



MKXIIA & MODE S IFF COMPACT TRANSPONDER

The M428 compact transponder is the ultimate evolution of the existing and well proven family of MkXIIA (MkXII + Mode 5) transponders developed under the NGIFF program. Military identification achieved through Mode 4 and Mode 5, supported by a removable encryption unit (SIT 2010 crypto appliqué) designed entirely in-house and certified by NATO Authorities (SECAN).

Removable encryption device and additional functions (e.g. ADS-B IN and Reverse Mode 5) are other topics that are coming up from most demanding customers.

Compatibility with the latest ATC standards is provided by a Mode S (up to Enhanced Surveillance) that includes an ADS-B Out capability and ADS-B IN growth capability. 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), UAS and ships plus future air to surface identification as Reverse Mode 5 growth capability.

The new transponder is packed into a reduced ½ ATR formfactor for hard mounting, specially designed for small size application as UAS. Integration with the platform can be via MIL-STD-1553 Bus, ARINC 429 or RS485; compatibility with conventional Control Panel (M910) is granted for legacy applications.

TRANSPONDER AND ADS-B (IN) RECEIVER INTEGRATION

A next market demand is the integration of the ADS-B IN functions inside the military transponder. Through the Mode S ADS-B IN function, aircraft will be able to receive surveillance information (about civil tracks) without the need to switch on the radar and the interrogator (if available on the platform). The M428 transponder also provides this capability.

M428

REVERSE MODE 5

Reverse Mode 5 is for Air-to-Surface Identification (ASID) and the relevant standard (STANAG 4722) has been approved and is under ratification.

MAIN FEATURES

- Compact dimensions - 124mm (w) x 84mm (h) x 200mm (d)
- Weight - 3 kg max
- Full MkXIIA, Mode 5 capability (compliant to STANAG 4193 Ed.2 plus agreed CN)
- Easily interchangeable with equipment of previous generation (i.e. M425)
- Removable crypto (SIT 2010) certified by SECAN
- ADS-B OUT capability (compliant to DO-260B)
- ADS-B IN and Reverse Mode 5 growth capability
- Multiple, self-configuring system interfaces
- Compatible with MIDS Data Link.

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
- Ethernet (Growth capability).

For integration on legacy platforms that do not include a Data Bus or FMS, M428 is compatible with M910 Control Panel For Mode S operation the equipment is capable of providing Enhanced Surveillance operation with its own interfaces, without the need of an additional ADLP. The equipment is also capable of operating in conjunction with a TCAS II (V7.1) processor. 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:

- Mounting tray

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

In order to support the system, the company 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.

Technical Specifications

OPERATING MODES

MkXA (1, 2, 3/A, C) i.a.w. STANAG 4193 Part I to III

Mode 4 i.a.w. STANAG 4193 Part I to III, with the removable crypto

Mode 5 Level 1, 2 (upgradable up to 2B) i.a.w. latest Stanag 4193 (Part V and VI) and AIMS 03-1000 issues, with the removable crypto

Mode S (Enhanced Surveillance) i.a.w. STANAG 4193 and ICAO Annex10, Vol. IV (Amd 85) and DO-260B(1), TCAS interface i.a.w. TCAS II (V7.1)

Mode 5 Reverse interrogation (Air to Surface) i.a.w. STANAG 4722, with the removable crypto (Growth capability)

ADS-B IN i.a.w. DO-260B (Growth capability).

DESIGN STANDARDS

Hardware i.a.w. level C of DO-254

Software i.a.w. level C of DO-178C

CRYPTO APPLIQUE

SIT 2010 Crypto appliqué format i.a.w. AIMS 04-900 option B

SECAN Certified

CCI Unclassified when keyed

Weight - 0.5kg

SYSTEM INTERFACE

MIL-STD-1553B

ARINC 429

RS-485

Ethernet (growth capability)

SENSITIVITY

i.a.w. STANAG 4193

OUTPUT POWER

i.a.w. STANAG 4193

RELIABILITY

MTBF > 4000 H @ ARW, 40°C, i.a.w. MIL-HDBK-217F

MAINTAINABILITY

TTR < 10m @ LRU level

TESTABILITY

95% fault isolation @ 2 SRUs

ENVIRONMENTAL CONDITIONS

MIL-STD-810G / DO-160F

OPERATING TEMPERATURE

-54°C to +71°C

Cold startup -40°C

ELECTROMAGNETIC COMPATIBILITY

DO-160F / MIL-STD-461F

DIMENSIONS

½ ATR compact : 124mm (w) x 84mm (h) x 200mm (d)

WEIGHT

< 3.0 Kg (including crypto applique)

INPUT POWER

28 VDC i.a.w. MIL-STD-704E

COOLING

No cooling air is required

MOUNTING

Hard mounted