uAvionix.com/Defense

uAvionix

IFF National Security Systems

DEVELOPED IN PARTNERSHIP WITH:

uAvionix

Low SWaP, No Compromise

uAvionix ZPX systems enable secure Mode 5 platform identification for Unmanned Aircraft Systems (UAS). ZPX transponders and receivers deliver functionality and performance like those on manned aircraft, but at a Size, Weight, and Power (SWaP) for carriage by tactical UAS, even ones weighing only 6 kg (Group 1). Each ZPX transponder has a built-in crypto emulator to support development and testing without the security burdens imposed by using actual cryptos. ZPX transponders, by possessing Mode S/1090ES ADS-B functionality, comply with civil requirements and simplify equipage for military aircraft having to transit civil airspace.

ZPX-A Transponder

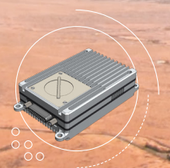
Mode 3/A,C,S
ADS-B Transponder

ZPX-B IFF Transponder

Mode 1,2,3/A,C,S,5 L1/2/2B
Squitter and ADS-B Receiver
Transponder

ZPX-B2 IFF CTR

Mode 1,2,3/A,C,S,5 L1/2/2B ADS-B
Combined Transponder - ADS-B
Mode 5 L2/2B Receiver (CTR)

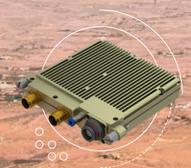


ZPR-B Receiver

Mode 5 L2/2B Squitter and
ADS-B Receiver

ZPX-C IFF Transponder

Mode 1,2,3/A,C,S,5 L1/2/2B
ADS-B Combined Transponder-
ADS-B Mode 5 L2/2B Receiver
(CTR) Diversity Transponder



UNRIVALED SWaP

- Available in LRU and surface mount versions to support any aircraft configuration
- Solutions as light as 50 grams
- Power consumption 3.5W Nominal
- 54-57dBm transmit power (250-500W)
- Crypto Ready

NO COMPROMISE

- Mode 5 AIMS certification to Mk XIIB Levels 1/2/2B
- ICAO Annex 10
- DO-181E Class 1, Level 2
- DO-260B Classes A and B
- Environmental Testing: MIL-STD-810H
- RF Testing: MIL-STD-461G

OPTIONS

- Available in LRU or surface mount
- truFYX TSO-C145e GPS available
- KIV Emulator for rapid integration
- Monopole and Dipole antennas
- National Secure Mode
- AV-30M Control Head and Tactical Traffic Display

DEVELOPED IN PARTNERSHIP WITH

ZPX-A
Mode S Transponder

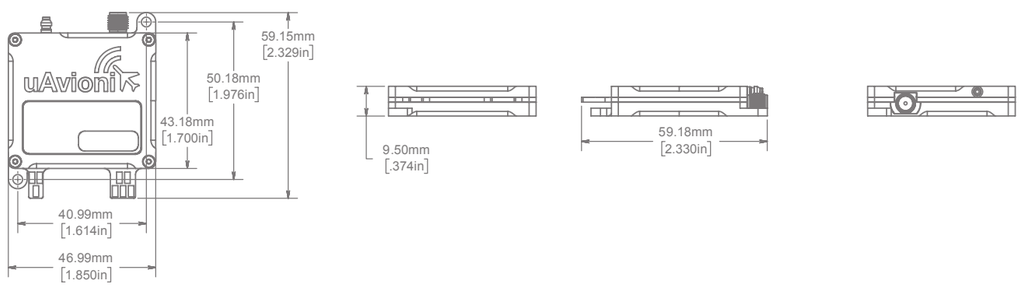
AIMS Certified

TSO C112e C166b C88b Derived

The ZPX-A is a complete system designed to meet the Transponder and Automatic Dependent Surveillance – Broadcast (ADS-B) surveillance requirements of both civilian and military users wanting to operate an Unmanned Aircraft (UA) in controlled airspace. It's derived from the successful uAvionix TSO-certified ping200X Mode S transponder with Design Assurance Level C. Enhancements to support military users include control of X-bit in Mode A replies and individual on/off mode control.

