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**Minimum Operational Performance Standards (MOPS)
for Electro-Optical/Infrared (EO/IR) Sensor Systems for
Traffic Surveillance**

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Prepared by: SC-228.
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EXECUTIVE SUMMARY

This document contains Minimum Operational Performance Standards (MOPS) for Electro-Optical/Infrared (EO/IR) Sensors for Traffic Surveillance.

The EO/IR sensor system is a surveillance source for non-cooperative intruders for a Detect and Avoid (DAA) system used in Unmanned Aircraft Systems (UAS) transiting through Class B, C, D, E and G airspace and performing extended operations higher than 400' Above Ground Level (AGL) in Class D, E (up to Flight Level 180 (FL180)), and G airspace. It includes equipment to enable UAS operations in Terminal Areas during approach and departure in Class C, D, E and G airspace and off-airport locations. It does not apply to small UAS (sUAS) operating in low-level environments (below 400') or other segmented areas. Likewise, it does not apply to operations in the Visual Flight Rules (VFR) traffic pattern of an airport or to surface operations.

The intended function of the EO/IR sensor system is to detect and generate tracks for all airborne traffic within the EO/IR sensor system detection volume. The onboard EO/IR sensor system complements other airborne surveillance sensors by providing detection of non-cooperative traffic. The track should be established at sufficient range and with sufficient accuracy to enable the remote pilot to plan and execute a maneuver to keep the Unmanned Aircraft (UA) well clear of other traffic and avoid collisions.

This document has the detailed performance and environmental requirements of the EO/IR sensor system along with their verification methods. Verification includes bench tests, flight tests and environmental tests. Recommendations and flight tests for installed performance are also provided.

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1 Purpose And Scope

1.1 Introduction

This document contains Minimum Operational Performance Standards (MOPS) for Electro-Optical/Infrared (EO/IR) sensors for traffic surveillance.

The EO/IR sensor system is a surveillance source for non-cooperative intruders for a Detect and Avoid (DAA) system used in Unmanned Aircraft Systems (UAS) transiting through Class B, C, D, E, and G airspace and performing extended operations higher than 400' Above Ground Level (AGL) in Class D, E (up to Flight Level (FL180)), and G airspace. It includes equipment to enable UAS operations in Terminal Areas during approach and departure in Class C, D, E and G airspace and off-airport locations. It does not apply to small UAS (sUAS) operating in low-level environments (below 400') or other segmented areas. Likewise, it does not apply to operations in the Visual Flight Rules (VFR) traffic pattern of an airport or to surface operations.

These standards specify the characteristics of the EO/IR sensor system that should be useful for designers, manufacturers, installers and users of the equipment. Compliance with these standards is recommended as one means of assuring that the equipment will perform its intended function(s) satisfactorily under the conditions specified herein. Any regulatory application of this document is the sole responsibility of appropriate governmental agencies.

This document sets performance standards for EO/IR sensor systems for non-cooperative traffic surveillance as part of a DAA system. Separate MOPS were developed for the DAA system adapted to low-power ownership.¹ The RTCA MOPS for DAA Systems (hereafter referred to as the “DAA MOPS”) refer to these MOPS (hereafter referred to as the “EO/IR sensor system MOPS” or “these MOPS”) to satisfy surveillance requirements for non-cooperative intruders adapted to a low-power Unmanned Aircraft (UA). The basic functions of the EO/IR sensor system, e.g., Power On/Off, are controlled by the Remote Pilot in the Control Station (CS). Similarly, the EO/IR sensor system provides its status to the CS during operation. The CS sends commands to the EO/IR sensor system and receives status from it. Tracks generated by the EO/IR sensor system are sent to the DAA system for further processing.

Section 1 of this document provides information needed to understand the rationale for the equipment characteristics and requirements in Section 2. It describes typical equipment operations and operational goals as envisioned by the members of RTCA Inc. Special Committee (SC)-228, and establishes the basis for the standards stated herein. Definitions and assumptions essential to proper understanding of this document are also provided in this section.

Section 2 contains the performance requirements for the equipment. These standards specify the required performance under standard environmental conditions. Also included are recommended bench test procedures necessary to demonstrate equipment compliance with the stated minimum requirements.

Section 3 describes the performance required of installed equipment. Tests for the installed equipment are included when performance cannot be adequately determined through bench testing.

Section 4 contains aircraft operational performance characteristics.

¹ Minimum Operational Performance Standards (MOPS) for Detect and Avoid (DAA) Systems, RTCA DO-365B