

European Aviation Safety Agency

European Technical Standard Order

Subject: EXTENDED SQUITTER AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST (ADS-B) AND TRAFFIC INFORMATION SERVICES-BROADCAST (TIS-B) EQUIPMENT OPERATING ON THE RADIO FREQUENCY OF 1090 MEGAHERTZ (MHz)

1 - Applicability

This ETSO provides the requirements which Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Services-Broadcast (TIS-B) Equipment Operating on the Radio Frequency of 1090 Megahertz (MHz) that are designed and manufactured on or after the date of this ETSO must meet in order to be identified with the applicable ETSO marking.

2 - Procedures

2.1 - General

Applicable procedures are detailed in CS-ETSO, Subpart A.

2.2 - Specific

None.

3 - Technical Conditions

3.1 - Basic

3.1.1 - Minimum Performance Standard

Standards set forth in the EUROCAE ED-102A, Minimum Operational Performance Standards for 1090 MHz Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Services-Broadcast (TIS-B), dated December 2009, section 2. EUROCAE ED-102A Corrigendum 1 dated January 2012 is also acceptable.

This ETSO supports two major classes of 1090 MHz ADS-B and TIS-B equipment:

- (a) Class A equipment, consisting of transmit and receive subsystems; and
- (b) Class B equipment, containing a transmit subsystem only.

Class A equipment includes Classes A0, A1, A1S, A2 and A3. This standard requires 1090 MHz airborne Class A equipment to include the capability of receiving both ADS-B and TIS-B messages and delivering both ADS-B and TIS-B reports, as well as transmitting ADS-B messages. A receive-only Class of equipment is allowed.

Class B equipment includes Classes B0, B1, and B1S. Classes B0, B1, and B1S are the same as A0, A1, and A1S, except they do not have receive subsystems. Note that Classes B2 and B3 are not for aircraft use.

3.1.2 - Environmental Standard

See CS-ETSO, Subpart A, paragraph 2.1. The required performance under test conditions is defined in EUROCAE ED-102A, section 2.4.

3.1.3 - Software

See CS-ETSO, Subpart A, paragraph 2.2.

3.1.4 - Airborne Electronic Hardware

See CS-ETSO, Subpart A, paragraph 2.3.

3.2 - Specific

3.2.1 - Failure Condition Classification

See CS-ETSO, Subpart A, paragraph 2.4.

Failure of the function defined in paragraph 3.1.1 of this ETSO resulting in misleading information is a major failure condition.

Failure of the function defined in paragraph 3.1.1 of this ETSO resulting in loss of function is a minor failure condition at equipment level.

Note: The major failure condition for transmission of incorrect ADS-B messages is based on the use of the data by other aircraft or Air Traffic Control for separation services.

Note: COMMISSION IMPLEMENTING REGULATION (EU) No 1207/2011 of 22 November 2011 laying down requirements for the performance and the interoperability of surveillance for the single European sky requires that the probability of discontinuity of the transmit function defined in paragraph 3.1.1 of this ETSO at aircraft level shall be equal to or less than $2 \cdot 10^{-4}$ per flight hour.

4 - Marking

4.1 - General

Marking as detailed in CS-ETSO, Subpart A, paragraph 1.2.

4.2 - Specific

Transmitting and receiving components must be permanently and legibly marked.

The following table explains how to mark components.

EUROCAE ED-102A provides the equipment class in Section 2.1.11, and the receiving equipment type in Section 2.2.6.

<i>If the component can:</i>	<i>Mark it with the:</i>	<i>Sample marking pattern:</i>
Transmit and receive	Equipment class it supports, and Receiving equipment type	Class A0/Type 1
Transmit, but not receive	Equipment class it supports	Class B1, or Class A3-Transmitting only
Receive, but not transmit	Equipment class it supports, and Receiving equipment type	Class A2/Type 2-Receiving only

5 - Availability of Referenced Document

See CS-ETSO, Subpart A, paragraph 3