Specification	Value
Input Voltage/Power	11-34 V (3S-8S LiPo) 1.5 W Continuous On/Alt. 4 W Peak (8ms maximum)
Size	47 x 54 x 9 mm
Weight	50 grams
Operating Temp	-45° to 70° C
Transponder	
Modes 3/A, C, S 1030 MHz Rx MTL (sensitivity)	-74 dBm ±3 dB
1090 MHz Tx Power	54 dBm (Nominal)
Altimeter	
Range Accuracy	-1000 to 35,000 ft - per AS 8003 35,000 – 60,000 ft, ±1%

Control Interface	
Baudrate	1200 to 2 Mbps
Protocol	GDL90+
Position Interface	
Baudrate	115,200 bps
Protocol	uAvionix OEM Protocol
Options	
1030/1090 MHz Transponder Antenna	
uAvionix truFYX TSO-C145e Position Source	
Similar unit available with TSO (vs. AIMS) certification, without X-bit control & Mode selection	



DEVELOPED IN PARTNERSHIP WITH

RT-2087/ZPX-B
Mode 5 Transponder

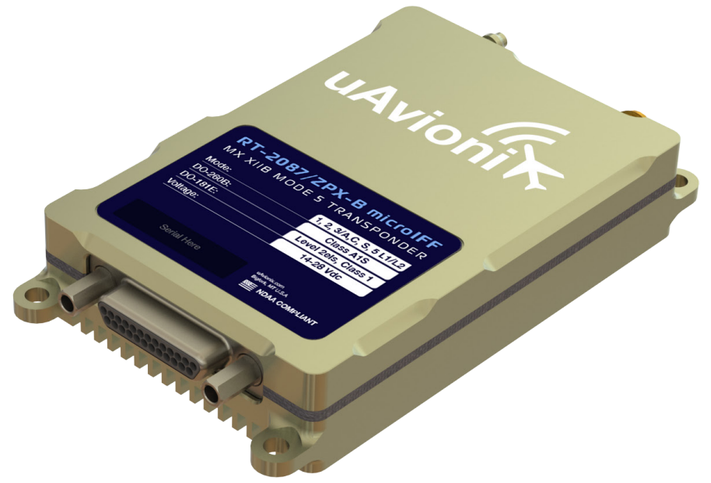
AIMS Mk XIIB Certified

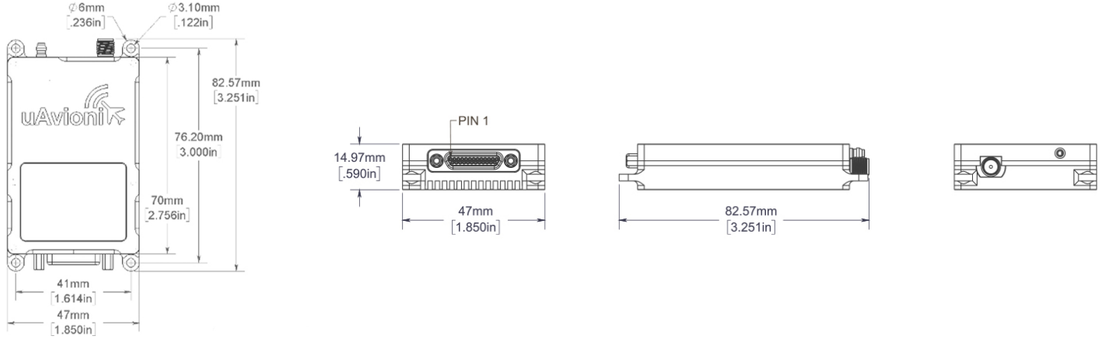
TSO C112e C166b C88b Derived

The RT-2087/ZPX-B (ZPX-B) is a complete, Low-SWaP Combat ID and Air Traffic Control surveillance system designed to satisfy Identification Friend or Foe (IFF) Transponder and ADS-B requirements for UAS operating both in the battlefield and in civilian airspace. When combined with a micro-crypto, small and tactical UAS benefit from interoperability using Mode 5 - the latest IFF encryption standard adopted by NATO and its allies. An internal crypto emulator comes as standard for non-classified development, testing, and NSM operation. ADS-B In is a supported native function providing Detect and Avoid (DAA) functionality. Ethernet control is an available option.

