

## **Improving the telecommunication system of a centralized control complex for aerogas safety of coal mines**

A telecommunication information-measuring system of supervisory control complex for aerogas safety of coal mines has been developed and proved. To improve the telecommunication system the authors proposed and developed optoelectronic subsystems of measuring methane and dust concentration, providing more informative complex. Experimental trials of the developed, designed and certified metrological device for measuring methane and dust concentration have been conducted. During the research, trial prototype models of meters of methane concentration for two ranges have been developed: from 0 to 4 vol.% with basic absolute error of no more than 0,1 vol.% and from 0 to about 100 vol.% with error value of no more than 1,0 vol.%. In this case, the error value obtained is 4 times less than regulated. The operation speed of the meter has been estimated, with the obtained value of less than 84 ms, which is 9,5 times less than the regulated one. During the research, trial models of meters of dust concentration in the range from 0 to 3000 mg/m<sup>3</sup> with basic error of no more than 14 mg/m<sup>3</sup>, which is 3,5 times less than the required value. The operation speed of the meter has been estimated, with the obtained value of no more than 0,15 s, which enabled dust concentration measuring in real time operation and synchronized with a methane concentration meter. Consistent patterns obtained during research have enabled the authors to develop the methodology, structure and means to improve telecommunication systems for measuring dust and gas components concentration in mine atmosphere.

**Keywords** : *telecommunication system, coal mine, concentration, methane, dust, precision, operation speed.*