GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ)
ISSN (E): 2347-6915
Vol. 9, Issue 12, Dec. (2021)

METHODS OF MICROELECTRONIC OPERATION OF THE NPM-69-M BLOCK COMPLIANCE SCHEME

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ANNATATION

The article focuses on issues related to the use of electromagnetic relays and their localization, which is one of the major problems in railway transporti control systems. To solve these problems, the issues of modeling processes and the use of microelectronics devices, increasing efficiency and reliability have been considered. To solve these issues, the methods and methods of microelectronic devices were developed.

Keywords: Railway transporti, electromagnetic relay, modelling, compatibility scheme, functional block.

INTRODUCTION

Issues such as the automation of transportation process control systems in the world, the introduction of systems implemented on the basis of microprocessor technologies in the continuous control of the state of train traffic control devices, the improvement of methods and technologies of control are taking one of the leading places. Therefore, in the process of ensuring security, it is necessary to introduce into practice diagnostic systems that increase the operational reliability of automation and telemechanics devices at railway stations, which are implemented on the basis of microelectronics technologies. In developed countries of the world, such as the United States, Germany, Japan, England, China and Spain, it is important to design and create railway automation and telemechanics systems, to ensure their stability, reliability and self-control, as well as to develop sophisticated microprocessor systems that give the necessary information about their technical condition.

Activation of the process of application of microprocessors is rapidly developing in the CIS countries and UZR Railways. Oty JSC is reducing the production of energy-collecting electrical mechanical relays, which constitute 90% of the existing devices in railway automation and telemechanics. For several years now, research has been under way on this problem of Osh in order to prevent the transition to microelectronics. For example, oty JSC is being implemented on the railways, on the new microprocessor electric centralization system, on the new stations and on the stations located on the plots intended for the movement of fast passenger trains. BMRM schemes for stations with arrows in the desired box are formed by interconnecting the principle of geography, collector and acting blocks according to the topology of the station's single-strand plan. Such a principle should be applied when drawing up electrical circuits, significantly facilitates the maintenance of systems, the search and elimination of malfunctions. Microprocessor systems, despite the fact that they have strong auxiliary functions, do not possess this principle, as a result of which the maintenance and troubleshooting will be significantly complicated. And this is confirmed by the experience of

using such systems. In the guaranteed service gate, the organization that produces devices with problems of troubleshooting, replacement of defective modules and blocks, software, is engaged. However, after the end of the warranty period, the listed issues remain as an economic problem on the railway shoulder. In microprocessor-based systems, making changes to the station configuration is a specific problem, which requires the need to reprogram the central processor. In the microprocessor system of electrical centralization, the software accounts for 80% of its volume. Therefore, any change in the configuration of the stencil is equated with the construction of a new system, from an economic point of view, equipped with electric centralization with a microprocessor.

MATERIAL AND METHODS

The purpose of this article is to solve innovative problems in the use of contactless devices, which will ensure an increase in transportation safety by increasing the reliability, technical condition of devices, and control. To achieve this goal, methods of digital information processing and modeling based on the theory of Petri nets were used.

RESULTS AND DISCUSSION

In the technological processes of large stations, much more serious requirements are imposed on centralization devices than on small stations, due to the large number of arrows (15 units and more), the time for preparing routes in the separate management of arrows and signals is significantly increased. For this purpose, a system of preparation of the route is developed automatically, with the click of its start and end buttons. This system is called Block route relay centralization block route relay centralization (BRRC), it is widely used in land, sorting and intermediate stations, where the number of arrows is more than 30 and has a large amount of train and maneuvering work.

Approximately 75% of all (BRRC) hardware is placed in functional blocks, which are manufactured in factories in the style of standard constructions. In addition, the block processing of functional tokens significantly reduces the time of design and construction of stationary electrical centralization systems, thereby simplifying the process of maintenance.

(BRRC) included a group of two functional blocks. The first of them is called the dialing group, which records the movements of the station guard on the control panel (pressing the buttons) and, accordingly, transmits commands belonging to the second group, which is called the execution group. The dial group was executed on the basis of coded relays (KDR), which do not belong to the category of first-class reliability because they did not control the security conditions

The executive team ensured that the trains had control of the safety of movement, and therefore performed on the basis of NM-type relays with respect to first-class reliability. Dialing group blocks are placed according to the plan of the station in accordance with the task that it performs and connect them among themselves on the four main chains.