Specification	Value
Input Voltage/Power	11-33 VDC 3.5 W Continuous (NORMAL) 4 W Peak (8ms maximum)
Size	83 x 47 x 15 mm
Weight	68 grams
Operating Temp	-45° to 71° C
Transponder	
Modes 1, 2, 3/A, C, S 1030 MHz MTL (sensitivity)	-76 dBm ±2 dB
Mode 5 MTL (sensitivity)	-80 dBm
1090 MHz Tx Power	250 W (54 dBm)
Altimeter	
Range Accuracy	Up to 35,000 ft - TSO-C88b compliant 35,000 to 60,000 ft, ±1%

Control Interface	
Baudrate	57,600 bps RS-485/-232
Protocol	GDL90+
Position Interface	
Baudrate	115,200 bps RS-232
Protocol	uAvionix OEM Protocol
ADS-B Traffic Interface	
Baudrate	115,200 bps RS-232
Protocol	GDL90
KIV Interface	
AIMS 04-900(A)	Option B (KIV 77 / micro KIV)
Crypto Emulator	Internal
Options	
1030/1090 MHz Transponder Antenna	
uAvionix truFYX TSO-C145e Position Source	
NSM programming for internal crypto emulator	
External crypto emulator for interrogators	





DEVELOPED IN PARTNERSHIP WITH

RT-20XX/ZPX-B2 Mode 5 IFF Combined Transponder – Receiver

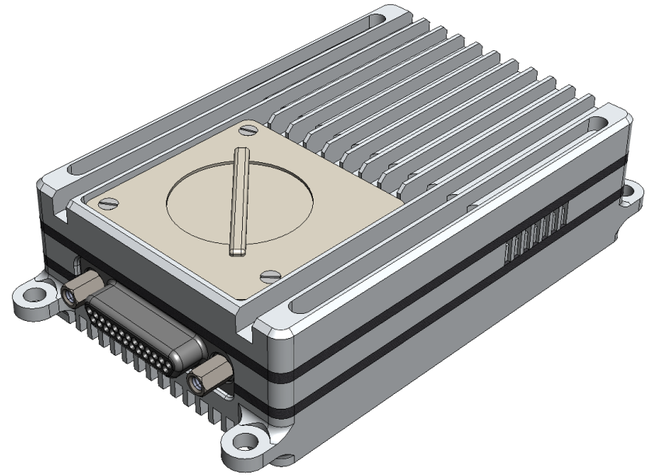
AIMS Mk XIIB — Pending (mid-2023)

