

SOFTWARE FOR CHECK AND SETUP OF MICROPROCESSOR'S PROTECTION MPZ-ZIM

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ABSTRACT

An advantage of microprocessor's protection in comparison with electromechanical and static relays can use only with appropriate software which is capable for easy check, quick setup, fault analyze and connection with power plant computer. During the choice, with technical characteristics and price of microprocessor's protection, should take in count possibilities, openness and adaptability for user needs, working platforms and cost of following programs, and also, their compatibility with familiar programs.

Expose shows program PRGPZ, which is applied for microprocessor's protection MPZ-ZIM. It describes procedures of configuration and setup of relay, carrying of counters' state, list of happenings and fault's records, searching of data base which contain configurations, settings, faults' list and records. Software is also capable to present graphically fault's records, phase diagram of measured values and single-line wiring diagram of protected equipment. The way of manual commands is explained to. A possibility of this program to apply to other types of protection is noticed and explicates communications protocol.

1.FOREWORD

Modern microprocessors' protection poses big number of functions which demand big number of parameters. Check of every function and its setting without appropriate program, which automates procedure, would be very slowly and inefficient. Therefore, development of new types of protection follows writing of software which task is decreasing of set up and test time and increasing of user comfort.

2. APPLYING OF PROGRAM

Program PRGPZ is applied for testing and set up of microprocessor's protection MPZ-ZIM in laboratory or power plant. In data base which belong to software is possible to store settings of protections and configuration which is sent to relays and data received from relays, such as lists of events, fault records, counter's value and so on. View of main window shown on figure 1.



Figure 1. View of main window programs PRGPZ

3. TEST OF DEVICE WORK

Connection is realized by asynchronous serial communication. Therefore, after beginning of work, is necessary check and match communication's parameters of protection and computer.

For verification of inputs and outputs of device, user activates part of program for measuring and commanding. He can choose window with phase diagram of voltages and currents (figure 2), or single-line wiring diagram (figure 3) with keys for manual commands.

4. SET UP

Software has more options for set up. It can send new or previously saved settings to relay. It is also possible reading of earlier settings. Sent settings for every device can be saved in data base.