The first is a chain of push-button relays, which records the pressing of the buttons on the control money, and also included schemes for re-activates, auxiliary finishing and auxiliary train relays.

The second is that the chain of automatic push-button rails (ACN), consisting of two or more elementary routes, allows the dialing group to automatically turn on the push-button rails in the signal blocks when installing the train or pick-up routes.
The third is a chain of relays that control the arrows (PU, MU) serves to command the transfer of arrows to the appropriate position along the route of the prepared route.
The Quaternary-compliance scheme checks the compliance of the state of the arrows with the established route.
In this article, research on the implementation of NPM-69 block with the help of microprocessors is carried out. The functional function of this block is to control and control the condition of the road traffic lights on the road site, which are located at the entrance to the train and manyovr traffic lights. Let's consider the Compatibility scheme of the NPM-69 block (picture 1). The fourth scheme of the (BRRC) dialing group is the compliance scheme (SCH), which checks whether the steering rails are in the correct position and their actual position after the arrows are held.

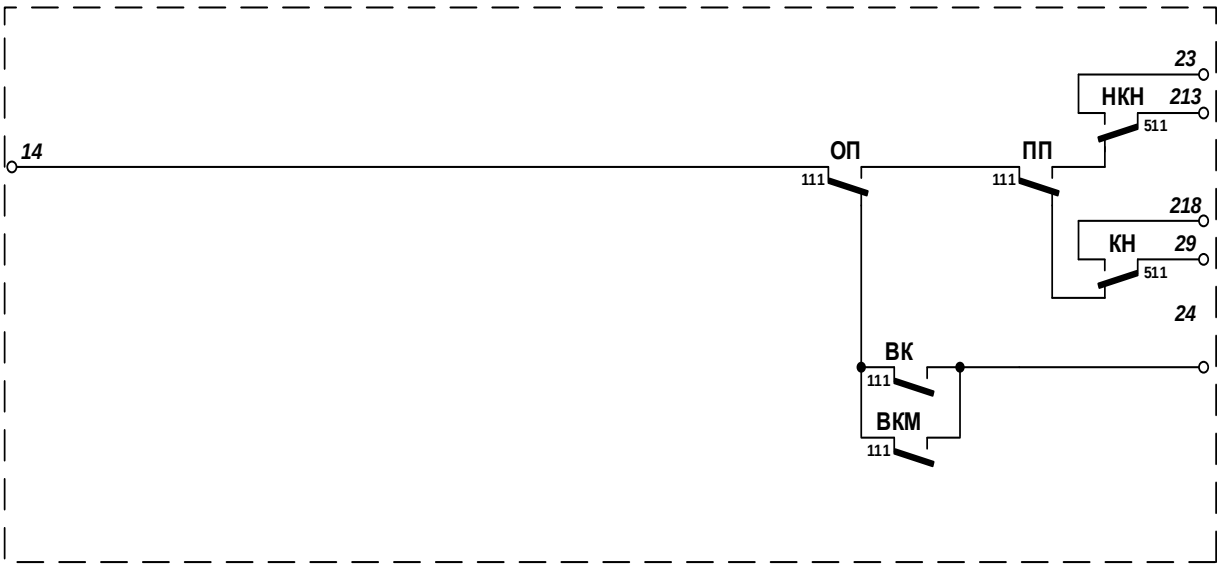

Figure. 1. NPM-69 block compliance scheme chain supply coupling electrical scheme

Figure. 1 can be seen from the picture, when the contacts of the OP Relay are in a current state, the Manba current goes to the PP relay through the NKN contacts, if the contacts of the PP Relay are in a current state, the train confirms that the traffic light relay is in a current state. Or the contacts of the PP relay in the non-toxic state confirm that the relay of the magnifying glass passes through the contacts of the KN relay in a non-toxic state. If the contacts of the OP relay sine are in a non-toxic state, then the Manba current through the contacts of the relays with the VK or VKM button, the electric chain of the comparison scheme goes to the minus library.
When the NPM-69 block studies the work of the existing blocks built on the basis of electric magnetic relays of the KDR type, replacing them with microprocessor blocks, the need arises for the development of new blocks that are able to maintain the existing functional capabilities of all electrical chains.