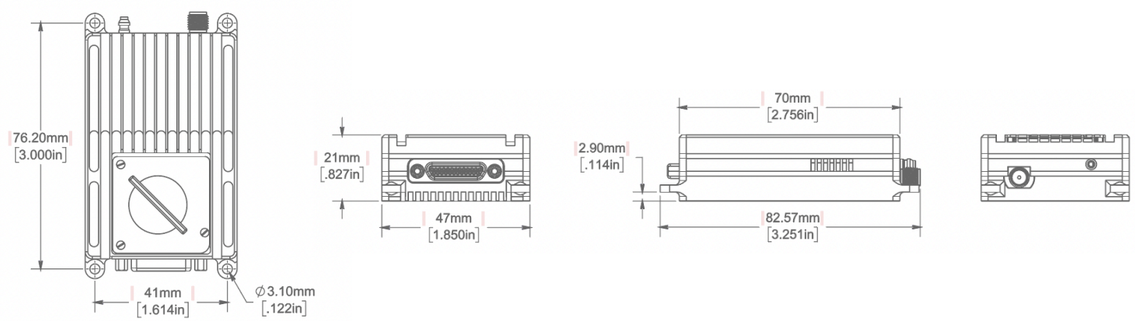
TSO C112e C166b C88b — Derived

The RT-20XX/ZPX-B2 (B2) is a complete, low-SWaP Combat ID system designed to satisfy Identification Friend or Foe (IFF) Transponder and Automatic Dependent Surveillance – Broadcast (ADS-B) requirements for Uncrewed Aircraft Systems (UAS) operating both in battlefield and civilian controlled airspace. When combined with a micro-crypto, UAS as small as Group 1 have available the latest IFF encryption standard used by NATO and its allies. B2 continues the spirit of low SWaP, offering the AIMS-certified RT-2087/ZPX an upgrade path that includes Enhanced Surveillance (EHS), ADS-B IN, and Mode 5 Level 2/2B IN receive capability for Detect and Avoid.

Specification	Value
Input Voltage/Power	11-33 VDC 3.5 W Continuous (STBY) 5.5 W Continuous (NORMAL) 6 W Peak (8ms maximum)
Size	83 x 47 x 21 mm
Weight	91 grams
Operating Temp	-45° to 71° C
Transponder	
SIF & Mode S MTL @ 1030 MHz MTL (sensitivity)	-76 dBm ±2 dB
Mode 5 MTL (sensitivity)	-80 dBm
1090 MHz Tx Power	250 W (54 dBm)
Receiver	
ADS-B Rx MDL (sensitivity)	-79 dBm ±2 dB
Mode 5 MDL L2/2B Rx (sensitivity)	-84 dBm
Altimeter	
Range Accuracy	-1000 to 126,750 ft

Control Interface	
Baudrate	57,600 bps RS-485/-232
Protocol	GDL90+
Position Interface	
Baudrate	115,200 bps RS-232
Protocol	uAvionix OEM Protocol
Mode 5 Level 2/2B and ADS-B IN Traffic	
Baudrate	115,200 bps RS-232
Protocol	GDL90+
KIV Interface	
AIMS 04-900(A)	Option B (KIV 77 / micro KIV)
Options	
1030/1090 MHz Transponder Antenna	
10/100 Ethernet Adapter	
uAvionix truFYX SIL 3 Position Source	
NSM programming for internal crypto emulator	





DEVELOPED IN PARTNERSHIP WITH

RT-2087/ZPX-C
Mode 5 Transponder

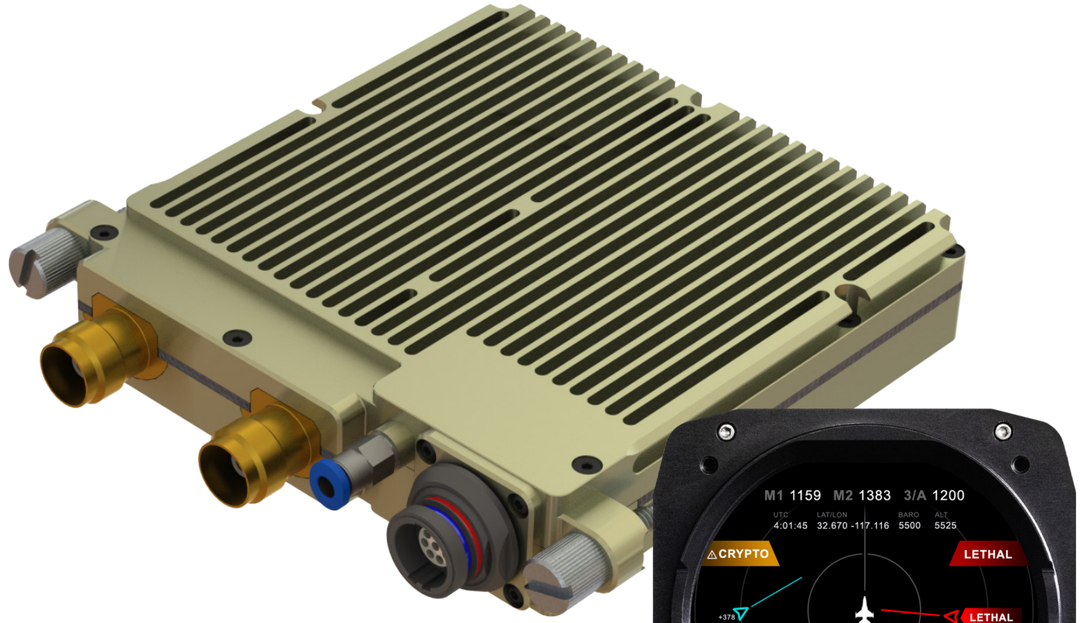
AIMS Mk XIIB — Pending (mid-2023)

