Configuration Method of Relay Input-Output System for a Safety-related Application Using General Purpose Devices

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In recent years, inexpensive single-board computers with input/output functions and arithmetic functions, such as Raspberry Pi, have been used for various purposes. Condition monitoring and remote control can be mentioned as one of its uses. However, it is very important to ensure safety when applying single-board computers, for example, to safety related equipment. This paper introduces a safety assurance method using pseudo-random numbers and encryption technology to configure a relay-based input/output system with a general-purpose device.