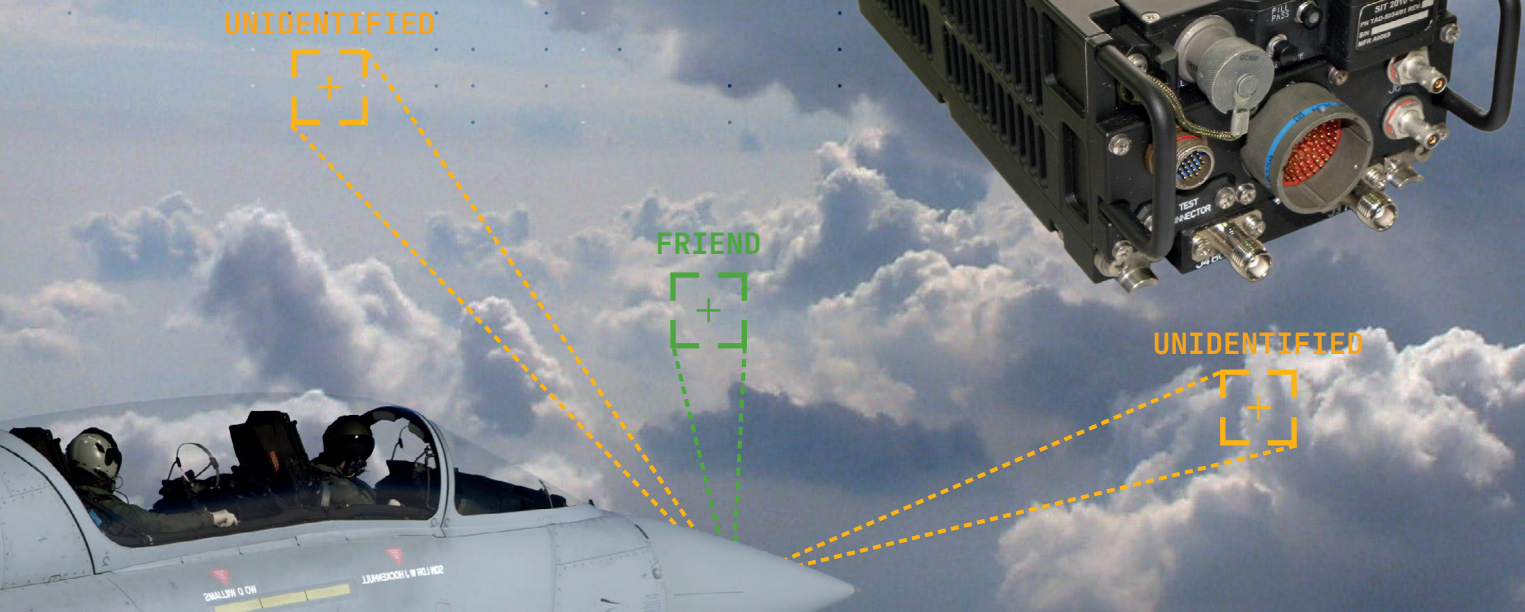


# M428

## 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 inhouse 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 1/2 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.

### 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

## 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.

## 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.

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## 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

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