



MINIMUM OPERATIONAL PERFORMANCE STANDARD FOR AIR DATA MODULES

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The European Organisation for Civil Aviation Equipment
L'Organisation Européenne pour l'Équipement de l'Aviation Civile

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CHAPTER 1

GENERAL

1.1 PURPOSE AND SCOPE

This minimum operational performance specification is for aircraft Air Data Modules (ADM) that measure static or total pressure.

It is designed to ensure that compliant equipment for static pressure measurement will meet the performance standard required to support Reduced Vertical Separation Minima (RVSM) operation throughout the operational life of the system.

Chapter 1 of this document provides information required to understand the need for the equipment characteristics and tests defined in the remaining chapters. It describes typical equipment applications and operational objectives and is the basis for the performance criteria stated in Chapter 2 to Chapter 4. Definitions and acronyms essential to proper understanding of this document are also provided in Chapter 1.

Chapter 2 contains general design requirements.

Chapter 3 contains the minimum performance specification for the equipment, defining performance under standard operating conditions.

Chapter 4 describes the environmental test conditions and recommended test procedures to provide a laboratory means of determining the overall performance characteristics of the equipment that may be encountered in actual operations.

Chapter 5 describes recommended test procedures for demonstrating compliance with Chapters 3.

Appendices provide additional information as referenced by the chapters.

1.2 APPLICATIONS

Compliance with this minimum operational performance specification by manufacturers, installers and users is recommended as a means of assuring that the equipment will satisfactorily perform its intended function(s) under all conditions normally encountered in routine aircraft operations.

Any regulatory application of this document in whole or in part is the sole responsibility of appropriate government agencies.

As the measured values of equipment performance characteristics may be a function of the method of measurement, standard test conditions and methods of test are recommended in this document.

1.2.1 Mandating and Recommendation Phrases

1.2.1.1 "Shall"

The use of the word "Shall" indicates a mandated criterion; i.e. compliance with the particular procedure or specification is mandatory and no alternative may be applied.

1.2.1.2 "Should"

The use of the word "Should" (and phrases such as "It is recommended that..." etc.) indicate that though the procedure or criterion is regarded as the preferred option, alternative procedures, specifications or criteria may be applied, provided that the manufacturer, installer or tester can provide information or data to adequately support and justify the alternative.

1.3 DESCRIPTION OF SYSTEM

An air data system provides all air data parameters to the aircraft based on pressure, temperature and airflow angles measurement. This MOPS applies to the ADM (Air Data Module), which is part of the air data system. The ADM measures absolute pressure

(total or static pressure) and sends it via a digital link to the user equipment (e.g. ADIRU).

1.4 COMPOSITION OF EQUIPMENT

The ADM consists of the following:

- A unit equipped with an electric connector and a pneumatic fitting
- A pressure cell
- An electronic assembly that performs the following functions:
 - Sensor functions (control of sensor cell, and outputs)
 - Processing functions (acquisition, measurement control, and calculation of the absolute pressure parameter)
 - Digital output
 - Power supply filtering and regulation.

1.5 DEFINITIONS AND ABBREVIATIONS

ADIRU	: Air Data Inertial Reference Unit
ADM	: Air Data Module
ALT	: Altitude
ATP	: Acceptance Test Procedure
BCD	: Binary Code Decimal
BITE	: Built In Test Equipment
BNR	: Binary
°C	: Degree Celsius
DITS	: Digital Information Transfer System
EASA	: European Aviation Safety Agency
EMC	: Electromagnetic Compatibility
EMI	: Electromagnetic Interference
ESD	: Electrostatic Discharge / Electrostatic Sensitive Device
ETSO	: European Technical Standard Order
EUROCAE	: European Organisation for Civil Aviation Equipment
FAA	: Federal Aviation Administration
FAR	: Federal Aviation Requirement
FHA	: Functional Hazard Assessment
FMEA	: Failure Mode and Effects Analysis
hPa	: Hectopascal
I/O	: Input / Output
LRU	: Line Replaceable Unit
MOPS	: Minimum Operational Performance Specification
MTBF	: Mean Time Between Failure
MTBUR	: Mean Time Between Unscheduled Removal
P/N	: Part Number
PSSA	: Preliminary System Safety Assessment
RTCA	: Radio and Technical Commission for Aeronautics
RVSM	: Reduced Vertical Separation Minima

SAE	: SAE International
SAE	: Society of Automotive Engineers
SSA	: System Safety Assessment
SSEC	: Static Source Error Correction
TBC	: To Be Confirmed
TBD	: To Be Defined
TSO	: Technical Standard Order

1.5.1 DEFINITION

Pressure altitude: altitude from pressure measurement referenced to standard pressure (1013,25 hPa / 29.92 in.Hg)

1.6 REFERENCES

ARINC 429	Mark 33 Digital Information Transfer System (DITS)
ARP4754A	Guidelines for Development of Civil Aircraft and Systems
ARP4761	Guidelines and Methods of Conducting the Safety Assessment Process on Civil Airborne Systems
EUROCAE ED-12C	Software Considerations in Airborne Systems and Equipment Certification
EUROCAE ED-14G	Environmental Conditions and Test Procedures for Airborne Equipment
EUROCAE ED-79A	Guidelines for Development of Civil Aircraft and Systems
EUROCAE ED-80	Design Assurance Guidance for Airborne Electronic Hardware
FAR Part 91.180	Operations within airspace designated as Reduced Vertical Separation Minimum airspace.
EASA CS-ACNS	Certification Specifications and Acceptable means of compliance for Airborne Communication Navigation Surveillance.