TECHNOGENIC ANALYZER MULTIPLEX SYSTEM BASED ON FIBER-OPTIC SENSORS

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Fiber-optic sensors of different parameters extensively use in technogenic industrial districts with stringent terms of exploitation. Modern nuclear plant, heat plant, hydroelectric station, procurement and transit linear gelled oil systems, chemical and metallurgic factories, big securities companies are such complex objects. In addition to these objects function in condition deterioration of main and intermediate facilities. In that case removal electronic subsystem from noise, electromagnetic field, radiation is advisably. If it is question about remote data processing (distance of few kilometers) signals must be multiplexed. Method of sensors signals multiplex based on polarizing flatness rotate is offered.

The action of analyzer system sensors based on J.B.Bio low (founded in 1815). In accordance with J.B.Bio low angle of rotation of flatness polarizing proportional to optic active agent layer fatness. Among that agent are present sold materials, for example, quartz, sugar.

The analyzer system includes energy source, laser-based polarizing radiation source, fiber-optic sensors, nonharmonic photodevice and analogue-to-digital converter. Units connected by fiber-optic connection line (FOCL). Sensors quantity depends on parameters which need control and system information possibility. Energy source voltage make freak-out current of laser-based polarizing radiation source and, contemporary, it is reference voltage level for analogue-to-digital converter. Thereby possible optical and electrical signals levels oscillation synchronization is accomplish. Polarizing radiation source (for example, Javan's laser) configure optic wave. Fatefully, that dielectric field intensity del and magnetic-field strength del make oscillation in the strict fixed fields.

During time in service relative position of these fields stay constant. Every fiber-optic sensor has optic active material element, which can rotate polarization plane. Crystal quartz may be such material. When sensor turns-in, crystal quartz element cover optical axis, which emission polarization spread down. Polarization plane rotate angle of linear-polarized light is proportional of optic active material element layer thickness.

In case actuating, every sensor turn angle of linear-polarized light by certain quantity. If we select optic active material element layer thickness as consistent with binary code, nonharmonic photodevice shape optical signal, which unambiguously identify all sensors state.

Thus, electrical signal level is proportionate to angle of linear-polarized light. It may be reach pass usage of polarized filter, integrated in optic system. Analogue-to-digital converter modify photodevice signal to binary code, which unambiguously identify all sensors state.

The main technical-scientific problem is provision of polarization plane rotate angle of linear-polarized light accurateness. Rotate angle error assign system information capacity equal to operate sensors quantity. This method has benefit to compare with other methods, because multiplexing execute with the aim of passive optical components. It is guarantee advance external immunity of system.