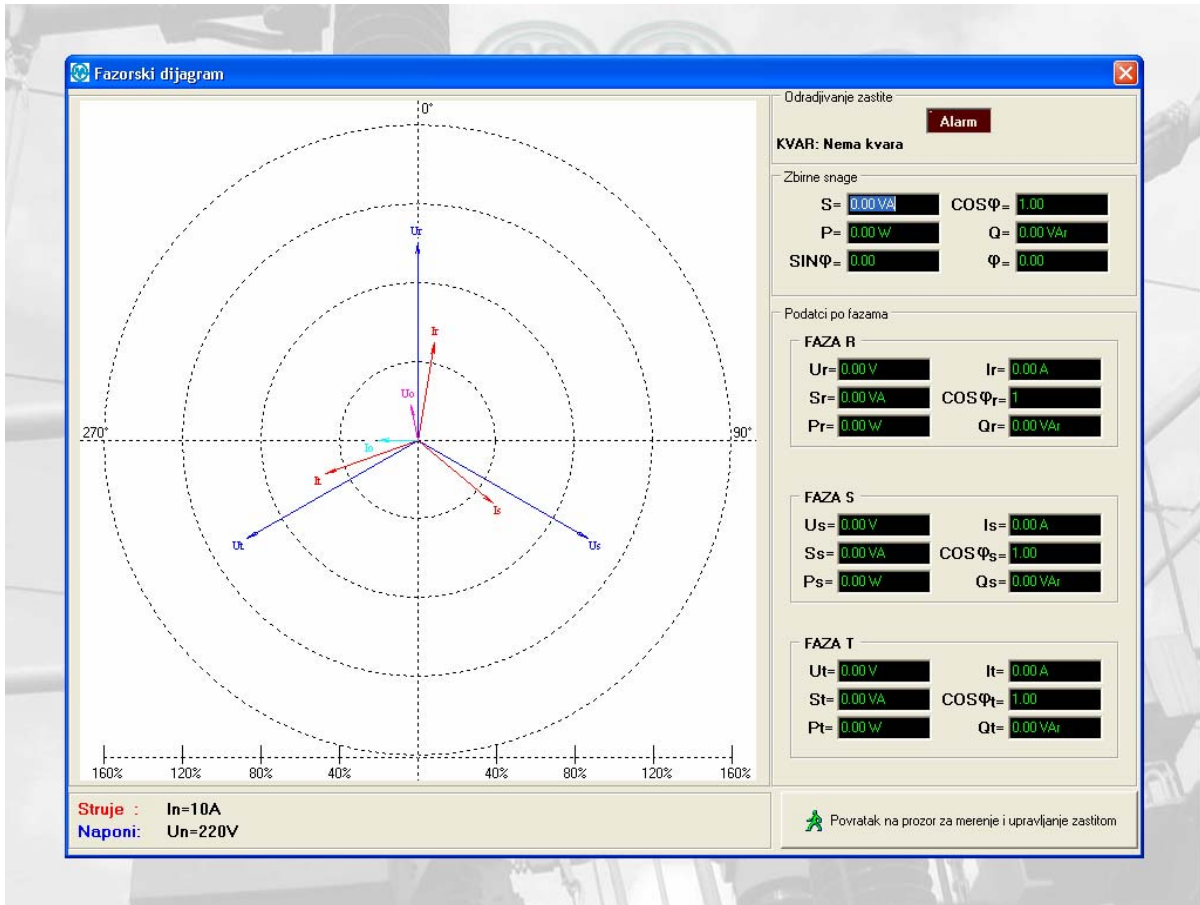


Figure 2. Window with measurements and phase diagram

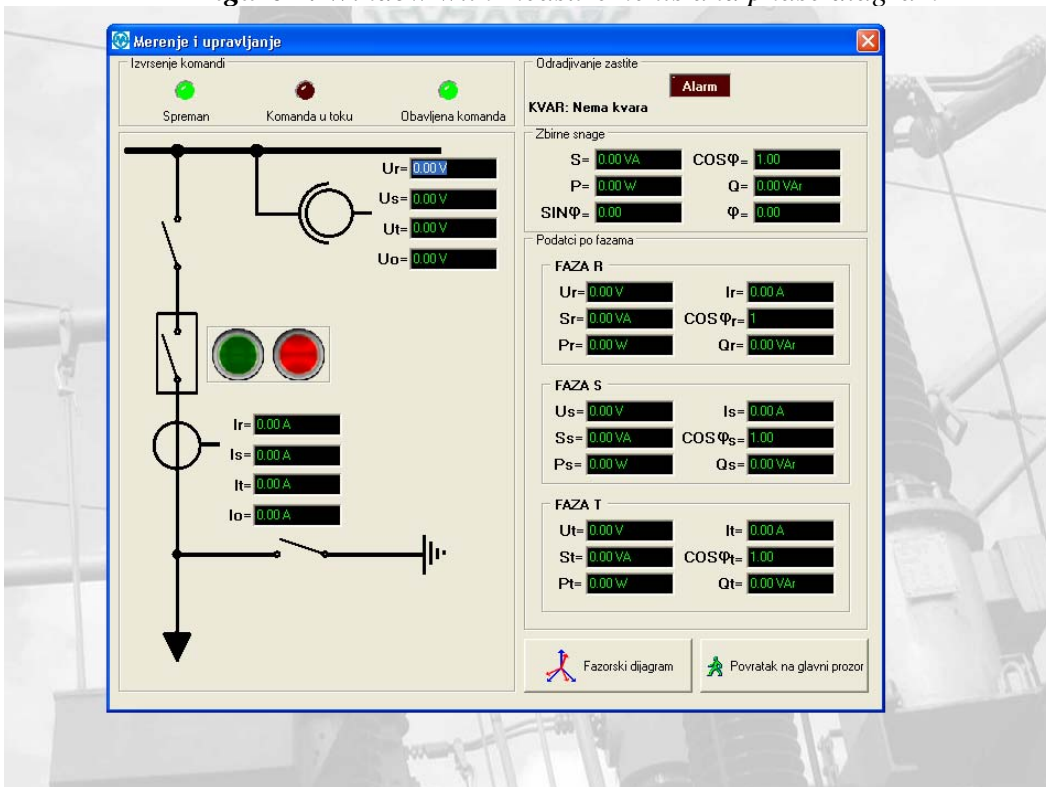


Figure 3. Single-line wiring diagram with keys for manual commands and measurements

5.LIST OF EVENTS AND FAULT RECORDER

If option called fault recorder select, window with list of all events appear on screen (picture 4). If event is circuit breaking caused by fault, with its selection, window show fault record (picture 5). Dragging cursor along time axis of diagram, allows reading values of voltage and current at pointed moment. Lists of events and fault records can store in data base to. It is possible to export fault recorder in form of MATLAB file. This is appropriate for off line analyze.

