created to see debug process and show reading result from each ID which written on datalogger. Data on datalogger can be erased later if the data is no longer needed.

When there's incoming ID, ID detection is match with database. Tag Card's reading status divided into two, "legal access" (marked with 4 left hand side LED ON), and "illegal access" (marked with 4 right hand side LED ON). On this final project, RFID works well because success rate in input testing with 10 seconds interval is 100%. And success rate in continuously input testing is 86,71%. Work range for RFID reader to read the tag card properly is up to 5 cm. In calculation, extended RFID module counter have capabilities to count up to 99999999 seconds or more than 3 years as long as RFID get sufficient power supply. So, time when ID detected will be stored in datalogger only for 99999999 seconds. After that, this system need to be reset so it can start the counting all over again and write new ID in datalogger according to the time when it's detected.

Keywords : RFID, RAPID, PLC RAPID, database, flash memory, datalogger, microcontroller.