Computer software programming for HMIIII box in boxed relay route interlocking system

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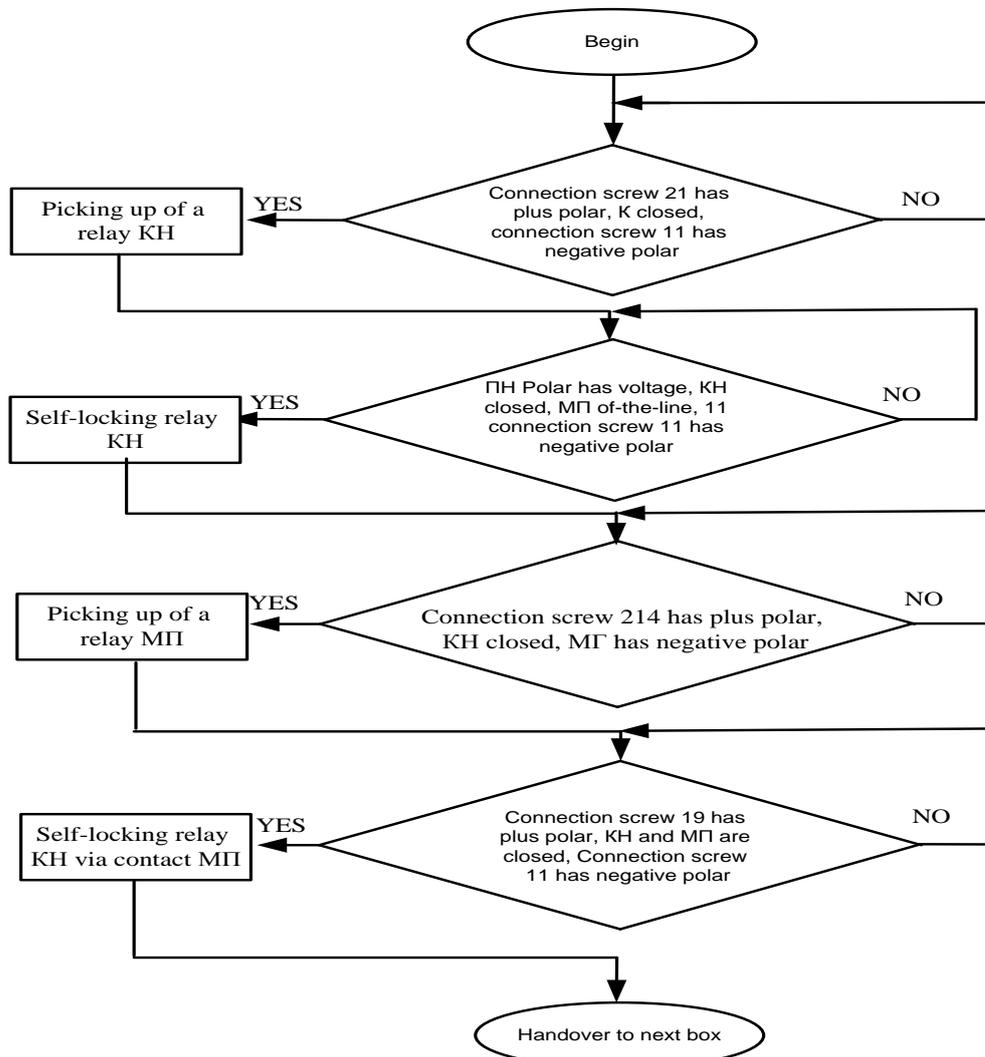Research supervisor: A.R. Azizov, c.t.s., decent (TashIRE)

Nowadays using energy economical and small size devices come to our live deeply and to all industry branches. Morally outdated, noisy devices which ended itself working life going out from live.

Also in our railway transport too little by little changing carriage rolling park and locomotives park. To use gives new railway lines, pass through tunnels and bridges via mountains and rivers. Across "Kamchik" we, our railway workers, done new tunnel with distance more than 19 kilometers opened new railway line which called "Angren – Pap". With this we reached to single railway line whole Republic. The same way plying high-speed train "Afrasiab", to big cities Uzbekistan like Samarkand, Karshi, Bukhara. By the way recently started plying international high-speed train "Tulpar" in line Almaty – Tashkent – Almaty, Numbered № 1 odd direction and numbered № 2 even direction. For promote safety like this high-speed railways to devices signalization, centralize, interlocking and community set down a lot of requires. They are also must be fit for carriages and locomotives. But invest foreign systems signalization, centralize, interlocking and community not effectively, isn't occupies and they sells to big cashes. The same way we have not specialists and experts to service foreign devices. Because they wouldn't teach us to their self objects of command and control. From this point of view, it had better produce our national system of signalization, centralize, interlocking and community. Optimal solution in this way will be change element base with safe method of procedure.

Interlockings allow trains to cross from one track to another using a turnout and a series of switches. Railroad terminology defines the following types of interlockings as either complete or incomplete depending on the movements available. Although timetables generally do not identify an interlocking as one or the other, and rule books do not define the terms, the below is generally agreed upon by system crews and rules officials.

Solution which we giving with our team in the head our research supervisor is replace old relay element base to new microprocessors. For more than 40 years in our Uzbekistan Railway uses boxed relay interlocking which element base is relays in type НМШ, ПМШ, КМШ.

