

Mechatronic control device

KEYWORDS

- ❑ DOMOTICS
- ❑ ELECTRICAL SWITCH
- ❑ BUS SYSTEM
- ❑ ELECTRICAL COMMAND
- ❑ MECHATRONIC COMMAND

AREA

- ❑ ELETTRICAL ELECTRONIC & ICT ENGINEERING

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Priority Number

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Patent Type

Patent for invention.

Ownership

Sapienza Università di Roma 100%.

Inventors

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Industrial & Commercial Reference

Electrical and lighting systems with the use of digital technologies. Home and building automation. Internet of Things.

Time to Market

The state of development can be classified in TRL2, i.e. the conceptual formulation of the technology and the detailed definition of the parts. It is necessary to develop the experimentation and prototyping phase which does not involve particular time requirements. It is plausible to reach production in a period of 4-6 months.

Availability

Cession, Licensing, Research, Development, Experimentation, Collaboration and Spin Off.

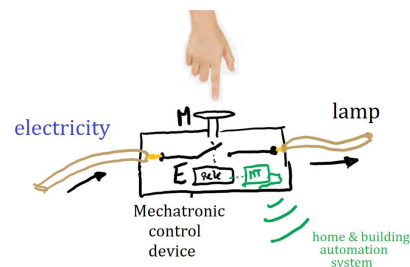


Fig. 1 Principle of operation

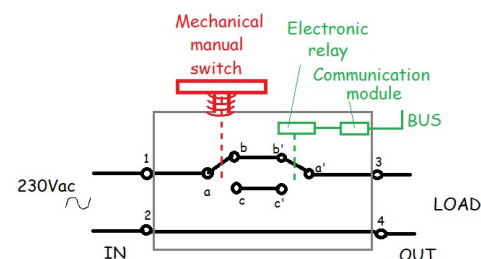


Fig. 2 General diagram



Fig. 3 Modularized version of the device

Abstract

The device consists of a control switch that combines traditional mechanical control technologies with electronic ones that adopt BUS digital communication. The device allows simultaneous mechanical and digital operation with high level of availability and flexibility. It can be used in the redevelopment of existing systems and in new installations as a home and building automation device. The advantage consists in the possibility of controlling the electrical load (light, motor, etc.) as if it were a traditional switch while having all the digital logic inside it to be integrated into home automation systems.



Fig. 4 Cable version of the device



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Technical Description

The device combines a mechanical part consisting of a contact that can be operated mechanically by means of a lever or button or switch and an electronic part that can be operated via a digital BUS circuit. The two parts interoperate in a combined way so that it is possible to operate it in both ways. It can be realized both with plug and play communication and with protocol for building automation systems. It consists of a mechanical part, an electrical part and an electronic and communication part.

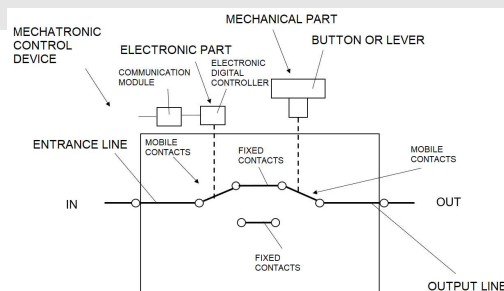
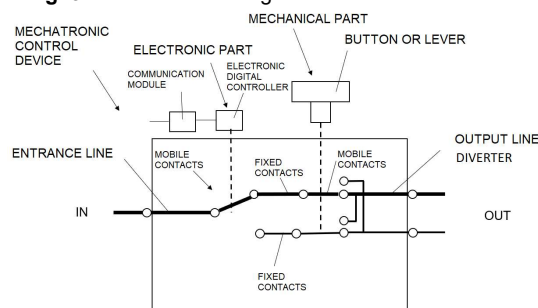


Fig. 5 Switch version diagram



Technologies & Advantages

The proposed patent significantly increases the reliability and flexibility of the control systems of electrical systems because it combines two command philosophies in a single device, interchangeable with each other without any setting and / or programming action. Through the innovative simple combination of two functions, which are currently considered alternatives, the proposed patent can favor an effective acceleration in the automation process of the most basic electrical systems, with all the undeniable consequent advantages such as energy saving. This potential development can be favored through a double useful effect: providing the option of a classic mechanical command as an alternative, it helps to overcome the inertia towards the home automation evolution of the most fearful users; at the same time, by significantly increasing the reliability of the command function, it also favors use in fields where continuity of service is a priority. It is a simple device to be inserted in an internet of things and home automation context, which can be integrated with voice command systems or advanced automation systems.

Fig. 6 Diverter version diagram

Applications

The feasibility is to be considered immediate and safe, based on the intelligent union of two consolidated technologies, the mechanical control and the electronic actuation, exploiting all their features but without any constraints for the exchange of implementation. The usability of the patent is potentially very high, considering the large mass of simple electrical systems present in homes and small tertiary businesses. Its applicability is immediate by simply replacing an existing mechanical control device with an innovative device that can be managed in the electronic part in wi-fi or equivalent mode. While the application of the device with electronic control via wired connection is obviously of greater interest where systems of this kind are already installed but you want to increase reliability by adding, always with a very simple installation, a mechanical back-up control for immediate use.

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