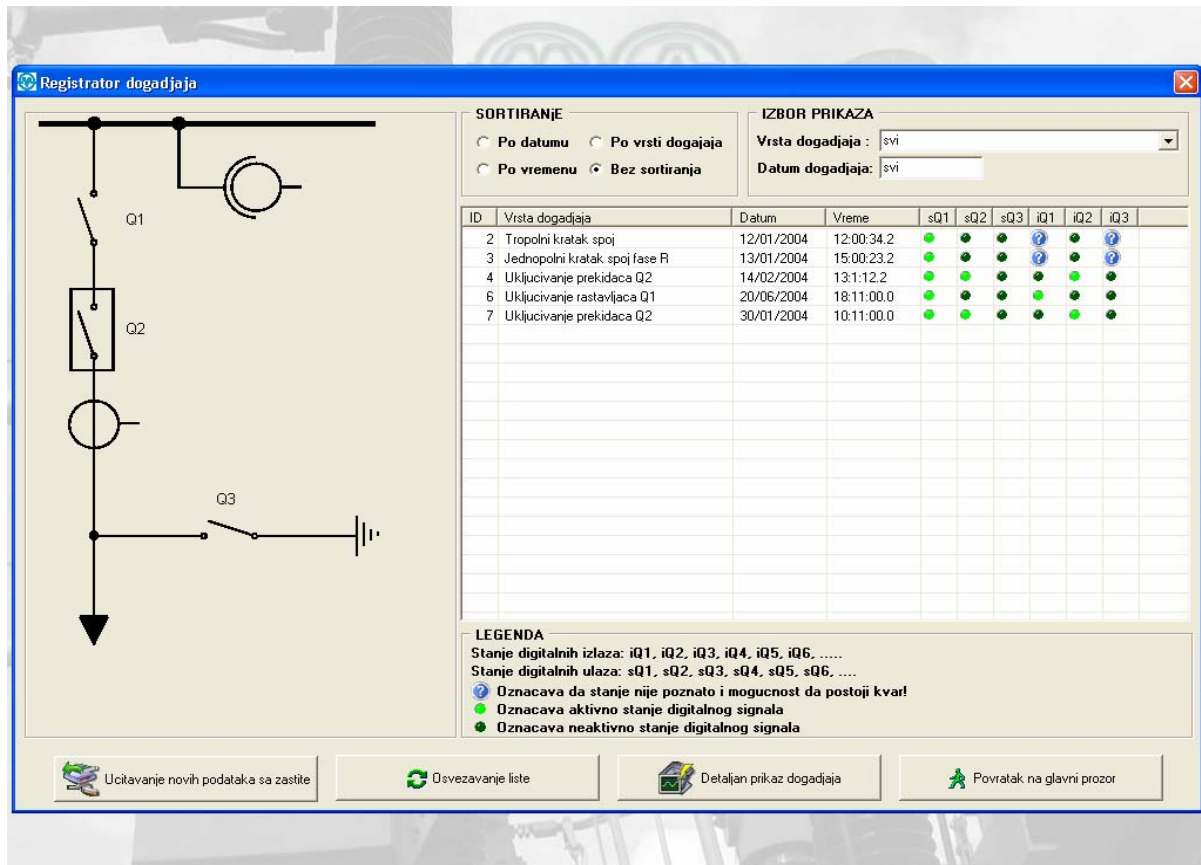


Figure 4. Fault recorder, window with list of all events appear on screen

6.STATISTICAL DATA

Program allows inspection of statistical data which relay collect during work. These are different types of counters, cumulative breaking current, active and reactive electric power and so on.

7.TIME SYNCHRONIZATION

Right chronology of events in power plant requires synchronization of all internal clocks in relays. Because of that, program allows synchronization of internal real time clock of protection with system clock of computer.

