Selex ES
A Finmeccanica Company

Avionics

1090ES RX
ADS-B/TIS-B AIRBORNE RECEIVER

Selex ES has designed and manufactured the 1090 Extended Squitter Airborne Receiver (herein referred to as 1090ES RX) to enable ADS-B7TIS-B applications and services for civil Air Transport and general/business aviation.

The 1090ES RX is a space efficient, cost-effective solution for the upgrading (retrofit/forward-fit) of aircraft with a full and Air Traffic Situational Awareness (ATSAW) capability according to the current air traffic management regulations. 1090ES RX functions are fully compliant to RTCA DO-260 and 260A MOPS.

1090ES RX IS COMPLIANT TO FAA TSO C166A. It receives Mode S squitters (DF17, DF18 and DF19) and performs message decoding and checking of validity (Basic Configuration). It can be upgraded with full ADS-B/TIS-B processing capability through software download (Enhanced Configuration).

MAIN CHARACTERISTICS

1090ES RX is provided with two completely independent receiving and processing channels for redundancy and diversity operations.

It implements an enhanced reception technique that allows guaranteed high performances in high density areas of air traffic and/or in high electromagnetic pollution environments (signal overlapping conditions).

1090ES RX is a low volume (2 MCU) and light equipment that can be inter faced with standard multifunction displays and/or traffic computer and connected with standard antennas being compatible with existing avionics architecture.

1090ES RX is provided with comprehensive Built-in test capability (PBIT, CBIT, IBIT) for fault detection and isolation and is capable to support graceful degradation with segmentation in stages and automatic reconfiguration.

SYSTEM DESCRIPTION

1090ES RX receives ADS-B/TIS-B messages through the antenna system (Top and Bottom antennas). Enhanced Reception Technique decodes the received messages and data are forwarded to the HMI through standard interfaces as per the existing avionic architectures.

BASIC CONFIGURATION

In its Basic Configuration, 1090ES RX decodes and validates Mode S DF data (raw data) being forwarded to the aircraft processing unit by means of a fast ethernet interface or AFDX avionics bus. This solution allows end users to perform data fusion or ADS-B/TIS-B reports processing according with its own requirements or applications to guarantee maximum flexibility for the customer.

ENHANCED CONFIGURATION

In its Enhanced Configuration, 1090ES RX decodes and validates the received Mode S DF and generated ADS-B/TIS-B reports being forwarded to the aircraft display (e.g. Cockpit display of traffic information) or processing unit by means of standard ARINC 429.

This solution is designed for end users claiming for immediate air traffic situational awareness on the existing multi-function display or electronic flight bag without intervention of additional processing units.

For ease of installation and operation both the Basic and Enhanced 1090ES RX are controlled by HMI's in the cockpits and need only a power supply, top/bottom antennas and transponder blanking line (if any) from the aircraft. The 1090ES RX allows immediate testing and equipment configuration through the support port.

1090ES RX FURTHER CHARACTERISTICS

Diversity

The 1090ES RX can be connected to a top and bottom antenna system and can operate in top only, bottom only, diversity and alternate configurations.

Discrete controls and indications

The 1090ES RX provides the necessary discrete interfaces to the aircraft. It provides double standard suppression input RS422 for protection against 1090MHz transmission of Mode S transponders onboard the aircraft (as per DO-260A). Indications and relevant discretes regarding the equipment status are also provided.

Design and construction

The 1090ES RX is a fully solid-state equipment. It makes extensive use of large-scale programmable components and state-of-the-art technologies to minimise volume and weight while maximising reliability. 1090ES RX structure is modular and includes a powerful BITE (power-up, continuous and initiated BIT).

Cooling

The 1090ES RX does not require forced air or embedded ventilators for cooling.

Software

The 1090ES RX has flexible software architecture and is designed in accordance with RTCA DO-178B level C.

In its Enhanced Configuration, the 1090ES RX may host the ADS-B/TIS-B-Reports software to provide reliable situation awareness of position, surrounding terrain/obstacles and other air traffic to ensure safe air navigation. ADS-B/TIS-B-Reports software development or customization is possible on customer request.

Software update is accomplished through a standard serial interface (serial interface in support port).

Power supply

The power supply accepts 28VDC. Maximum input power is 35W.

TECHNICAL SPECIFICATION

Environmental conditions	RTCA DO-160D
Operating temperature	-55°C to +71°C
Electromagnetic compatibility	RTCA DO-160D
Rx frequency	1090 ±1 MHz
Sensitivity	-79dBm
Skirt bandwidth (selectivity)	i.a.w. DO-260A
Dynamic range from MTL to	–21dBm
Reliability	MTBF > 20000 hours
Maintainability and testability	MTTR: 30 min. at Intermediate Level
Dimensions	ARINC 600 2 MCU
LRU connector	ARINC 600 Size 1
RF connector (each channel)	N-Type
Weight	< 4kg (ARINC 600)
Input power	28VDC, 35 W

For more information please email **infomarketing@selex-es.com**
Selex ES S.p.A. - A Finmeccanica Company
Via Tiburtina, Km 12.400 - 00131 Rome - Italy - Tel: +39 06 41501 - Fax: +39 06 4131133