TSO C112e C166b C88b — Derived

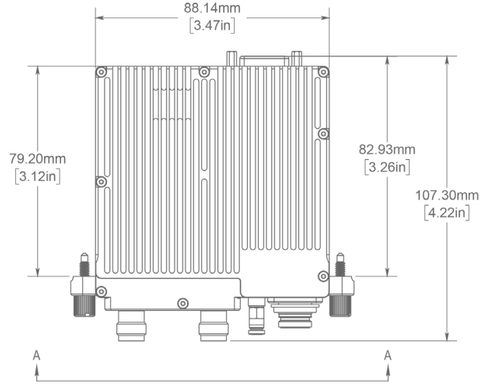
The RT-2087/ZPX-C (ZPX-C) is a complete low-SWaP Combat ID and Air Traffic Control surveillance system designed to satisfy IFF Transponder and ADS-B requirements for manned and unmanned aircraft operating both in the battlefield and in civilian airspace. ZPX-C possesses antenna diversity and twice the transmit power of ZPX-B, making it well suited to larger platforms having fuselages that obscure the antenna pattern and require long antenna cable runs. When combined with an external micro-crypto, Group 2 and larger tactical UAS can take advantage of Mode 5 - the latest IFF encryption standard adopted by NATO and its allies. In addition, an internal crypto emulator comes as standard to enable development and test without the burdens of COMSEC security.

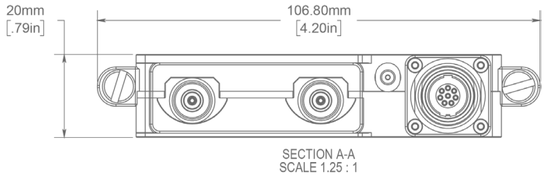
Specification	Value
Input Voltage/Power	22-29 VDC 4 W Continuous (NORMAL) 5 W Peak (8ms maximum)
Size	88 x 79 x 20 mm
Weight	225 grams
Operating Temp	-45° to 71° C
Transponder	
Modes 1, 2, 3/A, C, S 1030 MHz Rx MTL (sensitivity)	-76 dBm ±2 dB
Mode 5 Rx MTL	-80 dBm
1090 MHz Tx Power	500 W (57 dBm)
Receiver	
ADS-B Rx MDL (sensitivity)	-79 dBm ±2 dB
Mode 5 MDL L2/2B Rx (sensitivity)	-84 dBm
Altimeter	
Range Accuracy	-1000 to 126,750 ft

Control Interface	
Baudrate	57,600 bps RS-485/-232
Protocol	GDL90+
Position Interface	
Baudrate	115,200 bps RS-232
Protocol	uAvionix OEM Protocol
Mode 5 Level 2/2B and ADS-B IN Traffic	
Baudrate	115,200 bps RS-232
Protocol	GDL90+
KIV Interface	
AIMS 04-900(A)	Option B (KIV 77 / micro KIV)
Options	
1030/1090 MHz Transponder Antenna	
10/100 Ethernet Adapter	
uAvionix truFYX SIL 3 Position Source	
NSM programming for internal crypto emulator	
AV-30M Control Head and Tactical Traffic Display	



AV-30M CONTROL HEAD AND TACTICAL TRAFFIC DISPLAY (OPTIONAL)





