

Video Display Processing Unit (VDPU)

Model Number: THRSLVDP1001

Overview

The **Video Display Processing Unit (VDPU)** is a standard THRSL product designed to manage multiple onboard vision inputs in robotic and defense platforms. It consolidates video signals from multiple analog cameras, provides quad-vision selection, and converts analog PAL signals into Ethernet/IP format for further processing.

With ruggedized construction, MIL-grade connectors, and proven compliance to defense environmental and EMI/EMC standards, the VDPU is suited for both industrial and defense-grade vision systems. It has been **successfully deployed in the UXOR project supplied to the Indian Air Force (IAF)**, serving as a proven solution for mission-critical video processing.

Technical Specifications

Parameter	Specifications
Input Channels	11 (Analog PAL)
Input Interface	Multiple rugged MIL-grade connectors
Output Interface	1 × Ethernet (IP stream), 1 × PAL video output
Video Standard	PAL
Video Compression	H.265
Resolution	Up to 1080p
Control Interface	RS-232
Lock-in Time	< 1 second
Power Supply	12V DC
Connectors	Rugged circular connectors (Amphenol MIL-series)
Protection Standard	IP65

Operating Temperature	-20°C to +55°C
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Connector Mapping

Connector	Function	Interface
C1	Power Input (12V DC)	MIL circular connector
C2	Serial (RS-232 Control)	MIL circular connector
C3	Navigation Camera	PAL input
C4	Day Camera	PAL input
C5	AWJCM Camera	PAL input
C6	Cutting Aid Camera	PAL input
C7	Rear Camera	PAL input
C8	Left Navigation Camera	PAL input
C9	Right Navigation Camera	PAL input
C10	Center Camera	PAL input
C11	Turret Camera	PAL input
C12	Thermal Imager	PAL input
C13	PTU Camera / Auxiliary	PAL input
C14	Video Output (PAL/Ethernet)	Panel output

Key Features

- Aggregates up to **11 PAL camera inputs**
- Supports **single camera or quad-vision selection**
- Converts **PAL analog video to IP/Ethernet**
- Real-time video compression (H.265) up to **1080p**
- Rugged MIL-grade connectors for defense deployment
- Fast channel switching (<1 second lock-in)
- IP65-rated with wide operating temperature range

Applications

- Industrial multi-camera vision processing
- Robotics and defense platform vision integration
- Real-time operator video feeds with quad-view capability
- UXOR vision system integration (**field-proven in IAF deployment**)

Compliance

Environmental Qualification (JSS 55555)

Sr. No.	Standard	Compliance Details
1	Vibration (Test 28)	Ground equipment in tracked vehicle, 5–13 Hz: ± 6 mm, 13–500 Hz: ± 40 m/s ² , 1 hr cumulative (all axes)
2	Temperature Cycling	-20°C to +55°C, dwell time 60 min, 14 cycles
3	Random Vibration	Same as above (all three axes)
4	High Temperature (Test 17)	55°C $\pm$ 3°C for 16 hrs, followed by storage at 75°C $\pm$ 3°C for 24 hrs
5	Low Temperature (Test 20)	-10°C $\pm$ 3°C for 16 hrs
6	Tropical Exposure (Test 27)	14 cycles from 20°C to 45°C (RH 95%)
7	Bump (Test 5)	4000 bumps @10g, 2–3 bumps/sec, pulse width 16 ms
8	Rain (Test 12)	4 shower heads @45° directed at corners
9	Corrosion – Salt Fog (Test 9)	Enclosure, PCBs, painted parts
10	Corrosion – Acid (Test 7)	Enclosure, PCBs, painted parts
11	Dust (Test 14)	Equipment in unpacked, switched-off condition
12	Mould Growth (Test 21)	On PCBs, insulation, rubber, gaskets, plastics, polymers, textiles

EMI/EMC Compliance (Defense Standards)

Sr. No.	Standard	Compliance Details
1	CE 102	Conducted emissions, power leads, 10 kHz to 10 MHz
2	CS 101	Conducted susceptibility, power leads, 30 Hz to 150 kHz
3	CS 114	Conducted susceptibility, bulk cable injection, 10 kHz to 200 MHz
4	CS 115	Conducted susceptibility, bulk cable injection, impulse excitation
5	CS 116	Conducted susceptibility, damped sinusoidal transients, 10 kHz to 100 MHz
6	RE 102	Radiated emissions, Electric Field
7	RS 103	Radiated susceptibility, Electric Field, 2 MHz to 40 GHz
8	PBESD	Personnel Borne Electrostatic Discharge



Note

The **Video Display Processing Unit (VDPU)** is part of **THRSL's standard technology suite**, designed for **plug-and-play deployment** across industries. Its proven application in the **UXOR project for the Indian Air Force (IAF)** demonstrates its readiness for mission-critical defense and industrial environments.

Custom variants can be offered to support different video standards, resolutions, and integration requirements.