

ABSTRACT

A design of extended module input/output digital based on MCU ARM STM32 as a brain machine of system is implemented as supported device of creating PLC RAPID STM32 that affordable in industrial automation market. The realibility of using microcontroller unit is shown from data execution rate with belonged specifications. The first design of extended module input/output digital realibility measurement is identified by its input and output digital components. The power consumption for a system which needed a high execution rate consumption is calculated as a realibility parameter of system from power consumption aspect. Last, the connectivity of a data communication becomes a benchmark of extended module input/output digital design as an efficient device in industrial automation,

This design of system uses MCU ARM STM32F103Rx 64 pin low density. Testing parameter of extended module input/output digital measurement is done by overlaying the relay as output device with loads which over limit its specifications and optocoupler as input parameter with testing electrical voltage response ON-OFF. The testing of communication connectivity with PLC RAPID STM32 based on design of communication protocol between either is passed through Serial Peripheral Interface (SPI) communication line which is full duplex.

From above testing of system realibility, it can be concluded that input optocoupler ON device is 2,685Vdc until 24Vdc with based measurement operation voltage of a LED, Relay as output device would rather achived the better performance when installed a DC load with current limit of 5A 30Vdc than installed by AC load with current limit of 5A 250 Vac. Communication connectivity both of the system is not good evident between communication protocol mediator which established between the two, this problem maybe because where is data loss from mater to slave. Extended module 20 port input and 12 port output system performance is charged for working hard with power consumption which regarded low and efficient.

Keyword : *MCU ARM STM32, Microntroller Unit, Programmable Logic Controller, Extended Module Input/Output Digital, Protocol, Full Duplex, Serial Peripheral Interface (SPI)*