

ABSTRACT

DUAL CHANNEL OPTICAL-ELECTRONIC SURVEILLANCE SYSTEMS WITH MIRROR LENSES

Landik BV Dual-channel optoelectronic surveillance systems with mirror lenses. Dissertation for a master's degree in specialty - (152) Metrology and information-measuring technique. National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, 2019.

The dissertation is devoted to the design of a two-channel opto-electronic surveillance system with a minimized optical input unit.

Optical-electronic systems operating in several spectral bands, intended for round-the-clock all-weather observation, are now an important way of developing optics. As a rule, the main element of such devices is the opto-electronic system of the visible range, and the auxiliary - thermal imaging. The information received in each band is complementary to the information coming in the other band, which ultimately increases the objectivity of the original information. In surveillance devices, this leads to an increase in the information contained in the original image and, ultimately, to a better decoding of the picture presented to the observer for analysis. Dual-channel optoelectronic systems have been widely used in many fields of human activity. However, there are drawbacks that need to be addressed, so this topic is relevant.

The master's thesis consists of four sections.

The first section is devoted to the literature review and patent search of Dual Channel Optical-Electronic Surveillance Systems (DCOESS). The areas of use of such systems and options for combining their channels are considered. Advantages and disadvantages of typical radiation matrix receivers were analyzed and comparative tables of modern DCOESS were presented.

The second section presents a generalized mathematical model of remote observations, and discusses the relevant characteristics of the optical system and the 7

radiation receivers. In addition, a version of the energy calculation of the opto-electronic system according to NATO standard 4347 is given.

The third section is devoted to the design of the DCOESS. The first section provides an analysis of the factors affecting the mass-dimensional dimensions of the DCOESS. The second and third sections are devoted to the simulation, size calculation and synthesis of the DCOESS. In addition, the maximum range of detection and recognition of the synthesized system was calculated.

The fourth section is devoted to the development of the startup project "Dual-channel optoelectronic surveillance systems with mirror lenses" and to analyze the prospects for market entry from a marketing point of view.

During the project development the following works were written:

1. Ландік Б.В. Двоканальні оптико-електронні системи спостереження // XII Відкрита всеукраїнська науково-практична конференція студентів, аспірантів та молодих вчених «Погляд у майбутнє приладобудування», м. Київ, ПБФ, КПІ ім. Ігоря Сікорського. – 2019. – с. 97-100
2. Ландік Б.В. Двоканальні оптико-електронні системи спостереження // XV Всеукраїнська науково-практична конференція студентів, аспірантів та молодих вчених «Ефективність інженерних рішень у приладобудуванні», м. Київ, ПБФ, КПІ ім. Ігоря Сікорського. – 2019. – с. 78-80

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