ZPR-B
Mode 5 L2/2B and ADS-B Receiver

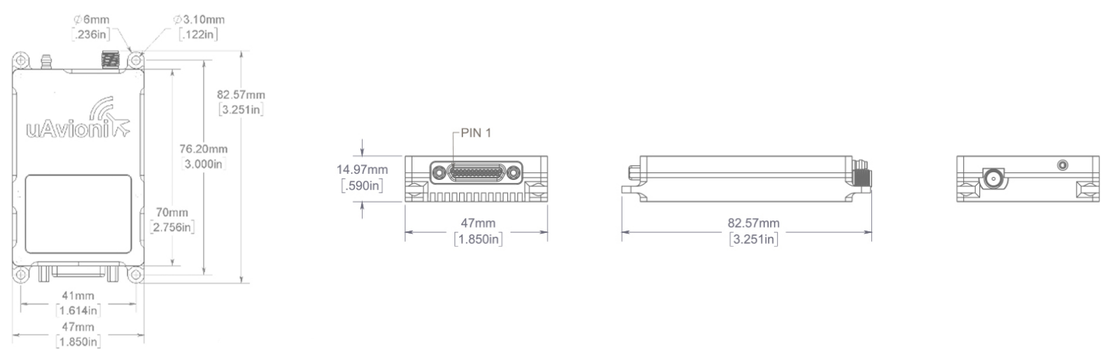
AIMS Mk XIIB — Pending (mid-2023)

TSO C112e C166b C88b — Derived

The uAvionix ZPR-B is a passive Mode 5 L2/2B IFF and civil 1090 MHz ADS-B receiver system which provides situational awareness of civil and military aircraft in national airspaces or on the battlefield. The low Size, Weight, and Power Consumption (SWaP) characteristics make ZPR-B ideal for airborne and shipboard deployments, as well as for temporary or permanent ground-based installation. The system's design is based on hardware and software deployed in the AIMS-certified uAvionix RT-2087/ZPX-B Mode 5 Micro IFF transponder.

Specification	Value
Input Voltage/Power	8-32 VDC 1 W Continuous
Size	83 x 47 x 15 mm
Weight	50 grams
Operating Temp	-45° to 71° C
Receiver	
ADS-B Rx MDL (sensitivity)	-79 dBm ±2 dB
Mode 5 MDL L2/2B Rx (sensitivity)	-84 dBm

Host Interface	
Baudrate	57,600 bps RS-232
Protocol	uAvionix OEM Protocol
Position Interface	
Baudrate	115,200 bps RS-232
Protocol	uAvionix OEM Protocol
Traffic Interface	
Baudrate	115,200 bps RS-232
Protocol	GDL90+
KIV Interface	
AIMS 04-900(A)	Option B (KIV 77 / micro KIV)
Crypto Emulator	Internal
Options	
uAvionix truFYX SIL 3 Position Source	
NSM programming for internal crypto emulator	



