S-PLANE

X-RPU

Remote Piloting Unit

Features

Overview

- High-performance, safety-critical remote piloting computer for manned and unmanned systems
- For autonomous and remote fly-by-wire command and control
- Interface between ground-based and aircraft flight control and automation systems
- Vast array of ports for interface to displays, piloting controls, and hard I/O
- Onboard data encryption and storage
- Network switching
- Software partitioning for 3rd party applications
- For certified safety-critical applications

Applications

- Fixed-wing, rotary-wing and multi-rotor aircraft
- MALE & HALE UAS
- OPS & AAM

Overview

The X-RPU is a safety-critical command and control computer and I/O concentrator that enables reliable remote piloting for manned, unmanned and optionally piloted aircraft systems. It serves as the interface between ground-based operators and the aircraft's flight control and automation system, translating operator inputs into safe automated and/or real-time fly-by-wire operation.

Powered by advanced multi-core ARM or x86 processing architectures, the X-RPU delivers exceptional computing performance. Its secure, certified RTOS, and extensive range of interfaces, enable seamless integration with piloting controls, multifunction displays, and hard I/O interfaces. The RTOS also supports partitioned S-PLANE, customer, and third-party software applications.

The X-RPU is implemented on S-PLANE's rugged X-AVU-R target hardware. Combined with advanced software, it delivers reliable and safe performance in the most demanding situations and environments. Developed in accordance with RTCA DO-254 and DO-178 standards and qualified against rigorous DO-380G environmental test conditions, the X-RPU is for certified safety-critical applications.

The X-RPU seamlessly integrates with S-PLANE's X-Series and NX-Series flight and mission computers, forming part of a certifiable, modular, scalable, and comprehensive safety-critical flight control and automation architecture. This architecture includes carefully crafted system-wide redundancy, while maintaining optimal situational awareness, thereby ensuring uninterrupted and safe command and control for the most challenging projects.

X-RPU

Technical Specifications

High-Performance | Reliable | Certification-ready

INPUT / OUTPUT	
Multiprotocol Serial Port	26x
General Purpose Input/Output ports (4 channels per port)	10x
Gigabit Ethernet	1x
Fast Ethernet	6x
DVI-D Video Outputs	3x
Audio: Single Ended Mono Inputs	4x
Audio: Single Ended Mono Outputs	4x
Audio: Differential Mono Inputs	2x
Audio: Differential Mono Outputs	2x

MECHANICAL AND ELECTRICAL	
Dimensions H x W x D	130 x 214 x 250 mm (incl. connectors)
Mass	4.3 – 5.5 kg (build Variant dependant)
Input Voltage	10 V to 32.2 V
Output Voltage	12 V and 5 V
Max Power Draw	60 W (Build Variant dependant)
Processor options	• Intel Atom x6414RE • i.MX 8 Quad Max
RAM	4 GB ECC RAM
Data Storage	64 GB storage via SATA (Read speed: 530 MB/s, Write speed: 380 MB/s)

ENVIRONMENTAL QUALIFICATION	
Operational Temperature	DO-380, Section 4.5.2 and 4.5.4 -10 °C to +55 °C ambient
Storage Temperature	DO-380, Section 4.5.1 and 4.5.3 -55 °C to +85 °C
Humidity	DO-380, Section 6 Relative Humidity 95% at 50 °C
Operational Shock	DO-380, Section 7.2.2 6 g/11 ms
Operational Vibration	DO-380, Section 8 0.25 g, 5 Hz – 100 Hz 0.91 grms, 5 Hz – 500 Hz

X-KIT Key Equipment

X-CUBE

- The X-CUBE is the core avionics unit of the X-KIT for UAS/OPS conversion
- Function: Flight Control Unit (FCU), Power Distribution Unit (PDU) and Input/Output (I/O) Concentrator
- Support SCP, DFR and TFR internal redundancy with dedicated voting
- Further supports dual X-CUBE external redundancy with failover architecture

X-ADT

- Airborne Data Terminal (ADT)
- Function: Mission Computer, I/O Concentrator, HD-SDI Video Encoder, Data Storage, Ethernet Switch
- Supports S-PLANE's mission software and third-party or custom containerised software
- Interfaces with and manages and controls mission payloads (RADAR, EO/IR, SIGINT, AIS and Direction Finder)

X-RPU

- Remote Piloting Unit (RPU)
- Function: Safety-critical Command & Control Computer, and I/O Concentrator
- Interfaces to Primary Flight Controls (PFC), GCC MFD, Hard I/O (buttons and switches with parallel redundancy) and to data links/tracker

TRACKER+

- Stand-alone GNSS-based antenna tracker for UHF, L-, S- and C-bands
- Function: Long-range Line of Sight Communication (LOSCom) between aircraft and Ground Control Stations (GCS)
- Mesh network enabled

GCC and Paragon

- Ground Control Console (GCC)
- Configured as a Remote Piloting Station, Payload Operating Station, or Engineering Station
- Function: HMI for Paragon, PFD with HUD, and MFD (touch display) for Remote Piloting

Equipment Chains & Products

	AIRBORNE CONTROL	GROUND CONTROL	COMMUNICATION	SIMULATION
NX-FCU	Automation & ISR Mission		Automation & ISR Mission	
X-CUBE	Automation		Automation	
X-ADT	ISR Mission		ISR Mission	
X-RPU		Automation		
GCC		Automation & ISR Mission		
Paragon	Automation & ISR Mission			
X-GDT		ISR Mission	Automation & ISR Mission	
TRACKER+			Automation & ISR Mission	
XSIM-HILS				Automation & ISR Mission
XSIM-Workbench				Automation & ISR Mission
XSIM-Video				Automation & ISR Mission

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