



MKIIA AND MODE S IFF TRANSPONDER

The M425 equipment is part of a family of MkIIA (MkXII + Mode 5) equipment developed under the NGIFF program in order to provide a state of the art IFF capability. Military identification is available with Mode 4 and Mode 5, supported by an embedded crypto module entirely designed by the company and qualified by NATO Authorities (SECAN).

Compatibility with the latest ATC standards is provided by a Mode S (up to Enhanced Surveillance) that includes an ADSB-OUT capability. Operation in Mode 5 has been successfully verified during bilateral IT-US interoperability trials with the US Navy. Variants of the equipment can be provided for non-NATO applications with a M4-only or National Secure Mode capability.

The equipment has been designed for all applications including avionic (fixed or rotary wings) and ships. The transponder is packed in a rugged single LRU intended for hard mounting, that has the popular for-factor of APX 100. Integration with the platform can be via 1553 Bus, ARINC 429 or RS485; a conventional Control Panel (M910) is available for legacy applications.

The M425 is currently installed on many Italian MoD aircraft, helicopters and ships, and used on a number of NATO platforms. A variant of the equipment, with limited repackaging, is provided for use on the Typhoon aircraft for the needs of the Four Nations.

MAIN FEATURES

- Full MkXII, Mode 5 and Mode S capability
- Embedded crypto certified by SECAN
- Tested for interoperability with US Navy
- Compliant to STANAG 4193, Ed2
- ADSB-OUT capability
- Multiple, self-configuring system interfaces
- Wide operational deployment.

M425

OPERATION

The equipment is fully solid-state and of modular construction to facilitate maintenance. Replies are transmitted on two RF connectors to provide full diversity operation, supported by a receive section that provides two matched channels. Multiple options are available in order to interface the Host platform; all interfaces are available in the same unit and are automatically selected at power-up.

These options are:

- MIL-STD-1553 to interface an avionic bus
- RS 485 to interface an FMS or dedicated Control Panel
- ARINC 429 to interface an FMS.

For integration on legacy platforms that do not include a Data Bus or FMS a Control Panel (M910) has been developed; it has the same footprint of existing MkXII panels in order to facilitate aircraft upgrade. For Mode S operation the equipment is capable of providing Enhanced Surveillance operation with its own interfaces, without the need of an additional ADLP; an Extended Squitter capability is also provided to support ADSB-OUT.

The equipment is also capable of operating in conjunction with a TCAS II (V7) interrogator.

An ACC function is included in Modes 1 and 3 to facilitate pre-flight initialization and reduce User workload (when operating in association with the M910 Control Panel. Extensive BITE is provided, including Power-Up, Continuous and Initiated BIT; test results and diagnostic information are available on the control interface.



CONFIGURATION

A transponder system includes, in addition to the IFF equipment:

- A mounting tray
- Two omni antennas (Top, Bottom) for diversity operation.

For applications where the antennas are not already present in the platform, we can provide a complete configuration with OEM components.

In order to support the system, we can provide a full range of solutions covering:

- Diagnostic SW (on OTS platform) for troubleshooting, calibration and Operational SW loading
- Special Test Equipment
- Automatic Test Equipment.

Operating Modes

- MXA (1, 2, 3/A, C) i.a.w. STANAG 4193 Part I to III; ACC for Modes 1 and 3
- Mode 4 i.a.w. STANAG 4193 Part I to III, embedded or external crypto
- Mode 5 Level 1 and 2, i.a.w. STANAG 4193 Part V and VI; embedded crypto
- Mode S (Enhanced Surveillance) i.a.w. STANAG 4193 Part IV and ICAO10 (Am 77), including Extended Squitter and TCAS II (V7).

TECHNICAL SPECIFICATIONS

System Interface	BUS-1553B
	ARINC 429
	RS 485
Sensitivity	-78dBm 1030MHz SIF, Mode 4
Output Power	27dBW 1090MHz
Reliability	2000h (ARW @ 40°C)
MTBF	>3000h (ARW @ 40°C) i.a.w. MIL-HDBK-217F
Maintainability	Mttr < 10m LRU level
Testability	95% fault isolation 2 SRUs
Environmental conditions	MIL-STD-810E
Operating temperature	-40°C to +71°C (-54°C after warm-up)
Electromagnetic compatibility	MIL-STD-461E
Dimensions	APX 100
Weight	< 6.5Kg (with embedded crypto)
Input power	28VDC i.a.w. MIL-STD-704D
Cooling	No cooling air is required
Mounting	Hard mounted