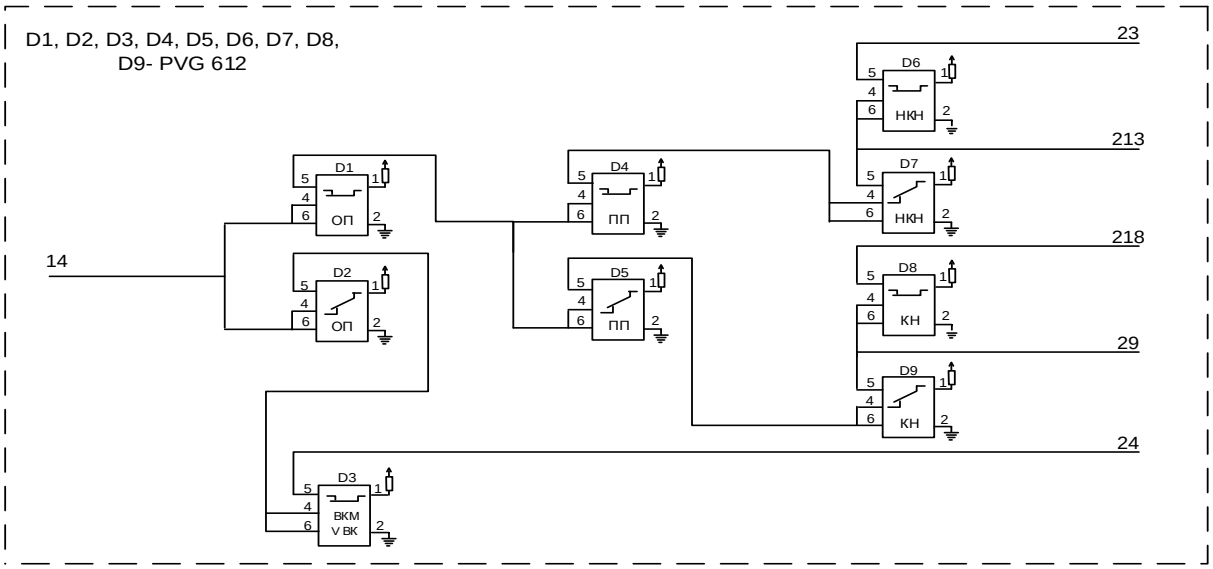

Figure. 2. Pvg-69 optorele applied conformity scheme in block NPM-612 electrical scheme of connecting the supply to the chain.

Figure. 2.there is a buckle in the chain bunda the first position boyicha14 klemma on the first position of the D1 (The Buckle of the OP relay) will cause the entry of elements D4, D6 and D7 on the first position (the buckle of the OP relay) 6 and the emergence of a 1pux signal on the 23 and

In the second case, 14 klemma causes the entry of elements D1, D5, D8 in the second case (op relay is non-toxic), D2, D9 in the second case, as well as 218 and 29 klemma cause the appearance of a 2pux signal, the appearance of this signal means that the release of PU2 (KN manyovr traffic light) in the software of the

In the third case, 14 klemma causes the entry of D2 to 6, and in the first case of the D3 element (VKM), 24 klemma causes the appearance of 3PUx signal, the appearance of this signal means that the PU3 (VKM) relay in the software of the microprocessor is started, as a result of which the output of 3PUx will have.

In the fourth case, 14 klemma causes the entry of D2 to 6, as well as the emergence of a 3PUx signal in the first case of the D3 element (VKM) in the 24 klemma, the emergence of this signal means that the release of PU3 (VKM) in the software of the microprocessor was launched, as a result of which the output

In the fifth position, 14 klemma causes the entry of D2 to 6, as well as the emergence of a 24pux signal in the first position (KM) of the D3 element, the emergence of this signal means that the PU4 (KM) relay is launched in the software of the microprocessor, as a result of which 4PUx output will have a value of 5V.

ACKNOWLEDGEMENT

The use of the achievements of modern system engineering makes it possible to ensure more efficient and safe management of the transport process in conditions of increasing need for rejection of electromagnetic relays. The solution of innovative tasks for the use of contactless devices in railway transport control systems will ensure an increase in transportation safety by

increasing the reliability, technical condition of devices, management. To achieve this goal, digital information processing and modeling methods based on the theory of Petri nets were used. Based on the results of the study of the operation model of push-button relays of the beginning and end of maneuvering routes, algorithms and software for the microcontroller were obtained, a schematic diagram of switching on the push-button relay of the NPM-69-M block, made on a contactless basis, was developed.

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