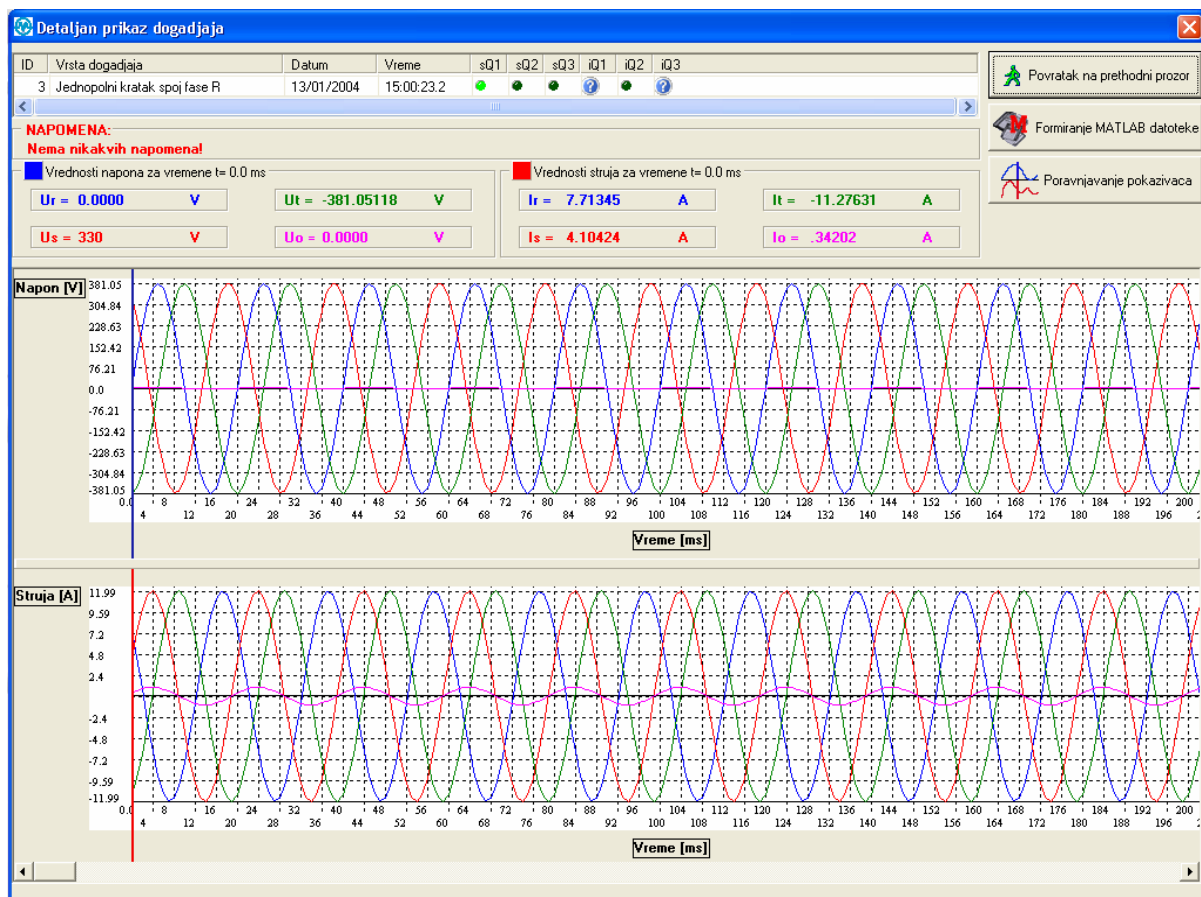


Figure 5. Fault record

8.COMMUNICATION'S PROTOCOL

Communication's protocol IEC60870-103 is chosen for link between computer and protection. Its area of use is connection between protections and computer in power plant. Majority of protections and stations for distant advising support them.

9.POSSIBILITY OF USE FOR OTHER TYPES OF RELAY

It is possible to modified program to support work with other types of relay. Necessary condition for this is knowledge of communication's standards and contents of messages for each type of protection. On this way we can obtain universal software tool. It reduce cost of software and time for training.

10.REFERENCES

[1]Commercial and technical documentation of manufacturers