This relays produces to our Republic only in Russia. One of them costs nearly 500 $ USA.

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                          ┌─────────────┐
                          │    Begin    │
                          └──────┬──────┘
                                 │
                                 ▼
  ┌──────────────┐  YES   ╱─────────────────╲   NO
  │ Picking up of│◄───────┤ Connection screw │
  │  a relay KH  │        │ 21 has plus polar│
  └──────┬───────┘        │ K closed,        │
         │                │ connection screw │
         │                │ 11 has negative  │
         │                │ polar            │
         │                ╲─────────────────╱
         │                         │
         │                         ▼
  ┌──────────────┐  YES   ╱─────────────────╲   NO
  │Self-locking  │◄───────┤ ПН Polar has     │
  │  relay KH    │        │ voltage, KH      │
  └──────┬───────┘        │ closed, МП       │
         │                │ of-the-line, 11  │
         │                │ connection screw │
         │                │ 11 has negative  │
         │                │ polar            │
         │                ╲─────────────────╱
         │                         │
         │                         ▼
  ┌──────────────┐  YES   ╱─────────────────╲   NO
  │ Picking up of│◄───────┤ Connection screw │
  │  a relay МП  │        │ 214 has plus     │
  └──────┬───────┘        │ polar, KH closed,│
         │                │ МГ has negative  │
         │                │ polar            │
         │                ╲─────────────────╱
         │                         │
         │                         ▼
  ┌──────────────┐  YES   ╱─────────────────╲   NO
  │Self-locking  │◄───────┤ Connection screw │
  │relay KH via  │        │ 19 has plus polar│
  │ contact МП   │        │ KH and МП are    │
  └──────┬───────┘        │ closed,          │
         │                │ Connection screw │
         │                │ 11 has negative  │
         │                │ polar            │
         │                ╲─────────────────╱
         │                         │
         │                         ▼
         │                ┌─────────────────┐
         └───────────────►│ Handover to     │
                          │ next box        │
                          └─────────────────┘
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Picture 1. Algorithm picking up relay МП when select start of route interlocking

But all emerged faults, bugs had being defeated by mechanics straight – line. So in my research work I'm selected two boxes НМIIП НМIIАП. These boxes participate in giving commands to traffic signals from track, to traffic signal in one range, and to traffic signals form line end tracks and in addition on train route participate as finish and start simples routes. Box НМIIП has four relays, and НМIIАП five relays. All of these relays reckon in second class safety.
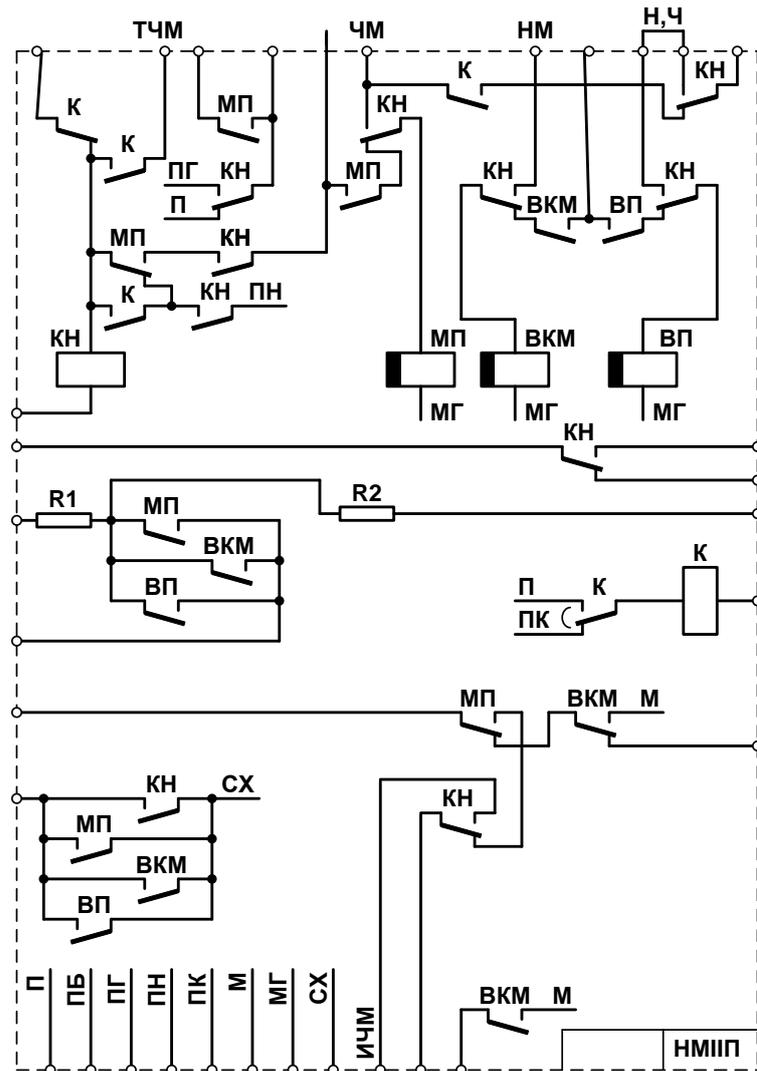
Picture 2. Scheme of

Scientific novelty of the article's author are simplest method of produce, promoting safety in new element base. This system would be used in future in our railway transport as primary guaranteeing safety system.

Literature:

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