# UGV Main Controller

**Model Number:** THRSLMC1001

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## Overview

The UGV Main Controller is a high-performance embedded control unit for robotics, automation, and defense. It unifies sensor processing, actuator control, and multi-protocol communications in a compact, rugged platform. Proven in the UXOR project supplied to the Indian Air Force (IAF), it delivers reliable field performance under demanding conditions.

## Technical Specifications

| Parameter | Specifications |
|---|---|
| Device Name | UGV Main Controller |
| Model Number | THRSLMC1001 |
| Processor | Cortex-M3 MCU (LPC1769) |
| Communication Interfaces | CAN, RS232, Ethernet, USB |
| Power Supply | 12/24V DC typical (16–50V DC range) |
| Operating Temperature | −10°C to +55°C |
| Storage Temperature | −20°C to +70°C |
| Dimensions | 495 × 115 × 48 mm (W × H × D) |
| Handle-to-handle (C–C) | 423 mm |
| Weight | (Insert actual weight) |

## Key Features

- Multi-protocol comms: CAN, RS232, Ethernet, USB
- 12× GPOs (10× 24V @ 2.5A, 2× 12V @ 2.5A) with low ON-resistance MOSFETs
- On-board status LEDs and ISP download facility
- MIL-grade connectors; rugged enclosure for vehicle integration
- Field-proven on UXOR platforms (IAF)

## Connector Details

| Connector | Label | Function |
|---|---|---|
| C1 | Power Input | 12/24V DC main supply |
| C2 | Vision | Camera/vision subsystem |
| C3 | Vehicle | Vehicle control signals |
| C4 | Payload | Payload subsystem |
| C5 | Communication | RS232 / CAN / Ethernet |
| C6 | Manipulator | Robotic arm/manipulator |
| C7 | Rear Expansion | Auxiliary connectivity |
| C8 | Reserved | Future use |
| C9–C14 | I/O Ports | User-configurable GPOs |
| Panel Block | Fuse & Indicators | Status LEDs, fuse bay, label plate |

# Applications

- Unmanned Ground Vehicles (UGVs)
- Autonomous mobile robots (AMRs)
- Defense and industrial automation platforms
- UXOR robotic systems (field-proven in IAF deployment)

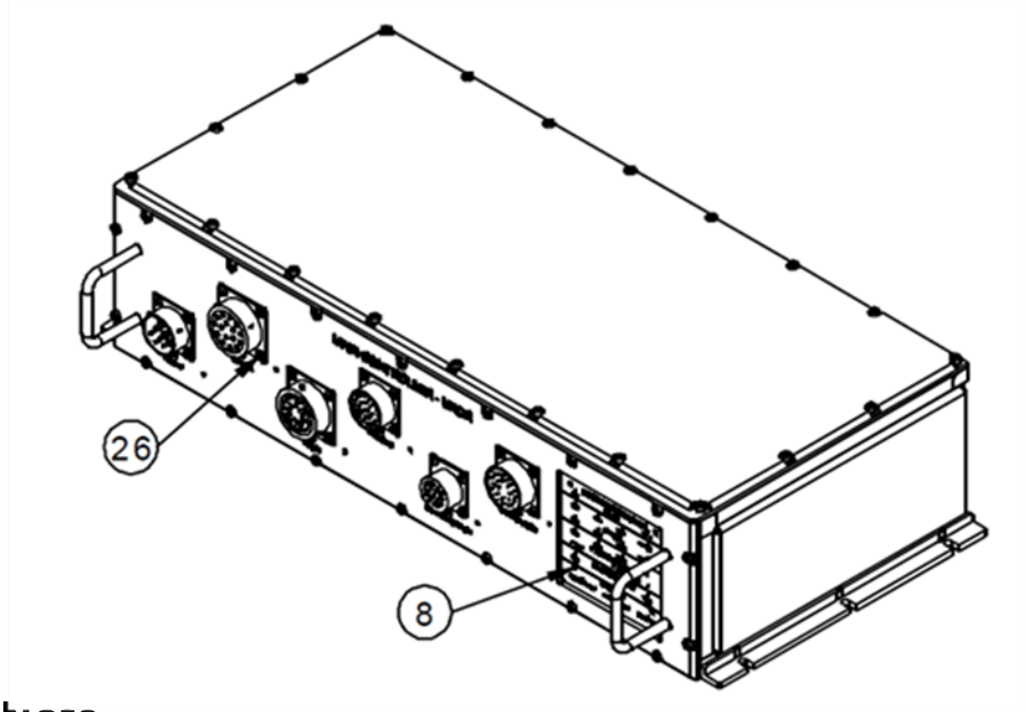
# Compliance

### 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/s²; 1 hr cumulative (all axes) |
| 2 | Temperature Cycling | −20°C to +55°C; 60 min dwell; 14 cycles |
| 3 | Random Vibration | Same profile as above (all three axes) |
| 4 | High Temperature (Test 17) | 55°C ±3°C for 16 hrs, then storage 75°C ±3°C for 24 hrs |
| 5 | Low Temperature (Test 20) | −10°C ±3°C for 16 hrs |
| 6 | Tropical Exposure (Test 27) | 14 cycles, 20°C→45°C at RH 95% |
| 7 | Bump (Test 5) | 4000 bumps @10 g; 2–3 bumps/sec; 16 ms pulse |
| 8 | Rain (Test 12) | 4 shower heads at 45° to the corners |
| 9 | Corrosion – Salt Fog (Test 9) | Enclosure, PCBs, painted parts |
| 10 | Corrosion – Acid (Test 7) | Enclosure, PCBs, painted parts |
| 11 | Dust (Test 14) | 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–10 MHz |
| 2 | CS 101 | Conducted susceptibility, power leads, 30 Hz–150 kHz |
| 3 | CS 114 | Conducted susceptibility, bulk cable injection, 10 kHz–200 MHz |
| 4 | CS 115 | Conducted susceptibility, impulse excitation |
| 5 | CS 116 | Conducted susceptibility, damped sinusoidal transients, 10 kHz–100 MHz |
| 6 | RE 102 | Radiated emissions, electric field |
| 7 | RS 103 | Radiated susceptibility, electric field, 2 MHz–40 GHz |
| 8 | PBESD | Personnel-borne electrostatic discharge |




## Note

The UGV Main Controller is part of THRSL's standard technology suite, designed for plug-and-play deployment across industries. Its proven use in the UXOR project for the Indian Air Force (IAF) demonstrates dependability in mission-critical environments. Custom configurations can support extended I/O, alternate processors, or specific integration needs.