ZPX-SK
KIV Emulator

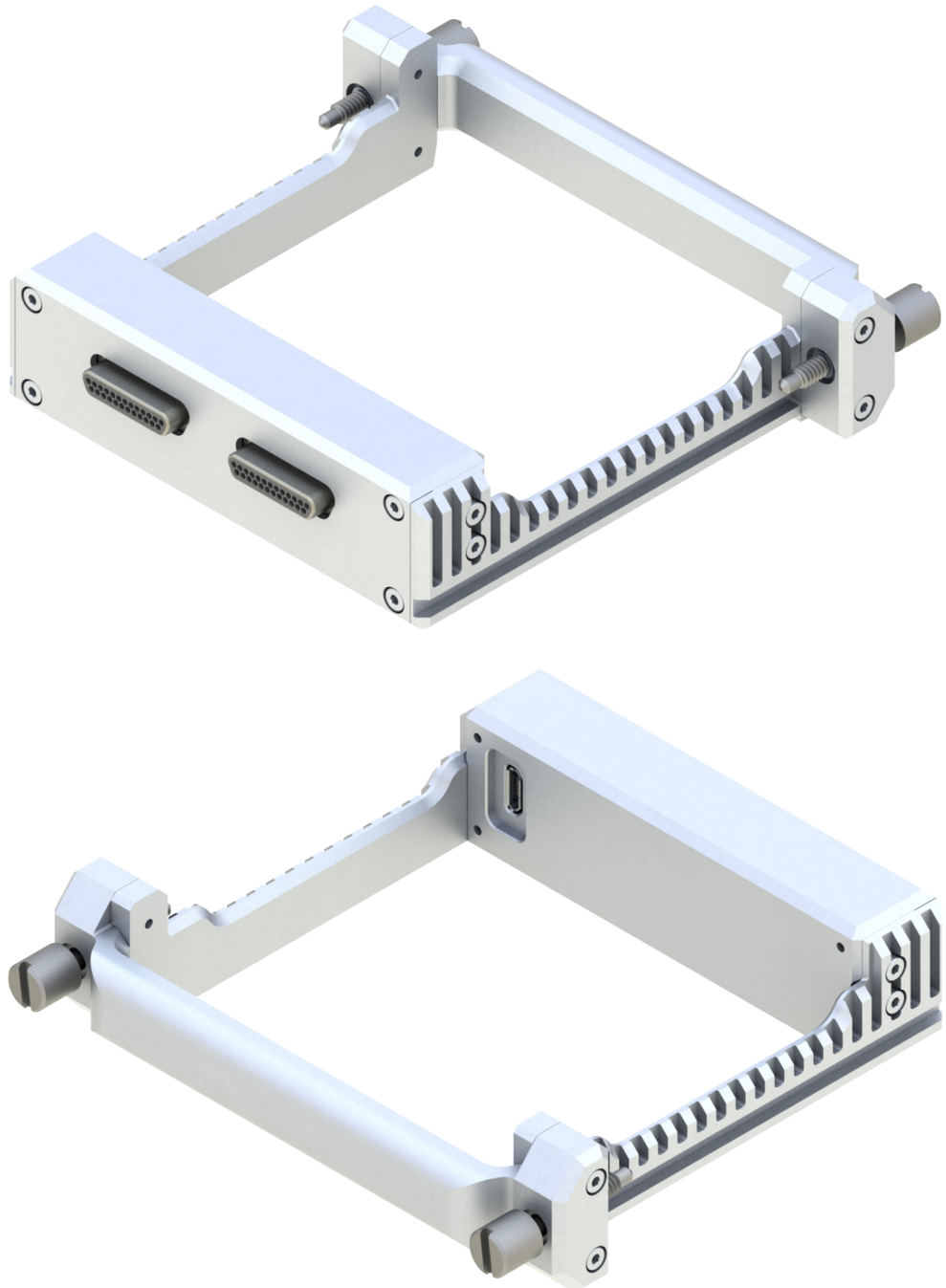
The Mode 5 Crypto Emulator provides users of the uAvionix RT-2087/ZPX family of Micro IFF Mode 5 transponders with the capability to perform ground and airborne Mode 5 functional testing and verification when crypto keys are unavailable or simply not desired. Using an emulator avoids the burdens of dealing with COMSEC security protocols, which often streamlines testiing and field operations.

ZPX-SK supports all essential AIMS 04-900(A) Option B functional interface requirements for Mode 5 Interrogator, Transponder, and Combined Interrogator-Transponder (CIT) applications.

Additionally, use of an emulator makes for a convenient path to AIMS 1102 and 1202 unclassified platform testing, enabling dry-runs of test plans in which operational KIVs or keys aren't readily available.

ZPX-SK is designed for autonomous operation. No external computer or power is required since it's controlled and powered by the transponder with which it's paired. An internal key-fill sequence is initiated after Time-of-Day (TOD) is loaded into the emulator.

In practice, ZPX-SK can be used with Mode 5 Interrogators in unclassified UAS combat or target training. This is readily accomplished by equipping target platforms with uAvionix ZPX Mode 5 transponders configured for operating with their internal crypto emulators.



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